

MEMORANDUM

May 2, 2018

To:
Brian Bauer
County of Orange/CEO/Real Estate

From:
Tin Cheung

Subject: Feasibility of Implementation of Provisions of MM GHG-6 for the West Alton Parcel Development Plan

This Technical Memorandum was developed to discuss the feasibility of implementing and ability to quantify the emission reductions identified in MM GHG-6 developed for the West Alton Parcel Development Plan. Briefly, this measure, which was developed in conjunction with the preparation of Responses to Comments on the Draft EIR, requires each application to incorporate measures to sufficiently reduce greenhouse gas (GHG) emissions to a level considered less than significant for a period of 30 years. The South Coast Air Quality Management District (SCAQMD) efficiency threshold of equal to or less than 3.0 metric tons of carbon dioxide equivalent per service population per year (MTCO_{2e}/SP/year) is used for determining significance. For purposes of implementing this mitigation measure, each development project's incremental contribution to the overall generation of GHG shall be determined using the application's service population.

The California Air Pollution Control Officers Association has published *Quantifying Greenhouse Gas Mitigation Measures – A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures* (CAPCOA Document). The CAPCOA Document provides quantification of GHG reduction measures for numerous categories of emission sources such as energy, transportation, water, area landscaping, solid waste, vegetation, construction and miscellaneous. For example, Chapter 7 of the CAPCOA Document provides suggested quantification methodology for energy for the following emission reduction measures:

- Building Energy Use - exceeding Title 24 standards, install programmable thermostat timers, third-part HVAC commissioning and verification of energy savings, energy efficient appliances, install energy efficient boilers);
- Lighting (higher efficacy street and area lighting, limiting outdoor light requirements, replace traffic lights with LED traffic lights);
- Alternative Energy Generation – Carbon neutral energy systems, solar power, wind power, combined heat and power systems.

This CAPCOA Document provides assessment methods that could be used to estimate GHG reductions associated with the menu of measures listed under MM GHG-6. Some of these measures, such as transportation reduction measures, are incorporated within the emission reductions taken through the CalEEMod model as mitigation options. There are other sources of quantification methods that could be applied as long as sufficient substantiation of values and methods are provided. The CARB has a website that provides numerous assessment methods for the quantification of GHG¹.

MM GHG-6 provides for the purchasing and retiring carbon credits that have been issued by a recognized and reputable accredited carbon registry. This approach is expressly identified in the CAPCOA Document

¹ CARB website. Accessed 8-7-2017. <https://www.arb.ca.gov/cc/capandtrade/auctionproceeds/quantification.htm>

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as an effective means of complying with the AB 32 requirements. The CAPCOA Document discusses how entities can obtain emissions reductions through emissions trading. Entities that reduce GHG emissions may qualify to have them considered as emission credits that could be used in a GHG trading market. These emission credits that are generated may be purchased by other entities that desire emissions reductions but are not able to make these reductions directly. A transaction can be made to obtain emission credits generated by an emission source. The CAPCOA Document establishes the following Standards for Credits:

In order to be acceptable for credit under the AB 32 program, GHG emission reductions must be real, permanent, quantifiable, verifiable, enforceable, and additional. Historically, the federal Clean Air Act (CAA, or Act) has required emission reduction credits to be: real, permanent, quantifiable, enforceable, and surplus². In this context, surplus means the reductions are not required by any law, regulation, permit condition, or other enforceable mechanism under the Act. California continued this concept in AB 32, requiring that any regulation adopted pursuant to AB 32 ensure that GHG reductions are “real, permanent, quantifiable, verifiable and enforceable.”³ The term “additional” comes from the Clean Development Mechanism in the Kyoto Protocol; it is essentially the same as “surplus” except that it is not restrict to any particular statute, and means that you cannot receive credit for any reductions that you were otherwise obligated to make. AB 32 requires it implementing regulations that include market-based compliance mechanisms to ensure that reductions are “in addition to any greenhouse gas emission reduction otherwise required by law or regulation, and any other greenhouse gas emission reduction that might otherwise occur.”⁴

PROVISIONS OF THE MITIGATION MEASURE

MM GHG-6 requires that each development project will incorporate sufficient GHG emission reduction requirement that would reduce the Project’s overall GHG emissions to a less than significant level, which is defined as a performance standard equal to 3.0 metric tons of carbon dioxide equivalent per service population per year (MTCO_{2e}/SP/year) in 2030. The measure, which is provided in its entirety in Attachment C, includes a menu of options of possible emission reducing actions. These include:

- Install solar water heating for swimming pools in private recreation centers in lieu of natural gas heating.
- Prepare a Transportation Demand Management Plan (TDM Plan)
- Install renewable energy power generation beyond the amount, if any, the application is getting credit for, pursuant to DR GHG-3.
- Install electric vehicle charging stations capable of charging on- or off-site parking spaces that would achieve the same or better functionality as Level 2⁵ charging stations.
- Reduce GHG emissions by purchasing and retiring carbon credits that have been issued by a recognized and reputable accredited carbon registry. The credits purchased must be real,

² 40 CFR Sections 51.493 and 51.852

³ California HS&C: Section 35862(d)(1)

⁴ Ibid. Section 35862(d)(2)

⁵ Level 2 charging refers to the voltage that the electric vehicle charger uses (240 volts). Level 2 chargers come in a variety of amperages ranging from 16 amps to 40 amps, the two most common are 16 and 30.

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quantifiable, enforceable, validated, and for the period of time specified in the application's GHG emissions analysis.

- Implement other quantifiable, GHG emission reduction measures identified and substantiated in the GHG study/plan submitted with each application.

METHOD FOR IMPLEMENTATION AND VERIFICATION OF GHG EMISSION REDUCTION

Solar Water Heating for Swimming Pools

Swimming pools typically use electricity for filters and pumps, and natural gas for water heating. This provides an opportunity for emissions reduction through the installation of solar heating for pools, which is a GHG emissions reduction strategy supported by CAPCOA and incorporated into the menu of options in MM GHG-6. The emissions reduction is the difference between the total GHG emissions from the annual energy usage associated with electricity and natural gas and the energy usage with the installation of solar equipment. The measure specifies use of published pools studies, the Department of Energy estimates, or other reliable methodology to calculate the saving. The precise emissions reduction would be scaled to represent energy consumption per year per volume of the pool and the contractor specifications for the specific equipment used. As noted in the measure, to assess the energy reductions each applicant shall be required to submit a GHG study. For energy reduction associated with solar heating of pools, the methodology will comply with the Department of Energy estimates or other reliable methodology. To provide a preliminary assessment of the potential reductions, typically for every 100,000 British Thermal Units (BTU), an electric pool heater uses approximately 5 kW per hour, a propane heater requires 1 gallon of fuel, or a natural gas heater requires 1 therm of energy. The energy savings, and therefore, the GHG emissions reduction, would be based on the number of hours the pool is heated.⁶ To efficiently size the solar thermal system, the system would need to be approximately 60 to 70 percent of the surface area of the pool to be heated. For example, a pool 20 feet by 50 feet has a surface area of 1,000 square feet, so a thermal solar array of approximately 600 to 700 square feet would be required to properly heat the pool. Space availability would need to be assessed if this measure is recommended. Alternatively, additional renewable energy production can be implemented and be used for pool heating, as well as other uses on site. Renewable energy production is further discussed below. Associated energy savings for pools can also be achieved through the use of insulated pool blankets, which serve to help maintain temperature and reduce energy usage associated with reheating of water.⁷

Transportation Demand Management Plan

Transportation Demand Management Plan (TDM Plan) enhancing the use of alternative transportation modes through the provision of incentives, subsidies, bike-sharing and car-sharing programs, and other technology-based programs. TDM strategies are identified by CAPCOA as a method of reducing GHG emissions and are included by SCAG in the Regional Transportation Plan/Sustainable Communities Systems. The intent is to identify key implementation actions that would reduce vehicle miles traveled (VMT) by providing people with more options for transportation and mobility and offering them various alternatives to driving alone. This concept is included in the Draft EIR through MM GHG-2, which require actions to support bus, Metrolink, and Amtrak by posting schedules. The Draft EIR did not

⁶ <https://www.inyopools.com/Blog/how-much-does-it-cost-to-run-a-pool-heater/> (accessed October 5, 2017)

⁷ The pool energy analysis conducted for the University of California Riverside identified a pool cover could save up to 44.6 percent of the water consumption of the facility due to annual evaporation and up to 49.7 percent of the energy consumption (Councilman Hunsaker, UC Riverside—Pool Energy Analysis, June 29, 2011).

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quantify the reductions associated with a TDM Plan because it will be dependent on the type of services and other measures offered in the any TDM Plan developed as part of implementation of the project and credit, if any, for VMT/GHG reductions already accounted for in trip generation calculations for the development/operations addressed in the TDM Plan. Only quantifiable GHG reductions documented in the required GHG study will be accounted for as part of the reductions required by MM GHG-6.

Increased Renewable Energy Production

The Draft EIR included a commitment (DR GHG-3) for renewable energy generation for the entirety of the Project, in an amount equivalent to 1.25 kilowatts (kW) per dwelling unit. The menu provided in MM GHG-6, which is not exclusive, expressly identifies two potentially options associated with renewable energy that projects may use to achieve additional emissions reduction. This could include solar heating of swimming pools, solar water heating, or increased onsite renewable energy generation beyond the amount of renewable energy generated in accordance with the requirement in DR GHG-3.

Renewable energy production is a technically feasible GHG reduction measure through, for example, the installation of low-carbon, on-site energy generation, such as solar photovoltaics (PV) panels. The National Renewable Energy Laboratory, which is part of the US Department of Energy, has a solar calculator to help calculate the expected production based on location and other reliable mechanisms exist to evaluate the specific energy production projections for a proposed renewable energy installation. In this location, i.e. Irvine, California, the solar capacity factor is estimated at 18.1 percent; thus a 10 kW system would produce an average of 15,858 kWh/year (range 15,411-16,094 kWh/year. This would be equivalent to a GHG reduction of approximately 3.1 MTCO_{2e} per year. As discussed in the Draft EIR (Section 4.7), DR GHG-3 requires total solar generation for the entire Project equivalent to 1.25 kW per dwelling unit; for GHG analysis, it is estimated that solar generation would be 1,592,550 kilowatt hours (kWh) per year; resulting in a GHG reduction of approximately 311 MTCO_{2e} per year. As each stage of the development is implemented, the GHG Study, required by MM GHG-6, will quantify the expected GHG reduction amount for the renewable energy installation required by DR GHG-3 and additionally proposed in furtherance of meeting the 3.0 MTCO_{2e}/SP/year standard established by MM GHG-6.

Purchase of Carbon Offsets

MM GHG-6 identifies the purchase of carbon offsets as a method to achieve a reduction in GHG emissions. The Air Resources Board (ARB), which has adopted five Compliance Offset Protocols that may be used to generate Registry Offset Credits (ROCs), is one example of a source for identifying potentially qualifying carbon offsets. The ARB's protocols currently include:

- U.S. Forest Projects Compliance Offset Protocol
- Livestock Projects Compliance Offset Protocol
- Mine Methane Capture Compliance Offset Protocol
- Ozone Depleting Substances Compliance Offset Protocol
- Rice Cultivation Compliance Offset Protocol
- Urban Forest Projects Compliance Offset Protocol

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Additionally, a process has been established for the listing, reporting, and verification of offset projects developed using the Compliance Offset Protocols. In that regard, the ARB currently identifies three registry offset websites that provide lists of projects with available offsets⁸:

- American Carbon Registry (<https://acr2.apx.com/myModule/rpt/myrpt.asp?r=111>)
- Climate Action Reserve (<https://thereserve2.apx.com/myModule/rpt/myrpt.asp?r=211>)
- Verified Carbon Standard (<http://www.v-c-s.org/project/california-offset-project-registry/>)

One program identified by the ARB for purchasing offsets is the Climate Action Reserve (CAR), which is a “national offsets program focused on ensuring environmental integrity of GHG emissions reduction projects to create and support financial and environmental value in the U.S. carbon market”. As an approved Offset Project Registry (OPR), the CAR can issue Registry Offset Credits under ARB Compliance Offset Protocols. When registering projects that have been independently verified as adhering to its project protocols, CAR assigns unique serial numbers to all generated carbon credits. This prevents the possibility of double counting and assures buyers that when a Climate Reserve Tonnes (CRT) has been retired, it cannot be sold or transferred again and has created a real and permanent offset. All project information is made publicly available through the CAR system.

Although not the exclusive resource for documenting the validity of carbon offsets, the ARB protocols are one example of rigorous, transparent verification process that involves participation from stakeholders representing a variety of sectors, including industry, government, science, academic, public, and environment.

CONCLUSIONS

Based on the information outlined above, and our experience with GHG reduction strategies, MM GHG-6 identifies appropriate performance standards and potential opportunities to sufficiently reduce the potentially significant impacts of the Project's GHG emissions. MM GHG-6's menu of approaches offers potentially verifiable mechanisms for the project to achieve an efficiency threshold of 3.0 MTCO_{2e}/SP/year for 2030.

⁸ <https://www.arb.ca.gov/cc/capandtrade/offsets/offsets.htm>

Attachment A**Full Text of MM GHG-6**

MM GHG-6 In conjunction with Level I, II, and III reviews, each applicant shall demonstrate how the proposed development will (i) satisfy its proportional contribution toward the Project's overall GHG emission reduction requirement as identified in DR GHG-3, MM GHG-1, and MM GHG-2 in Section 4.7, Greenhouse Gas Emissions, of the Draft EIR (or achieve equivalent reduction through other qualifying measures); and (ii) incorporate elements from the menu of options, provided below, sufficient to further reduce for a period of 30 years that application's incremental contribution to the Project's overall GHG emissions to a less than significant level, which is defined as a performance standard equal to 3.0 MTCO₂e/SP/year in 2030. For purposes of implementing this mitigation measure, each development project's incremental contribution to the overall generation of GHG shall be determined using the application's service population characteristics, which are defined as 1.99 persons per dwelling unit for residential development. For example, if an application proposes a total of 200 dwelling units, based on the application's service population of 398 (200 x 1.99), GHG emissions will be less than significant if the application's net GHG emissions with mitigation are less than 1,194 (398 x 3.0) MTCO₂e/year for year 2030.

The GHG emissions calculation for 2030 shall be submitted using the most current version of CalEEMod or subsequent emissions calculator model accepted by SCAQMD. Mobile source emissions shall be calculated using the proposed project's average daily trips. Furthermore, each application shall mitigate the construction emissions associated with the project application.

Applicants shall identify the GHG emission reduction measures proposed by the application (or previously approved excess reductions achieved by other applications within the Project) that will bring the application's GHG emissions below the SCAQMD-recommended project level significance threshold of 3.0 MTCO₂e/SP/year for 2030. Applications shall be accompanied by a GHG study/plan prepared by a qualified consultant, to substantiate the relative emissions reduction associated with each proposed reduction measure identified in the application.

In addition to the GHG emission reduction measures identified elsewhere in the Final EIR, the following presents a menu of GHG emissions reduction options that the applicant may pick from to achieve GHG emission reductions required to satisfy the performance standard specified in this mitigation measure. In conjunction with Level I, II, and III reviews, the County will review the applicant submitted GHG study/plan prepared by a qualified consultant to quantify the relative emissions reduction associated with each option selected for the application. The Level I, II and III approvals will identify the approved GHG reduction measures incorporated into the application in order to achieve the less than significant GHG emissions. The measures shall be incorporated by the County as conditions of approval that will be demonstrated as part of plan check and permitting processes. The County shall also verify implementation of the

measures prior to the issuance of the use and occupancy permit for the application.

- Install solar water heating for swimming pools in private recreation centers in lieu of natural gas heating. The GHG emissions reduction is the difference between the total GHG emissions from the annual energy usage associated with electricity and natural gas and the energy usage with the installation of solar equipment. The electricity and natural gas energy usage factors for swimming pools shall be based on the energy consumption identified in a published pools study, the Department of Energy estimates⁹ or other reliable methodology. The analysis would be scaled to represent energy consumption per year per volume of the pool and the contractor specifications for the specific equipment used.
- Prepare a Transportation Demand Management Plan (TDM Plan) enhancing the use of alternative transportation modes through the provision of incentives, subsidies, bike-sharing and car-sharing programs, and other technology-based programs. Identify key implementation actions that would reduce vehicle miles traveled (VMT).
- Install renewable energy power generation beyond the amount, if any, the application is getting credit for pursuant to DR GHG-3. The GHG emissions reduction would be calculated based on the amount of renewable energy provided.
- Install electric vehicle charging stations capable of charging on- or off-site parking spaces that would achieve the same or better functionality as Level 2¹⁰ charging stations.
- Reduce GHG emissions by purchasing and retiring carbon credits that have been issued by a recognized and reputable accredited carbon registry. The credits purchased must be real, quantifiable, enforceable, validated, and for the period of time specified in the application's GHG emissions analysis.
- Implement other quantifiable, GHG emission reduction measures identified and substantiated in the GHG study/plan submitted with each application.

⁹ <https://energy.gov/energysaver/solar-swimming-pool-heaters>

¹⁰ Level 2 charging refers to the voltage that the electric vehicle charger uses (240 volts). Level 2 chargers come in a variety of amperages ranging from 16 amps to 40 amps, the two most common are 16 and 30.