4.7 GREENHOUSE GAS EMISSIONS AND ENERGY

4.7.1 INTRODUCTION

The Greenhouse Gas Emissions and Energy section of the EIR describes the effects of the proposed project on global climate change and energy resources. The section includes a discussion of existing conditions, applicable regulations, and direct and indirect construction and operational greenhouse gas emissions. A discussion of energy usage and conservation is also included in the section, consistent with Appendix F of the CEQA Guidelines. Impacts of project emissions and energy usage on both the local and regional scale, and mitigation measures to reduce or eliminate any identified significant impacts are addressed as well. The impact analysis, and greenhouse gas emissions and energy calculations for the proposed project, herein, do not account for the range of potential sustainability features that may be incorporated into future MRIC or Mace Triangle buildings. Therefore, this section presents a conservative, worst-case analysis.

The Greenhouse Gas Emissions and Energy section is primarily based on information, guidance, and analysis protocol provided by the Yolo-Solano Air Quality Management District (YSAQMD). In addition, the section utilizes information obtained from the *Davis General Plan*[1] and associated EIR,[2] the *Davis Climate Action and Adaptation Plan*,[3] and the California Emissions Estimator Model (CalEEMod) version 2013.2.2.[4]

4.7.2 EXISTING ENVIRONMENTAL SETTING

The following information provides an overview of the existing environmental setting in relation to global climate change and energy resources within the proposed project area.

Greenhouse Gases

Greenhouse gases (GHGs) are gases that absorb and emit radiation within the thermal infrared range, trapping heat in the Earth's atmosphere. The increase in atmospheric concentrations of GHG has resulted in more heat being held within the atmosphere, which is the accepted explanation for global climate change. Some GHGs occur naturally and are emitted into the atmosphere through both natural processes and human activities. Other GHGs are created and emitted solely through human activities. The principal GHGs that enter the atmosphere due to

1 City of Davis. *Davis General Plan.* Adopted May 2001. Amended through January 2007.
2 City of Davis. *Program EIR for the City of Davis General Plan Update and Project EIR for Establishment of a New Junior High School*. January 2000.
3 City of Davis. *Davis Climate Action and Adaptation Plan*. June 1, 2010.
4 ENVIRON International Corporation and the California Air Districts. *California Emissions Estimator Model User's Guide Version 2013.2*. July 2013.

human activities are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and fluorinated carbons. Other common GHGs include water vapor, ozone, and aerosols.

Emissions of GHGs contributing to global climate change are attributable in part to human activities associated with industrial/manufacturing, utility, transportation, residential, and agricultural sectors. The primary GHG emitted by human activities is CO_2, with the next largest components being CH_4 and N_2O. The primary sources of CH_4 emissions include domestic livestock sources, decomposition of wastes in landfills, releases from natural gas systems, coal mine seepage, and manure management. The main human activities producing N_2O are agricultural soil management, fuel combustion in motor vehicles, nitric acid production, manure management, and stationary fuel combustion. Emissions of GHG by economic sector indicate that energy-related activities account for the majority of U.S. emissions. Electricity generation is the largest single-source, and transportation is the second largest source, followed by industrial activities. The agricultural, commercial, and residential sectors account for the remainder of emissions.[5] Attainment concentration standards for GHGs have not been established by the federal or State government. Emissions of GHG are partially offset by uptake of carbon and sequestration in forests, trees in urban areas, agricultural soils, and landfilled yard trimmings and food scraps. Additional emission reduction measures for GHG could include, but are not limited to, compliance with local, State, or federal plans or strategies for GHG reductions, on-site and off-site mitigation recommendations from the Office of the Attorney General, and project design features.

Global Warming Potential

Global Warming Potential (GWP) is one type of simplified index (based upon radiative properties) that can be used to estimate the potential future impacts of emissions of various gases. According to the U.S. Environmental Protection Agency (USEPA), the global warming potential of a gas, or aerosol, to trap heat in the atmosphere is the "cumulative radiative forcing effects of a gas over a specified time horizon resulting from the emission of a unit mass of gas relative to a reference gas." The reference gas for comparison is CO_2. GWP is based on a number of factors, including the heat-absorbing ability of each gas relative to that of CO_2, as well as the decay rate of each gas relative to that of CO_2. Each gas's GWP is determined by comparing the radiative forcing associated with emissions of that gas versus the radiative forcing associated with emissions of the same mass of CO_2, for which the GWP is set at one. Methane gas, for example, is estimated by the USEPA to have a comparative global warming potential 21 times greater than that of CO_2, as shown in Table 4.7-1.

As shown in the table, at the extreme end of the scale, sulfur hexafluoride is estimated to have a comparative GWP 23,900 times that of CO_2. The "specified time horizon" is related to the atmospheric lifetimes of such GHGs, which are estimated by the USEPA to vary from 50 to 200 years for CO_2, to 50,000 years for tetrafluoromethane. Longer atmospheric lifetimes allow GHG to buildup in the atmosphere; therefore, longer lifetimes correlate with the global warming

[5] U.S. Environmental Protection Agency. *Sources of Greenhouse Gas Emissions*. April 17, 2014. Available at: http://epa.gov/climatechange/ghgemissions/sources/industry.html. Accessed March 10, 2015.

potential of a gas. The common indicator for GHG is expressed in terms of metric tons of CO_2 equivalents ($MTCO_2e$).

Table 4.7-1
GWPs and Atmospheric Lifetimes of Select GHGs

Gas	Atmospheric Lifetime (years)	Global Warming Potential (100 year time horizon)
Carbon Dioxide (CO_2)	50-200	1
Methane (CH_4)	12±3	21
Nitrous Oxide (N_2O)	120	310
HFC-23	264	11,700
HFC-134a	14.6	1,300
HFC-152a	1.5	140
PFC: Tetrafluoromethane (CF_4)	50,000	6,500
PFC: Hexafluoroethane (C_2F_6)	10,000	9,200
Sulfur Hexafluoride (SF_6)	3,200	23,900

Source: U.S. Environmental Protection Agency, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2011, February 2013.

Analysis of GHGs and Global Climate Change

Analysis of global climate change presents the challenge of analyzing the relationship between local and global activities. GHGs are not generally thought of as traditional air pollutants because GHGs, and their impacts, are global in nature, while air pollutants affect the health of people and other living things at ground level, in the general region of their release to the atmosphere. Accordingly, the issue of global climate change is different from any other areas of air quality impact analysis. A global climate change analysis must be conducted on a global level, rather than the typical local or regional setting, and requires consideration of not only emissions from the project under consideration, but also the extent of the displacement, translocation, and redistribution of emissions.

In the usual context, where air quality is linked to a particular location or area, considering the creation of new emissions in that specific area to be an environmental impact whether or not the emissions are truly "new" emissions to the overall globe is appropriate. In fact, the approval of a new developmental plan or project does not necessarily create new automobile drivers – the primary source of a land use project's emissions. Rather, a new land use project may simply be redistributing existing mobile emissions. For example, future workers at the project site could already be working within the City or region and would be moving from other parts of the region to the project site, which could result in a shorter or longer associated vehicle trip, but would not introduce a new vehicle trip to the overall region. Accordingly, the use of models that measure overall emissions increases without accounting for existing emissions would substantially overstate the impact of the development project on global warming. Thus, an accurate analysis of GHG emissions substantially differs from other air quality impacts, where the "addition" of redistributed emissions to a new locale can make a substantial difference to overall air quality in that area.

Uncertainties exist as to exactly what the climate changes will be in various local areas of the Earth. According to the Intergovernmental Panel on Climate Change's Working Group II Report, *Climate Change 2007: Impacts, Adaptation and Vulnerability*,[6] climate change impacts to North America may include:

- Diminishing snowpack;
- Increasing evaporation;
- Exacerbate shoreline erosion;
- Exacerbate inundation from sea level rising;
- Increased risk and frequency of wildfire;
- Increased risk of insect outbreaks;
- Increased experiences of heat waves; and
- Rearrangement of ecosystems as species and ecosystems shift northward and to higher elevations.

For California, climate change has the potential to cause/exacerbate the following environmental impacts:

- Air Pollution - Increased frequency, duration, and intensity of conditions conducive to air pollution formation (particularly ozone);
- Water Resources - Reduced precipitation, changes to precipitation and runoff patterns, reduced snowfall (precipitation occurring as rain instead of snow), earlier snowmelt, decreased snowpack, and increased agricultural demand for water;
- Agricultural Impacts - Increased growing season and increased growth rates of weeds, insect pests and pathogens;
- Coastal Impacts - Inundation by sea level rise; and
- Forests and Natural Landscapes Impacts - Increased incidents and severity of wildfire events and expansion of the range and increased frequency of pest outbreaks.

Existing GHG Emissions

The MRIC site is currently used for agricultural purposes. The Mace Triangle site currently consists of an existing water storage tank, Park-and-Ride lot, Ikedas Market, fallow agricultural land, and vacant land. Sunflowers are currently being grown on the MRIC site, and prior to this, tomato has been the primary crop. The tomato farming operations have consisted of the following: spray operations in the beginning of the year; opening of tomato beds, incorporation of herbicides, and transplanting of tomato plants in March; starting pump for drip irrigation and spaying for aphids and worms in April; hoeing of weeds in May; high cropping the tomato beds in June; training tomato vines, high cropping tomato beds, discing the headlands in July; and harvesting, working ground, and shaping tomato beds in August.

[6] Intergovernmental Panel on Climate Change. *Climate Change 2007: Impacts, Adaptation, and Vulnerability.* 2007.

Based on these operations, the existing associated GHG emissions were estimated using CalEEMod. According to the CalEEMod results, approximately 1,747.45 $MTCO_2e$ per year ($MTCO_2e$/yr) are generated by existing operations on the project site. However, the on-site tomato crops allow for carbon sequestration. Based on the amount of GHG emissions sequestered per acre by tomato crops (i.e., 6.98 $MTCO_2e$/yr, per acre),[7] the existing on-site crops are estimated to be sequestering approximately 1,479.76 $MTCO_2e$/yr of GHG emissions. Accordingly, the overall GHG emissions associated with the existing site conditions would be a value of approximately 267.69 $MTCO_2e$/yr.

Energy

In order to ensure energy implications are considered in project decisions, Appendix F of CEQA Guidelines requires a discussion of the potential energy impacts of projects, with particular emphasis on avoiding or reducing inefficient, wasteful, and unnecessary consumption of energy. The main forms of available energy supply are electricity, natural gas, and oil. A discussion regarding the existing supplies in the State and locally related to each form of energy supply is provided below, as well as a discussion of demand and usage patterns in the project area.

Electricity

Currently PG&E provides energy (electricity and gas) to the City of Davis. PG&E's current energy supplies consist of 28 percent natural gas, 22 percent nuclear, 18 percent market purchases, 10 percent large hydroelectric facilities, and 22 percent renewables. More than half of PG&E's power is from clean or no emissions sources such as nuclear, large hydroelectric facilities, and renewables. As a result, PG&E is ranked one of the three cleanest large power producers in the country.[8]

It should be noted that the City of Davis is currently researching the energy service options available to the City, including consideration of the possible formation of a municipally-owned utility within the City, which would allow for more control over electric service options, energy portfolio allocations, and decision-making authorities.[9]

The proposed project site is located adjacent to other existing development to the south, east, and north that are currently supplied electricity and gas services via PG&E. The project site would connect to existing PG&E utility lines in the project vicinity.

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[7] Intergovernmental Panel on Climate Change. *2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 4, Agriculture, Forestry and Other Land Use*. Table8.4. 2006.

[8] Pacific Gas & Electric Company, Tim Fitzpatrick, Chief Communications Officer. *PG&E Cuts Carbon Emissions with Clean Energy*. January 30, 2015. Available at: http://www.pgecurrents.com/2015/01/30/pge-cuts-carbon-emissions-with-clean-energy/. Accessed March 10, 2015.

[9] City of Davis. Staff Report: "*Explication of Resolution No. 13-169*". March 25, 2014.

Existing Electricity Demand and Use Patterns

In 2013, PG&E reported total electricity consumption within its planning area of 109,460.87 million kilowatt-hours (kWh), or gigawatt-hours (GWh), with the majority of usage associated with commercial and residential land uses. Similarly, within Yolo County, non-residential land uses consumed 1,183.91 GWh of electricity in 2013 compared to the total electricity consumed of 1700.24 GWh. However, over the past five years, the County's overall electricity consumption has fluctuated, with a peak occurring in 2009, and an overall very slight decrease in consumption from 2008 levels by 2013.[10] The City of Davis, as of 2010, consumed approximately 273.388 GWh of electricity, with residential uses consuming the most (147.513 GWh) followed by commercial and industrial uses (101.271 GWh).[11] The existing farming operations on the project site do not involve electricity usage at the site.

The CEC has prepared the *California Energy Demand 2014-2024 Final Forecast*,[12] which describes 10-year forecasts for electricity and end-user natural gas in California and for major utility planning areas within the State, including the PG&E planning area. The report is intended to improve the measurement of energy efficiency, distributed generation, and other demand-side impacts within the energy demand forecast. Three growth scenarios were included in the report in order to capture a reasonable range of demand outcomes over the 10-year period. The high demand scenario incorporates relatively high economic/demographic growth, relatively low electricity rates, and relatively low committed efficiency program, self-generation, and climate change impacts. On the contrary, the low demand scenario includes lower economic/demographic growth, higher assumed rates, and higher committed efficiency program and self-generation impacts. The mid-demand scenario uses assumptions at levels between the high and low scenarios.

According to the *California Energy Demand 2014-2024 Final Forecast*, within the PG&E planning area, electricity consumption is projected to reach 121,804 GWh in the low demand scenario and 132,510 GWh in the high demand scenario by 2024. The Peak electricity demand is projected to reach between 25,578 and 28,298 megawatts (MW) by 2024. Both consumption and peak demand over the forecast period is projected to grow the fastest inland within Climate Zones 2 and 3 (the proposed project site is located in Climate Zone 2). Self-generation is expected to reduce peak demand by 2,000 MW in the mid-demand scenario by 2024, more than 1,000 MW of which would be due to photovoltaic systems. Electric vehicles are expected to increase electricity consumption by roughly 2,000 GWh in the mid-demand scenario by 2024. Additional achievable energy efficiency scenarios for the PG&E service territory range from 5,332 to 14,924 GWh of energy savings and from 1,398 to 3,964 MW of peak demand savings.[13]

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[10] California Energy Commission, Energy Consumption Data Management System. *California Energy Consumption Database*. Available at: http://ecdms.energy.ca.gov/. Accessed March 10, 2015.

[11] City of Davis. *2012 Community Greenhouse Gas Emissions Inventory Update*. 2012.

[12] California Energy Commission. *California Energy Demand 2014-2024 Final Forecast, Volume 1: Statewide Electricity Demand, End-User Natural Gas Demand, and Energy Efficiency*. January 2014.

[13] California Energy Commission. *California Energy Demand 2014-2024 Final Forecast, Volume 2: Electricity Demand by Utility Planning Area*. January 2014.

Natural Gas

Currently PG&E provides energy (electricity and gas) to the City of Davis. The proposed project would connect to existing PG&E utility lines in the project vicinity. The California Public Utilities Commission (CPUC) regulates natural gas utility service, including rates, the transmission and distribution pipeline system, storage, procurement, metering, and billing. Natural gas transported via the interstate pipelines, as well as some of the California-produced natural gas, is delivered into the PG&E and SoCalGas intrastate natural gas transmission pipeline systems, which is then delivered into the local transmission and distribution pipeline systems or to natural gas storage fields. PG&E operates several natural gas storage fields, which help meet peak seasonal natural gas demand and allow California natural gas customers to secure natural gas supplies more efficiently.[14]

Existing Natural Gas Demand and Use Patterns

According to the CEC's *2012 Natural Gas Market Trends* report,[15] policy developments in renewable energy, GHG, and other environmental initiatives are increasing natural gas demand, as natural gas is the cleanest of the fossil fuels. Environmental policies are driving a shift from coal to natural gas for electric generation. Demand for natural gas falls mainly into the following four sectors: residential; commercial; industrial; and electric power generation. Small amounts of natural gas are used for vehicle use and for production and transmission of natural gas to consumers. Factors that affect California demand for natural gas include the following: recent demand for natural gas, population, income, natural gas price, cold/hot weather, coal cost, and availability of hydroelectric generation. The trend of rising population growth in California and migration of residents to hotter regions such as in the Central Valley and Inland Empire, where temperatures are colder in the winter and hotter in the summer could cause a trend in the increase in natural gas demand to heat homes and businesses in the winter and natural gas-fired electricity generation to support air conditioning load in the summer.

Within Yolo County, natural gas consumption has only minimally fluctuated over the past five years, but has remained relatively steady. Non-residential uses within Yolo County consumed 33.43 million (MM) therms of natural gas in 2013 out of a total consumption of 60.36 MM therms for the County.[16] The City of Davis, as of 2010, consumed approximately 12.24 MM therms of natural gas, with residential uses consuming the most (9.23 MM therms) followed by commercial and industrial uses (2.88 MM therms).[17] Natural gas is not currently used for the on-site agricultural operations.

Similarly, according to the *California Energy Demand 2014-2024 Final Forecast*, within the entire PG&E planning area, natural gas consumption is projected to only slightly fluctuate from

[14] California Public Utilities Commission. *Natural Gas and California*. September 7, 2013. Available at: http://www.cpuc.ca.gov/puc/energy/gas/natgasandca.htm. Accessed March 10, 2015.
[15] California Energy Commission. *2012 Natural Gas Market Trends*. May 2012.
[16] California Energy Commission, Energy Consumption Data Management System. *California Energy Consumption Database*. Available at: http://ecdms.energy.ca.gov/. Accessed March 10, 2015.
[17] City of Davis. *2012 Community Greenhouse Gas Emissions Inventory Update*. 2012.

current conditions to 2024. By 2024, under the low and high demand scenarios, the PG&E planning area is projected to reach an annual consumption of 4,611 and 4,786 MM therms, respectively.

Oil

Petroleum-based fuels account for 96 percent of the State's transportation needs.[18] The dependence on a single type of transportation fuel makes Californians vulnerable to petroleum price spikes. The State is currently working on developing flexible strategies to reduce petroleum use and is developing alternative transportation fuels to reduce air pollutant and GHG emissions. In the meantime, the demand for gasoline and diesel fuel is expected to continue to rise due to population growth, lack of mass transit, and the number of sports utility vehicles on California roads.

Existing Oil Energy Demand and Use Patterns

Existing agricultural production on the project site requires oil, gas, and/or diesel fuel. Transportation dominates California's energy consumption profile. Major airports, military bases, and California's many motorists all contribute to high demand for petroleum. More motor vehicles are registered in California than in any other state, and commute times in California are among the longest in the country.[19]

California production and inventory levels for gasoline in 2014 were typically within or near the previous five-year range of recorded high and low values. In 2014, gasoline production totals fluctuated between roughly 5.5 and 7.5 million barrels of gasoline per week, and inventories of gasoline fluctuated between 9.5 and 14 million barrels per week. As a whole, production of diesel in 2014 appeared to be elevated with respect to the previous five years, with a new five-year high of 3.2 million barrels of production peaking the week of January 2, 2014. California inventories of diesel fluctuated between 2.75 and 4.25 million barrels per week in 2014.[20]

4.7.3 REGULATORY CONTEXT

Global climate change and energy are monitored through the efforts of various international, federal, State, and local government agencies. Agencies work jointly and individually to improve current conditions through legislation, regulations, planning, policy-making, education, and a variety of programs. The agencies responsible for regulating global climate change and energy within the City of Davis area are discussed below.

[18] California Energy Commission. *California's Petroleum Statistics & Data*. Available at: http://energyalmanac.ca.gov/petroleum/. Accessed March 10, 2015.

[19] U.S. Energy Information Administration. *California State Profile and Energy Estimates, Profile Analysis*. June 19, 2014. Available at: http://www.eia.gov/state/analysis.cfm?sid=CA. Accessed March 10, 2015.

[20] California Energy Commission. *Petroleum Watch.* February 2015. Available at: http://energyalmanac.ca.gov/petroleum/petroleum_watch/2015_Petroleum_Watch/2015-02_Petroleum_Watch.pdf. Accessed March 10, 2015.

Federal Regulations

The most prominent federal regulation is the Clean Air Act (CAA), which is implemented and enforced by the USEPA.

CAA and USEPA

On December 7, 2009, USEPA issued findings under Section 202(a) of the CAA concluding that GHGs are pollutants that could endanger public health. Under the so-called Endangerment Finding, USEPA found that the current and projected concentrations of the six key well-mixed GHGs – CO_2, CH_4, N_2O, PFCs, SF_6, and HFCs – in the atmosphere threaten the public health and welfare of current and future generations. The findings do not, by themselves, impose any requirements on industry or other entities.

The USEPA has been directed to develop regulations to address the GHG emissions of cars and trucks. The Mandatory Reporting of Greenhouse Gases Rule requires reporting of GHG emissions from large sources and suppliers in the U.S., and is intended to collect accurate and timely emissions data to inform future policy decisions. Under the rule, suppliers of fossil fuels or industrial GHG, manufacturers of vehicles and engines, and facilities that emit 25,000 metric tons or more per year of GHG emissions are required to submit annual reports to the USEPA. To track the national trend in emissions and removals of GHG since 1990, USEPA develops the official U.S. GHG inventory each year.

Energy-Related Regulations

Federal agencies regulate energy production, transmission and consumption through various regulations and programs. Federal agencies, such as the U.S. Environmental Protection Agency (USEPA), the USDOE, and the U.S. Department of Transportation (USDOT) affect energy consumption in the transportation sector through fuel economy standards, funding for transportation infrastructure and funding for energy related research and development projects. The USDOE also promotes a diverse supply and delivery of reliable, affordable and environmentally sound energy. The Federal Energy Regulatory Commission (FERC) is an independent agency that regulates the interstate transmission of electricity, natural gas, and oil. FERC also reviews proposals to build liquefied natural gas (LNG) terminals and interstate natural gas pipelines as well as licensing hydropower projects.

Energy Policy and Conservation Act (1975)

On December 22, 1975, President Ford signed the Energy Policy and Conservation Act, extending oil price controls into 1979, and mandating automobile fuel economy standards, and authorizing creation of a strategic petroleum reserve. The Act was enacted for the purpose of serving the nation's energy demands and promoting conservation methods. The Act directed the creation of strategic petroleum reserve for the U.S.

Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA)

In 1991, Congress established ISTEA to promote the development of inter-modal transportation systems to maximize mobility as well as address national and local interests in air quality and energy. ISTEA includes requirements that Metropolitan Planning Organizations (MPOs) must address when developing transportation plans and programs, including energy-related issues. To meet the new ISTEA requirements, MPOs adopted explicit policies defining social, economic, energy, and environmental values that were to guide transportation decision in metropolitan areas. In addition, MPOs were required to consider the consistency of transportation planning with federal, state, and local energy goals. This requirement was designed to make energy consumption a decision criterion in determining the best transportation solution.

Energy Policy Act of 2005 (EPACT)

The EPACT is intended to establish a comprehensive, long-range energy policy, and the USDOE is responsible for its implementation. The EPACT provides incentives for traditional energy production as well as newer, more efficient energy technologies and conservation that avoid the by-production of greenhouse gases. Those incentives come in the form of various tax credits and deductions, which include automobile tax credits, home energy efficiency improvement tax credits, energy efficient commercial building deduction and business tax credits for businesses that produce biodiesel/alternative fuels and manufacture or purchase energy-efficient appliances.

Energy Independence and Security Act of 2007

The Energy Independence and Security Act was signed into law on December 19, 2007 with the intention to move the U.S. towards a greater energy independence, increase clean renewable fuels, protect consumers, increase efficiency of products (new development, vehicles, etc.), as well as improve the energy performance of the Federal government.

EnergyStar Program

EnergyStar is a joint program of the USEPA and the USDOE that assists consumers in saving money and protecting the environment through energy efficient products and practices. In 1992, the USEPA introduced the EnergyStar Program as a voluntary labeling program, designed to identify and promote energy-efficient products to reduce greenhouse gas emissions. Through 1995, the USEPA expanded the label to additional office equipment products and residential heating and cooling equipment. In 1996, the USEPA partnered with the USDOE for particular product categories. The EnergyStar label is now on major appliances, office equipment, lighting, home electronics, and more. The USEPA has also extended the label to cover new homes and commercial and industrial buildings.

State Regulations

California has adopted a variety of regulations aimed at reducing GHG emissions and energy consumption. The adoption and implementation of the key State legislation described in further detail below demonstrates California's leadership in addressing global climate change. Only the

most prominent and applicable California GHG- and energy-related legislation are included below; however, an exhaustive list and extensive details of California air quality legislation could be found at the California Air Resources Board (CARB) website.[21]

State GHG-Related Regulations

The following applicable State regulations pertain to GHG emissions and/or climate change.

Assembly Bill 32

In September 2006, Assembly Bill (AB) 32, the California Climate Solutions Act of 2006 (Health & Saf. Code, §38500 et seq.) was enacted. AB 32 delegated the authority for its implementation to the CARB and directs CARB to enforce the State-wide cap. Among other requirements, AB 32 required CARB to (1) identify the State-wide level of GHG emissions in 1990 to serve as the emissions limit to be achieved by 2020, and (2) develop and implement a Scoping Plan. Accordingly, the CARB has prepared the *Climate Change Scoping Plan* (Scoping Plan) for California, which was approved in 2008.[22] The Scoping Plan provides the outline for actions to reduce California's GHG emissions. Based on the reduction goals called for in the 2008 Scoping Plan, a 29 percent reduction in GHG levels relative to a Business As Usual (BAU) scenario would be required to meet 1990 levels by 2020. The reduction goal and BAU scenario for the Scoping Plan were based on 2005 emissions projections. A BAU scenario is a baseline condition based on what could or would occur on a particular site in the year 2020 without implementation of a proposed project or any required or voluntary GHG reduction measures, including any State regulation GHG emission reductions. A project's BAU scenario is project- and site-specific, and varies from project to project.

In 2011, the baseline or BAU level for the Scoping Plan was revised based on more recent (2010) data in order to account for the economic downturn and State regulation emission reductions (i.e., Pavley, Low Carbon Fuel Standard [LCFS], and RPS).[23] Accordingly, the Scoping Plan emission reduction target from BAU levels required to meet 1990 levels by 2020 was modified from 29 percent to 21.7 percent (where BAU levels do not account for statewide regulation emission reductions) below the revised estimated BAU level. The amended Scoping Plan was re-approved August 24, 2011.[24]

California GHG Cap-and-Trade Program

The AB 32 Scoping Plan identifies a cap-and-trade program as one of the strategies California will employ to reduce the GHG emissions that cause climate change. The

[21] California Air Resources Board. *Laws and Regulations*. February 26, 2015. Available at: http://www.arb.ca.gov/html/lawsregs.htm. Accessed March 2015.
[22] California Air Resources Board. *Climate Change Scoping Plan*. December 2008.
[23] California Air Resources Board. *Status of Scoping Plan Recommended Measures*. Available at: http://www.arb.ca.gov/cc/scopingplan/status_of_scoping_plan_measures.pdf. Accessed October 2014.
[24] California Air Resources Board. *Final Supplement to the AB 32 Scoping Plan Functional Equivalent Document*. August 19, 2011.

program will help put California on the path to meet the GHG emission reduction goal of 1990 levels by the year 2020, and ultimately achieving an 80 percent reduction from 1990 levels by 2050. Under cap-and-trade, an overall limit on GHG emissions from capped sectors would be established by the cap-and-trade program and facilities subject to the cap would be able to trade permits (allowances) to emit GHGs. The CARB has designed a California cap-and-trade program that is enforceable and meets the requirements of AB 32. The program started on January 1, 2012, with an enforceable compliance obligation beginning with the 2013 GHG emissions.

AB 1493

California AB 1493 (Stats. 2002, ch. 200) (Health & Safety Code, §§42823, 43018.5), known as Pavley I, was enacted on July 22, 2002. AB 1493 requires that the CARB develop and adopt regulations that achieve "the maximum feasible reduction of GHGs emitted by passenger vehicles and light-duty truck and other vehicles determined by the CARB to be vehicles whose primary use is noncommercial personal transportation in the state." On June 30, 2009, the USEPA granted a waiver of CAA preemption to California for the State's GHG emission standards for motor vehicles, beginning with the 2009 model year. Pursuant to the CAA, the waiver allows for the State to have special authority to enact stricter air pollution standards for motor vehicles than the federal government's. On September 24, 2009, the CARB adopted amendments to the Pavley regulations (Pavley I) that reduce GHG emissions in new passenger vehicles from 2009 through 2016. The second phase of the Pavley regulations (Pavley II) is expected to affect model year vehicles from 2016 through 2020. The CARB estimates that the regulation would reduce GHG emissions from the light-duty passenger vehicle fleet by an estimated 18 percent in 2020 and by 27 percent in 2030.

California Clean Air Act and CARB

The CARB is the agency responsible for coordination and oversight of State and local air pollution control programs in California and for implementing the California Clean Air Act (CCAA). The CCAA requires that air quality plans be prepared for certain areas. Among other requirements of the CCAA, the plans must include a wide range of implementable control measures, which often include transportation control measures and performance standards. In order to implement the transportation-related provisions of the CCAA, local air pollution control districts have been granted explicit authority to adopt and implement transportation controls. The CARB, California's air quality management agency, regulates and oversees the activities of county air pollution control districts and regional air quality management districts. The CARB regulates local air quality indirectly using State standards and vehicle emission standards, by conducting research activities, and through planning and coordinating activities. In addition, the CARB is charged with developing rules and regulations to cap and reduce GHG emissions.

Executive Order S-03-05

On June 1, 2005, Executive Order (EO) S-03-05 was enacted, which established total GHG emission targets. Specifically, emissions are to be reduced to year 2000 levels by 2010, 1990 levels by 2020, and to 80 percent below 1990 levels by 2050. The EO directed the Secretary of

the California Environmental Protection Agency (Cal-EPA) to coordinate a multi-agency effort to reduce GHG emissions to the target levels. The Secretary is also directed to submit biannual reports to the governor and state legislature describing: (1) progress made toward reaching the emission targets; (2) impacts of global warming on California's resources; and (3) mitigation and adaptation plans to combat these impacts.

To comply with the EO, the Secretary of the Cal-EPA created a Climate Act Team (CAT) made up of members from various State agencies and commissions. In March 2006, CAT released their first report. In addition, the CAT has released several "white papers" addressing issues pertaining to the potential impacts of climate change on California.

EO S-13-08

EO S-13-08 was issued on November 14, 2008. The EO is intended to hasten California's response to the impacts of global climate change, particularly sea level rise, and directs state agencies to take specified actions to assess and plan for such impacts, including requesting the National Academy of Sciences to prepare a Sea Level Rise Assessment Report, directing the Business, Transportation, and Housing Agency to assess the vulnerability of the State's transportation systems to sea level rise, and requiring the Office of Planning and Research and the Natural Resources Agency to provide land use planning guidance related to sea level rise and other climate change impacts.

The order also required State agencies to develop adaptation strategies to respond to the impacts of global climate change that are predicted to occur over the next 50 to 100 years. The adaption strategies report summarizes key climate change impacts to the State for the following areas: public health; ocean and coastal resources; water supply and flood protection; agriculture; forestry; biodiversity and habitat; and transportation and energy infrastructure. The report recommends strategies and specific responsibilities related to water supply, planning and land use, public health, fire protection, and energy conservation.

EO B-30-15

On April 29, 2015, Governor Jerry Brown issued EO B-30-15, which establishes a State GHG reduction target of 40 percent below 1990 levels by 2030. The new emission reduction target provides for a mid-term goal that would help the State to continue on course from reducing GHG emissions to 1990 levels by 2020 (per AB 32) to the ultimate goal of reducing emissions 80 percent under 1990 levels by 2050 (per EO S-03-05). This is in line with the scientifically established levels needed in the U.S. to limit global warming below 2 degrees Celsius – the warming threshold at which scientists say there will likely be major climate disruptions.[25] EO B-30-15 also addresses the need for climate adaptation and directs State government to:

[25] See http://gov.ca.gov/news.php?id=18938; accessed August 11, 2015.

- Incorporate climate change impacts into the State's Five-Year Infrastructure Plan;
- Update the Safeguarding California Plan, the State climate adaptation strategy, to identify how climate change will affect California infrastructure and industry and what actions the State can take to reduce the risks posed by climate change;
- Factor climate change into State agencies' planning and investment decisions; and
- Implement measures under existing agency and departmental authority to reduce GHG emissions.

SB 97

SB 97, signed in August 2007, acknowledges that climate change is an important environmental issue that requires analysis under CEQA. The bill directs the Governor's Office of Planning and Research (OPR) to prepare, develop, and transmit to the Resources Agency guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions, by July 1, 2009.

As directed by SB 97, the Governor's Office of Planning and Research (OPR) amended the CEQA Guidelines, effective March 18, 2010, to provide guidance to public agencies regarding the analysis and mitigation of GHG emissions and the effects of GHG emissions in draft CEQA documents. The amendments include revisions to the *Appendix G Initial Study Checklist* that incorporate a new subdivision to address project-generated GHG emissions and contribution to climate change. The new subdivision emphasizes that the effects of GHG emissions are cumulative, and should be analyzed in the context of CEQA's requirements for cumulative impacts analysis. In addition, the revisions include a new subdivision to assist lead agencies in determining the significance of project related GHG emissions. Under the revised CEQA Appendix G checklist, an agency would consider whether the project will generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment, and whether the project conflicts with an applicable plan, policy or regulation adopted for the purpose of reducing the emission of GHGs.

Guidance on determining the significance of impacts from GHG emissions is also provided in the SB 97 amendments. The guidance suggests the lead agency make a good-faith effort, based on available information, to describe, calculate or estimate the amount of GHG emissions resulting from a project. When assessing the significance of impacts from GHG emissions on the environment, lead agencies can consider the extent to which the project may increase or reduce GHG as compared to the existing environmental setting, whether the project emissions exceed a threshold of significance determined applicable to the project, and/or the extent to which the project complies with adopted regulations or requirements to implement a State-wide, regional, or local plan for the reduction or mitigation of GHG emissions. When adopting thresholds of significance, a lead agency may consider thresholds of significance previously adopted or recommended by other public agencies, or recommended by experts, provided the decision of the lead agency to adopt such thresholds is supported by substantial evidence.

Under the SB 97 amendments, if GHG emissions of a project are determined to be significant, feasible means of mitigating GHG emissions, such as the following, shall be applied:

- Measurement of the reduction of emissions required as part of the lead agency's decision;
- Reductions in emissions resulting from project through project features, design, or other measures;
- Off-site measures, including offsets, to mitigate a project's emissions;
- Measures that sequester GHG gases; and
- If a GHG reduction plan, ordinance, regulation, or other similar plan is adopted, mitigation may include project-by-project measures, or specific measures or policies found in the plan that reduces the cumulative effect of emissions.

SB 375

In September 2008, SB 375, known as the Sustainable Communities and Climate Protection Act of 2008, was enacted, which is intended to build on AB 32 by attempting to control GHG emissions by curbing sprawl. SB 375 enhances CARB's ability to reach goals set by AB 32 by directing CARB to develop regional GHG emission reduction targets to be achieved by the State's 18 metropolitan planning organizations (MPOs), including the Sacramento Area Council of Governments (SACOG). Under SB 375, MPOs must align regional transportation, housing, and land-use plans and prepare a "Sustainable Communities Strategy" (SCS) to reduce the amount of vehicle miles traveled in their respective regions and demonstrate the region's ability to attain its greenhouse gas reduction targets. SB 375 provides incentives for creating walkable and sustainable communities and revitalizing existing communities, and allows home builders to get relief from certain environmental reviews under CEQA if they build projects consistent with the new sustainable community strategies. Furthermore, SB 375 encourages the development of alternative transportation options, which will reduce traffic congestion.

State Energy-Related Regulations

The following applicable State regulations pertain to energy.

AB 1007

AB 1007, State Alternative Fuels Plan (Pavley, Chapter 371, Statutes of 2005), required development and adoption of a State plan to increase the use of alternative fuels. The final *State Alternative Fuels Plan* was adopted on December 5, 2007 and presents strategies and actions California must take to increase the use of alternative, non-petroleum fuels in a manner that minimizes costs to California and maximizes the economic benefits of in-state production. The plan assessed various alternative fuels and developed fuel portfolios to meet California's goals to reduce petroleum consumption, increase alternative fuels use, reduce GHG emissions, and increase in-state production of biofuels without causing a significant degradation of public health and environmental quality. The Plan recommends goals for alternative fuel use of nine percent by 2012, 11 percent by 2017, and 26 percent by 2022, and lays a foundation for building a multi-fuel transportation energy future for California by 2050.

AB 2076

In response to the public's concerns about price volatility, supply shortages, and the frequency of refinery outages, the California Legislature passed AB 2076 in 2000 (Shelley, Chapter 936, Statutes of 2000). AB 2076 directs CARB and the California Energy Commission (CEC) to develop and adopt recommendations for a California strategy to reduce petroleum dependence. Per AB 2076 requirements, CARB and the CEC prepared and published the *Reducing Petroleum Dependence in California* report in August 2003. The report addresses both near-term and mid- to long-term strategies to reduce the demand for petroleum fuels in California. Conservation, efficiency, non-petroleum fuels, and land-use planning measures to meet mismatched supply and demand in California through 2030 were identified in the report. The *Reducing Petroleum Dependence in California* report recommends a reduction goal for gasoline and diesel fuel demand of 15 percent below 2003 demand levels by 2020 and to maintain that level for the foreseeable future.

California Building Standards Code

California's building codes (California Code of Regulations [CCR], Title 24) are published on a triennial basis, and contain standards that regulate the method of use, properties, performance, or types of materials used in the construction, alteration, improvement, repair, or rehabilitation of a building or other improvement to real property. The California Building Standards Commission (CBSC) is responsible for the administration and implementation of each code cycle, which includes the proposal, review, and adoption process. Supplements and errata are issued throughout the cycle to make necessary mid-term corrections. The 2013 code has been prepared and became effective January 1, 2014, with minor exceptions to Part 6, Part 1, and energy provisions of Part 11, which did not become effective until July 1, 2014. The California building code standards apply State-wide; however, a local jurisdiction may amend a building code standard if the jurisdiction makes a finding that the amendment is reasonably necessary due to local climatic, geological, or topographical conditions.

California Green Building Standards Code

The 2013 California Green Building Standards Code, otherwise known as the CALGreen Code (CCR Title 24, Part 11), became effective January 1, 2014. As mentioned above, the energy provisions of the CALGreen Code did not become effective until July 1, 2014. The purpose of the CALGreen Code is to improve public health, safety, and general welfare by enhancing the design and construction of buildings through the use of building concepts having a reduced negative impact or positive environmental impact and encouraging sustainable construction practices. The provisions of the code apply to the planning, design, operation, construction, use, and occupancy of every newly constructed building or structure throughout California.

The key features of the CALGreen Code include the following mandates:

- Compliance with the California Building Energy Efficiency Standards Code;
- 20 percent mandatory reduction in indoor water use, with voluntary goal standards for 30, 35 and 40 percent reductions;
- Separate indoor and outdoor water meters to measure nonresidential buildings' indoor and outdoor water use with a requirement for moisture-sensing irrigation systems for larger landscape projects;
- Diversion of 50 percent of construction waste from landfills, increasing voluntarily to 65 and 75 percent for new homes and 80 percent for commercial projects;
- Mandatory periodic inspections of energy systems (i.e., heat furnace, air conditioner, mechanical equipment) for nonresidential buildings over 10,000 square feet to ensure that all are working at their maximum capacity according to their design efficiencies; and
- Mandatory use of low-pollutant emitting interior finish materials such as paints, carpet, vinyl flooring, and particle board.

In addition to the mandatory measures listed above and to other State-wide mandates, the CALGreen Code encourages local governments to adopt more stringent voluntary provisions, known as Tier 1 and Tier 2 provisions, to further reduce emissions, improve energy efficiency, and conserve natural resources. If a local government adopts one of the tiers, the provisions become mandates for all new construction within that jurisdiction. The City of Davis adopted Tier 1 of the 2010 CALGreen Code and is in the process of adopting the same for the 2013 CALGreen Code.

California Building Energy Efficiency Standards Code

The CEC administers building energy efficiency standards (CCR Title 24, Part 6), commonly referred to as "Title 24", which were established in 1978 in response to a legislative mandate to reduce California's energy consumption. Standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods. As stated above, the 2013 Building Energy Efficiency Standards became effective July 1, 2014. It should be noted that the 2013 Building Energy Efficiency Standards are anticipated to result in 25 percent less energy consumption for residential buildings and 30 percent savings for nonresidential buildings over the previous energy standards.[26]

California Energy Commission

The CEC is the State's primary energy policy and planning agency. Created by the Legislature in 1974, the Commission has seven major responsibilities: forecasting future energy needs;

[26] California Energy Commission. News Release: "*New Title 24 Standards Will Cut Residential Energy Use by 25 Percent, Save Water, and Reduce Greenhouse Gas Emissions*." July 1, 2014.

promoting energy efficiency and conservation by setting the State's appliance and building energy efficiency standards; supporting energy research that advances energy science and technology through research, development, and demonstration projects; developing renewable energy resources; advancing alternative and renewable transportation fuels and technologies; certifying thermal power plants 50 MW and larger; and planning for and directing State response to energy emergencies.[27]

California Public Utilities Commission

The CPUC regulates privately owned electric, natural gas, telecommunications, water, railroad, rail transit, and passenger transportation companies. The CPUC is responsible for ensuring that customers have safe, reliable utility service and infrastructure at reasonable rates, regulating utility services, stimulating innovation, and promoting competitive markets.[28]

EO S-01-07

On January 18, 2007, EO S-01-07 was enacted, which mandates that a State-wide goal be established to reduce carbon intensity of California's transportation fuels by at least 10 percent by 2020. The Order also requires that a Low Carbon Fuel Standard (LCFS) for transportation fuels be established for California.

Renewable Portfolio Standard

Established in 2002 under SB 1078, accelerated in 2006 under SB 107, and expanded in 2011 under SB 2, California's RPS is one of the most ambitious renewable energy standards in the country. The RPS program requires investor-owned utilities, electric service providers, and community choice aggregators to increase procurement from eligible renewable energy resources to 33 percent of total procurement by 2020.

State of California Energy Action Plan

The State of California Energy Action Plan was adopted by the CEC and the CPUC in May 2003. A second Energy Action Plan was adopted in 2005 to reflect policy changes and actions that ensued between 2003 and 2005. In 2008, the CEC and the CPUC found that a new Energy Action Plan would not be necessary or productive, as the State's energy policies have been significantly influenced by the passage of AB 32. As such, rather than produce a new Energy Action Plan, the CEC and CPUC have prepared instead an "update" that examines the State's ongoing actions in the context of global climate change using information and analysis prepared for the *2007 Integrated Energy Policy Report*, which includes policies that would enable the

[27] California Energy Commission. *About the California Energy Commission*. Available at: http://www.energy.ca.gov/commission/index.html. Accessed January 2015.

[28] California Public Utilities Commission. *California Public Utilities Commission*. Available at: http://www.cpuc.ca.gov/puc/. Accessed January 2015.

State to meet its energy needs and provides a comprehensive set of recommended actions to achieve the policies.[29]

Local Regulations

The following are the local regulatory agencies and regulations associated with GHG and energy pertinent to the proposed project.

YSAQMD

Various local, regional, State and federal agencies share the responsibility for air quality management in Yolo County. The YSAQMD operates at the local level and is tasked with enforcing the implementation of federal and State programs and regulations. The YSAQMD works jointly with the USEPA, CARB, SACOG, other air districts in the region, county and city transportation and planning departments, and various non-governmental organizations to work towards improving global climate change through a variety of programs. Programs include the adoption of regulations, policies and guidance, extensive education and public outreach programs, as well as emission reducing incentive programs.

Nearly all development projects in the region have the potential to generate air pollutants that may increase global climate change. Therefore, for most projects, evaluation of air quality impacts is required to comply with CEQA. The YSAQMD has not adopted thresholds of significance for GHG emissions. In absence of thresholds of significance, the YSAQMD is currently recommending GHG analysis consistent with Sacramento Metropolitan Air Quality Management District (SMAQMD) approach.[30]

City of Davis

In addition to the City's General Plan goals and policies, the City of Davis has various strategies for reducing the City's GHG emissions. In 1999, Davis joined a small group of cities calling for local action and a national policy on climate change. In 2006, the City joined the US Conference of Mayors Climate Protection Agreement that called for local and national action to reduce GHG emissions. In a follow-up action in spring 2007, the Davis City Council unanimously adopted a strategy to reduce the City's GHG emissions. Based on the City Council action, the City joined the *Cities for Climate Protection* (CCP) program along with hundreds of other communities across the globe to reduce GHG emissions at the local level. The program is designed to educate and empower local governments to take action on climate change. The CCP is a performance-oriented campaign that offers a framework for local governments to reduce greenhouse gas emissions and improve livability within their municipalities. As part of this effort, the City of Davis has undertaken various actions to reduce GHG emissions within the City of Davis,

[29] California Energy Commission. *State of California Energy Action Plan.* Available at: http://www.energy.ca.gov/energy_action_plan/index.html. Accessed January 2015.

[30] Personal communication between Nick Pappani, Vice President of Raney Planning & Management, and Matt Jones, Planning and Air Monitoring Manager, YSAQMD, January 15, 2015.

including the adoption of the *Davis Climate Action and Adaptation Plan* (CAAP), as well as, adoption of local GHG reduction targets, carbon budgets, and carbon allowances for residential land uses.

Davis General Plan

The applicable *Davis General Plan* goals, policies, and performance objectives relating to GHG emissions and energy are presented and addressed below in Table 4.7-2.

Davis Climate Action and Adaptation Plan

The *Davis Climate Action and Adaptation Plan* (CAAP) is designed to place the community on a path to achieve the GHG emission reduction targets adopted by the City Council in November 2008. The targets were based on a range that uses the State of California targets as a minimum goal and deeper reductions as the desired outcome. The City adopted this range in recognition that emission reductions are not precise and that many scientists believe that a reduction of 80 percent below 1990 levels by 2050 may not be adequate. The City's GHG emission reduction targets per the CAAP are summarized in Table 4.7-2.[31]

Table 4.7-2
City of Davis and State GHG Reduction Targets

Year	Target Range[1]	
	State (City minimum target)	**City of Davis (desired target)[2]**
2010	2000 levels[3]	1990 levels
2020	1990 levels[4]	28% below 1990 levels
2030	40% below 1990 levels[5]	N/A
2040	N/A[6]	80% below 1990 levels
2050	80% below 1990 levels[7]	Carbon neutral[8]

Notes:
1 Davis anticipates to achieve reductions within the range of the State targets (minimum) and local targets (desired).
2 Due to residency time of GHGs in the atmosphere, early GHG reduction is generally more beneficial for mitigation of the most severe impacts of climate change.
3 EO S-03-05, June 1, 2005.
4 EO S-03-05, June 1, 2005, and AB 32, September 2006.
5 EO B-30-15, April 2015.
6 A formal State target for 2040 does not exist; however, an average reduction of 2.66 percent per year from 2020 to 2050 (assuming the State target of 1990 levels by 2020 has been met) would be required in order to achieve 80 percent below 1990 levels by 2050 (Davis CAAP, June, 2010).
7 EO S-03-05, June 1, 2005.
8 i.e., net zero GHG emissions.

Preparation of the CAAP was guided by a community-based public input process executed by the Davis Climate Action Team, the Natural Resources Commission, and staff. Based on

[31] City of Davis. Staff Report: "*Adoption Davis Climate Action and Adaptation Plan*." June 1, 2010.

community input, analysis of best practices adopted by other communities, and contributions from subject matter experts, the plan utilizes a systems-based approach to address local GHG emissions. The plan identifies objectives and actions for the first five years after adoption in 2010 that were intended to reverse local GHG emission growth and establish a foundation for deeper, longer-term reductions beyond 2015. The plan includes objectives and actions in nine sectors, including: (1) Mobility; (2) Energy; (3) Land use and buildings; (4) Consumption and waste; (5) Food and agriculture; (6) Community engagement; (7) Government operations; (8) Advocacy; and (9) Climate change preparation (adaptation).

Adoption of the City CAAP addresses the City's goal of conserving natural resources and protecting the environment. Specifically, plan adoption implements the City Council's objective of addressing global warming and reducing the carbon footprint of Davis.

City of Davis Municipal Code

Section 8.01.065(a) of the Municipal Code requires mandatory compliance with Tier 1 standards of the CALGreen Code, which would otherwise be voluntary under the California Building Standards Code.

4.7.4 IMPACTS AND MITIGATION MEASURES

The standards of significance and methodology utilized to analyze and determine the proposed project's potential project-specific impacts are described below. The standards are based on policies of the City of Davis and other responsible agencies. In addition, a discussion of the project's impacts, as well as mitigation measures where necessary, is also presented.

Standards of Significance

The City of Davis does not have adopted thresholds of significance for GHG emissions resulting from non-residential development. With respect to establishing significance thresholds for GHG emissions, CEQA Guidelines Section 15064.4 states:

> (a) The determination of the significance of GHG emissions calls for a careful judgment by the lead agency consistent with the provisions in Section 15064. A lead agency should make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate or estimate the amount of GHG emissions resulting from a project.
> (b) A lead agency should consider the following factors, among others, when assessing the significance of impacts from GHG emissions on the environment:
> (1) The extent to which the project may increase or reduce GHG emissions as compared to the existing environmental setting;
> (2) Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project;
> (3) The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions. Such requirements must be adopted by the relevant public agency through a public review process and must reduce or

> mitigate the project's incremental contribution of GHG emissions. If there is substantial evidence that the possible effects of a particular project are still cumulatively considerable notwithstanding compliance with the adopted regulations or requirements, an EIR must be prepared for the project.

Thus, one threshold that is commonly used to analyze a project's GHG emissions is whether the project would conflict with or obstruct the goals or strategies of the California Global Warming Solutions Act of 2006 (AB 32) or its governing regulation (Health & Safety Code, §§ 38500-38599). The City of Davis established a more ambitious (than AB 32) goal in its CAAP, which is achievement of net zero carbon emissions by 2050, along a sliding trajectory downward from 2015 targets. For purposes of this analysis, the CEQA Guidelines Appendix G thresholds are utilized for the GHG significance determination, with the understanding that these general thresholds are to be understood within the context of the City of Davis. For example, when determining whether the project would conflict with an applicable plan (i.e., the second threshold), this threshold is evaluated in the context of the project's consistency with the Davis CAAP. The Appendix G thresholds are as follows:

- Generate GHG 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 GHGs;

Based on Appendix F and G of the State CEQA Guidelines, the proposed project would result in a significant impact on energy use if it would:

- Result in significant adverse impacts related to project energy requirements, energy use inefficiencies, and/or energy intensiveness of materials by amount and fuel type for each stage of the project including construction, operations, maintenance, and/or removal;
- Result in significant adverse impacts on local and regional energy supplies and on requirements for additional capacity;
- Result in significant adverse impacts on peak and base period demands for electricity and other forms of energy;
- Fail to comply with existing energy standards;
- Result in significant adverse impacts on energy resources;
- Result in significant adverse impacts related to transportation energy use requirements of the project and use of transportation alternatives; or
- Conflict, or create an inconsistency, with any applicable plan, policy, or regulation adopted for the purpose of avoiding or mitigating environmental effects related to energy conservation.

Method of Analysis

The proposed project's GHG emissions, including the MRIC and Mace Triangle development, were estimated using the California Emissions Estimator Model (CalEEMod) version 2013.2.2 software - a statewide model designed to provide a uniform platform for government agencies,

land use planners, and environmental professionals to quantify air quality emissions, including GHG emissions, from land use projects. The model applies inherent default values for various land uses, including trip generation rates based on the ITE Manual, vehicle mix, trip length, average speed, etc. However, where project-specific data was available, such data was input into the model.

Construction GHG Emissions

Although the proposed MRIC is expected to be built out over four separate phases (see Figure 3-19 of the Project Description chapter of this EIR), specific uses to be built out per phase is speculative at this time and would ultimately be based on demand. Accordingly, project-specific details regarding the buildout schedule for the proposed project are currently unavailable. Phasing has not been identified for the Mace Triangle, though development of the Triangle could occur in a phased manner over the same horizon as the proposed project. Thus, the following assumptions were made for the project construction modeling:

- Demolition would not be required;
- Construction was assumed to commence in July 2017;
- Construction was assumed to occur continuously over the construction period in order to provide a conservative estimate;
- In order to be consistent with the buildout assumptions utilized by the traffic consultant, the project was assumed to be fully operational by 2035 (i.e., construction was assumed to occur over an 18-year period);
- Construction phase durations (i.e., site preparation, grading, building construction, and architectural coating phases) were modified to reflect an 18-year construction period; and
- A total of 224.42 acres would be disturbed during the grading phase.[32]

The results of the GHG emissions estimations were compared to the standards of significance discussed above in order to determine the associated level of impact. All CalEEMod GHG modeling results are included in Appendix E to this EIR.

The maximum annual construction-related GHG emissions estimated for the proposed project were amortized over the 18-year construction period and added to the annual operational GHG emissions in order to provide a conservative analysis of total project-related GHG emissions.

Operational GHG Emissions

In order to be consistent with the buildout assumptions utilized by the traffic consultant, the project was assumed to be fully operational by 2035. The modeling performed for the proposed project included compliance with YSAQMD rules and regulations (i.e., low-VOC paints and low-VOC cleaning supplies), as well as with the California Building Energy Efficiency

[32] The 224.42 acres assumed for modeling includes the entire MRIC site plus the Mace Triangle site, with the exception of the Public and Quasi Public parcel, which is already developed with a water storage tank and park-and-ride lot and would not involve any further development.

Standards Code and Tier 1 of the CALGreen Code per City standards to the extent feasible at this time. The proposed project's compliance with the California Building Energy Efficiency Standards Code and CALGreen Code would be verified as part of the City's building approval review process. The proposed project's inclusion of on-site renewable energy sufficient to supply a minimum of 50 percent of the energy requirements of the project has been applied to CalEEMod as an inherent project feature (see Chapter 3, Project Description, for further discussion). The CO_2, CH_4, and N_2O intensity factors within CalEEMod were adjusted in order to reflect PG&E's progress towards the State RPS goal by 2035.

The project-specific daily VMT of 196,000 provided by Fehr & Peers, Inc. for year 2035 was also applied to the project modeling. This VMT includes MRIC trips and Mace Triangle trips. According to Section 4.14, Transportation and Circulation, of this EIR, forecasts of VMT were estimated using the four-step SACMET travel model that encompasses the six-county SACOG region. The SACMET model was used, as the model more fully accounts for the length of trips originating in Davis given the larger geographic coverage. The VMT forecasts were developed by incorporating into the SACMET model the land use forecasts and employment reallocation assumptions as discussed in further detail in Section 4.14 of this EIR.

All CalEEMod GHG modeling results are included in Appendix E to this EIR. As discussed above, the maximum annual construction-related GHG emissions estimated for the proposed project were amortized over the 18-year construction period and added to the annual operational GHG emissions in order to provide a conservative analysis of total project-related GHG emissions.

Energy Demand

The CalEEMod modeling results include estimations for the proposed project's annual electricity and natural gas consumption, which were used for the energy analysis. The project-specific VMT data provided by Fehr & Peers, Inc. for full buildout of the proposed project was also used for the energy analysis.

Project-Specific Impacts and Mitigation Measures

Global climate change is, by nature, a cumulative impact; however, the project's effects on global climate change are being addressed within this EIR as project-specific impacts. Emissions of GHG contribute, on a cumulative basis, to the significant adverse environmental impacts of global climate change (e.g., sea level rise, impacts to water supply and water quality, public health impacts, impacts to ecosystems, impacts to agriculture, and other environmental impacts). A single project could not generate enough GHG emissions to contribute noticeably to a change in the global average temperature. However, GHG emissions from a project in combination with other past, present, and future projects contribute substantially to the world-wide phenomenon of global climate change and the associated environmental impacts. Although the geographical context for global climate change is the Earth, for analysis purposes under CEQA and due to the regulatory context pertaining to GHG emissions and global climate change applicable to the proposed project, the geographical context for global climate change in this EIR is limited to the State of California.

The following discussion of GHG emissions and energy impacts is based on implementation of the proposed project in comparison to the standards of significance presented above. The discussions and mitigation measures presented below apply to both the MRIC and the Mace Triangle unless otherwise stated.

4.7-1 Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment. Based on the analysis below, even with mitigation, the impact is *significant and unavoidable.*

According to CEQA Guidelines Section 15064.4(b), the extent to which a project may increase or reduce GHG emissions as compared to the existing environmental setting should be considered when assessing the significance of impacts from GHG emissions on the environment. As presented in the Existing Setting section of this section, the total existing GHG emissions associated with the project site are approximately 267.69 $MTCO_2e$/yr.

Construction GHG emissions are a one-time release and are typically considered separate from operational emissions, as global climate change is inherently a cumulative effect that occurs over a long period of time and is quantified on a yearly basis. However, the proposed project's construction GHG emissions have been amortized over the total estimated duration of construction, which is anticipated to occur over an 18-year span, and included in the total annual operational GHG emissions for disclosure purposes. Assuming that construction-related GHG emissions would continue to occur each year after construction is complete would represent a conservative estimation of annual GHG emissions. According to CalEEMod, the proposed project would result in maximum annual construction-related GHG emissions of 2,860.82 $MTCO_2e$/yr.

The proposed project's total annual GHG emissions, including annual operational GHG emissions and amortized construction GHG emissions, are presented in Table 4.7-3. The project-specific VMT, inclusion of on-site renewable energy sufficient to supply a minimum of 50 percent of the energy requirements of the project, compliance with the California Building Energy Efficiency Standards Code, and Tier 1 of the CALGreen Code per City of Davis standards have been applied to CalEEMod as inherent project features. The proposed project's compliance with the California Building Energy Efficiency Standards Code and CALGreen Code would be verified as part of the City's building approval review process.

Based on the current GHG emissions associated with the site and the estimated future emissions at buildout of the site per the proposed project, the total net new emissions that would be generated by the proposed project would be 25,775.62 $MTCO_2e$/yr (26,043.31 – 267.69 = 25,775.62). Therefore, the proposed project would result in a substantial net increase in GHG emissions currently emanating from the project site. This is considered a ***significant*** impact on the environment.

Table 4.7-3 Unmitigated Proposed Project GHG Emissions at Buildout (2035)	
Emission Source	**Annual GHG Emissions ($MTCO_2e$/yr)**
Construction Emissions[1]	**158.93**
Operational Emissions	**25,884.38**
Area	0.05
Energy	4,440.53
Mobile	19,269.84
Solid Waste	649.59
Water	1,524.36
TOTAL ANNUAL GHG EMISSIONS	**26,043.31**

[1] Amortized maximum annual construction emissions (2,860.82 $MTCO_2e$) over an estimated 18-year construction period for the project (2,860.82 $MTCO_2e$ / 18 years = 158.93 $MTCO_2e$/yr).

Source: CalEEMod, July 2015 (see Appendix E).

Mitigation Measure(s)

Implementation of Mitigation Measure 4.3-2, set forth in Section 4.3, Air Quality, and Mitigation Measure 4.14-6 set forth in Section 4.14, Transportation and Circulation, of this EIR, which require use of only zero-VOC paints and a reduction of vehicle trips by 10 percent, respectively, would further reduce the proposed project's operational GHG emissions. The proposed project's GHG emissions, with implementation of Mitigation Measures 4.3-2 and 4.14-6, is shown in Table 4.7-4. As shown in the table, although Mitigation Measures 4.3-2 and 4.14-6 would reduce the proposed project's GHG emissions by approximately seven percent, the reduction would not be sufficient to reach existing GHG emission levels emanating from on-site agricultural operations. Thus, the GHG emissions would still be considered a substantial increase; and the impact would remain *significant and unavoidable*.

Table 4.7-4 Proposed Project Mitigated GHG Emissions at Buildout (2035)[1]	
Emission Source	**Annual GHG Emissions ($MTCO_2e$/yr)**
Construction Emissions[2]	**158.93**
Operational Emissions	**24,039.93**
Area	0.05
Energy	4,440.53
Mobile	17,425.40
Solid Waste	649.59
Water	1,524.36
TOTAL ANNUAL GHG EMISSIONS	**24,198.86**

[1] Includes implementation of Mitigation Measures 4.3-2 and 4.14-6 of this EIR.
[2] Amortized maximum annual construction emissions (2,860.82 $MTCO_2e$) over an estimated 18-year construction period for the project (2,860.82 $MTCO_2e$ / 18 years = 158.93 $MTCO_2e$/yr).

Source: CalEEMod, July 2015 (see Appendix E).

4.7-2 Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs. Based on the analysis below, even with mitigation, the impact is *significant and unavoidable.*

Table 4.7-7, at the end of this technical section, includes a discussion of the City's General Plan policies relevant to reduction of carbon emissions and VMT, both of which are directly related to reducing GHG emissions. The proposed project's consistency with the City's CAAP and the State's GHG regulations is specifically evaluated in the following section.

As discussed above, in absence of thresholds of significance, the YSAQMD is currently recommending GHG analysis consistent with the SMAQMD approach, which the YSAQMD intends to adopt in 2015. The SMAQMD has established a threshold for both construction and operational GHG emissions of 1,100 $MTCO_2e$/yr. For projects within their jurisdiction that exceed 1,100 $MTCO_2e$/yr, SMAQMD requires a further detailed analysis, showing whether the project would meet State and/or local GHG emission reduction targets.

As discussed above, the proposed project would result in maximum annual construction-related GHG emissions of 2,860.82 $MTCO_2e$/yr, which would exceed the recommended 1,100 $MTCO_2e$/yr threshold of significance. In addition, as shown in Table 4.7-3 above, the proposed project's operational GHG emissions would exceed the recommended 1,100 MTCO2e/yr threshold of significance. Seventy-four percent of unmitigated operational emissions are estimated to be from mobile sources generated by the proposed project. Because both the proposed project's construction-related GHG emissions and operational GHG emissions were estimated to exceed YSAQMD's recommended GHG threshold of 1,100 $MTCO_2e$/yr, further analysis in comparison with State and/or local GHG emission reduction targets is conducted in the following section.

As shown in Table 4.7-2 above, the State has a target to reach 1990 GHG levels by 2020 (consistent with AB 32), 40 percent below 1990 levels by 2030 (consistent with EO B-30-15), and 80 percent below 1990 levels by 2050 (consistent with EO S-03-05). The Davis CAAP considers consistency with the State reduction goals as the "minimum" reduction target for the community, but sets more stringent "desired" reduction targets than the State. For example, the Davis CAAP has a minimum goal to reach 1990 GHG levels by the year 2020, consistent with AB 32, but a desired goal to reach the same target by 2010. In addition, the CAAP includes a desired 2020 target of an additional 28 percent reduction below 1990 levels, a desired 2040 target of 80 percent below 1990 levels (ten years earlier than the State's goal), and a desired 2050 target of carbon neutral.

In order to provide a comparison to the State and City GHG emission reduction goals, the proposed project's 1990 GHG emission levels were estimated using CalEEMod. The 1990 GHG modeling is intended to represent a benchmark, to which proposed project emissions can be compared to determine consistency with State and local goals, given that these goals are themselves benchmarked to 1990 emission levels. The California Building Energy Efficiency Standards Code and CALGreen Code, as well as other GHG-

related State programs (i.e., the Low Carbon Fuel Standard Program and the Pavley Clean Car Standards), were not in place in the year 1990; therefore, compliance with such was not applied in the model. Similarly, because such a feature would not likely have been considered in 1990, the project's inclusion of on-site renewable energy was not applied for the 1990 level GHG modeling. However, the project-specific VMT, and compliance with YSAQMD rules and regulations (i.e., low-VOC paints and low-VOC cleaning supplies), were assumed to occur at 1990 GHG levels. According to CalEEMod, the proposed project's GHG emissions at a 1990 benchmark level, including annual operational GHG emissions and amortized construction GHG emissions, was estimated as shown in Table 4.7-5.

Table 4.7-5
Proposed Project GHG Emissions at 1990 Levels

Emission Source	Annual GHG Emissions ($MTCO_2e$/yr)
Construction Emissions[1]	**158.93**
Operational Emissions	**41,961.33**
Area	0.07
Energy	10,524.42
Mobile	28,010.54
Solid Waste	649.59
Water	2,776.70
TOTAL ANNUAL GHG EMISSIONS	**42,120.26**

[1] Amortized maximum annual construction emissions (2,860.82 $MTCO_2e$) over an estimated 18-year construction period for the project (2,860.82 $MTCO_2e$ / 18 years = 158.93 $MTCO_2e$/yr).

Source: CalEEMod, July 2015 (see Appendix E).

The proposed project would result in approximately a 38.17 percent reduction in annual GHG emissions from 1990 levels by buildout (2035) ([42,120.26 $MTCO_2e$/yr – 26,043.31 $MTCO_2e$/yr] / 42,120.26 $MTCO_2e$/yr x 100% = 38.17%). The reduction in GHG emissions is primarily attributable to the continued advancement of vehicle and equipment efficiency, as well as more stringent standards and regulations as time progresses.

Using the downward trajectory of GHG emissions from the project from 1990 levels to 2035 levels, approximately 357.27 $MTCO_2e$ of GHG emissions would be reduced per year ([42,120.26 $MTCO_2e$/yr – 26,043.31 $MTCO_2e$/yr] / [2035 – 1990]), or approximately 0.85 percent per year (38.17% / [2035 – 1990]). Based on the estimated 0.85 percent reduction per year from 1990 to 2035, the proposed project would have an associated 2020 GHG emission level of 25.42 percent below 1990 levels, which would meet the State AB 32 goal and Davis CAAP minimum goal of 1990 levels by 2020, but would not meet the Davis CAAP 2020 desired target of 28 percent below 1990 levels. At 2030 GHG emission levels, a GHG emissions reduction of approximately 33.92 percent below 1990 levels would occur, which does not meet the State's goal of 40 percent below 1990 levels by 2030.

In addition, as it is impossible to predict the impact of legislation and policy that has yet to come, an accurate prediction of 2050 emissions is not possible. The regulatory environment associated with climate change is becoming more stringent and technological advancements for the reduction of GHG emissions are ever-evolving. Accordingly, the future regulations that may be in place in the year 2050 could substantially reduce project emissions at that time, but are currently unknown and cannot be reasonably predicted or quantified. Furthermore, based upon market absorption projections, the proposed project can reasonably be assumed to build out by 2035, which equates to an annual buildout of 140,000 to 150,000 square feet of innovation center uses.[33]

While the proposed project includes features intended to reduce its GHG emissions to the extent practicable at this time, the future of transportation emissions generated by the MRIC, the largest GHG-emitting sector of the project, are uncertain (e.g., additional state-mandated low carbon fuel standards, percentage of electric vehicles traveling to/from the site). With the variety of factors involved, and without further action on the MRIC site to reduce mobile source emissions or purchase GHG emissions offsets, it is uncertain that the MRIC could be on a trajectory to achieving net zero carbon emissions by 2050. Therefore, impacts would be considered ***significant***.

Mitigation Measure(s)

As shown above, implementation of Mitigation Measures 4.3-2 and 4.14-6 of this EIR, which requires the use of only zero-VOC paints and solvents and a 10 percent reduction in VMT, would reduce the proposed project's total annual GHG emissions to 24,198.86 $MTCO_2e$/yr as shown in Table 4.7-4. Using the mitigated GHG emissions in comparison with the proposed project's 1990 level GHG emissions, an estimated 42.55 percent reduction from 1990 levels by 2035 would occur, which results in a downward trajectory in GHG emissions of approximately 0.95 percent per year.

Based on the estimated 0.95 percent reduction per year from 1990 to 2035, an associated 2020 GHG emission reduction of 28.30 percent below 1990 levels would be expected, which would meet the Davis CAAP desired target of 28 percent below 1990 levels by 2020. However, at 2030 GHG emission levels, a GHG emissions reduction of approximately 37.80 percent below 1990 levels would occur, which does not meet the State's goal of 40 percent below 1990 levels by 2030. An accurate prediction of 2050 emissions is not possible for reasons discussed above.

Mitigation Measures 4.7-2(a) and (b) below have been prepared to be consistent with the intent of the statewide and City's CAAP goals, which require GHG emission reductions by a greater, increasing percentage over time. With implementation of Mitigation Measure 4.7-2(a) below, the proposed project would result in an additional 2.2 percent reduction from 1990 levels by the year 2030 (i.e., from 37.8 to 40 percent reduction below 1990 levels), which would meet the State's goal of 40 percent below 1990 levels

[33] See BAE Urban Economics. *City of Davis Economic Evaluation of Innovation Park Proposals*. July 9, 2015, p. 28.

by 2030.[34] As such, the mitigation measures set forth in this EIR would ensure that the proposed project would meet the State's 2020 and 2030 GHG emission reduction goals, and would demonstrate meaningful progress towards the City's 2020, 2040, and 2050 desired targets (see Table 4.7-6). In addition, it is assumed that the State and the City will continue to develop programs for the reduction of local, regional, and statewide GHG emissions in order to meet GHG emission reduction goals per State and City standards and regulations. Thus, net future reductions in city-wide GHG emissions (including the proposed project) would be expected to potentially meet the 2050 State and local goals.

Although future regulations that may be in place in the year 2050 could substantially reduce project emissions at that time, such regulations are currently unknown and cannot be reasonably predicted or quantified. Due to such regulatory uncertainties, as well as uncertainties related to the actual buildout of the proposed project and potential GHG emissions reductions due to sustainability features of the project, the full GHG reductions associated with such are speculative at this time. For this reason, and because the proposed project's GHG emissions cannot be conclusively shown to be reduced to net zero by 2050, the impact would remain *significant and unavoidable.*

MRIC and Mace Triangle

4.7-2(a) *Each individual development of the proposed project shall demonstrate consistency with the City's Climate Action and Adaptation Plan by achieving a downward trajectory in GHG emissions, towards the City goal of zero net GHG emissions by the year 2050. The project must achieve the target in place for the year in which the application is filed.*

At the City's discretion, compliance with this mitigation measure for different development activities associated with the same approval may occur at different stages in the development process depending on the nature of the project and may be based on the year that physical improvements are anticipated. At the time of or before building permits are issued, the applicant must demonstrate reduction of GHG emissions consistent with this measure. Mitigation for buildings shall occur at the time the building permit is issued, and the amount of mitigation shall be based on the year the building permit is issued. Mitigation for other emissions from a project may occur at an earlier approval but no later than issuance of entitlements. The applicant may file and City may consider and approve a GHG mitigation plan that lays out the mitigation for different stages of development within the same subsequent project approval.

[34] The 40 percent reduction below 1990 levels by 2030 was calculated based on the annual GHG emission reductions required per Mitigation Measure 4.7-2(a), the assumption that 150,000 square feet of development would occur per year, and the estimated 1990 GHG emissions for the proposed project (Table 4.7-5).

Table 4.7-6
Consistency of Proposed Project (Mitigated) GHG Emissions with State and Local Targets (2020 and 2030)

Year	State Reduction Target (City Minimum)	City Reduction Target (Desired)	Project Emissions w/ MMs 4.3-2 and 4.14-6	Project Emissions w/ MM 4.7-2(a)	Consistent with State Target? (City minimum)		Consistent with City Target? (Desired)	
					w/ MMs 4.3-2 and 4.14-6	w/ MM 4.7-2(a)	w/ MMs 4.3-2 and 4.14-6	w/ MM 4.7-2(a)
2020	1990 levels	28% below 1990	28.3 % below 1990	28.3 % below 1990	Yes	Yes	Yes	Yes
2030	40% below 1990 levels	N/A	37.8 % below 1990	40.0 % below 1990	No	Yes	N/A	N/A
2040	N/A	80% below 1990	While project-specific calculations have not been provided for 2040 due to difficulties discussed in this section, this EIR demonstrates that meaningful progress towards the City's 2040 desired target would be achieved by the increasingly higher reduction percentages required in MM 4.7-2(a).[1]					
2050	80% below 1990	carbon neutral	While project-specific calculations have not been provided for 2050 due to difficulties discussed in this section, this EIR demonstrates that meaningful progress towards the State's and City's 2050 targets would be achieved by the increasingly higher reduction percentages required in MM 4.7-2(a).					

[1] It is speculative to predict the impact of legislation and policy that has yet to come; therefore, an accurate prediction of 2040 and 2050 emissions is also speculative at this time. The regulatory environment associated with climate change is becoming more stringent and technological advancements for the reduction of GHG emissions are ever-evolving. Accordingly, the future regulations that may be in place in the years 2040 and 2050 could substantially reduce project emissions at that time, but are currently unknown and cannot be reasonably predicted or quantified. Furthermore, based upon market absorption projections, the proposed project can reasonably be assumed to build out by 2035, which equates to an annual buildout of 140,000 to 150,000 square feet of innovation center uses.

Prior to issuance of any subsequent entitlement or permit in the MRIC, or alternatively prior to any approval taking effect, the applicant shall implement the following steps unless these steps have already been undertaken for the project through a prior approval or action:

1) *Using CalEEMod or another model accepted for this purpose by the City, calculate total expected GHG emissions (all sectors) for the proposed project under two scenarios: a) 1990 emissions rates; and, b) emission rates applicable at the time of the application, taking into account applicable building standards and other adopted regulatory requirements, as well as building design, use of renewable energy, etc.*
2) *Calculate the difference between these two scenarios in step 1 as a percentage of the 1990 project emissions.*
3) *Compare the difference in emissions from step 2 to the required minimum emissions reduction schedule provided below:*

Applications Filed On or Before	***Minimum Required Reduction percentage in GHG Emissions from Calculated 1990 Emissions***
12/31/16	*22.5*
12/31/17	*25.0*
12/31/18	*27.5*
12/31/19	*30.0*
12/31/20	*32.5*
12/31/21	*35.0*
12/31/22	*37.5*
12/31/23	*40.0*
12/31/24	*42.5*
12/31/25	*45.0*
12/31/26	*47.5*
12/31/27	*50.0*
12/31/28	*52.5*
12/31/29	*55.0*
12/31/30	*57.5 (2.5% increased reduction per year)*
12/31/35	*70.0 (2.5% increased reduction per year)*
12/31/40	*82.5 (2.5% increased reduction per year)*
12/31/45	*95.0 (2.5% increased reduction per year)*
12/31/50	*100.0*

If the difference calculated in Step 2 is greater than the required reduction in Step 3, the MRIC may "bank" this as a credit to use with later projects.

4) *If the difference calculated in step 2 does not demonstrate the required reduction in step 3, applicant shall identify feasible actions to achieve the required reductions using the following priority:*

   - *First priority – building specific actions*
   - *Second priority – onsite (within MRIC) actions*
   - *Third priority – community based (within Davis) actions*
   - *Fourth priority – pay GHG reduction fees (carbon offsets) into a qualified existing local program, if one is in place*
   - *Fifth priority – other demonstrated method of reducing emissions*

5) *Calculate, using acceptable methods, the measurable GHG reduction value of each proposed action.*
6) *Provide a Technical Memorandum of Compliance (TMC) documenting the following minimum items: modeling (step 1); emissions calculations (step 2); applicable reduction (step 3); chosen feasible actions to achieve required reduction (step 4); and measurable GHG reduction value of each action (step 5). The TMC and all steps of the process are subject to review and authorization by the City of Davis Department of Community Development and Sustainability.*
7) *Implement the authorized actions and provide evidence of this to the City of Davis Department of Community Development and Sustainability. The City upon review and acceptance of implementation, shall issue the subject entitlement, permit, or approval.*

MRIC

4.7-2(b) *Every five years, the MRIC Master Owners' Association (MOA) shall submit a GHG Emissions Reduction Accounting and Program Effectiveness Report for the entire innovation center. The report shall be submitted by 12/31 of each fifth year starting in 2020. First report due by 12/31/20, second report due by 12/31/25, etc., through 2050 or until the center is built out.*

The report shall identify the following minimum items. Other documentation requirements may be added by the City if found to be necessary to satisfy this mitigation measure.

1) *Projected annual GHG emissions for MRIC, total and by sector, from the project EIR.*
2) *GHG emissions from all uses collectively operating at the MRIC, total and by sector, at the time of reporting.*
3) *GHG emissions from each occupied building within the MRIC, total and by sector.*
4) *Summary of prior TMCs and 5-year reports.*
5) *Running total of MRIC emissions reductions and reduction credits, in total and by building.*
6) *Comprehensive data base and summary of implemented reduction actions.*

4.7-3 Impacts related to energy associated with construction. Based on the analysis below, the impact is *less than significant*.

In order to ensure energy implications are considered in project decisions, Appendix F of CEQA Guidelines requires a discussion of the potential energy impacts of project, with particular emphasis on avoiding or reducing inefficient, wasteful, and unnecessary consumption of energy. Appendix F identifies several potential sources of energy conservation impacts, including the project's construction energy requirements and energy use efficiencies by amount and fuel type. Construction of the proposed project would result in a temporary increase in energy consumption in the area.

For analysis purposes, construction of the proposed project is assumed to commence in July 2017 and would be occur over an approximately 18-year period until full buildout in 2035. To provide a conservative analysis, the construction period is considered to be ongoing for the entire 18-year period. However, the proposed project is expected to be built out in multiple phases based on market demand. Thus, construction of the proposed project would more likely occur in distinct individual phases, one-by-one, as necessary to meet demands over the years. In such a case, only portions of the site would be disturbed at a time, with operation of construction equipment regulated by federal, State, and local standards, including YSAQMD rules and regulations, and occurring intermittently throughout the course of a day for a temporary period of time during each phase of construction. Overall, construction equipment operating at the project site would occur over a relatively short duration in comparison to the operational lifetime of the proposed project, and would operate intermittently over the construction period for the project.

Nonetheless, construction of the proposed project would involve on-site energy demand and consumption related to use of oil in the form of gasoline and diesel fuel for construction worker vehicle trips, hauling and materials delivery truck trips, and construction and off-road equipment. In addition, diesel-fueled portable generators may be necessary to provide additional electricity demands for temporary on-site lighting, welding, and for supplying energy to areas of the site where energy supply cannot be met via a hookup to the existing electricity grid. Project construction would not involve the use of natural gas appliances or equipment. Construction activities would be limited to the hours of 7:00 AM and 7:00 PM on Mondays through Fridays, between the hours of

8:00 AM and 8:00 PM on Saturdays and Sundays per the City's Municipal Code (Section 24.02.040[b]).

Electricity Demand

Typically at construction sites, electricity from the existing grid is used to power portable and temporary lights or office trailers. Because grid electricity would be utilized primarily for steady sources such as lighting, not sudden, intermittent sources such as welding or other hand-held tools, the increase in electricity usage at the site during construction would not be expected to cause any substantial peaks in demand. However, an increase in the base demand for electricity in the area would increase. As stated above, the proposed project would be built out over a series of phases where only portions of the project site would be developed at a time, with periods of non-construction between phases. Thus, between phases, construction-related increases in electricity demand would not occur. Overall, construction of the project would be over a relatively short duration in comparison to the operational lifetime of the proposed project and would occur intermittently throughout the buildout period of the project. As the site develops, operational electricity demand would become the dominant demand source. Operational electricity demand would be much greater than construction, and is discussed further below in Impact 4.7-4.

PG&E currently supplies electricity to the area and would supply electricity to the project site, including during construction. Increases in demand for electricity within the PG&E planning area have been projected to the year 2024. Construction of the proposed project, which would result in temporary increases in electricity demand, would not cause a permanent or substantial increase in demand that would exceed the demand projections or such that the existing PG&E supplies or infrastructure could not handle the increase. Therefore, project construction would not result in any significant impacts on local or regional electricity supplies, the need for additional capacity, or on peak or base period electricity demands. In addition, standards or regulations specific to construction-related electricity usage do not currently exist. As such, the temporary increase in electricity due to project construction activities would not be considered an inefficient, wasteful, and unnecessary consumption of energy, and significant adverse impacts on electricity resources would not occur.

Oil Demand

Based on the CalEEMod results for the proposed project, construction is anticipated to generate a maximum of approximately 1,001 worker vehicle trips and 456 delivery truck trips during the peak construction period. Worker vehicle trips are assumed to utilize gasoline and delivery trucks are assumed to utilize diesel fuel. Diesel fuel would also be used to power the construction and off-road equipment necessary for construction activities, including rubber tired dozers, tractors, excavators, cranes, and other types of equipment. In addition, diesel-fueled portable generators would be used where electricity from the grid cannot be provided or for where more immediate electricity is needed such as for welding or other hand tools. As discussed above, construction of the project would

occur over multiple phases where operation of construction equipment would occur intermittently throughout the course of a day for a temporary period of time during each phase of construction. Between phases, construction-related increases in gasoline and diesel fuel demand would not occur. Overall, construction equipment operating at the project site would occur over a relatively short duration in comparison to the operational lifetime of the proposed project and would be intermittent over the period of construction for the project. Operational oil demand would be much greater than construction, and is discussed further below in Impact 4.7-4.

As discussed previously, the demand for gasoline and diesel fuel is expected to continue to rise due to population growth, lack of mass transit, and the number of sports utility vehicles on California roads. However, a number of federal, State, and local standards and regulations exist that require improvements in vehicle efficiency, fuel economy, cleaner-burning engines, and emissions reductions. For example, CARB adopted a regulation to reduce emissions from in-use, off-road, heavy-duty diesel vehicles in California, which imposes limits on idling, requires all vehicles to be reported to CARB, restricts adding of older vehicles into fleets, and requires fleets to reduce emissions by retiring, replacing, or repowering older engines, or installing exhaust retrofits. The regulation would subsequently help to improve fuel efficiency and reduce GHG emissions. Any licensed contractor for the project and equipment would have to be in compliance with all applicable regulations, such as the in-use, off-road, heavy-duty vehicle regulation. Thus, the proposed project would comply with existing standards related to construction fuel efficiency. Technological innovations and more stringent standards are being researched, such as multi-function equipment, hybrid equipment, or other design changes, which could help to reduce demand on oil and emissions associated with construction.

Therefore, the temporary increase in gasoline and diesel consumption due to project construction activities would not be an inefficient, wasteful, and unnecessary consumption of energy, and significant adverse impacts on oil resources would not occur.

Conclusion

Construction of the proposed project would result in a temporary increase in demand for energy resources. However, the temporary increase would not result in significant increase in peak or base demands or require additional capacity from local or regional energy supplies. In addition, the proposed project would be required to comply with all applicable regulations related to energy conservation and fuel efficiency, which would help to reduce the temporary increase in demand. The project applicant and/or contractor may choose to implement voluntary measures to further reduce the project's construction-related energy demand. As such, the project would not result in an inefficient, wasteful, and unnecessary consumption of energy. Therefore, the proposed project would result in a ***less-than-significant*** impact on energy resources during construction.

Mitigation Measure(s)
None required.

4.7-4 Impacts related to energy associated with operations. Based on the analysis below and with implementation of mitigation, the impact is *less than significant.*

In order to ensure energy implications are considered in project decisions, Appendix F of CEQA Guidelines requires a discussion of the potential energy impacts of project, with particular emphasis on avoiding or reducing inefficient, wasteful, and unnecessary consumption of energy. Appendix F identifies several potential sources of energy conservation impacts, which are listed as follows and discussed in further detail below, with the exception of the project's construction-related energy requirements and energy use efficiencies, which are discussed under Impact 4.7-3 above:

- The project's energy requirements and its energy use efficiencies by amount and fuel type for each stage of the project including construction, operation, maintenance and/or removal.
- The effects of the project on local and regional energy supplies and on requirements for additional capacity.
- The effects of the project on peak and base period demands for electricity and other forms of energy.
- The degree to which the project complies with existing energy standards.
- The effects of the project on energy resources.
- The project's projected transportation energy use requirements and its overall use of efficient transportation alternatives.

The project site is currently designated for Agriculture uses in the City of Davis General Plan, and the existing land use designations within the General Plan do not fully reflect the type of project envisioned on the MRIC site. As such, a General Plan amendment is proposed to add a new land use designation to the City's General Plan that would better suit the MRIC portion of the proposed project. A General Plan amendment for the Mace Triangle portion of the proposed project would assign land use designations to reflect the existing ongoing uses on the Mace Triangle site and allow future development on the agricultural and Ikedas parcels. Because the proposed project has not been included in the City's General Plan or analyzed in the associated EIR, the energy implications of the proposed project have not been formally considered by the City.

The MRIC would introduce up to approximately 2,654,000 square feet of innovation center uses, including offices, laboratories, manufacturing uses, a hotel, and support retail. The proposed uses would result in an increase in energy demand and usage within the City, including building energy usage and transportation energy usage. Future development on the Mace Triangle site is assumed to include up to 45,901 square feet of new research, office, and/or research and development (R&D) uses, and up to 25,155 square feet of new ancillary retail, for a total of 71,056 square feet. A discussion regarding the proposed project's demand and potential effects, including both the MRIC

and Mace Triangle, on supplies with regards to building and transportation energy usage is provided below.

Building Energy

Buildout of the MRIC would result in energy consumption in the form of electricity and natural gas for interior and exterior building lighting, heating, ventilation, and air conditioning (HVAC), electronic equipment, machinery, refrigeration, appliances, security systems, irrigation well pump, and more. In addition, maintenance activities during operations, such as landscape maintenance, would involve the use of electric or fueled equipment. The proposed project site is located adjacent to other existing development to the west and south that are currently supplied electricity and natural gas services by PG&E. The project site would connect to existing PG&E utility lines in the project vicinity.

According to the CalEEMod results for the proposed project, at full buildout, the project would be expected to result in consumption of electricity of a maximum of 12.01 gigawatt-hours (GWh) per year, which would be a maximum of 0.01 percent of PG&E's total planning area projected electricity consumption in 2024. In addition, according to the CalEEMod results for the proposed project, at full buildout, the project would be expected to result in consumption of natural gas of approximately 0.27 therms per year, which would be a minor fraction of the amount (approximately $5.8x10^{-9}$ percent) of PG&E's total planning area projected consumption in 2024. Due to the assumption that full buildout of the project would occur by 2035 and the trend of an increase in energy savings due to more stringent regulations and energy efficiency technological advancements over time, the actual proposed project demand on electricity and natural gas supplies would likely be less and the percentage of PG&E's total consumption would be less. The aforementioned energy consumption would be related to base period demands, which applies to the total quantity of energy over a billing period.

Peak period demands are the highest measured amount of energy supplied at any one time within a billing period. For non-residential/commercial buildings, peak period demands are typically associated with the spike in air conditioning use during the heat of the afternoon. Heat within a building is associated with direct rays of the sun against the building. Reductions in peak demand associated with such would be reduced by improving the efficiency of air conditioning systems, turning up the thermostat, installing sufficient wall and roof insulation, installing thermally efficient doors and windows, using cool roofs, design of building orientation, and adequate shading.

The MRIC portion of the project would incorporate use of shading and passive solar techniques to minimize heat gain and orient buildings to maximize solar exposure from natural daylight. Passive design systems are intended to allow the sun to enter into buildings in the winter through south-facing windows and retain the heat within building materials; whereas, in the summer, shade is provided to the south-facing windows by roof overhangs or other control approaches such as screens, planters, shutters, or trellises, blocking summer solar heat gain in the building. Figure 4.7-1, Figure 4.7-2, and Figure

4.7-3 show the proposed building orientations and sun shadow during the spring, summer, and winter, respectively.

The proposed high-tech uses for the project site, such as the Research and Development uses, would require the processing of large amounts of electronic data. As such, data centers would be expected to occur throughout the project site, which would likely be necessary to be running constantly. Due to the Information Technology (IT) equipment and necessary associated cooling equipment required for data centers for large-scale projects such as the proposed project, data centers are linked to intensive consumption of large amounts of energy. According to PG&E's *Data Center Best Practices Guide*,[35] data centers can consume 100 to 200 times as much electricity as standard office spaces. IT loads can account for over half of an entire facility's energy use. With such large energy consumption, data centers are increasingly becoming a target area for potential reduction requirements.

The Center of Expertise for Energy Efficiency in Data Centers is a USDOE, Federal Energy Management Program (FEMP), and Lawrence Berkley National Laboratory (LBNL) website provides energy efficient technologies and best practices for data center facilities managers.[36] The Center of Expertise for Energy Efficiency in Data Centers website identifies tools, best practices, analyses, and the introduction of technologies to assist federal agencies with implementing policies and developing data center energy efficiency projects.[37] A number of best management practices currently exist for reducing energy consumption associated with data centers, such as those included in PG&E's *Data Center Best Practices Guide*.

In order to ensure the future data centers would not result in an inefficient, wasteful, or unnecessary consumption of energy, the data centers must be designed to be energy efficient to the maximum extent practicable.

The proposed project is required to comply with the mandated standards of the CALGreen Code, including compliance with the California Building Energy Efficiency Standards Code. The 2013 Building Energy Efficiency Standards focus on several key areas to improve the energy efficiency and include requirements to enable both demand reductions during critical peak periods and future solar electric and thermal system installations. Compliance with the CALGreen Code and California Building Energy Efficiency Standards Code would help to further reduce the proposed project's overall consumption of energy.

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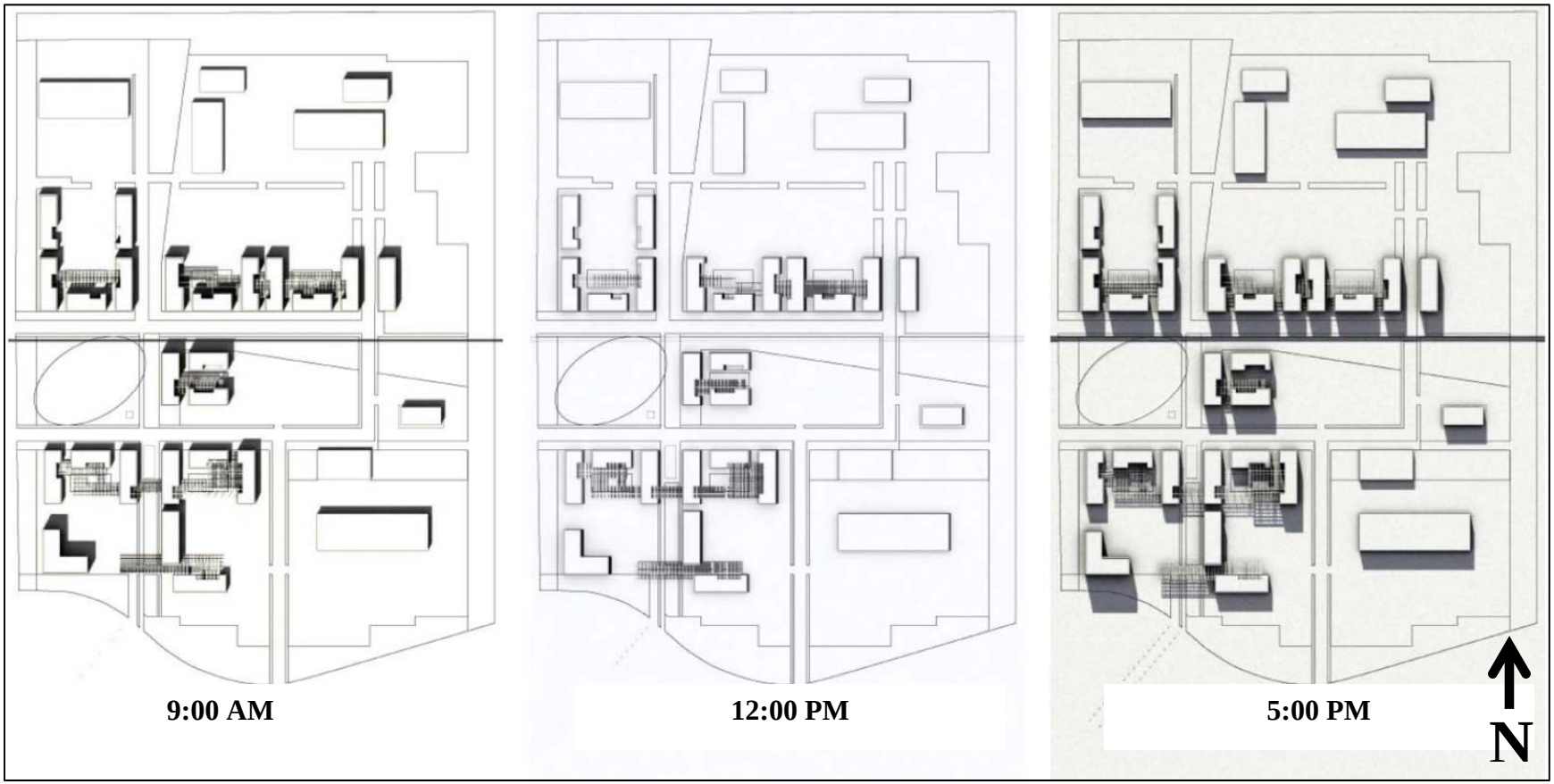
[35] Pacific Gas and Electric Company. *Data Center Best Practices Guide.* 2012.

[36] U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy. *Resources on Data Center Energy Efficiency*. Available at: http://energy.gov/eere/femp/resources-data-center-energy-efficiency. Accessed May 2015.

[37] Lawrence Berkeley National Laboratory, U.S. Department of Energy, and Federal Energy Management Program. *Center of Expertise for Energy Efficiency in Data Centers*. Available at: https://datacenters.lbl.gov/. Accessed May 2015.

Figure 4.7-1
Sun Shadow in March



Source: Pinto & Partners, November 21, 2014.

Figure 4.7-2
Sun Shadow in June

Source: Pinto & Partners, November 21, 2014.

Figure 4.7-3
Sun Shadow in December

Although the proposed project would not be expected to result in significant adverse impacts on local and regional energy supplies, requirements for additional capacity, peak and base period demands, and would comply with existing energy standards, design of future on-site data centers could still result in an inefficient, wasteful, or unnecessary consumption of energy, and which could cause a significant impact on electricity and natural gas resources.

Transportation Energy

Based on project-specific VMT data provided by Fehr & Peers, Inc., the proposed project is expected to result in a daily VMT at full buildout of 196,000. The average fuel economy in miles per gallon (mpg) for the U.S. car (24.9 mpg) and light truck (18.5 mpg) fleet, which each make up 50 percent of new light vehicle sales in the U.S., was obtained from the *Transportation Energy Data Book*.[38] Based on the data, the overall average fuel economy of the U.S. vehicle fleet was calculated to be of 21.7 mpg. Using 21.7 mpg, the proposed project would be expected to consume approximately 0.003 million barrels of gasoline per week. California inventories of gasoline fluctuated between 9.5 and 14 million barrels per week in 2014. The proposed project's anticipated demand at full buildout would be a maximum of approximately 0.01 percent of the State's current inventory of gasoline.

As discussed previously, the State leads the nation in registered alternatively-fueled and hybrid vehicles. In addition, State-specific regulations encourage fuel efficiency and reduction of dependence on oil. Improvements in vehicle efficiency and fuel economy standards help to reduce consumption of gasoline. As further technological advancements are made, more efficient and cost effective oil productivity would occur, which would lead to an increase in oil productivity. In addition, advancements in more efficient, cleaner burning fuels and vehicles would occur, which would help to reduce the State's dependence on petroleum products. The proposed project would be required to comply with all applicable regulations associated with vehicle efficiency and fuel economy.

The Davis CAAP includes objectives for mobility within the City with priorities to reduce VMT, improve efficiency of the transportation network, improve energy efficiency of the vehicle fleet by implementing more advanced technologies, and reduce the carbon content of fuels through the use of alternative fuels. As the City implements the CAAP objectives, the City's overall dependence on oil would be expected to be reduced, including project-related consumption of gasoline.

In addition, Mitigation Measure 4.14-6 in the Transportation and Circulation section of this EIR requires the implementation of a Travel Demand Management program. Because the MRIC includes implementation of a number of sustainability features, as listed in the Project Description chapter of this EIR, that would contribute to a reduction of the project's potential increase in demand for oil, promote alternative modes of

[38] Oak Ridge National Laboratory. *Transportation Energy Data Book: Edition 33*. July 2014.

transportation, comply with all applicable standards and regulations, and encourage fuel consumption reductions and efficiency, the proposed project would not result in an inefficient, wasteful, and unnecessary consumption of energy. It should also be noted that the SACOG MTP/SCS anticipates a certain amount of growth in the region and includes the associated vehicle trips. The proposed project would fulfill a portion of the anticipated growth in the region. Thus, the vehicle trips associated with the proposed project were included in the MTP/SCS. Therefore, the proposed project would not be considered to result in a substantial increase in demand for regional fuel supplies, or a requirement for substantial additional fuel capacity, and a less-than-significant impact related to transportation energy use would occur.

Conclusion

As discussed above, the proposed project operations would involve an increase in energy consumption. The proposed project (including MRIC and Triangle) would comply with all applicable standards and regulations regarding energy conservation and fuel efficiency. To ensure that the proposed project would not result in a wasteful, inefficient, or unnecessary usage of energy, the future on-site data centers must be designed to be energy efficient to the maximum extent practicable. With implementation of the mitigation measure below, impacts related to operational energy would be considered ***less than significant***.

Mitigation Measure(s)

MRIC

4.7-4 *Prior to approval of construction drawings for innovation center buildings that include data centers, the applicant shall submit an Energy Management Plan to the City of Davis Department of Community Development and Sustainability demonstrating compliance with principles for energy management for data centers, which could include, but not be limited to the following:*

- *IT Systems;*
- *Air Management;*
- *Centralized Air Handling;*
- *Cooling Plant Optimization;*
- *On-Site Generation;*
- *Uninterruptible Power Supply Systems.*

Other energy efficient technologies and best practices that are available at the time construction drawings are submitted could be included in the Energy Management Plan as well, such as any measures described by US Department of Energy Center of Expertise for Energy Efficiency in Data Centers.

Mace Triangle – none

4.7-5 Conflict, or create an inconsistency, with any applicable plan, policy, or regulation adopted for the purpose of avoiding or mitigating environmental effects related to energy conservation. Based on the analysis below, the impact is *less than significant*.

Table 4.7-7 includes the applicable City of Davis General Plan policies and performance objectives related to energy and includes a discussion of the proposed project's compliance with the policies. As demonstrated in the table, based on the project's design, a finding of consistency or a finding of substantial compliance with City's policies and performance objectives related to energy could be made. Accordingly, the proposed project would not conflict, or create an inconsistency, with any applicable plan, policy, or regulation adopted for the purpose of avoiding or mitigating environmental effects related to energy conservation, and impacts would be ***less than significant***.

Mitigation Measure(s)
None required.

Table 4.7-7
City of Davis Policy Discussion

Policy		Project Consistency
City Policies Related to Global Climate Change and GHG Emissions **Transportation Element of the Davis General Plan**		
Performance Objective #2.1:	Reduce carbon emissions from the transportation sector 61% by 2035.	The 61 percent reduction from the transportation sector by 2035 is in comparison with 2010 levels. Performance Objective #2.1 was derived from the CAAP to achieve carbon neutrality by 2050. As discussed above, due to the mitigation measures required in this EIR, as well as GHG emission reductions resultant of the future regulatory environment and new technological advancements as they become available, the proposed project would be expected to be capable of achieving compliance with the City's 2050 goal. However, due to future regulatory uncertainties, as well as uncertainties related to the actual buildout of the proposed project and potential GHG emissions reductions due to sustainability features of the project, the full GHG reductions associated with such would be speculative to identify at this time. For this reason, and because the proposed project's GHG emissions cannot be shown to be reduced to net zero by 2050 with any certainty at this time, the impact would remain significant and unavoidable.
Performance Objective #2.2:	Reduce vehicle miles traveled (VMT) 39% by 2035.	Performance Objective #2.2 is discussed in further detail in the Transportation and Circulation section of this EIR. Similar to above, the 39 percent reduction in VMT by 2035 is in comparison with 2010 levels, and was derived from the CAAP to achieve carbon neutrality by 2050. As discussed above, due to the mitigation measures required in this EIR, as well as GHG emission reductions resultant of the future regulatory environment and new technological advancements as they become available, the proposed project would be expected to be capable of achieving compliance with the City's 2050 goal, thus, would contribute a VMT reduction of 39 percent by 2035. In addition, the State and the City is expected to continue to develop programs for the reduction of local, regional, and statewide GHG emissions, likely to include VMT reduction programs. However, due to uncertainties related to the future regulatory environment and actual buildout of the proposed project, such reductions cannot be shown with any certainty at this time.

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Table 4.7-7
City of Davis Policy Discussion

Policy		Project Consistency
		As discussed in the Transportation and Circulation section of this EIR, the project would increase the total City-generated VMT rather than reduce VMT. However, the project applicant and future tenants have a unique ability to implement programs that promote travel alternatives to the single-occupant vehicle, control the fuel types and efficiencies of vehicles accessing the site, and collectively contribute to the goal of minimizing VMT on a per capita basis. With implementation of Mitigation Measure 4.14-6 of this EIR, the project would minimize its VMT. Nonetheless, as stated above, Mitigation Measure 4.14-6 alone would not be sufficient to reduce VMT by 39 percent from 2010 levels by 2035.
Policy TRANS 1.6	Reduce carbon emissions from the transportation system in Davis by encouraging the use of non-motorized and low carbon transportation modes.	As listed in the Project Description chapter of this EIR, the MRIC portion of the proposed project would include a number of sustainability features that would contribute to a reduction of carbon emissions associated with the transportation system and encourage the use of non-motorized and low carbon transportation modes, including dedicated drop-off and pick-up zones for buses, dedicated shuttles, integrated carpool uses, a "Transit Plaza", and bicycle supportive facilities. In addition, Mitigation Measure 4.14-6 in the Transportation and Circulation section of this EIR requires the implementation of a Travel Demand Management (TDM) program, which would be designed to reduce vehicle trips and encourage the use of non-motorized transportation.
Policy TRANS 1.7	Promote the use of electric vehicles and other low-polluting vehicles, including Neighborhood Electric Vehicles (NEV).	According to the Design Guidelines for the MRIC, electric vehicle charging stations will be made available at the site per City requirements. In addition, the TDM program required per Mitigation Measure 4.14-6 in the Transportation and Circulation section of this EIR would contribute to the promotion of low-polluting vehicles.
Policy TRANS 1.8	Develop and maintain a work trip-reduction program designed to reduce carbon emissions, criteria pollutants, and local traffic congestion.	Mitigation Measure 4.14-8 in the Transportation and Circulation section of this EIR requires the implementation of a TDM program, which would be designed to reduce vehicle trips. The TDM program may include, but would not be limited to, features to reduce work trips, such as provision of pedestrian and bicycle amenities, establishment of carpool, buspool, or vanpool programs, and preferential parking for ridesharing vehicles.

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Table 4.7-7
City of Davis Policy Discussion

Policy		Project Consistency
Policy TRANS 2.3	Apply best practices in sustainability to new streets and redesigns of existing streets/corridors.	Best practices in sustainability to streets, such as Complete Streets designs, are primarily associated with enabling safe access for all users (i.e., pedestrians, bicyclists, motorists, and transit riders). Such practices include sidewalks, crosswalks, bicycle facilities such as bike lanes, bicycle support facilities such has bike racks, easily accessible bus stations and transit support facilities such as bus stop shelters. In addition, best practices include safety measures such as traffic circles, curb extensions, and roundabouts. The Project Description chapter of this EIR includes a summary of the proposed sustainability features for the MRIC project, which are outlined in greater detail in the Design Guidelines for the MRIC. As listed in the Project Description chapter, the project would incorporate a multitude of TDM strategies, would have dedicated drop-off and pick-up zones for buses, dedicated shuttles, and would install bicycle supportive facilities such as racks, storage lockers, a repair station, and showers. In addition, the proposed project would include a number of alternative transportation connectivity options, as shown in Figure 3-15 of the Project Description chapter, including a bike path and enhanced intersection features. As such, the proposed project would apply best practices in sustainability to new streets.
Policy TRANS 3.3	Require new development to be designed to maximize transit potential.	As discussed in the Project Description chapter of this EIR, the proposed project would include a transit plaza, which may include a primary drop-off/pick-up area for local shuttles to downtown Davis and the Amtrak, and other more direct destination shuttles. In addition, the MRIC Site is proximate to a Yolo Bus stop at the Park-and-Ride lot, as well as an existing transit stop located on Mace Boulevard.
Policy TRANS 4.4	Provide pedestrian and bicycle amenities.	As discussed above and in further detail in the Project Description chapter of this EIR, the proposed project would include a number of pedestrian and bicycle amenities, including, but not limited to, a new bike path, bicycle parking, bike storage, a bike repair area, and links to the existing pedestrian trail system and regional bike trail (Yolo Causeway Bike Path).

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City Policies Related to Energy Chapter 17, Energy, of the Davis General Plan		
Policy ENERGY 1.1	Develop programs to increase energy conservation on the household and business level.	As listed in the Project Description chapter of this EIR, the MRIC would include incorporation of LEED standards, passive solar techniques, use of parking lots, rooftops, drainage features, and other areas deemed appropriate for dual purposes, for the installation of solar panels to generate energy for on-site uses, use of latest building technology mechanical/electrical systems for energy efficiency, and use of natural ventilation. A minimum of 50 percent of the electrical energy requirements of the project would be supplied by on-site energy generation and energy conversion systems. In addition, the proposed project would be required to comply with all applicable federal, State, and local standards related to energy conservation.
Policy ENERGY 1.3	Promote the development and use of advanced energy technology and building materials in Davis.	The proposed MRIC uses, such as Research and Development, have the potential to directly contribute to the future development of advanced energy technology and building materials in Davis. As discussed above, the MRIC would include incorporation of LEED standards, passive solar techniques, use of parking lots, rooftops, drainage features, and other areas deemed appropriate for dual purposes, for the installation of solar panels to generate energy for on-site uses, use of latest building technology mechanical/electrical systems for energy efficiency, including energy reductions on plug-loads and ventilation systems, and use of natural ventilation. A minimum of 50 percent of the electrical energy requirements of the project would be supplied by on-site energy generation and energy conversion systems.
Policy ENERGY 1.4	Continue to enforce landscaping requirements that facilitate efficient energy use or conservation.	As listed in the Project Description chapter of this EIR, the proposed project would use drought tolerant plantings and incorporate native species adapted to the local climate. In addition, the project would promote water conservation and reductions where feasible, including the utilization of smart and/or high-efficiency fixtures and appliances.
Policy ENERGY 1.5	Encourage the development of energy-efficient subdivisions and buildings.	As discussed above and listed in the Project Description chapter of this EIR, the proposed project design would include a number of energy-efficient features, including the provision of a minimum of 50 percent of the electrical energy requirements of the project using on-site energy generation and energy conversion systems. Additional energy-efficiency features of the proposed project, as listed in the Project Description chapter, included, but are not limited to, the following: use of shading and passive solar techniques; orient buildings to maximize solar exposure from natural daylight; make use of

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	areas deemed appropriate for dual purposes (e.g., parking lots, rooftops, drainage features) for the installation of solar panels to generate energy for on-site uses; and include the necessary infrastructure to utilize to the extent possible solar panels as a means for energy generation on-site and energy exchange throughout the project site including the potential for on-site energy storage.