July 17, 2014

Ms. Molly Pearson
Santa Barbara County Air Pollution Control District
260 North San Antonio Road, Suite A
Santa Barbara, CA 93110
mmp@sbcapcd.org

**Re: Proposed District Environmental Review Guidelines Addressing Greenhouse Gas Emissions under the California Environmental Quality Act (CEQA)**

Dear Ms. Pearson:

Thank you for the opportunity to comment on the Santa Barbara County Air Pollution Control District's (District) proposal to update its Environmental Review Guidelines to include guidance for evaluating the significance of the impacts of greenhouse gas (GHG) emissions from new or modified stationary sources. This letter is submitted by the Environmental Defense Center (EDC) and Community Environmental Center (CEC). Both of our organizations are very involved in efforts to reduce climate change impacts from our communities, and we support the need to ensure thorough analysis and disclosure of GHG emissions that will result from new or modified stationary sources. We also support identification and implementation of measures that will mitigate such emissions to the maximum extent feasible.

Our understanding is that the District's proposal is focused on stationary sources because those are the sources subject to the District's direct jurisdiction and permitting authority. We also understand that the Santa Barbara County Planning and Development Department is planning to adopt CEQA thresholds for GHG emissions, and we urge the District to coordinate closely with the County in its efforts. Notably, the County has

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already conducted an extensive analysis of the environmental impacts of GHG emissions and opportunities to mitigate such impacts.[1]

EDC and CEC support a zero emission threshold approach, as is discussed in the CAPCOA white paper on CEQA and climate change[2] and utilized by the California State Lands Commission in its recent Environmental Impact Reports (EIRs) regarding local oil and gas projects. As there is ample opportunity for smaller projects to fully mitigate their emissions, a zero emission threshold will not force projects into environmental review solely on the basis of projected GHG emissions. If a higher threshold is adopted, we urge the District to require mitigation to the fullest extent possible, and to require Best Available Technology for smaller projects that don't trigger the adopted threshold.

Community feedback at the public workshops on this topic was overwhelmingly in favor of a zero emission threshold. We attended the Santa Barbara May 8, 2014, workshop and voiced our support for a zero emission threshold. We also noted that every other public speaker was in support of a zero emission threshold and no public speakers argued for a higher or no threshold. According to the notes and reports from the Santa Maria workshop, a zero emission threshold was widely supported there as well.

## I. A Zero Emission Threshold for Stationary Sources

Recent science supports a determination that *any* net increase in GHG emissions will have a significant effect on global climate change and therefore a "zero emission" threshold should be used to evaluate project impacts. This approach is based on current evidence demonstrating that the target atmospheric level of CO2 should be 350 ppm to achieve climate stabilization and avoid disastrous global consequences.[3] Given that atmospheric levels have reached 400 ppm,[4] we are already on a trajectory that is not sustainable, and we must decrease GHG emissions more rapidly and to a greater extent than previously thought. Thus, *any* additional contribution of CO2 would be a step further from acceptable target levels.

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[1] See attached excerpt from the Final EIR for the Santa Maria Energy Oil Drilling/Production Plan/LCSB Recycled Water Pipeline (12EIR-00000-00003; SCH#201109108), September 2013; Draft Recirculation Document – Greenhouse Gas Emissions Analysis for the Air Quality Section of the Proposed Final Environmental Impact Report for Santa Maria Energy Oil and Gas Drilling and Production Plan and Laguna Sanitation District Recycled Water Pipeline (12EIR-00000-00003; SCH#2011091085), July 2013; and EDC comment letter regarding the Draft Recirculation Document, August 15, 2013.

[2] CAPCOA. 2008. *CEQA & Climate Change: Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act.* Jan.

[3] Matthews H.D., and K. Caldeira (2008), *Stabilizing climate requires near-zero emissions*, Geophys. Res. Lett., *35*, L04705, doi:10.1029/2007GL032388; James Hansen, et al., *Target Atmospheric CO2: Where Should Humanity Aim?* The Open Atmospheric Science Journal, 2008, 2, 217-231; Statements of Dr. Chris Field, Carnegie Institution for Science, Decisive Action Needed as Warming Predictions Worsen, Says Carnegie Scientist, available at http://www.ciw.edu/news/decisive_action_needed_warming_predictions_worsen_says_carnegie_scientist

[4] http://research.noaa.gov/News/NewsArchive/LatestNews/TabId/684/ArtMID/1768/ArticleID/10187/NOAA-Carbon-dioxide-levels-reach-milestone-at-Arctic-sites.aspx

The potential consequences of global warming further underscore the need for a zero emission threshold. The Intergovernmental Panel on Climate Change (IPCC), Union of Concerned Scientists, and the California Climate Change Center have published several studies that identify how climate change will affect the environment.[5] These impacts include an increase in water temperatures, rise in sea level, coastal erosion, reduction of the Sierra snowpack, increase in severity and frequency of storms, increased droughts, famine, changes in ecosystems, increase in heat waves, increases in pests and diseases, flooding, retreating glaciers, ozone formation, and the potential for wildfires.[6] More recently, the U.S. Global Change Research Program released a report on "Climate Change Impacts in the United States" that identified current and projected effects of climate change on a regional basis in the U.S.[7] This report confirms that climate change impacts from GHG emissions are real and must be addressed without further delay.

The use of a "zero emission" threshold is one of the options discussed in CAPCOA's white paper on CEQA and climate change.[8] According to the CAPCOA report,

> The scientific community overwhelmingly agrees that the earth's climate is becoming warmer, and that human activity is playing a role in climate change. Unlike other environmental impacts, climate change is a global phenomenon in that all GHG emissions generated throughout the earth contribute to it. Consequently, ***both large and small GHG generators cause the impacts.*** While it may be true that many GHG sources are individually too small to make any noticeable difference to climate change, it is also true that the ***countless small sources around the globe combine to produce a very substantial portion of total GHG emissions***.

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[5] Union of Concerned Scientists. 2006. California Global Warming Impacts and Solutions, available at http://www.ucsusa.org/clean_california/ca-global-warming-impacts.html. California Climate Change

[6] Karl, T.R., *supra;* Levin, K., *supra*, citing Emanuel, K., *Increasing Destructiveness of Tropical Cyclones Over the Past 30 Years* (Nature, vol. 436, August 4, 2005), P.J. Webster, et al., *Changes in Tropical Cyclone Number, Duration, and Intensity in a Warming Environment* (Science, vol. 309, September 16, 2005), NASA Earth Observatory, *Record Low for June Arctic Sea Ice* (June 2005 at earthobservatory.nasa.gov/Newsroom/NewImages/images.php3?img_id=16978), A.J. Cook et al., *Retreating Glacier Fronts on the Antarctic Peninsula Over the Past Half-Century* (Science, vol. 308, April 22, 2005), R.B. Alley et al., *Ice-Sheet and Sea-Level Changes* (Science, vol. 310, October 21, 2005), E.D. Domack, et al., *Stability of the Larsen B Ice Shelf on the Antarctic Peninsula During the Holocene Epoch* (Nature, vol. 436, August 4, 2005), F.S. Chapin III, et al., *Role of Land Surface Changes in Arctic Summer Warming* (Science, vol. 310, October 28, 2005), M. Hopkin, *Amazon Hit by Worst Drought for 40 Years: Warming Atlantic Linked to Both US Hurricanes and Rainforest Drought* (Nature, October 11, 2005), I.T. Stewart, et al., *Changes Toward Earlier Streamflow Timing Across Western North America* (Journal of Climate, vol. 18, April 2005).

[7] Melillo, Jerry M., Terese (T.C.) Richmond, and Gary W. Yohe, Eds., 2014: *Highlights of Climate Change Impacts in the United States: The Third National Climate Assessment.* U.S. Global Change Research Program, 148 pp.

[8] CAPCOA. 2008. *CEQA & Climate Change: Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act.* Jan.

> ***A zero threshold approach is based on a belief that, 1) all GHG emissions contribute to global climate change and could be considered significant, and 2) not controlling emissions from smaller sources would be neglecting a major portion of the GHG inventory.***
>
> CEQA explicitly gives lead agencies the authority to choose thresholds of significance. CEQA defers to lead agency discretion when choosing thresholds. Consequently, ***a zero-emission threshold has merits***.[9]

A "zero emission" threshold has been used by the California State Lands Commission in its Final EIR for the Venoco Ellwood Marine Terminal, proposed Final EIR for Venoco's Revised PRC 421 Recommissioning Project, and Draft EIR for the Venoco Ellwood Full Field Project.[10] We strongly encourage the District to utilize a zero emission threshold in its evaluation of direct and indirect greenhouse gas emissions.

Other options from the CAPCOA report that would not be as strong or effective as a zero emission threshold while still addressing a majority of the GHG emissions generated by new projects would be to (1) base the threshold on Executive Order S-3-05, or (2) capture most of the expected GHG emissions.

While some operators and applicants may prefer a target based on AB 32 goals (designed to achieve 1990 GHG levels by 2020), this target is inadequate for two important reasons. First, this target is based on out-of-date data that assumed that our global target for GHG emissions was 450 ppm. Consequently, this target was designed to allow a significant increase in GHG emissions over current levels. As noted above, more recent scientific evidence indicates that 450 ppm is too high and that we instead should work to achieve a target of 350 ppm. Even at current levels, the effects of climate change are being felt throughout the globe. Thus, it is important to at least achieve the S-3-05 target (which is based on a goal of reducing GHG emissions to 80 percent below 1990 levels by 2050). Second, the S-3-05 target more closely aligns with the expected life of new or modified projects, which will undoubtedly last beyond 2020. Using the AB 32 goal will not address the full life of proposed projects, or the emissions that will occur beyond 2020. To achieve the state's 2050 target, new projects would need to reduce GHG emissions by 90 percent below business-as-usual.[11]

A third option would be to "capture" most new emissions. The Bay Area AQMD adopted the 10,000 MTCO2e threshold because this threshold would capture 95% of new

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[9] *CAPCOA*, p. 27, emphasis added.
[10] Venoco Ellwood Marine Terminal Lease Renewal Project Final Environmental Impact Report, California State Clearinghouse (SCH) No. 2004071075, CSLC EIR No. 743, April 30, 2009; Proposed Final Environmental Impact Report for Venoco's Revised PRC 421 Recommissioning Project, California State Clearinghouse (SCH) No. 2005061013, CSLC EIR Number 732, January 2014; Draft Environmental Impact Report for the Venoco Ellwood Oil Development and Pipeline (Full Field) Project, State Clearinghouse No. 2006061146, CSLC EIR No. 738, June 2008.
[11] CAPCOA, p. 33.

emissions for stationary sources.[12] Information on Santa Barbara County capture rates was presented by the District at the 2011 APCD CAC meeting on GHG thresholds. This data showed that a 10,000 MTCO2e threshold in Santa Barbara County would affect 7% of projects (six projects) and 55% of new emissions from stationary sources (198,786 MTons/yr). Additionally, while 55% of new emissions would be affected, if these six projects were required to mitigate to 10,000 MTCO2e, that would mean 60,000 MTCO2e would remain unmitigated, leading to a total capture rate of 138,786 Mtons/yr, or 39% of new emissions, not 55%. Thus a lower threshold is required to capture an equivalent percentage of new emissions in our County.

We understand that due to increased oil drilling in Santa Barbara County, the data presented in 2011 may be out of date, and that current, and especially future, data may skew toward more, larger projects, with a corresponding higher capture rate. The District should conduct a new analysis that looks at current and possible capture rates based upon estimated projects seeking permits at current and future rates. This analysis would show a range of activity so that the District could determine at what threshold level 95% of new emissions in Santa Barbara County would be captured. Setting the threshold at this level would capture a similar level of emissions as in other districts.

## II. Scope of Review

At the workshop on February 24, 2011, staff noted that the District's analysis thus far has concentrated on combustion emissions, not indirect or fugitive emissions. We want to clarify that when analyzing potential impacts from a specific project, CEQA requires the lead agency to consider indirect[13] and cumulative impacts.[14] The District's guidance should clarify the full scope of emissions that will be subject to quantification and assessment. As methane is the second most common GHG, and has 21 times or greater impact on climate change than CO2, particular care should be made to quantify and assess methane fugitive emissions at projects.

## III. Mitigation

While our preference is for a zero emission threshold, if a larger threshold is chosen, projects should be required to mitigate to a level that is consistent with S-3-05 targets or capture of 95% of new emissions.

The District has provided three options for projects that exceed the proposed threshold: incorporating energy efficiency into the new project, reducing emissions at other applicant owned facilities in the County, and purchasing credits. The first two options should be strongly encouraged as they will lead to co-benefits of decreased Santa Barbara County pollution and increased local economic activity. Purchasing credits

[12] SBC Board of Supervisors Agenda Letter, 8/3/10, Attachment, p. 3.
[13] CEQA Guidelines §§ 15126.2(a), 15358(a)(2).
[14] CEQA Guidelines §§ 15130, 15355.

should only be allowed if the applicant demonstrates they cannot achieve emissions reductions in any other feasible manner.

Smaller projects that don't trigger the adopted threshold should be required to use Best Available Technology. By requiring such practices, impacts from the many smaller projects can be lessened.

**Conclusion**

In conclusion, we encourage the District to work closely with the Planning & Development Department to develop a threshold for GHG emissions for stationary sources. In doing so, we request that the District consider a threshold that will capture the most potential new GHG emissions in the County. We prefer a zero emission threshold because it is the threshold that will go furthest in meeting the targets of 350 ppm and S-3-05. This threshold will not force projects into environmental review solely on the basis of projected GHG emissions because there are ample opportunities to fully mitigate GHG emissions. As noted in the District's fact sheet and the CAPCOA report, it is entirely feasible for a project proponent to mitigate their GHG emissions to a net of zero new emissions.[15]

Additionally, the District should consider a policy requiring projects that exceed adopted thresholds to mitigate emissions to zero. If that is not possible they should be mitigated to a level that is consistent with the S-3-05 target. Smaller projects should be required to adopt Best Available Technology.

Thank you for your consideration of these comments. We wish you success in your endeavor to ensure meaningful consideration and mitigation of GHG emissions from stationary sources.

Sincerely,

Linda Krop,
Chief Counsel

Dave Davis
Executive Director

Attachments:

Excerpt from the Final EIR for the Santa Maria Energy Oil Drilling/Production Plan/LCSB Recycled Water Pipeline (12EIR-00000-00003; SCH#201109108), September 2013.

[15] Santa Barbara County Air Pollution Control District, *CEQA Significance Thresholds for GHGs – Questions and Answers*, pp. 3-5; CAPCOA, p. 28; see also California Climate Action Registry, http://www.climateregistry.org/.

Draft Recirculation Document – Greenhouse Gas Emissions Analysis for the Air Quality Section of the Proposed Final Environmental Impact Report for Santa Maria Energy Oil and Gas Drilling and Production Plan and Laguna Sanitation District Recycled Water Pipeline (12EIR-00000-00003; SCH#2011091085), July 2013.

EDC comment letter regarding the Draft Recirculation Document, August 15, 2013.

| *Impact #* | *Impact Description* | *Phase* | *Residual Impact* |
|---|---|---|---|
| SME AQ.3 | Potential operations and drilling could create odor events. | Operations | Class II |

Odor events could occur due to several different situations associated with equipment or drilling upset conditions. The equipment components could also leak and cause odors. Tanks are equipped with hatches to protect them from overpressure. If these hatches lift, due to a failure of the vapor recovery compressor, for example, odor events could occur. During drilling, drilling muds, well kicks, and releases from increased pressure up the wellbore could cause odor events. During drilling, pockets of gas can be encountered, which can be picked up by the circulating muds, brought to the surface, and released through the muds processing system. These types of releases have caused notices of violation (NOV) at other oilfields in the past, such as the Baldwin Hills Oilfield in Los Angeles. Any of these scenarios could be considered a significant impact during drilling if there is sufficient pressure in the well bore.

The release of material that contains even small amounts of sulfur compounds ($H_2S$) or hydrocarbons produces an odor. Several compounds associated with the oil and gas industry can produce nuisance odors. Sulfur compounds, found in oil and gas, have very low odor threshold levels. The $H_2S$ levels in the produced gas from the Proposed Project wells are estimated to be less than a few parts per million.

Modeling conducted on a number of different oil and gas development project (Excelaron in SLO County, Baldwin Hill EIR in Los Angeles, etc) by MRS indicates that, with $H_2S$ levels of 100 ppm, normal operations fugitive emissions could produce concentrations greater than the 50 percent odor threshold less than 1,000 feet from the project equipment. For $H_2S$ levels higher than that, impacts would be farther.

Upset conditions that could cause a tank hatch release could produce concentrations greater than the 50 percent odor threshold 4,000 feet from the tank location, which would be far enough to reach areas outside the project parcel and would therefore be *significant.*

Odor thresholds are defined as the point at which a person can detect the substance. Below the odor threshold, a person would not smell anything. According to the American Industrial Hygiene Association, the odor detection threshold is the lowest concentration of odorant that will elicit a sensory response in the olfactory receptors of a specified percentage of a given population (AIHA 1989). The annoyance level would be a higher concentration.

Released materials that cause odors can travel a substantial distance since the odor thresholds for materials can be as low as parts per billion. Odor impacts associated with accidental releases from the oil field could impact surrounding areas.

### 5.1.2.4.a Cumulative Air Quality Impacts – Greenhouse Gas Emissions

| **Impact #** | **Impact Description** | **Residual Impact** |
|---|---|---|
| SME AQ.4 | Operational activities could increase GHG emissions. | Class II |

The approach taken in this EIR to assess baseline and required mitigation levels are as follows:

1. Quantify the baseline GHG emissions associated with the current emissions (not including the 26 wells in the pilot project) at the field. CEQA Guideline Section 15125(a) states that: "The environmental setting will normally constitute the baseline physical conditions by which the lead agency determines whether an impact is significant." In this case, an exception has been made not to include the environmental impacts from the temporary 26-well pilot project as a part of the baseline, even though those wells were in operation when the Notice of Preparation for this EIR was issued. The 26-well pilot project was permitted as a temporary use with a termination date. This preliminary permitting action allowed SME the opportunity to experiment with the cyclic steaming process in order to understand the response of the oil-bearing diatomite in the Orcutt field to that process. This understanding was a necessary prelude to designing the long-term production plan. The permitting process for the pilot project did not identify and analyze the long-term emissions, whether criteria pollutants or greenhouse gases. Rather, it was understood that, once the producer was able to design the long-term production plan, the entire project of 136 wells and associated operations, including conversion of the 26 pilot wells to permanent wells, would be analyzed as the proposed project. (These long-term emissions have not been considered in a previous environmental document.) Therefore, the pilot project impacts are considered throughout this EIR to provide full disclosure of the potential impacts of the action requested of the decision-makers.

2. In order to assess the level of mitigation required, the GHG emissions from the Proposed Project are estimated with the proposed criteria pollutant mitigation measures included (Table 5.1-12 and 5.1-13).

3. The level of mitigation required is then obtained by calculating the required reduction of the Proposed Project GHG emissions (item 2 above) for the threshold used. This amount of emissions must be produced as mitigation, either from onsite or offsite sources.

The majority of the GHG emissions come from the combustion of fossil fuels associated with the steam generators. Stationary combustion equipment at the facility would create the largest percentage of GHG emissions. The steam generators would produce approximately 94 percent of the GHG emissions associated with the project.

GHG associated with operations include emissions from combustion sources (e.g., flare, steam generators, drilling engines, etc), offsite vehicles, and fugitive emissions that contain $CO_2$ and methane. In addition, electrical use at the facility has been included as indirect emissions. Table 5.1-12 shows the GHG emissions for operations under the Proposed Project full build-out. See Air Quality Appendix 12.2.B for detailed calculations.

**Table 5.1-12 Proposed Project Annual GHG Emissions – No Mitigation**

| Activity | $CO_2e$ Metric tonnes |
|---|---|
| ***Construction*** | |
| Onsite Grading and Construction | 907 |
| Pipeline Installations (Crude, Gas Connections) | 139 |
| Pipeline Installation (Water to Laguna) | 531 |
| Offsite: Grading/Construction | 222 |
| Offsite: Pipelines Crude/Gas | 15 |
| Offsite: Pipeline Water | 113 |

| Activity | $CO_2e$ Metric tonnes |
|---|---|
| Total | 1,926 |
| | |
| ***Operations*** | |
| Processing Site Combustion Sources | 82,892 |
| Processing Site Fugitive Emissions | 135 |
| Drilling Emissions | 672 |
| Offsite: Operations | 382 |
| Offsite: Crude Hauling | 470~~758~~ |
| Offsite: Water Hauling | 758~~470~~ |
| Indirect: Electrical Generation | 2,564 |
| | |
| ***Total Operations*** | 87,874 |
| | |
| Baseline Emissions (see p. 5.1-30)<br>• Combustion of Monterey Field Gas<br>• Electrical Generation<br>• Miscellaneous<br>***Total Baseline Emissions*** | <br>16,444<br>1,923<br>528<br>18,895 |
| | |
| ***Adjusted Operations Emissions***<br>*(Total Operations minus Total Baseline)* | 68,979 |

*Note: GHG emissions for peak year, projected to be 2015. Assumes all crude oil and water are hauled by truck.*

The emissions tabulated in Table 5.1-12 are the emissions during the peak year in 2015. Emissions of GHG would decrease thereafter due to a decrease in crude production. The allowances required to be purchased under the Cap-and-Trade program would increase over time due to the lowering "cap" and the reduced efficiency of the enhanced recovery technique as the field ages (more steam per bbl of crude produced). After a certain point, the number of allowances required to be purchased by the Applicant under the Cap-and-Trade program in combination with the onsite reductions, would exceed the GHG threshold established by the lead agency for this project, unless a threshold of zero were applied. Table 5.1-13 shows different thresholds along with the estimated year that the Cap-and-Trade purchased allowance would fulfill all of the threshold requirements, along with the average costs of the "credits" (not the Cap-and-Trade purchased allowances, as they would be required under current regulations) over that timeframe.

Figures 5.1-4 through 5.1-8~~5.1-7~~ show the estimated GHG emissions through the year 2030 along with the "credits" and allowances used as part of the threshold reduction requirement under the Cap-and-Trade program and other, offsite or onsite reductions. ~~(The 16 percent BAU threshold is not shown as, under the use of the 16 percent threshold, all reductions would be accomplished with onsite reductions).~~ The baseline emissions are also shown in these figures. The percent reduction from BAU thresholds are calculated as percent reductions from the emissions above the baseline level. The bright line thresholds are calculated as an increase above the baseline level.

The increasing number of Cap-and-Trade purchased allowances over time shown in the graphs is based on two components: the reduction over time in the amount of allocated "free" allowances (a reduction in

the "cap") and the reduced efficiency in the recovery of crude oil at the field, requiring more steam per bbl of crude oil recovered (the allocated "free" allowances are allocated based on the amount of crude oil produced). These two items produce the need for the Applicant to purchase an increasing amount of allowances.

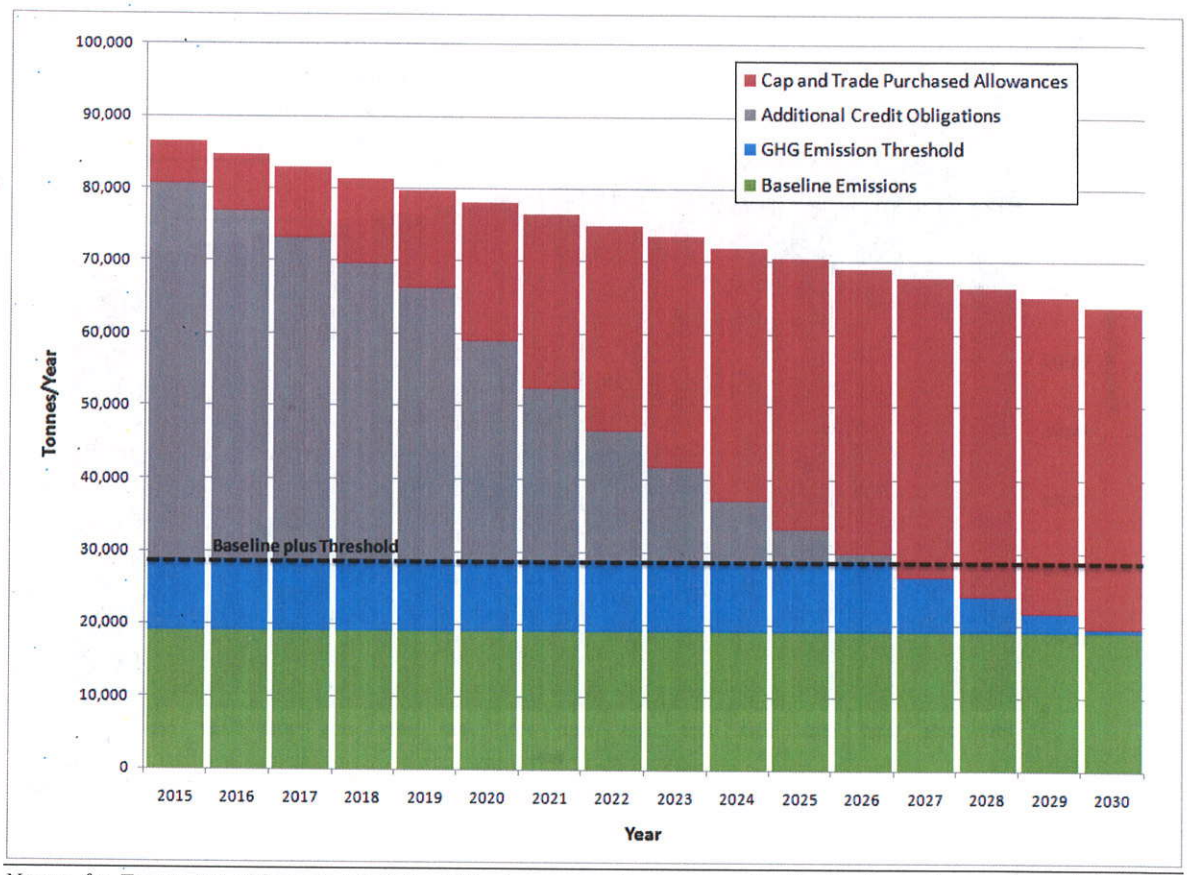
The cost estimates in the figures are based on a cost curve that would increase the costs of allowances and credits over time in a curve shape that was estimated to be similar to the curve shape that has historically been seen with the SCAQMD RECLAIM program. The RECLAIM cost curve showed an increase of 10 times in the costs per credit (for NOx and SOx in the RECLAIM program) over 15 years. The costs of GHG credits may act similarly, or could be substantially different and costs could range substantially higher or lower, depending on the market conditions and the availability of GHG credits. While the RECLAIM program is different than the Cap-and-Trade program (RECLAIM has no price floor or reserve pricing), it is a market based approach and its cost curve over time could be similar, although there is a high degree of uncertainty associated with estimating future costs. It is also assumed that the Cap-and-Trade program would continue after the year 2020, with a reduction in the cap level equal to the reduction rate seen prior to the year 2020.

**Table 5.1-13 Proposed Project Credit Requirements and Costs**

| Threshold | Year of C&T Full Coverage | Average Costs of Credits Only, annual | Average Cost per bbl, Credits Only |
|---|---|---|---|
| Zero threshold | 2030 | $889,282 | $1.17 |
| 10,000 $MTCO_2E$ | 2026~~2028~~ | $~~704,981~~667,565 | $0.72~~$0.79~~ |
| 16% Below BAU | 2018~~2015~~ | $36,207~~$0~~ | $0.03~~$0.00~~ |
| 29% Below BAU | 2020~~2017~~ | $145,158~~$19,206~~ | $0.13~~$0.02~~ |
| 50% Below BAU | 2022~~2021~~ | $347,171~~$234,433~~ | $0.32~~$0.21~~ |
| 90% Below BAU | 2029 | $739,172~~$765,450~~ | $0.87~~$0.92~~ |

*Note: These costs do not include the costs to purchase Cap-and-Trade allowances, which would be required under the Cap-and-Trade program regardless of the threshold used. Average price per bbl of crude oil $96-$128 EIA reference price between 2015 and 2029. BAU calculations are based on a percent reduction from the amount of emissions above the baseline level. Average costs of credits per bbl increases substantially in later years as the amount of crude oil produced drops.*

**Figure 5.1-4 Future GHG Emissions, Reductions with the 10,000 $MTCO_2E$ GHG Threshold**




*Notes: for Figure 5.1-4 through 5.1-7, the following assumptions are made: Production estimates through the year 2020 are based on Applicant submittals. After 2020, Monterey crude production declines by 2% annually; Diatomite crude production declines by 10% annually while GHG emissions from diatomite production (for steam generation) declines by only 2% annually; and the cap adjustment factor decreases by 2% annually.*

Under the 10,000 $MTCO_2E$ threshold, initial offsite credit purchases would be substantial, but would decrease until the year 2027, when the requirements under the Cap-and-Trade program, along with the onsite reductions, would most likely provide all of the reductions needed to achieve the 10,000 $MTCO_2E$ threshold. Average credit costs over that period would be in excess of $668,000~~$700,000~~ annually, with a cost per bbl of about $0.72~~$0.79~~. Note that the zero threshold option would be the same as the above graph, but that the additional credit obligation would extend to the baseline emission~~s~~ and that the GHG threshold (blue) would be zero. Costs would also be higher, with an average annual cost of $889,000 and a cost per bbl of about $1.17.

~~Figure 5.1-4 Future GHG Emissions, Reductions with the 10,000 $MTCO_2E$ GHG Threshold~~

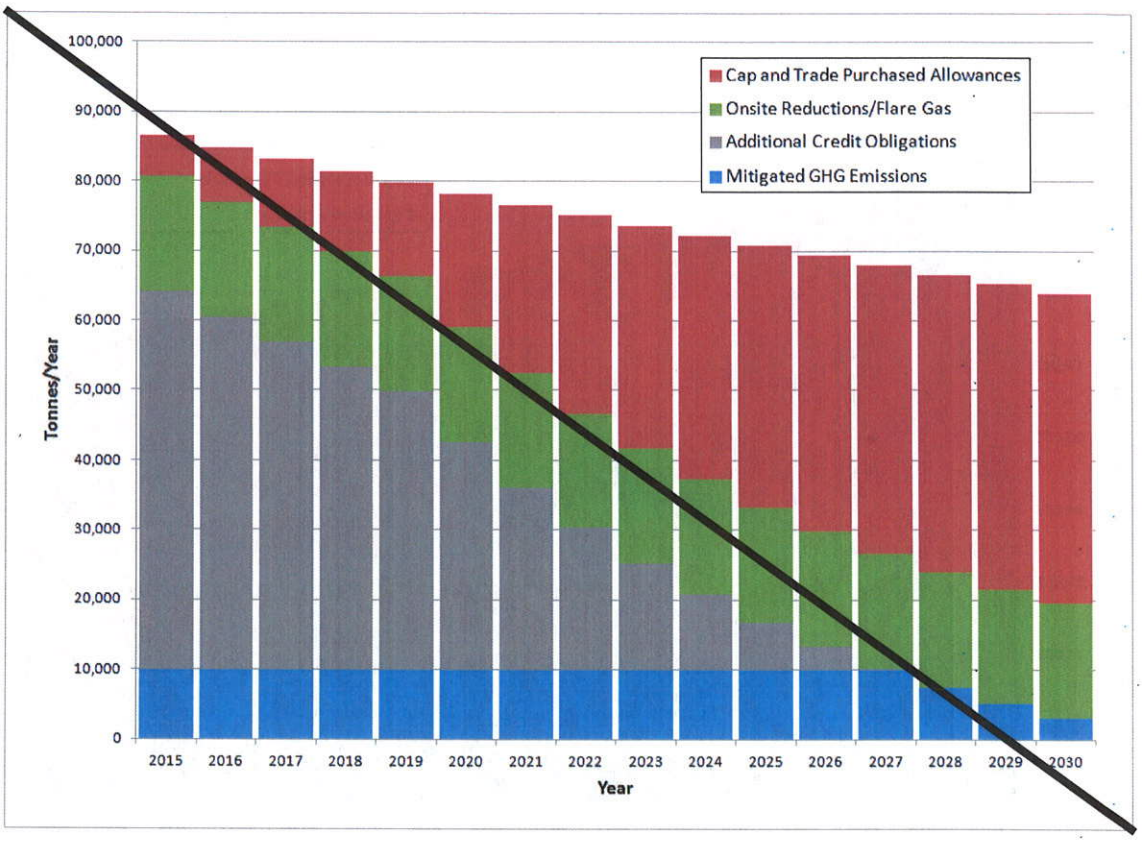
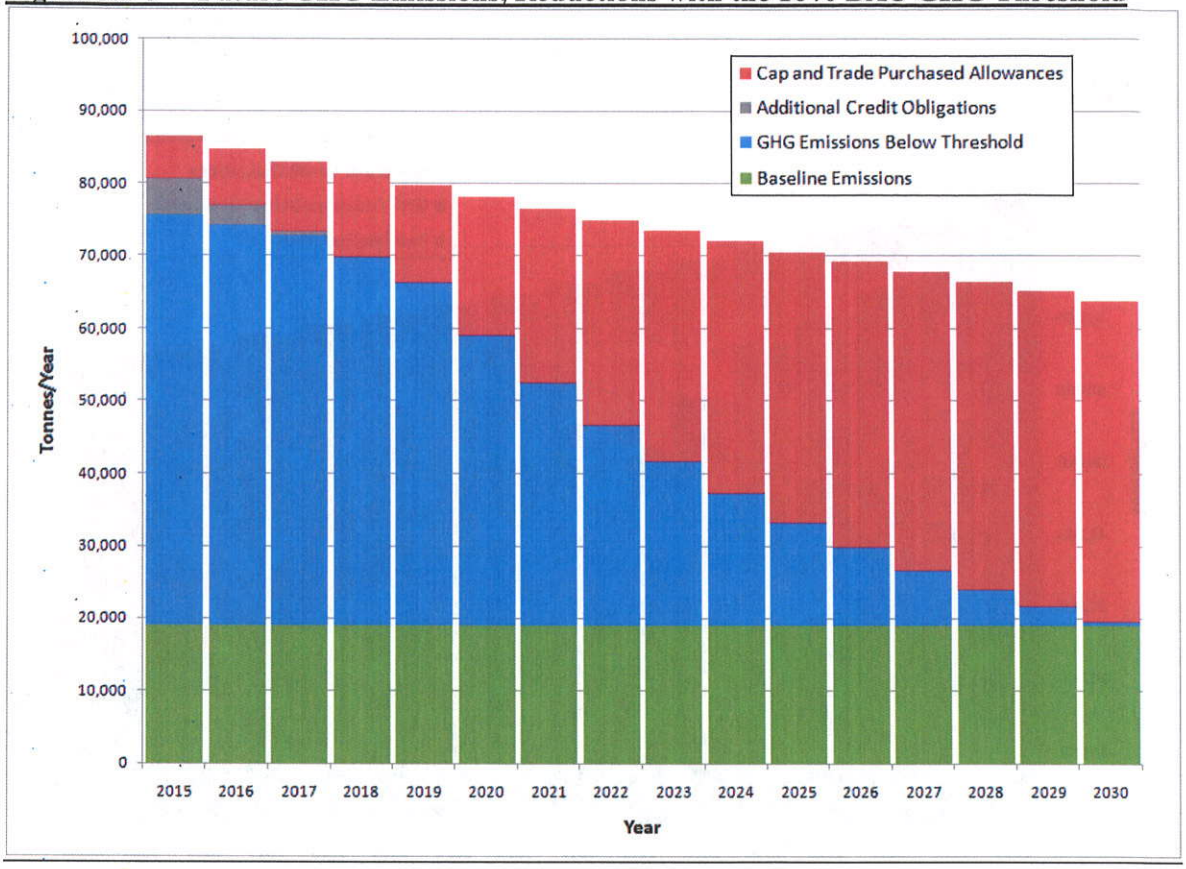
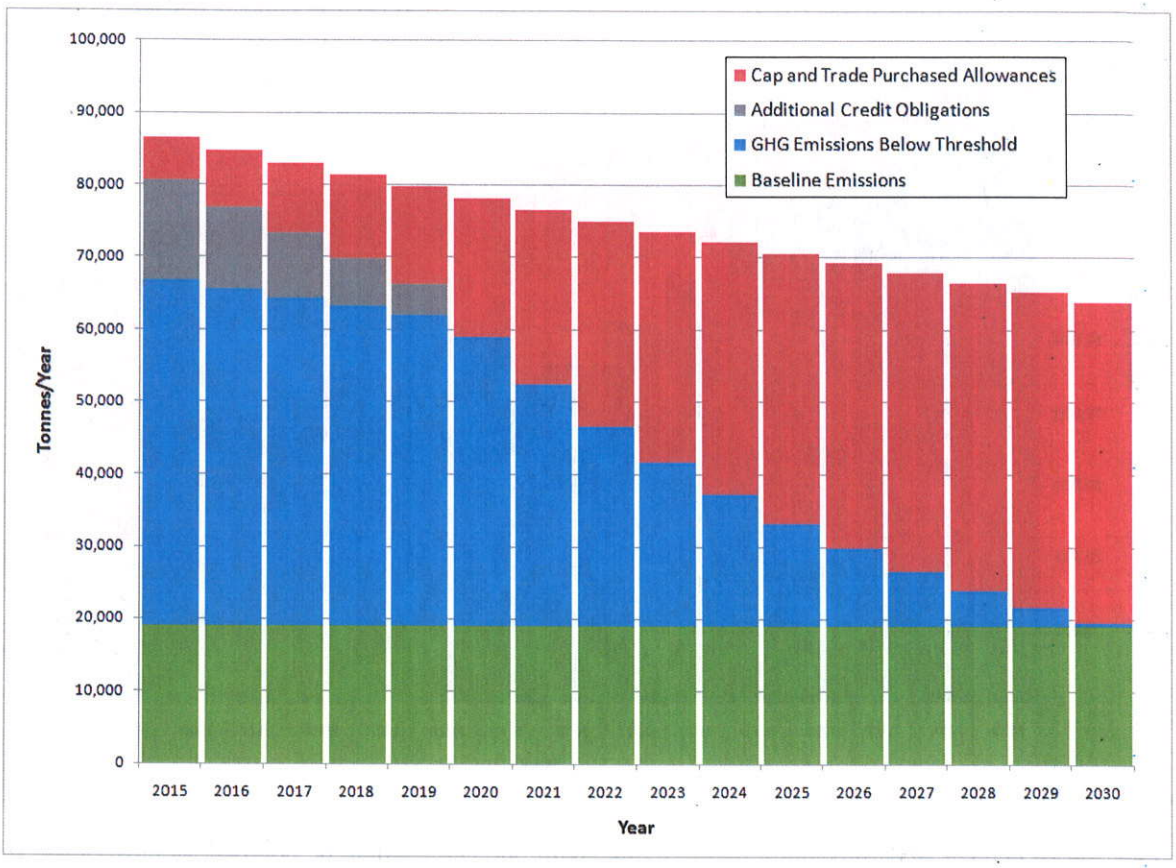


**Figure 5.1-5 Future GHG Emissions, Reductions with the 16% BAU GHG Threshold**




Under the 16 percent BAU threshold, initial offsite credit purchases would be nominal, as most of the 16 percent reduction from the emissions above baseline would be accomplished through the Cap-and-Trade requirements. The requirements under the Cap-and-Trade program, along with the onsite reductions, would provide all of the reductions needed to achieve the threshold by 2018. Average credit costs over that period would be about $36,000 annually, with an average cost per bbl of about $0.03.

**Figure 5.1-6~~5~~ Future GHG Emissions, Reductions with the 29% BAU GHG Threshold**




Under the 29 percent BAU threshold, initial offsite credit purchases would be ~~nominal~~moderate.~~, as most of the 29 percent would be accomplished through the Cap-and-Trade requirements and onsite reductions.~~ The requirements under the Cap-and-Trade program, along with the onsite reductions, would provide all of the reductions needed to achieve the threshold by 2020~~2017~~. Average credit costs over that period would be about $145,000~~$19,000~~ annually, with an average cost per bbl of about $0.13~~$0.02~~.

~~**Figure 5.1-5 Future GHG Emissions, Reductions with the 29% BAU GHG Threshold**~~

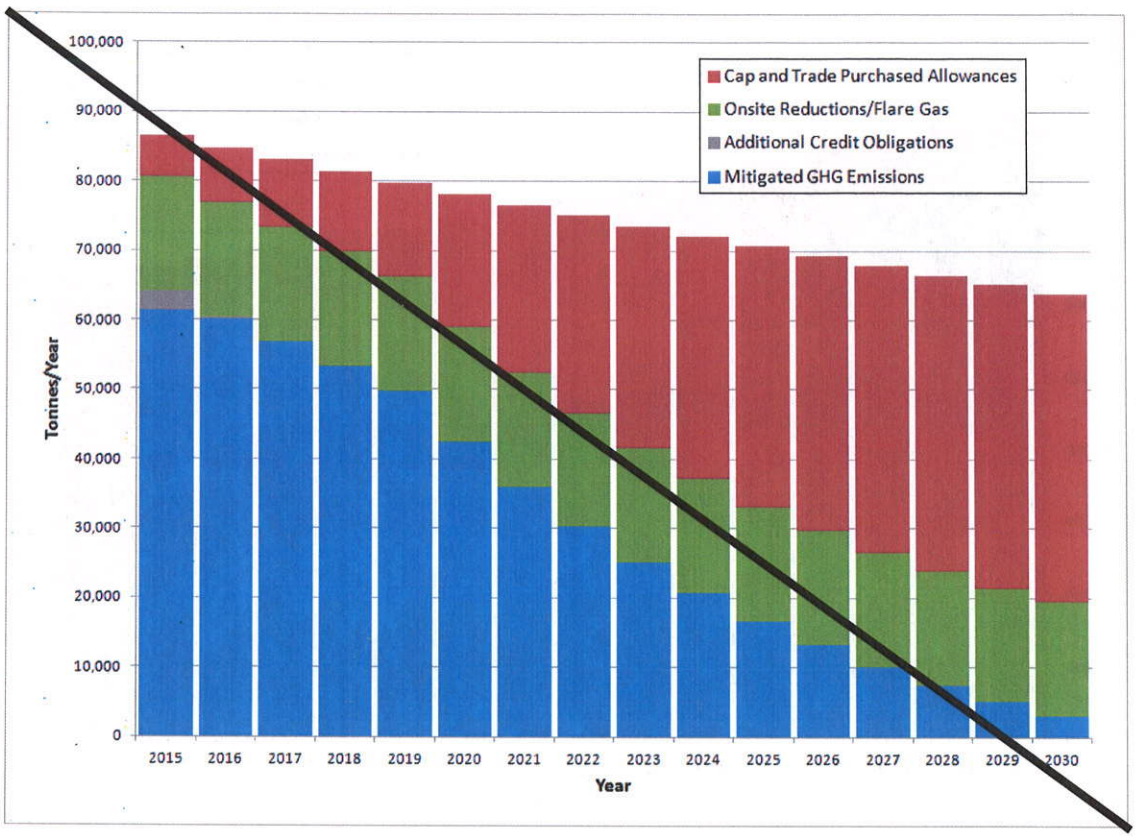
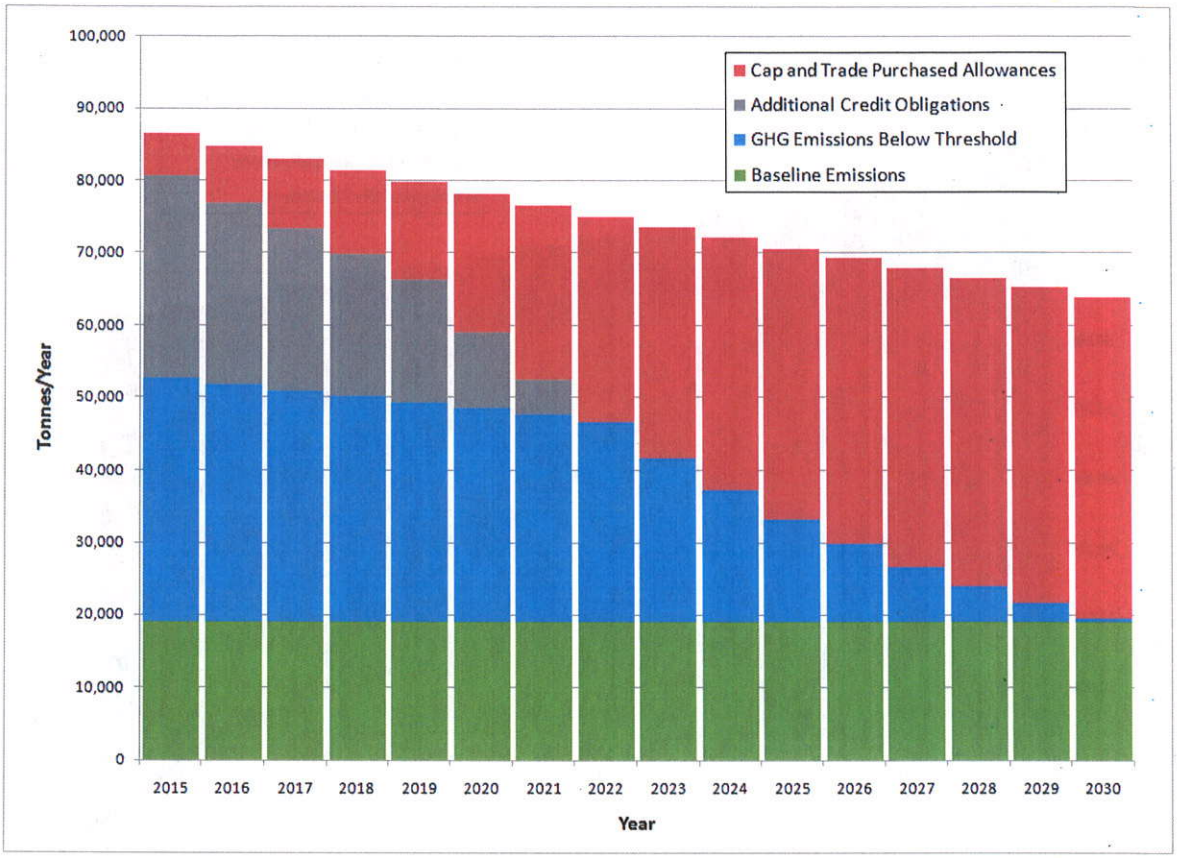


**Figure 5.1-~~7~~6 Future GHG Emissions, Reductions with the 50% BAU GHG Threshold**




Under the 50 percent BAU threshold, initial offsite credit purchases would be ~~moderate~~substantial, and would decrease until the year 2022~~2021~~, when the requirements under the Cap-and-Trade program, along with the onsite reductions, would provide all of the reductions needed to achieve the threshold. Average credit costs over that period would be in excess of $347,000~~$230,000~~ annually, with an average cost per bbl of about $0.32~~$0.21~~.

~~**Figure 5.1-6 Future GHG Emissions, Reductions with the 50% BAU GHG Threshold**~~

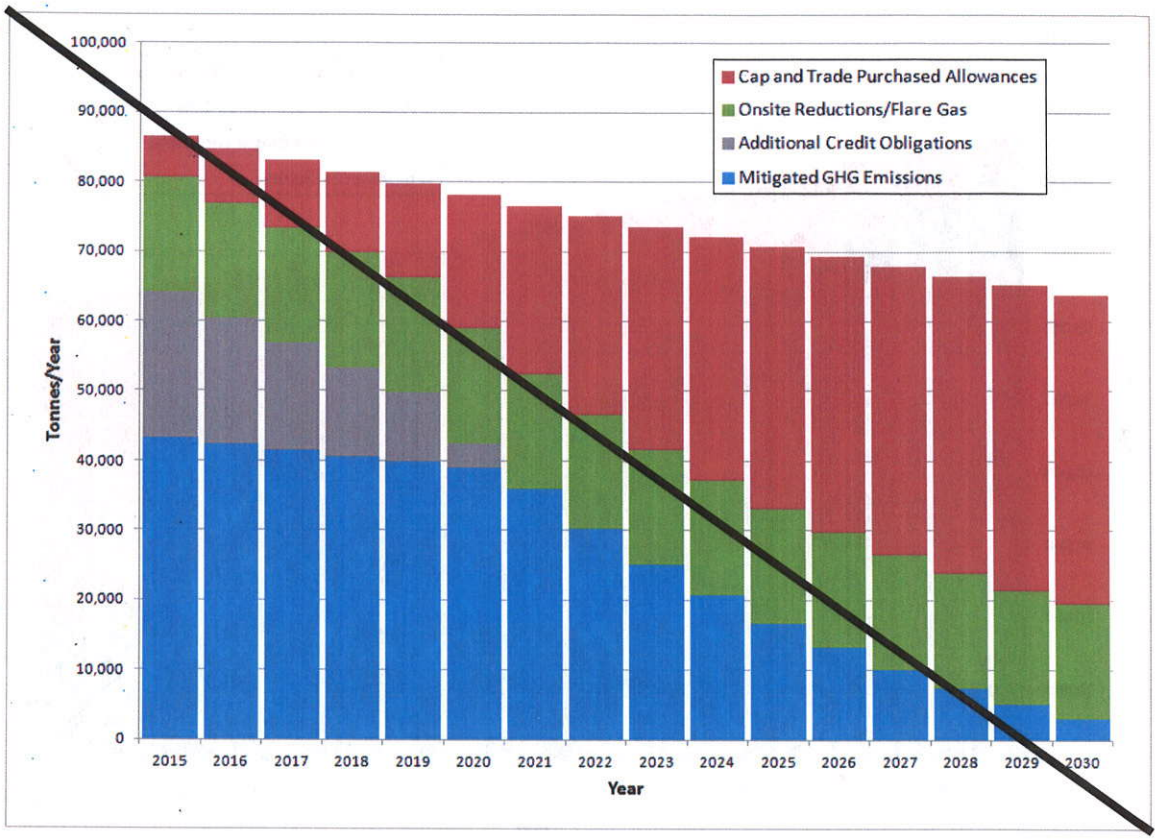
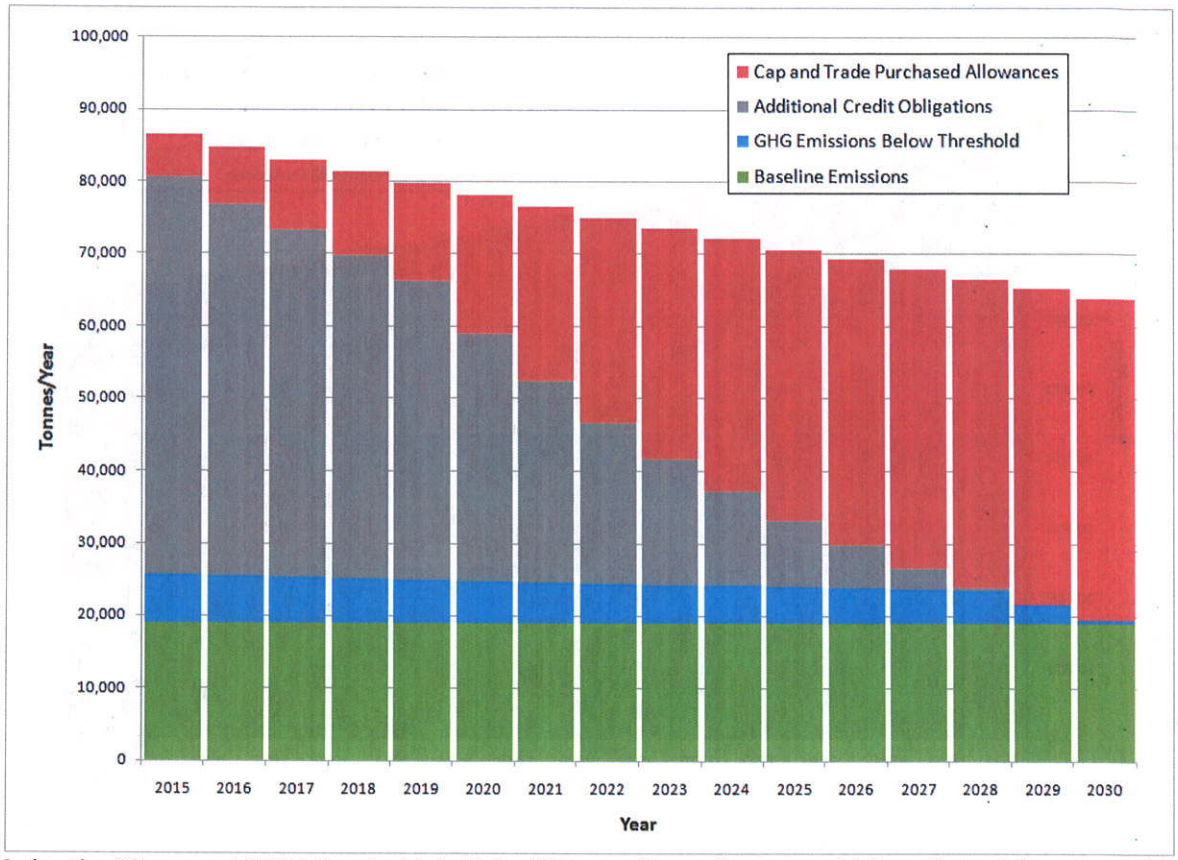
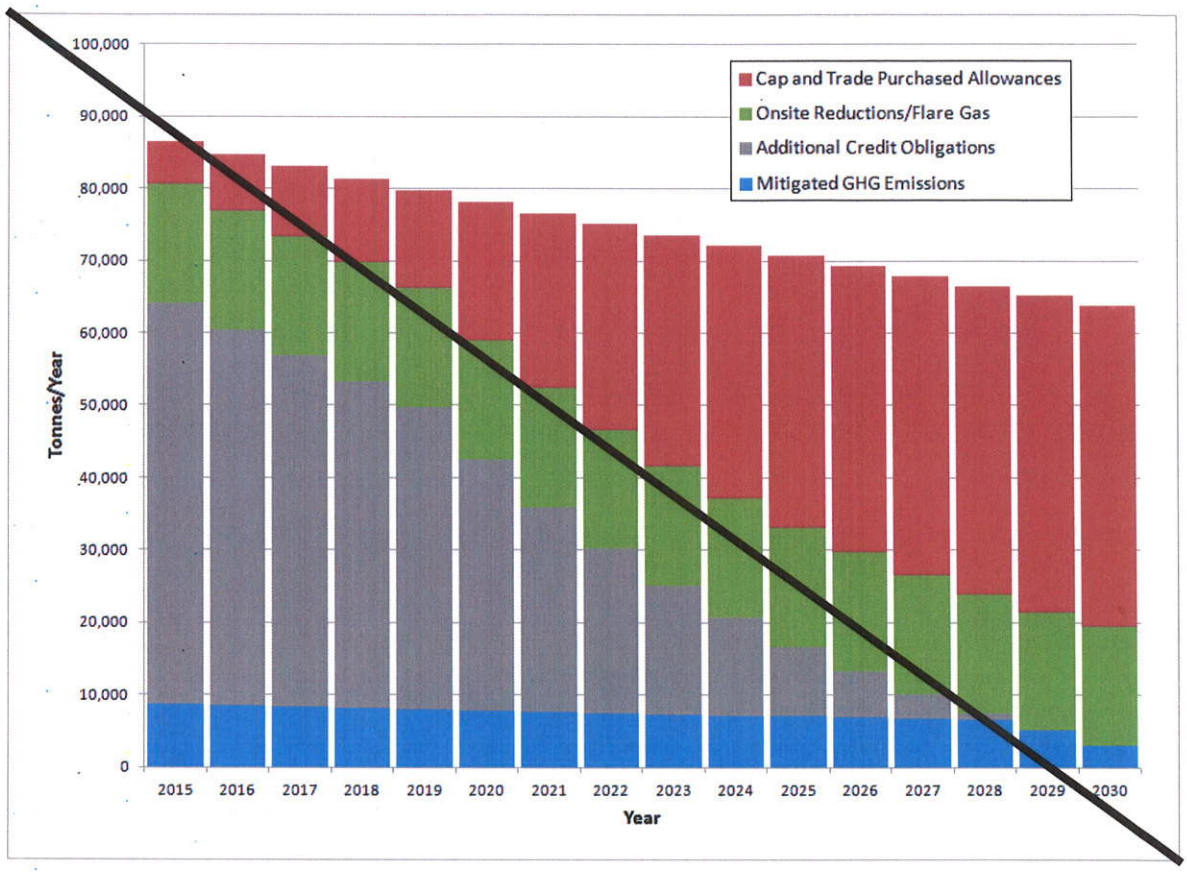


**Figure 5.1-~~8~~7 Future GHG Emissions, Reductions with the 90% BAU GHG Threshold**




Under the 90 percent BAU threshold, initial offsite credit purchases would be substantial, and would decrease until the year 2029, when the requirements under the Cap-and-Trade program, along with the onsite reductions, would provide all of the reductions needed to achieve the threshold. Average credit costs over that period would be in excess of $739,000~~$760,000~~ annually, with an average cost per bbl of about $0.87~~$0.92~~.

~~**Figure 5.1-7 Future GHG Emissions, Reductions with the 90% BAU GHG Threshold**~~




## 5.1.2.4.b Cumulative Air Quality Impacts – Criteria Pollutants

The Santa Barbara County Environmental Thresholds Manual defines a significant cumulative impact if a project's total emissions of the ozone precursors NOx or ROC exceed the long-term thresholds. For projects that do not have significant ozone precursor emissions or localized pollutant impacts, emissions would need to have been taken into account in the Clean Air Plan growth projections in order for cumulative impacts to be considered insignificant.

No residential projects would be constructed near the proposed Project area, so there would be no operational localized impacts associated with cumulative projects and non-GHG pollutants. Operational regional impacts from criteria pollutants could be produced, however, as multiple projects would emit into the same air basin at the same time. Although the proposed Project would produce less than significant impacts with mitigation, cumulative impacts associated with the combined projects could be significant.

Since none of the residential cumulative projects would be constructed near the proposed Project area, there would be no cumulative impacts associated with odors or toxic emissions.

COUNTY OF SANTA BARBARA
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# DRAFT RECIRCULATION DOCUMENT

## GREENHOUSE GAS EMISSIONS ANALYSIS FOR THE AIR QUALITY SECTION OF THE PROPOSED FINAL ENVIRONMENTAL IMPACT REPORT FOR

## Santa Maria Energy Oil and Gas Drilling and Production Plan and Laguna Sanitation District Recycled Water Pipeline 12EIR-00000-00003; SCH#2011091085

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**July 2013**

# EXECUTIVE SUMMARY

Impact SME AQ-4, identified in Table ES-2, Summary of Class II Environmental Impacts and Mitigation Measures of the April 2013 Proposed Final EIR, with previously approved revisions, is revised. There are no other changes to the Executive Summary.

## SUMMARY OF PROJECT IMPACTS

### Table ES-2 Summary of Class II Environmental Impacts and Mitigation Measures

| Impact | Class II - Impact Summary | Mitigation Measures | Residual Impact |
|---|---|---|---|
| **Santa Maria Energy** | | | |
| **SME AQ.4** | **Operational activities could increase Greenhouse Gas (GHG) emissions.** | **Quantify GHG emissions associated with operations and reduce emissions to an annual level that is equal to or less than a prescribed threshold selected by decision-makers.** | **Less than Significant** |

# 5.0 SIGNIFICANT ENVIRONMENTAL IMPACT DISCUSSIONS

The Air Quality Greenhouse Gas (GHG) sub-sections of Section 5.1 of the April 2013 Proposed Final EIR, have been revised and are included in their entirety. All other air quality analysis in Section 5.1 is identical to the Proposed Final EIR with previously approved revisions.

### 5.1.1.3 GHG Emission Thresholds

Climate Change under CEQA differs from most other types of impacts in that, by definition, it is only examined as a cumulative impact that results not from any one project under CEQA, but rather from greenhouse gas (GHG) emissions "…generated globally over many decades by a vast number of different sources." (Kostka, 2007, §20.83; Hegerl, 2007.) Accordingly, climate change is treated herein as a cumulative impact, subject to the CEQA Guidelines for conducting cumulative impact analyses. CEQA Guidelines direct that a project's contribution to a significant cumulative impact will be rendered less than significant if the project is required to implement or fund its fair share of a mitigation measure designed to alleviate the cumulative impact (§15130(a)(3)). Such determinations must be based on analysis in the environmental document with evidence to demonstrate that mitigation required of a project represents the project's "fair-share" contribution.

Recently, the California Natural Resources Agency amended the Guidelines for Implementation of the California Environmental Quality Act in 2009, placing specific requirements on CEQA lead agencies for the treatment of greenhouse gas emissions in environmental documents. Under CEQA, lead agencies must "…make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate, or estimate the amount of greenhouse gas emissions resulting from a project" (Section 15064.4

was added to the CEQA Guidelines on October 23, 2009). These amendments further obligate the lead agency to consider if the estimated amount of greenhouse gas (GHG) emissions from a proposed project exceed a threshold of significance that the lead agency determines to apply to the project, and consider 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.

Neither Santa Barbara County nor the Santa Barbara County Air Pollution Control District (APCD) have adopted thresholds for determining if the projected GHG emissions of a proposed project constitute a considerable contribution to global climate change, and therefore would be classified as a cumulative significant impact. Absent such thresholds, the CEQA lead agency must make such significance determinations on a case-by case basis. California does not have one, statewide-accepted significance threshold as of yet. Several approaches have been discussed and, to some extent, implemented (CAPCOA 2008, pp. 23-57; Crockett 2011, pp. 213-245). Some have been, or are being, litigated. These approaches are numerous but generally fall into one of two categories for addressing stationary sources of GHG emissions: Numeric "Bright Line" thresholds or a specified reduction in "Business as Usual" (BAU) thresholds.

***Numeric Bright-Line Thresholds***

Numeric bright line thresholds are specific numeric thresholds above the baseline operations that, if exceeded, would produce a significant cumulative impact. To date, bright line thresholds have ranged from zero to 100,000 metric tonnes of $CO_2$ equivalent ($MTCO_2E$) annually. With the exception of a threshold of zero, sources that produce emissions below the threshold are considered insignificant, and thus do not have to reduce their GHG emissions, based on their relatively small individual and cumulative contributions. The Bright Line threshold approach has the advantage of being easy to apply; however, it more strictly regulates larger sources than smaller sources.

Multiple agencies/districts have applied bright line thresholds. For example, the South Coast Air Quality Management District (SCAQMD), the Bay Area Air Quality Management District (BAAQMD) and the San Luis Obispo Air Pollution Control District (SLOAPCD) have established a 10,000 $MTCO_2E$ per year CEQA significance threshold for stationary sources.

Additionally, the California Air Resources Board (CARB) and the Federal EPA have established reporting and regulatory thresholds. These are:

- CARB has established a 10,000 $MTCO_2E$ per year threshold for mandatory reporting for combustion and process source emissions (the mandatory reporting rule also requires reporting for certain industries regardless of emissions levels or 25,000 $MTCO_2E$ per year for petroleum processing combined sources of stationary combustion, process, fugitive, and vented emissions)
- CARB has established a 25,000 $MTCO_2E$ per year threshold for applying the Cap-and-Trade program for stationary sources;
- Federal EPA has established a 25,000 $MTCO_2E$ per year threshold for mandatory reporting;
- Federal EPA has established a 100,000 ton per year permitting threshold for large stationary sources under the Prevention of Significant Deterioration (PSD) and Title V Operating Permit programs;

Each of these is discussed below.

CARB Reporting and Cap-and-Trade Thresholds

The CARB regulation for the Mandatory Reporting of Greenhouse Gas Emissions was originally approved in 2007 and was revised in 2010 and 2012. CARB has issued reports on the reporting entities and their corresponding GHG emission levels annually. In 2010, about 85-90 percent of industrial sources were captured by the reporting rule (based on the most recent CARB Reporting Rule reports for 2010 and 2011 emissions (CARB, 2012 and CARB, 2013 excel databases) and Emission Inventory reports for 2010 available at the time of this EIR (CARB, 2013b). CARB proposed to use the 10,000 $MTCO_2E$ for combustion and process source emissions as a reporting threshold, not as a CEQA significance threshold that would be used to define mitigation requirements.

Cap-and-Trade is designed to reduce the emissions from a substantial percentage of GHG sources (about 85% of GHG emissions will come under the program (CARB, 2011c, p. 1)) within California through a market trading system. An operator is required to participate in the Cap-and-Trade program if its facility emits more than 25,000 $MTCO_2E$ annually.

Federal Reporting and Permit Thresholds

In 2009, the Federal EPA established a 25,000 $MTCO_2E$ per year threshold for reporting GHG emissions to the Federal government under Title 40 CFR Part 98. The requirement applies to direct greenhouse gas emitters, fossil fuel suppliers, industrial gas suppliers, and facilities that inject $CO_2$ underground for sequestration or other reasons. EPA estimates that 85-90 percent of the total U.S. GHG emissions from over 8,000 facilities are covered by the reporting rule (USEPA, 2013, p.1).

The 100,000 tons of $CO_2E$ level (note: not metric tonnes) has been adopted by the Federal EPA as the limit above which a Prevention of Significant Deterioration ("PSD") and a Title V operating permit are required. The 100,000 ton level is cited in the Mojave Air Pollution Control District CEQA Guidelines as a CEQA threshold of significance.

The 10,000 $MTCO_2E$ CEQA Threshold

The 10,000 $MTCO_2E$ threshold has been adopted by three air quality districts in California. It was originally adopted as an interim threshold by the SCAQMD in 2008. The SCAQMD's 10,000 $MTCO_2E$ threshold is based on a goal of a 90 percent emission capture rate. Because most new stationary combustion sources were anticipated to utilize natural gas in SCAQMD, the 90 percent capture rate was based on combustion of natural gas at facilities that were required to report under their Annual Emissions Reporting program for the preceding 12-month period in 2006-2007. SCAQMD's interim threshold was expected to capture more than 90 percent of GHG emissions from stationary source projects. Key rationale for SCAQMD choosing a 90 percent capture rate included the following considerations:

- The policy would be consistent with Executive Order S-3-05 which required a 90 percent reduction of GHG emissions below then-current levels by 2050;
- The policy would be consistent with CARB's 2008 draft staff proposal (never adopted) that included a 90 percent capture efficiency target;
- The emission threshold is low enough to capture a substantial fraction of future stationary source projects that will be constructed to accommodate future statewide population and economic growth, while setting the threshold high enough to exclude small projects that will in aggregate contribute a relatively small fraction of the cumulative statewide GHG emissions;
- A 90 percent capture rate is more appropriate than a zero threshold as it will assure that all feasible GHG reductions will be implemented for a large majority of emissions, without overwhelming SCAQMD's ability to process environmental documents; and

- This approach was included in CAPCOA's 2008 CEQA and Climate Change white paper (CAPCOA, 2008, p. 33).

The SCAQMD also relied on and vetted the threshold through a stakeholder working group to receive input on establishing a GHG significance threshold. The working group recommended an interim threshold that achieved an emission capture rate of 90 percent of all new or modified stationary source projects (SCAQMD, 2008, Attachment E). Pursuant to CEQA Guidelines 15064.7, the SCAQMD Governing Board adopted the threshold for its use as a lead agency via a resolution on December 5, 2008. It was considered an interim to an anticipated CARB GHG threshold; however, a GHG threshold has not been adopted by CARB to date (SCAQMD, 2008, pp. 2, 4, & 5, and Attachment C).

Subsequent to the SCAQMD threshold adoption, the BAAQMD adopted a 10,000 $MTCO_2E$ interim threshold based on capturing approximately 95 percent of all GHG emissions for new or modified stationary sources. (The threshold was adopted as an interim threshold that would be reevaluated once the CARB's Scoping Plan measures, including the Cap-and-Trade program, are more fully implemented at the state level.) BAAQMD staff reports (BAAQMD, 2010, pp. 27 - 28) indicated that a 95 percent emission capture rate would capture only the large, significant projects. Permit applications for projects with emissions above the 10,000 $MTCO_2E$ threshold would account for less than 10 percent of stationary source permit applications which represent 95 percent of GHG emissions from new permits analyzed during a three year analysis period (2007-2009). BAAQMD staff concluded that compliance with the stationary source quantitative threshold of 10,000 $MTCO_2E$/yr would not be "cumulatively considerable" because projects would not hinder the state's ability to solve the cumulative greenhouse gas emissions problem pursuant to AB 32 (BAAQMD, 2010, pp. 30 - 31).

The BAAQMD stationary source interim thresholds were subsequently set aside by a trial court in a lawsuit, which found that the Air District had failed to comply with CEQA when it adopted the thresholds. The court did not determine whether or not the thresholds were based on substantial evidence and thus valid on the merits, only that the CEQA process should have been utilized in the adoption of the thresholds. Therefore, the BAAQMD does not recommend specific thresholds of significance for use by local governments at this time (BAAQMD, 2012, p. 2-5).

SLOAPCD established a 10,000 $MTCO_2E$ interim threshold based on an analysis of their stationary-source emission inventory year 2009 (SLOAPCD, 2012. p. 27). (Similar to the BAAQMD interim threshold, SLOAPCD adopted its threshold as an interim threshold that would be reevaluated once the CARB's Scoping Plan measures, including the Cap-and-Trade program, are more fully implemented at the state level.) The analysis showed facilities with emissions above 10,000 $MTCO_2E$ accounted for 94% of all combustion-related $CO_2E$ emissions in 2009 in San Luis Obispo County (SLOAPCD, 2012. p. 27).

California does not yet have one distinct methodology for establishing a data set to determine a "percent-capture" level for the purpose of forecasting the size (i.e., the annual GHG emissions) of future projects that may be subject to CEQA review. Use of an existing emission inventory or data set is the simplest approach. Developing a data set based on historic project approvals requires a much larger effort and may require extensive primary research and refinement.

SCAQMD staff developed a GHG emissions data set based on annually reported natural gas usage, with a goal of determining a screening threshold level that would capture 90% of the GHG emissions related to new stationary source projects. The data set SCAQMD staff used was deemed to be the best information available at the time. As a result of the ongoing implementation of AB 32 requirements and other local

initiatives, other GHG emission inventories and data sets have been developed for more recent years. These more recent inventories may include combustion emissions from natural gas combustion, additional fuel types, indirect GHG emissions from electricity, mobile source emissions, and GHG from fugitive methane releases. However, some of the more recent inventories do not include smaller sources (less than 25,000 $MTCO_2E$/year or less than 10,000 $MTCO_2E$/yr). This is the case for the data set based on the CARB GHG Mandatory Reporting Rule (MRR) reported emissions data.

SCAQMD staff acknowledged in its proposal that not all GHG emissions and source types were included in the data set used to determine a screening threshold of 10,000 $MTCO_2E$/year as follows:

> "Staff's interim GHG significance threshold proposal for stationary sources was developed using AQMD's AER Program ... because this is the only comprehensive data base available to SCAQMD staff. Staff then compiled reported annual natural gas consumption for 1,297 permitted facilities for 2006 through 2007 and rank-ordered the facilities to estimate the 90th percentile of the cumulative natural gas usage for all permitted facilities. Most GHG emissions from industrial facilities are generated from stationary sources, while a relatively small percent is generated by traffic, water usage, etc. Therefore, although staff's GHG significance threshold proposal was derived without considering offsite indirect GHG emissions, staff believes the interim GHG significance threshold for stationary source projects is appropriate because it is consistent with staff's overarching goal of capture 90 percent or more of the GHG emissions from industrial projects." (SCAQMD, 2008, Attachment D, pp. 2 - 3)

The GHG emissions that were reported to CARB for 2011 (hereafter referred to as the 2011 MRR data set), although more complete in terms of some emissions sources (fugitive methane emissions, process gas emissions, electricity emissions), is deficient for developing a threshold level as it includes very few sources that emit less than 25,000 $MTCO_2E$/year (only 69 for the South Coast AQMD region). The South Coast AQMD dataset includes a total of 1,297 sources, 58 of which are above 25,000 $MTCO_2E$/year and 1,239 of which are below 25,000 $MTCO_2E$/year. The CARB 2011 MRR data set includes a total of 132 sources in the South Coast AQMD region, 67 of which are above 25,000 $MTCO_2E$/year, and 65 of which are below 25,000 $MTCO_2E$/year. Both data sets have their limitations; by design, the MRR 2011 data set excludes a large portion of the projects in the region, and captures only the very largest projects.

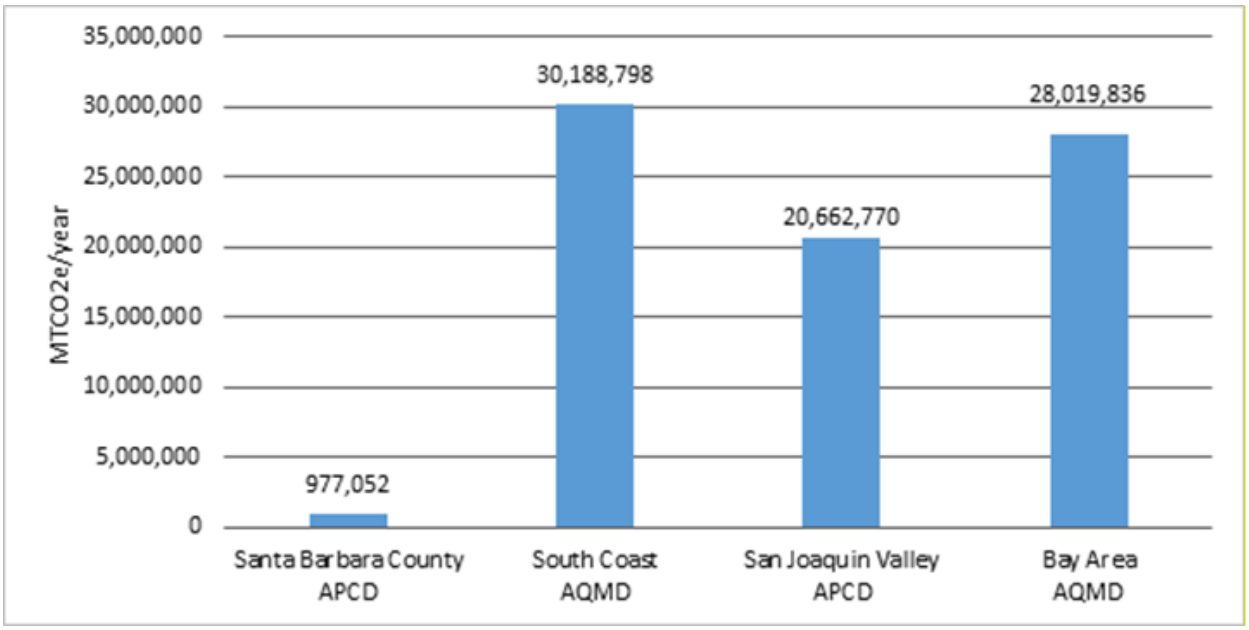
SME has questioned the SCAQMD data set approach, contending that calculating a 90% capture rate through the use of the CARB GHG MMR (2011 date) would produce a much higher threshold – estimated by SME to be 205,299 $MTCO_2e$ instead of 10,000 $MTCO_2E$. Determining a 90% capture level based on the 2011 MRR dataset essentially applies a filter to a data set that has already been filtered. SME derived a hypothetical threshold from the CARB dataset without the inclusion of approximately 1200 SCAQMD facilities.

Based on one year (2011) of Santa Barbara County stationary source GHG data (total of 246 stationary sources), the Santa Barbara County APCD has made preliminary estimates of the 90 and 95 percent capture rates. The thresholds were estimated to be 10,000 $MTCO_2E$ and 3,000 $MTCO_2E$, respectively, for 90% and 95% capture. The APCD suggests using a larger data set and taking a regional view to establish a CEQA GHG threshold. For instance, inclusion of Santa Barbara County in the South Coast regional emissions inventory, which is about 33 percent of permitted sources in California, supports a 10,000 $MTCO_2E$ threshold for Santa Barbara County because the emissions inventory in Santa Barbara County is very small compared to the South Coast regional emissions.. As described above, the interim SCAQMD threshold is based upon a 90 percent capture rate calculated by SCAQMD, using the 2008 methodology.

The figure below compares Santa Barbara County APCD's stationary source emissions from 2011 to the GHG emissions reported to the California Air Resources Board in 2011 for sources in the South Coast AQMD, San Joaquin APCD, and Bay Area AQMD regions.

**Figure 5.1-1a Comparison of Air District Stationary Source GHG Emissions**

**Sources emitting more than 10,000 metric tons/yr**




**Reference**: Santa Barbara County APCD and CARB, 2013a. The Santa Barbara County emissions number does not include emissions generated by biogenic fuels, such as landfill gas, wastewater treatment methane, and biomass facilities/power plants, and does not include GHG emissions that will occur from energy embedded in fuels used by consumers.

Although Santa Barbara County is a relatively large geographic region (approximately 2,700 square miles), the region is much less densely populated (2012 population estimate is 431,000) and has less commercial and industrial land uses than neighboring counties to the south. Correspondingly, the GHG emissions related to stationary sources are much smaller than other counties in the South Coast AQMD region. Using the values in the figure above, the GHG emissions in Santa Barbara County are approximately 3.2% of the GHG emissions for the South Coast AQMD region, which is made up of the most populated areas of Los Angeles, Riverside, and San Bernardino Counties, and all of Orange County. The collective South Coast AQMD region comprises a large and important regional economy in the United States, encompasses about 10,750 square miles, and has a population of approximately 16.8 million people. It is the second most populated urban area in the United States. The GHG emissions associated with Santa Barbara County's stationary source facilities are a very small portion of the GHG emissions in the Southern California region. If the GHG emissions from Santa Barbara County were folded into an inventory for the larger Southern California region, it is evident that the additional data would have little or no effect on the percent amount of GHG emissions "captured" by a 10,000 MT/yr stationary source threshold for that larger region.

There is no science-based reason for applying a more stringent threshold to the Santa Barbara County region than is applied in a larger region within the State of California. Rather, the stationary source threshold of 10,000 MT/yr adopted by the South Coast AQMD is a reasonable threshold to apply if a numeric, bright-line threshold were considered for this project, as allowed by CEQA Guidelines Section 15064.7(c).

***BAU Thresholds***

The essential rationale behind the BAU thresholds is that CEQA Guidelines Section 15064.4(b)(3) provides that when determining if cumulative impacts from GHG emissions are significant, a lead agency may consider whether a project complies with the regulations or requirements adopted pursuant to a statewide plan adopted for the reduction or mitigation of GHG. CARB's *Climate Change Scoping Plan* (hereafter "Scoping Plan") is such a plan. CARB prepared the first Scoping Plan in 2008 (with a re-approval in August 2011) as part of its mandate to implement Assembly Bill (AB) 32, the "California Global Warming Solutions Act" (Health & Safety Code sections 369500 et. seq.). AB 32 mandates a reduction in California's GHG emissions to 1990 levels by 2020 (the 1990 level that serves as the 2020 target is 427 million $MTCO_2E$). This reduction is viewed as an aggressive, but achievable, mid-term target toward stabilization of the planet's climate in the latter half of the 21st century (CARB, 2008, pp. 4 and 117). Prior to the adoption of AB 32 process, former-Governor Schwarzenegger's issued Executive Order S-3-05 setting a long term goal for GHG reduction, calling for an 80 percent reduction of GHG emissions from 1990 levels by the year 2050, which results in a target level of 85.4 $MTCO_2E$. (Ibid.) The Scoping Plan indicates how emission reductions in California will be achieved through regulations, market mechanisms, and other actions, to reach the 2020 target. AB 32 represents California's solution to global climate change in legal terms, and also represents the state's solution in policy terms when combined with S-3-05. (Crockett, 2011, pp. 7 - 8.)

To achieve the AB 32 2020 mid-term goal of reducing GHG to 1990 emission levels, the Scoping Plans projected the reasonable expected GHG emissions growth through the year 2020 which is the "business-as-usual" (BAU) scenario, and then determined the GHG emission reductions that are expected or have occurred due to the emission reduction measures required by the Scoping Plan.

Since 2008, ARB has updated the projected BAU emissions based on current economic forecasts (i.e., as influenced by the economic downturn) and GHG-reduction measures already in place. The BAU projection for 2020 GHG emissions in California was originally, in the 2008 Scoping Plan, estimated to be 596 $MMTCO_2E$. ARB subsequently derived an updated estimate of emissions by considering the influence of the recent recession and reduction measures that are already in place. The 2011 Scoping plan estimates the year 2020 emissions at 507 MMTCO2E (as the BAU estimate). CARB estimates that statewide emissions have to be reduced by 80 million $MTCO_2E$/year form 2008 emission levels to meet the 2020 target emissions level.

The 2011 Scoping Plan concluded that achieving the 1990 levels by 2020 meant cutting approximately 16 percent, compared to the original 2008 Scoping Plan that estimated a 29% reduction (CARB, 2011a, p. 11). The 2011 Scoping Plan sets forth the expected GHG emission reductions from a variety of measures, including the Pavley I automobile standards and the Renewables Portfolio Standard, neither of which were assumed in the 2008 Scoping Plan (CARB, 2011b).

AB 32 requires that the Scoping Plan be revised every five years; the first five-year revision is scheduled to be heard by CARB for adoption in November of 2013. This first revision will provide an update on climate science and a report on progress toward the 2020 target, including achievements of the 2008 and

2011 Scoping Plans, an update on the inventory of GHG emissions, and an update of the economy and its potential influence on future emissions' forecasting. It will also address post-2020 goals, including Executive Order S-3-05.

BAU thresholds are based on a reduction from a "business-as-usual" scenario, where BAU emissions equate to the emissions that would have occurred in the absence of the mandated reductions under AB-32 programs. The definition of BAU is a critical aspect of determining the significance of a project. In the CARB Scoping Plans, the BAU case is a representation of what the State of the California economy will be in the year 2020 assuming that none of the measures recommended in the Scoping Plan are implemented. The BAU should not be confused with a CEQA baseline analysis, where, for a new housing development project, for example, the baseline would be the empty field, while the BAU would be the development project "in the absence of any AB 32 programs." CAPCOA defines BAU as emissions that would occur "in the absence of mandated reductions" and does not equate the BAU with a CEQA baseline. A recent court case provides some guidance on what a BAU project scenario would be for a proposed project (*Friends of the Northern San Jacinto Valley et al. v. County of Riverside, 5/31/2012).* This court case ruled that a BAU scenario for a project should meet the following conditions:

- It should be within the existing legal constraints;
- It should be practical and credible;
- It should include the application of local planning and zoning laws;

The decision provides guidance on the selection of the BAU scenario from which a percent reduction would be calculated.

If the projected emissions levels from a source can be reduced to a percentage below BAU that is consistent with the Scoping Plan targets (e.g., 16 percent below BAU), cumulative impacts would be found to be mitigated to less than significant because it has implemented or funded its fair share of mitigation to alleviate the cumulative impact. Options for setting thresholds at reduction rates higher than 16% have relied on the necessity of addressing the long-term 2050 emission-reduction goal set in Executive Order S-3-05, as further discussed below.

The Scoping Plan relies on several command and control measures to reduce GHG pollution, such as regulation of landfills and certain commercial refrigerant operations, Pavley I automobile standards, regional transportation measures, energy efficiency, and many other measures. (CARB, 2008, p. 15.) A key part of the program, however, is Cap-and-Trade, which is applied to a number of sources, including all stationary sources with GHG pollution in excess of 25,000 tons annually. (Cap-and-Trade is discussed in more detail below, under State GHG Regulations and Programs.)

The SME project is required to participate in the Cap-and-Trade program by virtue of its total annual emissions that would surpass the threshold of 25,000 $MTCO_2E$. Between now and the year 2020, the Cap-and-Trade program statewide is estimated to account for a reduction of 18 $MTCO_2E$ (or 22.5 percent) of the 80 $MTCO_2E$ required to meet the AB 32 mid-term target. CARB estimates that, by 2030, a reduction in California's GHG emissions to below 300 $MTCO_2E$ is needed to stay on course toward the long-term 2050 target; CARB also estimates that the Scoping Plan measures would produce a reduction to 284 $MTCO_2E$ by 2030. (CARB, 2008, pp. 118 - 120.) For its part, a comprehensive Cap-and-Trade program of regional or national scope could lower emissions in those sectors of the economy subject to the program from 365 $MTCO_2E$ in 2020 to around 250 $MTCO_2E$ in 2030. According to the Plan: "By

tightening the cap over time, it is expected that facilities in the industrial and natural gas sectors would achieve reductions well beyond those needed to meet the 2020 emissions cap." (*Ibid,* pp. 118 - 120.)

There are multiple possibilities under the BAU approach in terms of reductions from the BAU scenario and demonstrating consistency with the AB 32's target. These include:

- Reliance on only AB 32 Scoping Plan programs. CARB has adopted the Scoping Plan that shows the State will achieve the 1990 GHG emission levels by 2020 with the implementation of the Scoping Plan programs (i.e. for stationary sources, this would primarily be the Cap-and-Trade program). No additional reductions are needed. CARB also sees the Cap and Trade Program as an important facet in achieving the longer term State goal of reducing statewide GHG emissions to a level 80% below 1990 emission levels by 2050.
- A 29 percent reduction, as is currently the adopted approach in San Joaquin Valley APCD (SJVAPCD) and East Kern County APCD (EKCAPCD) areas, where the reduction is based on the original 2008 Scoping Plan reduction requirements to achieve the year 2020 targets. This threshold level is discussed in CAPCOA's CEQA and Climate Change Paper (CAPCOA 2008);
- A 16 percent reduction where the reduction is based on the revised 2011 Scoping Plan reduction requirements;
- A 50 percent reduction from BAU, with an increased reduction over what is required to achieve the AB-32 target for 2020. This threshold level is discussed in the CAPCOA's CEQA and Climate Change Paper (CAPCOA 2008) and Alexander Crockett's "Addressing the Significance of Greenhouse Gas Emissions under CEQA: California's Search for Regulatory Certainty in an Uncertain World," (Crockett, 2011, p. 14); and
- A 90 percent reduction from BAU, where an even greater reduction over what is required to achieve the AB 32 target for 2020 is based on the presumption that new development should contribute an even greater percent reduction from business-as-usual.

Each of these is discussed below

<u>Reliance on AB 32 Scoping Plan for Projects Subject to Cap and Trade</u>
This threshold relies entirely on the Scoping Plan programs to achieve the required reductions. These programs are numerous, but for stationary sources, are composed primarily of the Cap-and-Trade program. The Cap-and-Trade program includes all stationary sources in California that emit more than 25,000 MTCO2E per year. According to CARB, this would capture most of the GHG emissions from stationary sources in the State. Participants in the program are required to reduce emissions or purchase/obtain "allowances" so that the total GHG emissions from all covered sources in California would not increase over time, with a reduction in the "cap", or total emissions, occurring over time as part of the regulation. This would enable the State-wide GHG emissions from the majority of stationary sources to be reduced each year until the 2020 goals are achieved. The program beyond the year 2020 has not been developed at this time, but CARB indicates that it most likely would continue and the Cap-and-Trade program would be used to achieve the 2050 goals also. More information is included in section 5.1.2.2 Regulatory Setting below.

<u>Percent Reduction Below BAU</u>
A number of approaches discussed below allow for an accelerated method to implement additional reductions earlier than the Scoping Plan Cap-and-Trade program prescribes. These approaches also attempt to address the need to ensure that the S-3-05 goal of an 80 percent reduction by 2050 (from 1990 emissions) is achieved.

*29 or 16 Percent Reductions Below BAU*

The approach stems from the CARB AB 32 Scoping Plan of 2008, which prepared and adopted a statewide greenhouse gas inventory for the years 2002 – 2004 and determined that an emission reduction of approximately 29 percent below business as usual was necessary to achieve 1990 emission levels by 2020. This is referred to as reducing emissions below the expected "BAU" scenario. Due to a lawsuit, CARB re-approved the Scoping Plan in 2011 with revisions; including new calculations that determined a lower reduction level of 16 percent rather than 29 percent was necessary to meet the goal of AB -32 by 2020. This recalculation was based on a lower statewide greenhouse gas inventory for the years 2006-2008, revised growth projections, and estimated increase of effectiveness of AB-32 greenhouse gas reduction measures already implemented (e.g., the Pavley motor vehicle standards, and the Renewable Portfolio Standards for the generation of electricity). The BAU approach has been adopted or utilized as CEQA threshold by the SJVAPCD, Eastern Kern APCD (both prescribing a 29 percent reduction) and the City of Chula Vista (and upheld by *Citizens for Responsible Equitable Environmental Development, Petitioner and Appellant, v. City of Chula Vista).*

AB 32 requires CARB to update the Scoping Plan every 5 years in order to achieve the maximum technologically feasible and cost-effective reductions of greenhouse gases. (Health & Safety Code sec. 38561(h).) CARB may consider the goals of EO S-3-05 as part of that process. Variability in the reduction percentage is anticipated as the Scoping Plan is revised multiple times between now and the year 2020, and it is anticipated that the reduction percentage would increase from 16 percent, as the economy is expected to recover over the next 5-10 years. At this time, however, the 16% threshold is identified in the revised 2011 Scoping Plan as necessary to meet the 2020 mid-term target, and the 29% threshold, which was identified in the 2008 Scoping Plan as necessary to meet the 2020 target, provides additional reductions to address the 2050 goal provided in Executive Order S-3-05.

*50 Percent Reductions Below BAU*

The use of a higher reduction than the Scoping Plan levels of 16 or 29 percent is based on the conclusion that new development should contribute a greater percent reduction from BAU because greater reductions can be achieved at lower cost from new projects than can be achieved from existing sources (CAPCOA 2008, pp. 33-34; Crockett, 2011, p. 14). In addition, Former Governor Schwarzenegger adopted E.O. S 3-05 which set a goal of reducing emissions to 80 percent below 1990 levels by 2050. CARB has partially addressed this goal in the Scoping Plan, which is the formal plan for implementing AB 32, as discussed later in this section. However, CARB indicates in the Scoping Plan that the programs adopted, including Cap-and Trade, would contribute to achieving the 2050 goals. It is assumed that, under Cap-and-Trade, additional reductions in allowances would continue to be required past 2020, along with land use and transportation achievements, in order to achieve the 2050 targets. "ARB believes, based on the review of emission reduction opportunities conducted for the Scoping Plan, that significant reduction opportunities exist in the industrial sector that are more readily achieved through market mechanisms than through direct measures [i.e., regulations]*."* (CARB, 2008, page C-17).

As the S-3-05 Executive order sets a goal of an 80 percent reduction by 2050, higher reduction levels than the 16 or 29 percent as detailed in the Scoping Plans would be required beyond 2020 in order to achieve that longer term goal. Reduction levels of between 50 percent (CAPCOA, 2008, pp. 33-34) and 90 percent could be utilized to account for a greater contribution by new development and the need to achieve these longer terms goals of S-3-05. CAPCOA specifically discusses the 50 percent reduction

threshold, determining that it would have a high level of consistency with AB-32, a medium level of effectiveness but a medium/high level of uncertainty. (CAPCOA, 2008, pp. 33-34.)

*90 Percent Below BAU*
Establishment of a 90 percent BAU threshold is based in part on the SCAQMD Interim Threshold development where a reduction of 90 percent over the current (at the time of SCAQMD development) emissions would be required to achieve an 80 percent reduction by 2050 as defined in the S-3-05 Executive order.

***EIR Significance Determination***
If the projected project emissions are mitigated to a level that will be consistent with AB 32, then the cumulative GHG impacts contributed by the project will be found to be less than significant. This method is based on CARB's implementation of AB 32, including the Scoping Plans, as the statewide program that will achieve the State's emission reduction goal of achieving 1990 emission-levels by 2020, and further the State's progress towards meeting the 2050 policy target. These targets (as established by AB 32 and the Scoping Plans) have been established as goals that will reduce impacts from climate change, and contribute to reducing global atmospheric GHG to levels that are projected to produce less than significant impacts.

An alternative approach to assess significance is based on emissions captured. If the projected project emissions fall into the category that represents the smallest projects within the lead agency's jurisdiction – i.e., those projects that collectively make up only 5-10% of new projects, then the projects contribution to climate change would not be considered to be cumulatively considerable. For those projects with projected emissions that fall into the category of larger projects, GHG emissions would be considered to be a significant contribution to the cumulative impact of climate change, and all feasible alternatives or mitigation would be required.

The original draft EIR for this project identified that a mitigation of GHG emissions to a level equating to 29% below BAU, or more, would render the project's cumulative impact to be less than significant. The public review of the draft EIR resulted in some agreement with this choice of threshold, and some opposition; the latter contending that a 29% reduction from BAU was inadequate in light of thresholds used by other lead agencies that required larger reductions of GHG emissions. Planning and Development staff prepared a proposed Final EIR and proceeded to the County's Planning Commission with a recommendation to approve the project with a required reduction in the project's GHG emissions to 29% below BAU. The County's Planning Commission, on a 3-2 vote, disagreed with staff's recommendation and directed staff to apply a 50% below BAU threshold, and to recirculate the GHG component of the Air Quality section of the proposed Final EIR for public comment, including several additional thresholds options that were described during the hearing.

Accordingly, this Draft Recirculation Document includes a range of options for establishing a CEQA threshold of significance for GHG emissions, specifically the 16, 29, 50 and 90 percent below BAU and the 10,000 $MTCO_2E$/year threshold. The BAU approaches, as discussed above, would be consistent with AB 32 as they would achieve similar reductions to AB 32, although at different levels and different timeframes. The use of the 10,000 $MTCO_2E$/yr threshold would also obtain mitigation and reduction levels comparable to the 90 percent BAU threshold for this project, and would therefore also be consistent with AB 32 (see subsequent analysis below Table 5.1-12 and 5.1-13).

Reductions, or mitigation measures, could include a wide variety of measures which could reduce GHG emissions, including:

- Onsite increased equipment efficiencies or operational modifications;
- Offsite programs implemented in the community;
- Purchased "credits" from a source that are verified by CARB or equivalent; or
- Allowances purchased as part of the Cap-and-Trade program.

The use of purchased Cap-and-Trade allowances is allowed to be counted towards the threshold in order to give credit for the reductions associated with the Cap-and-Trade program. Under the Cap-and-Trade program, these purchased allowances are estimated to, after a 5-10 year timeframe, contribute all of the required reductions under any of threshold approaches described above.

## 5.1.2 SANTA MARIA ENERGY 136-WELL, CYCLIC-STEAMING ODPP

### 5.1.2.1 Environmental Setting

[No changes in this sub-section from the proposed Final EIR. This sub-section discussion on GHG has been included for reference purposes only.]

**Greenhouse Gases**

Greenhouse gases (GHGs) are defined as any gas that absorbs infrared radiation in the atmosphere, including water vapor, carbon dioxide ($CO_2$), methane ($CH_4$), nitrous oxide ($N_2O$) and fluorocarbons. These GHGs lead to the trapping and buildup of heat in the atmosphere near the earth's surface, commonly known as the "greenhouse effect". The accumulation of GHGs in the atmosphere regulates the earth's temperature. Without natural GHGs, the Earth's surface would be cooler (CA 2006b). Emissions from human activities, such as electricity production and vehicles, have elevated the concentration of these gases in the atmosphere.

GHGs have varying global warming potential (GWP). The GWP is the potential of a gas or aerosol to trap heat in the atmosphere. Because GHGs absorb different amounts of heat, a common reference gas ($CO_2$) is used to relate the amount of heat absorbed to the amount of the gas emissions, referred to as the "$CO_2$ equivalent". This is the amount of GHGs emitted multiplied by the GWP. The GWP of $CO_2$ is defined as one, whereas the GWP of methane, for example, is 21, meaning that methane gas absorbs 21 times as much heat, and therefore has 21 times greater impact on global warming per pound of emissions, as $CO_2$.

Water vapor is the most abundant and variable GHG in the atmosphere. It is not considered a pollutant, however, as in the atmosphere it maintains a climate necessary for life. The main source of water vapor is evaporation from the oceans (approximately 85 percent). Other sources include evaporation from other water bodies, sublimation (change from solid to gas) from ice and snow, and transpiration from plant leaves (AEP 2007).

Carbon dioxide is an odorless, colorless GHG. Natural sources of $CO_2$ include decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungus; evaporation from oceans; and volcanic outgassing. Anthropogenic (human caused) sources of $CO_2$ include burning fuels, such as coal, oil, natural gas, and wood. Atmospheric $CO_2$ concentrations are currently around 370 ppm.

Methane gas is the main component of natural gas used in homes. As discussed above, it has a GWP of about 21. Natural sources of methane arise from the decay of organic matter and from geological deposits known as natural gas fields, from which methane is extracted for fuel. Sources of decaying organic material include landfills, and manure.

Nitrous oxide is a colorless gas with a GWP of about 310 that is produced by microbial processes in soil and water, including those reactions which occur in fertilizer containing nitrogen. In addition to agricultural sources, some industrial processes (nylon production, nitric acid production) also emit N2O. It is used in rocket engines, as an aerosol spray propellant, and in race cars. During combustion, $NO_x$ ($NO_x$ is a generic term for mono-nitrogen oxides, NO and $NO_2$) is produced as a criteria pollutant (see above), and is not the same as N2O. Very small quantities of nitrous oxide ($N_2O$) may be formed during fuel combustion by reaction of nitrogen and oxygen (API 2004).

Chlorofluorocarbons (CFCs) are gases formed synthetically by replacing all hydrogen atoms in methane or ethane with either chlorine and/or fluorine atoms. CFCs are nontoxic, nonflammable, insoluble, and chemically nonreactive in the troposphere (the level of air at the earth's surface). CFCs were first synthesized in 1928 for use as refrigerants, aerosol propellants, and cleaning solvents. They destroy stratospheric ozone; therefore their production was stopped as required by the Montreal Protocol. Hydrofluorocarbons (HFCs) are synthetic man-made chemicals that are used as a substitute for CFCs in automobile air conditioners and refrigerants. Perfluorocarbons (PFCs) are used in aluminum production and semiconductor manufacture industry In general, fluorocarbons have a GWP of between 140 and 11,700.

Sulfur hexafluoride ($SF_6$) is an inorganic, odorless, colorless, nontoxic, nonflammable gas. It also has the highest GWP of any gas at 23,900. Sulfur hexafluoride is used for insulation in electric power transmission and distribution equipment, in the magnesium industry, in semiconductor manufacturing, and as a tracer gas for leak detection.

Ozone is a greenhouse gas; however, unlike the other greenhouse gases, ozone in the troposphere is relatively short-lived and therefore is not global in nature. According to CARB, it is difficult to make an accurate determination of the contribution of ozone precursors ($NO_x$ and volatile organic compounds [VOCs]) to global warming (CARB 2006b).

Table 5.1-5 shows a range of gasses that contribute to GHG warming with their associated global warming potential. The table also shows their estimated lifetime in the atmosphere and the range in global warming potential over 20 years.

Fossil fuel combustion represents the vast majority of the anthropogenic GHG emissions, with $CO_2$ being the primary GHG. The total U.S. GHG emissions were 7,260 million metric tons of carbon equivalents (MMTCE) in 2005, of which 84 percent were $CO_2$ emissions (EPA 2007). In 2005, approximately 33 percent of GHG emissions were associated with transportation and about 41 percent with electricity generation.

California's GHG emissions are large in a world-scale context and continuing to grow over time. California GHG emissions would rank 16$^{th}$ largest in the world. In 2004, California produced 492 million metric tons of $CO_2$ equivalent GHG emissions (CEC 2006). The transportation sector is the single largest category of California's GHG emissions, producing 41 percent of the State's total GHG emissions in

2004. Electrical generation produced 22 percent of GHG emissions. Most of California's emissions, 81 percent, are $CO_2$ produced from fossil fuel combustion (CEC 2006).

In order to quantify the emissions associated with electrical generation, the "resource mix" for a particular area must be determined. The resource mix is the proportion of electricity that is generated from different sources. Electricity generated from coal or oil combustion produces greater GHG emissions than electricity generated from natural gas combustion due to coal and oil's higher carbon content. Electricity generated from wind turbines, hydroelectric dams or nuclear power is assigned zero GHG emissions. Although these sources have some GHG emissions associated with the manufacture of the wind generators, the mining and enrichment of uranium or the displacement of forest areas for reservoirs, these emissions have not been included in the lifecycle analysis as they are assumed to be relatively small compared to the electricity generated. Estimates of nuclear power GHG emissions associated with uranium mining and enrichment range up to about 60 lbs/MWh, or about five percent of natural gas turbine GHG emissions (Canada 1998).

**Table 5.1-5 Global Warming Potential of Various Gases**

| Gas | Life in the Atmosphere (years) | 20-year GWP (average) |
|---|---|---|
| Carbon Dioxide | 50-200 | 1 |
| Methane | 12 | 21 |
| Nitrous Oxide | 120 | 310 |
| HFC-23 | 264 | 11,700 |
| HFC-125 | 32.6 | 2,800 |
| HFC-134a | 14.6 | 1,300 |
| HFC-143a | 48.3 | 3,800 |
| HFC-152a | 1.5 | 140 |
| HFC-227ea | 36.5 | 2,900 |
| HFC-236fa | 209 | 6,300 |
| HFC-4310mee | 17.1 | 1,300 |
| $CF_4$ | 50,000 | 6,500 |
| $C_2F_6$ | 10,000 | 9,200 |
| $C_4F_{10}$ | 2,600 | 7,000 |
| $C_6F_{14}$ | 3,200 | 7,400 |
| $SF_6$ | 3,200 | 23,900 |

Note: GWP = global warming potential
Source: EPA 2007

Detailed information on the power generation plants, their contribution to area electricity "resource mix" and their associated emissions have been developed by the Federal EPA in a database called the Emissions & Generation Resource Integrated Database (eGRID). eGRID is a comprehensive inventory of environmental attributes of electric power systems and is developed from a variety of data collected by the U.S. Environmental Protection Agency (EPA), Energy Information Administration (EIA), and Federal

Energy Regulatory Commission (FERC). The most recent version released in 2012 contains information as recent as 2009.

About half of the electricity in the United States is generated from coal, producing a U.S. GHG emissions level of about 1,222 lbs/MWh (pounds per mega-watt hour). The GHG emissions rate is lower for western states, primarily due to the increased use of hydroelectric and natural gas. The California area has a GHG emission rate of about 661 lbs/MWh due to the contribution of hydroelectric, nuclear and renewable sources. Table 5.1-6 shows the resource mix and the nationwide and California GHG emission rates.

**Table 5.1-6 Electricity Generation Resource Mix and Greenhouse Gas Emissions**

| Resource Mix[a] | United States | Calif Area (CAMX) |
|---|---|---|
| Coal | 44.5 | 7.3 |
| Oil | 1.1 | 1.4 |
| Gas | 23.3 | 53.0 |
| Other Fossil | 0.3 | 0.2 |
| Biomass | 1.4 | 2.7 |
| Hydro | 6.8 | 12.7 |
| Nuclear | 20.2 | 14.9 |
| Wind | 1.9 | 2.8 |
| Solar | 0.02 | 0.3 |
| Geo | 0.4 | 4.4 |
| Other | 0.1 | 0.3 |
| Non-Renewables | 69.2 | 62.0 |
| Renewables | 30.8 | 38.0 |
| $CO_2$ Rate, lb/MWh | 1,222 | 661 |

a. Resource Mix is the percentage of total mega-watt hours.
Source: eGRID database with modifications and updates, EPA 2012, data for year 2009

The Pacific Gas and Electric (PG&E) GHG emission rate is slightly lower than the California average due to its reliance on the nuclear power and hydroelectric. The PG&E service area includes partial use of electricity from the Diablo Canyon nuclear power plant, the use of hydroelectric in the Sierra Nevada and the use of geothermal plants located in Nevada. The rate used in this analysis was taken from CalEEMod modeling program and is 641 lbs/MWh.

The GHG emission rate for electricity obtained from PG&E is about 45 percent less than the rate associated with direct natural gas combustion due to the electricity resource mix which includes non-GHG emission creating resources (hydroelectric, nuclear, renewables).

**Calculation of Greenhouse Gas Emissions**

The quantification of GHG emissions associated with a Project can be complex and relies on a number of assumptions. GHG emissions are global because emissions from one location could affect the entire planet, and they are not limited to local impacts. Therefore, offsite impacts, such as vehicle emissions and other associated transportation emissions, are included.

Emissions are generally classified as either direct or indirect. Direct emissions are associated with the production of GHG emissions at the Project Site. These include the combustion of natural gas in heaters or stoves, the combustion of fuel in engines and construction vehicles, and fugitive emissions from valves and connections, which include methane as a component.

Indirect emissions include the emissions from vehicles (both gasoline and diesel) delivering materials and equipment to the site and the use of electricity. Electricity also produces GHG emissions because fossil fuels generate some electricity.

This report utilizes the California Climate Action Registry General Reporting Protocol and the CARB Compendium of Emission Factors and Methods to Support Mandatory Reporting of Greenhouse Gas Emissions as methods to calculate GHG emissions (CCAR 2009, CARB 2007c).

Indirect GHG emissions associated with trash hauling and other services that might visit the Proposed Project Site are incorporated through the inclusion of the travel of diesel trucks that would visit and service the Project Site.

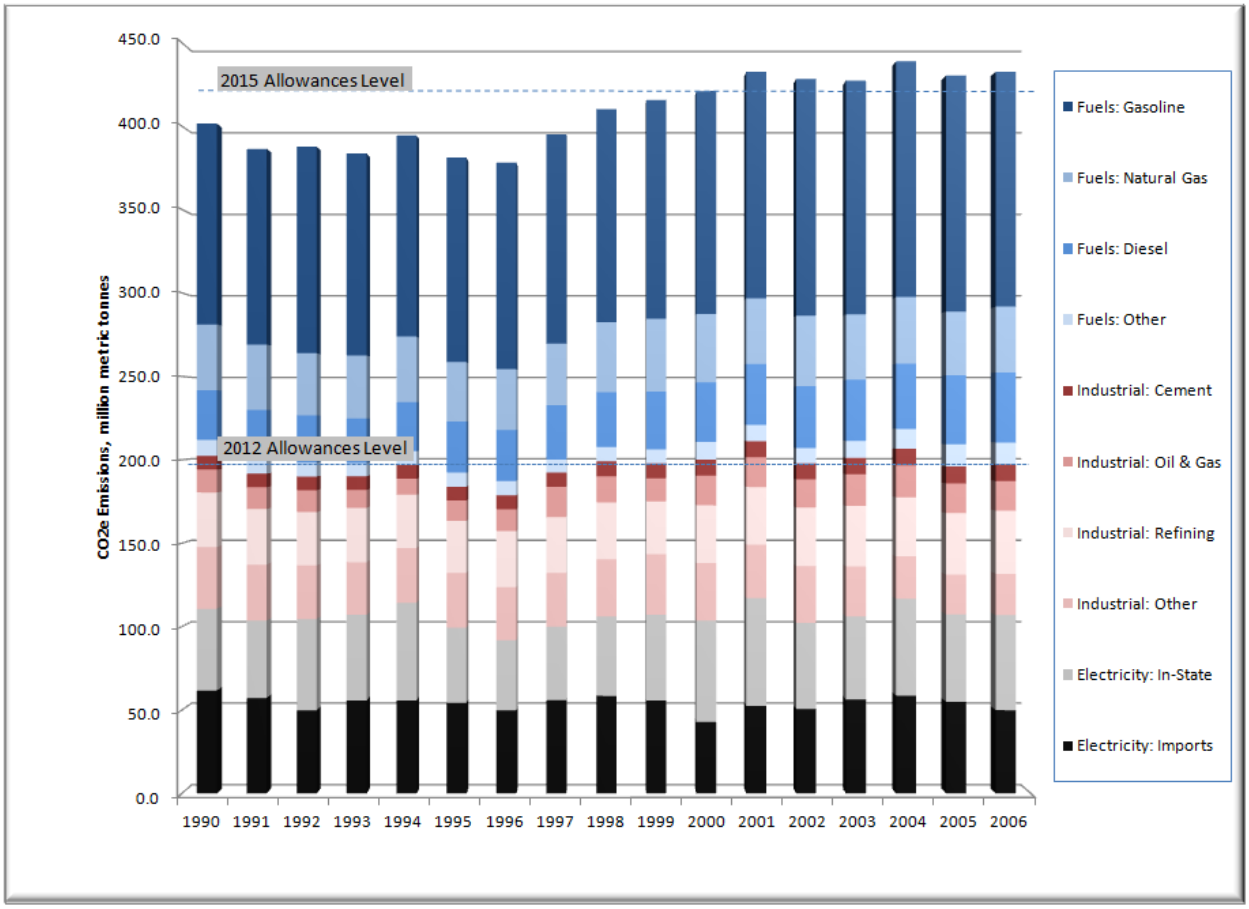
**National Greenhouse Gas Emissions**

Fossil fuel combustion is responsible for the vast majority of the United State's GHG emissions, and $CO_2$ is the primary GHG. In 2005, total US GHG emissions were 7,260 million metric tons of carbon equivalent (MMTCE); 84 percent of which were $CO_2$ emissions (EPA 2007). In 2005, approximately 33 percent of GHG emissions were associated with transportation and approximately 41 percent were associated with electricity generation.

**Statewide Greenhouse Gas Emissions**

With a population of over 37 million, California is the most populous state in the United States. In 2004, California produced 492 MMTCE of GHG emissions (CARB 2008). Overall, 81 percent of California's emissions are $CO_2$ from fossil fuel combustion (CARB 2008). The transportation sector is the single largest contributor of California's GHG emissions, producing 38 percent of the State's total GHG emissions in 2004. In contrast, electrical generation produced 23 percent. Nonetheless, California ranks fourth lowest of the 50 states in $CO_2$ emissions per capita. Figure 5.1-1 shows the historical GHG emissions in California along with the allowances levels defined in the recent cap-and-trade legislation (see below).

**Figure 5.1-1b California GHG Emissions**




Source: CARB 2009, Allowance levels shown for Cap-and-Trade legislation

### Impacts of GHG Emissions

Global climate change is a change in the average weather of the earth, which can be measured by wind patterns, storms, precipitation, and temperature. Historical records have shown that dramatic temperature changes have occurred in the past, such as during previous ice ages. Some data indicate that the current temperature record differs from previous climate changes in both rate and magnitude (AEP 2007). These climate changes could lead to alterations in weather, rainfall patterns, and increasing sea levels leading to flooding. The worldwide scientific consensus is that global climate change is caused by anthropogenic GHG emissions. The issue of how best to respond to climate change and its effects is currently one of the most widely debated economic and political issues in the United States.

Atmospheric $CO_2$ concentrations are currently around 392 ppm (based on the NOAA global annual mean calculated 6/2013, NOAA 2013) and concentrations may increase to 540 ppm by 2100 as a direct result of anthropogenic sources .

A summary report from the California Climate Change Center (CARB 2009) notes that a warming California climate would generate more smoggy days by contributing to ozone formation while also fostering more large brush and forest fires. Continuing increases in global greenhouse gas emissions at business-as-usual rates would result, by late in the century, in California losing 90 percent of the Sierra snowpack, sea level rising by more than 20 inches, and a three to four times increase in heat wave days. And increases in temperature will lead to increased concentrations and emissions of harmful pollutants in California.

In the Findings and Declarations for AB 32, the Legislature found that: "The potential adverse impacts of global warming include the exacerbation of air quality problems, a reduction in quality and supply of water to the state from the Sierra snowpack, a rise in sea levels resulting in the displacement of thousands of coastal businesses and residences, damage to the marine ecosystems and the natural environment, and an increase in the incidences of infectious diseases, asthma, and other health-related problems."

Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice and rising global average sea level. The linear warming trend over the 50 years from 1956 to 2005 (0.13 °C per decade) is nearly twice that for the 100 years from 1906 to 2005. Global average sea level rose at an average rate of 1.8 mm per year over 1961 to 2003 and at an average rate of about 3.1 mm per year from 1993 to 2003 (IPCC 2007).

AB 32 addresses the results of studies conducted by the Intergovernmental Panel on Climate Change (IPCC 2001, 2007) that examined a range of scenarios that estimated an increase in globally averaged surface temperature of 0.5 to 11.5°F over the period 1990 to 2100 with ocean rise between 0.6 to 1.9 feet over the same timeframe.

The IPCC Studies (2007) indicate that "In order to stabilize the concentration of GHGs in the atmosphere, emissions would need to peak and decline thereafter. The lower the stabilization level, the more quickly this peak and decline would need to occur". The studies also found that stabilization of atmospheric $CO_2$ concentrations at less than 450 ppm would limit temperature rise to less than 3.6°F by the year 2100 and would require global anthropogenic $CO_2$ emissions to drop below the year 1990 levels within a few decades (by 2020). If GHG emissions, and atmospheric $CO_2$ levels, were kept to this "Category I" level (producing increases in global average temperature of less than 1.8-5.4 °F above 1980-1999 levels) impacts to gross domestic product (GDP) are projected to "produce market benefits in some places and sectors while, at the same time, imposing costs in other places and sectors" (IPCC 2007). Higher levels of $CO_2$, ranging above 700 ppm with corresponding temperature increases of 7°F, could cause a reduction in global GDP of more than 5%, with regional losses substantially higher. Therefore, stabilizing GHG emissions levels at 1990 levels over the next 2 decades would reduce the impacts of climate change to levels that would produce nominal changes in global average GDP and would be less than significant.

**Countywide Greenhouse Gas Emissions**

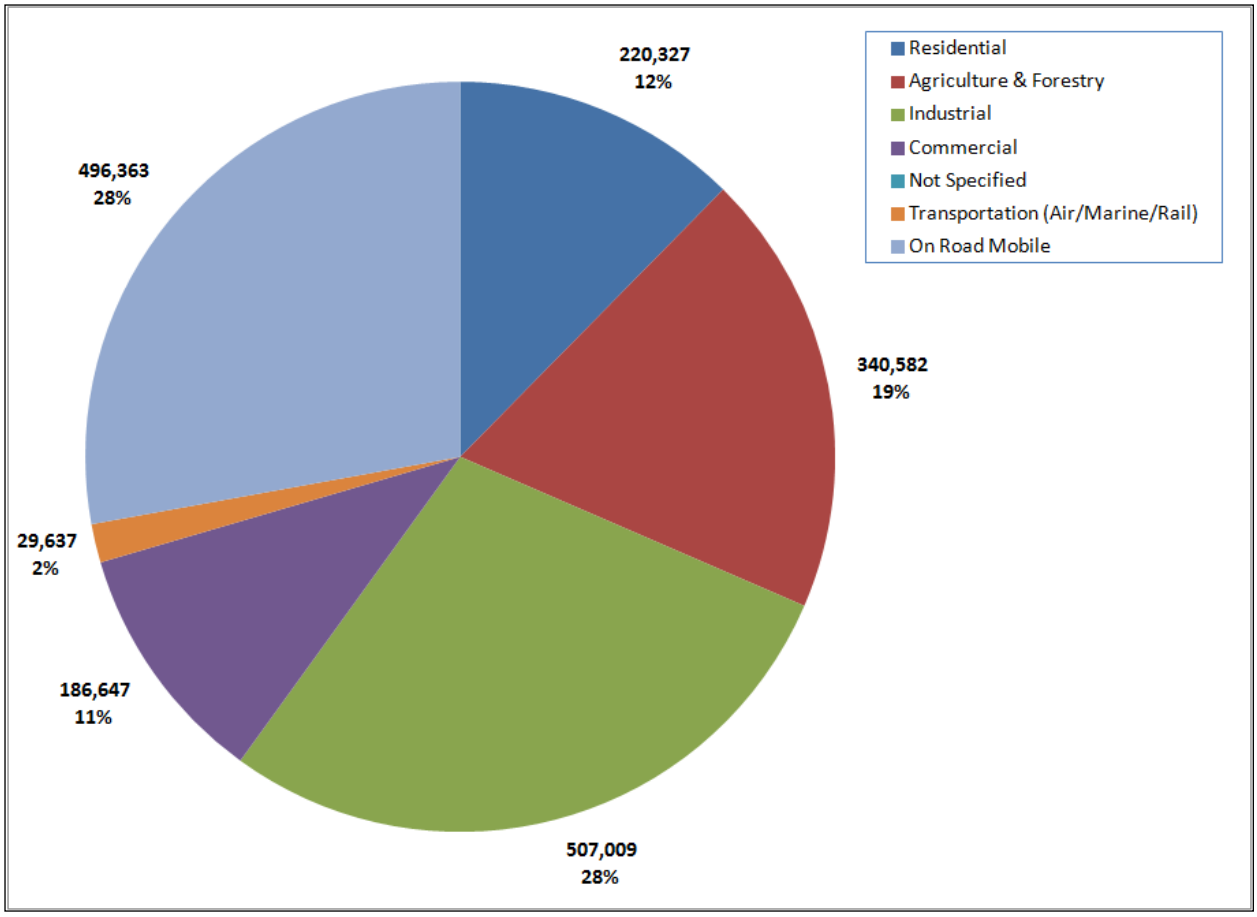
The Santa Barbara County Climate Action Strategy (CAS) is being developed to address greenhouse gas (GHG) emissions pursuant to the Board of Supervisors' March 2009 direction (BOS Resolution 09-059) "to take immediate, cost effective, and coordinated steps to reduce the County's collective GHG emissions." The CAS follows a two-phase structure to reduce emissions. Phase 1 is preparation of a Climate Action Study and phase 2 is the development of an Energy and Climate Action Plan. The Study is the first phase of the CAS. It includes: a GHG inventory and forecast for the unincorporated County, a discussion of GHG emission reduction target options that the County could pursue, a list of current

County activities which reduce GHG emissions, evaluation of potential additional emission reduction measures (ERMs) the County could implement, and recommendations for implementation of the Study through a Climate Action Plan (CAP).

The Climate Action Plan would represent the second phase of the CAS and would seek to reduce the County's GHG emissions through implementation of selected programs with the goal of achieving a GHG reduction target to be selected by the Board as part of the CAP. Additionally, a CAP could allow for programmatic mitigation of GHG emissions as required under CEQA.

The Climate Action Study was released in September 2011 and addresses municipal operations, countywide operations and implementation. Total GHG emissions were estimated at about 1.8 million tons in 2007. See Figure 5.1-3 for a categorization of the County emissions.

**Figure 5.1-3 Santa Barbara County GHG Emissions – 2007**




Note: Total emissions equal 1,780,565 $MTCO_2E$. Figure shows unincorporated Santa Barbara County only. It does not include emissions from other sources in County, such as cities, state and federal lands, Native American reservations, UCSB, and offshore seeps.
Source: SBC 2011.

**Current Santa Maria Energy Facility Emissions**

Emissions of GHG are generated from current operations, including flaring and combustion of field gases (16,444 MTCO2e), electrical generation (1,923 MTCO2e), offsite sources and miscellaneous (555 MTCO2e) annually. See the Air Quality appendix for detailed calculations.

## 5.1.2.2 Regulatory Setting

**GREENHOUSE GAS EMISSIONS REGULATIONS AND PROGRAMS**

**International GHG Regulations**

*Kyoto Protocol*

The Kyoto Protocol is a treaty made under the United Nations Framework Convention on Climate Change, which was signed on March 21, 1994. The Convention was the first international agreement to regulate GHG emissions. It has been estimated that if the commitments outlined in the Kyoto Protocol are met, global GHG emissions would be reduced by an estimated 5 percent from 1990 levels during the first commitment period from 2008 until 2012. However, while the US is a signatory to the Kyoto Protocol, Congress has not ratified it; therefore, the US is not bound by the Protocol's commitments.

*Climate Change Technology Program*

In lieu of the Kyoto Protocol's mandatory framework, the US has opted for a voluntary and incentive-based approach toward emissions reductions. This approach, the Climate Change Technology Program, is a multi-agency research and development coordination effort, led by the Secretaries of Energy and Commerce, who are charged with carrying out the President's National Climate Change Technology Initiative.

**Federal GHG Regulations**

*Clean Air Act*

In the past, the US EPA has not regulated GHG under the Clean Air Act. However, in 2007 the US Supreme Court held that the EPA can, and should, consider regulating motor-vehicle GHG emissions. In *Massachusetts v. Environmental Protection Agency*, 12 states and cities, including California, in conjunction with several environmental organizations sued to force the EPA to regulate GHG as a pollutant pursuant to the Clean Air Act (US Supreme Court No. 05-1120; 127 S.Ct. 1438 (2007)). The Court ruled that GHG fit within the Clean Air Act's definition of a pollutant and that the EPA's reason for not regulating GHG was insufficiently grounded.

40 CFR Section 98 specifies mandatory reporting requirements for a number of industries. The final 40 CFR part 98 applies to certain downstream facilities that emit GHG, and to certain upstream suppliers of fossil fuels and industrial GHG. For suppliers, the GHG emissions reported are the emissions that would result from combustion or use of the products supplied. The rule also includes provisions to ensure the accuracy of emissions data through monitoring, recordkeeping and verification requirements. The mandatory reporting requirements generally apply to facilities that produce more than 25,000 MTCO2E (or 10,000 MTCO2E for combustion and process source emissions).

## State GHG Regulations and Programs

*Executive Order S-3-05*

The 2005 California Executive Order S-3-05 established the following GHG emission-reduction goals for California:

- By 2010, reduce GHG emissions to 2000 levels;
- By 2020, reduce GHG emissions to 1990 levels; and
- By 2050, reduce GHG emissions to 80 percent below 1990 levels.

The Secretary of the California Environmental Protection Agency (CalEPA) is charged with coordinating oversight of efforts to meet these targets and formed the Climate Action Team to carry out the Order. Emission reduction strategies or programs developed by the Climate Action Team to meet the emission targets are outlined in a March 2006 report (CalEPA 2006). The Climate Action Team also provided strategies and input to the CARB Scoping Plan.

*Assembly Bill 1493*

In 2002, the legislature declared in AB 1493 (the Pavley regulations) that global warming was a matter of increasing concern for public health and the environment in the state. It cited several risks that California faces from climate change, including reduction in the state's water supply, increased air pollution due to higher temperatures, harm to agriculture, and increase in wildfires, damage to the coastline, and economic losses caused by higher food, water, energy, and insurance prices. Furthermore, the legislature stated that technological solutions for reducing GHG emissions would stimulate California's economy and provide jobs. Accordingly, AB 1493 required the CARB to develop and adopt the nation's first GHG emission standards for automobiles. The CARB responded by adopting $CO_2$-equivalent fleet average emission standards. The standards will be phased in from 2009 to 2016, reducing emissions by 22 percent in the "near term" (2009 to 2012) and 30 percent in the "mid-term" (2013 to 2016), as compared to 2002 fleets.

The legislature passed amendments to AB 1493 in September 2009. Implementation of AB 1493 requires a waiver from the EPA, which was granted in June 2009.

*Assembly Bill 32*

AB 32 codifies California's GHG emissions 2020 goal by requiring the state to reduce global warming emissions to 1990 levels by 2020. It further directs the CARB to enforce the statewide cap that would begin phasing in by 2012. AB 32 was signed and passed into law by Governor Arnold Schwarzenegger on September 27, 2006. Key milestones of AB 32 include:

- June 20, 2007 – Identification of "discrete early action GHG emission-reduction measures."
- January 1, 2008 – Identification of the 1990 baseline GHG emissions levels and approval of a statewide limit equivalent to that level. Adoption of reporting and verification requirements concerning GHG emissions.
- January 1, 2009 – Adoption of a scoping plan for achieving GHG emission reductions.
- January 1, 2010 – Adoption and enforcement of regulations to implement the actions.
- January 1, 2011 – Regulatory adoption of GHG emission limits and reduction measures.
- January 1, 2012 – GHG emission limits and reduction measures become enforceable.

Since the passage of AB 32, the CARB published Proposed Early Actions to Mitigate Climate Change in California. This publication indicated that the issue of GHG emissions in CEQA and General Plans was being deferred for later action, so the publication did not discuss any early action measures generally related to CEQA or to land use decisions.

*California Senate Bill 1368*

In 2006, the California legislature passed SB 1368, which requires the Public Utilities Commission (PUC) to develop and adopt a "greenhouse gases emission performance standard" by March 1, 2007, for private electric utilities under its regulation. The PUC adopted an interim standard on January 25, 2007, requiring that all new long-term commitments for base load generation involve power plants that have emissions no greater than a combined cycle gas turbine plant. That level is established at 1,100 lbs/MWh of $CO_2$. The California Energy Commission has also adopted similar rules.

*Senate Bill 97 – CEQA: Greenhouse Gas Emissions*

In August 2007, Governor Schwarzenegger signed into law SB 97 – CEQA: Greenhouse Gas Emissions stating, "This bill advances a coordinated policy for reducing greenhouse gas emissions by directing the Office of Planning and Research and the Resources Agency to develop CEQA guidelines on how state and local agencies should analyze, and when necessary, mitigate greenhouse gas emissions." Specifically, SB 97 requires the Office of Planning and Research (OPR), by July 1, 2009, to prepare, develop, and transmit to the Resources Agency guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions, as required by CEQA, including, but not limited to, effects associated with transportation or energy consumption. The Resources Agency would be required to certify and adopt those guidelines by January 1, 2010. OPR would be required to periodically update the guidelines to incorporate new information or criteria established by the CARB pursuant to the California Global Warming Solutions Act of 2006. SB 97 also identifies a limited number of types of projects that would be exempt under CEQA from analyzing GHG emissions.

On January 7, 2009, OPR issued its draft CEQA guidelines revisions pursuant to SB 97. On March 16, 2010, the Office of Administrative Law approved the Amendments, and filed them with the Secretary of State for inclusion in the California Code of Regulations. The Amendments became effective on March 18, 2010.

*Office of Planning and Research Technical Advisory and Preliminary Draft CEQA Guidelines Amendments for Greenhouse Gas Emissions*

Consistent with SB 97, on March 18, 2010, the CEQA Guidelines were amended to include references to GHG emissions. The amendments offer guidance regarding the steps lead agencies should take to address climate change in their CEQA documents.

According to OPR, lead agencies should determine whether GHG may be generated by a Proposed Project, and if so, quantify or estimate the GHG emissions by type and source. Second, the lead agency must assess whether those emissions cumulatively significant. When assessing whether a Project's effects on climate change are cumulatively considerable, even though its GHG contribution may be individually limited, the lead agency must consider the impact of the Project when viewed in connection with the effects of past, current, and probable future projects. Finally, if the lead agency determines that the GHG

emissions from the Proposed Project are potentially significant, it must investigate and implement ways to avoid, reduce, or otherwise mitigate the impacts of those emissions.

The Amendments do not identify a threshold of significance for GHG emissions, nor do they prescribe assessment methodologies or specific mitigation measures. The Preliminary Amendments maintain CEQA discretion for lead agencies to establish thresholds of significance based on individual circumstances.

The guidelines developed by OPR provide the lead agency with discretion in determining what methodology is used in assessing the impacts of greenhouse gas emissions in the context of a particular Project. This guidance is provided because the methodology for assessing GHG emissions is expected to evolve over time. The OPR guidance also states that the lead agency can rely on qualitative or other performance based standards for estimating the significance of GHG emissions.

*California Air Resources Board: Scoping Plan*

On December 11, 2008, the CARB adopted the Scoping Plan as directed by AB 32 (CARB 2008). The Scoping Plan proposes a set of actions designed to reduce overall GHG emissions in California. The numerous measures in the Scoping Plan approved by the Board are being implemented in phases with Early Action Measures that have already been implemented. Measures include a cap-and-trade system, car standards, low carbon fuel standards, landfill gas control methods, energy efficiency, green buildings, renewable electricity standards, and refrigerant management programs.

The Scoping Plan provides an approach to reduce emissions to achieve the 2020 target, and to initiate the transformations required to achieve the 2050 target. The 2008 Scoping Plan indicated that a 29 percent reduction below the estimated "business as usual" levels would be necessary to return to 1990 levels by 2020. The 2011 supplement (Functional Equivalent Document) to the Scoping Plan emission inventory revisions indicated that a 16 percent reduction below the estimated "business as usual" levels would be necessary to return to 1990 levels by 2020. This revision was due to the slowing economy between 2008 and 2010 and to reduction measures that were already in place (CARB, 2011a, p. 10). An update of the Scoping Plan is scheduled for hearing and approval in late 2013, and another update is required in 2018

CARB underwent an extensive and rigorous process in developing and approving the Scoping Plans. (For detailed discussion of this process, see Association of Irritated Residents et. al. v. State Air Resources Board et. al., Court of Appeal of California, First Appellate District, Division Three (206 Cal. App. 4th 1487; 143 Cal Rptr. 3d 65; 2012 Cal. App. LEXIS 718; 42 ELR 20127, June 19, 2012, p. 5 – hereafter "AIR.") Among other things, CARB considered several alternatives to achieve the mandated maximum technologically feasible and cost-effective reductions in GHGs and submitted its analyses and recommendations for peer review and public comment on many occasions (AIR p. 5). In affirming CARB's adoption of the Scoping Plan, the Court of Appeal of California concluded as follows:

> "The Governor and the Legislature have set ambitious goals for reducing the level of greenhouse gas emissions in California and to do so by means that are feasible and most cost-effective. The challenges inherent in meeting these goals can hardly be overstated. *[C]*ARB has been assigned the responsibility of designing and overseeing the implementation of measures to achieve these challenging goals. The scoping plan is but an initial step in this effort, to be followed by the adoption of regulations, the first of which are already in effect, and plan updates no less than every five years. As the plan itself indicates, there is still much to be learned that is pertinent to

> minimizing greenhouse gas emissions. It is hardly surprising that the scoping plan leaves some questions unanswered and that opinions differ as to *[the]* many complex issues inherent in the task. After reviewing the record before us, we are satisfied that the Board has approached its difficult task in conformity with the directive from the Legislature, and that the measures that it has recommended reflect the exercise of sound judgment based upon substantial evidence. Further research and experience likely will suggest modifications to the blueprint drawn in the scoping plan, but the plan's adoption in 2009 was in no respect arbitrary or capricious." (AIR, p. 13.)

Executive Order S-03-05 sets a goal that California emit 80 percent less GHGs in 2050 than it emitted in 1990. CARB's Scoping Plan provides insight as to how it anticipates California will achieve the 2050 reduction goal in Governor Schwarzenegger's Executive Order S-03-05:

> "Reducing our greenhouse gas emissions by 80 percent will require California to develop new technologies that dramatically reduce dependence on fossil fuels, and shift into a landscape of new ideas, clean energy, and green technology. The measures and approaches in this plan are designed to accelerate this necessary transition, promote the rapid development of a cleaner, low carbon economy, create vibrant livable communities, and improve the ways we travel and move goods throughout the state." (CARB, 2008, p. ES-2.)

"[T]he measures needed to meet the 2050 goal are too far in the future to define in detail . . ." (Ibid.) The CEC and CARB also have published an alternative fuels plan that identifies challenging but plausible ways to meet 2050 transportation goals. The majority of the measures identified by the CEC/CARB (renewable power requirements, the low carbon fuel standard, and vehicle emissions standards) relate to technology improvements beyond both the control of the Project applicant and the scope of the proposed SME Project. But these technological improvements would reduce the demand for crude oil through a reduction in demand for gasoline and diesel fuels.

In light of the uncertainties regarding the specific reduction strategies and methods needed for California to achieve the 2050 reduction goal identified in Governor Schwarzenegger's Executive Order S-03-05, the impact of the proposed Project on the 2050 reduction goal is considered too speculative to assess at this time.

California businesses are required to report their annual GHG emissions. This requirement is contained within sections 95100-95133 of Title 17, California Code of Regulations. It establishes who must report GHG emissions to the CARB and sets forth the requirements for measuring, calculating, reporting and verifying those emissions. The rule specifies a reporting threshold of 25,000 $MTCO_2E$ or 10,000 $MTCO_2E$ for combustion and process source emissions.

Cap-and-Trade is designed to reduce the emissions from a substantial percentage of GHG sources (about 80% of GHG emissions will come under the program) within California through a market trading system. The system would reduce GHG emissions by reducing the available GHG "allowances" over time up until the year 2020. The program beyond the year 2020 has not been designed yet, but the program is intended to extend beyond that timeframe.

Facilities are required to obtain an "allowance", either through purchasing on auction or through freely allocated "industry assistance" allowances from CARB, for each $MTCO_2E$ of GHG they emit.

CARB issues the "industry assistance" allocations for free for a number of industries. These are based, in part, on a pre-defined "benchmark" of GHG emissions per unit of production. For the thermally enhanced oil recovery (TEOR) production sector, allowances are provided as a function of the amount of crude oil produced, thereby establishing, in effect, a level of efficiency in regards to GHG emissions for that sector. Other sectors are also allocated allowances based on their own respective activities.

If an operation within the TEOR sector operates less efficiently than the specified "benchmark", thereby receiving an insufficient number of "free" allowances to cover their emissions, they would be required to implement efficiency improvements or purchase additional allowances from the CARB auction. Some availability of "offsets" is also included in the program which can be obtained from specific, allowable offset programs, such as GHG reduction projects related to forestry, livestock and ozone depleting chemicals. Offsets outside of these three options are not allowed at this time.

The first group of sectors began trading in allowances in 2012. That group includes the oil and gas sector as well as most stationary sources. A second group is planned to begin the program in 2015, which would include the transportation fuels sector. CARB auctioned about 23 million allowances in November 2012 to be used for the 2013 year.

For subsequent periods after the initial 2013 period, allowances are planned to be distributed freely through the "industry assistance" program or auctioned off. Industry assistance allowances would decrease each year as per a "cap adjustment factor". The cap adjustment factor would be about 2-3% annually through 2020. The total allowances allowed to be allocated each year (either freely allocated or auctioned) are limited by the defined allowance budget, which decreases each year through 2020 and is current set at about 163 million $MTCO_2e$ for the year 2013.

An operator is required to participate in the Cap-and-Trade program if its facility emits more than 25,000 $MTCO_2e$ annually. Annual reporting of GHG emissions is required under the CARB Mandatory Reporting Rule. At this time, SME emits less than 25,000 $MTCO_2e$ annually from their current operations at the field and is therefore not a part of the Cap-and-Trade program. However, if the project is implemented, emissions would exceed the threshold and they would be required to obtain allowances.

As only a limited number of allowances are issued, based on the original emissions estimates prepared by the CARB, and these allowances are reduced each year by a given percentage to achieve the year 2020 goals, any operator who commences operations after the Cap-and-Trade program is in effect would be required to obtain allowances from the given limited pool. Any increase in GHG emissions at a facility would therefore be allowed through a reduction in GHG emissions at some other location with the net GHG emissions statewide not increasing. This mechanism would serve to ensure that the goals of AB 32 are achieved and emissions statewide are reduced, even if local GHG emissions increase and that, ultimately, emissions of GHG and atmospheric $CO_2$ concentrations are stabilized (thereby reducing impacts). This produces, in effect, mitigation for this cumulative impact.

Note that GHG emissions produce no immediate, local health effects (such as criteria pollutants or ozone), and therefore GHG emissions reduced in another County, for example, could be used to offset the GHG emissions occurring at a project site.

The evolution of the Cap-and-Trade program past 2020 may render certain industries with higher GHG emissions economically infeasible. The SME project may no longer exist by 2050 as the remaining unextracted resources targeted by this project may no longer be economically recoverable due to the cost

of obtaining allowances. In addition, the goals of the State programs are to move the demand-side away from fossil fuels. As per the Scoping Plan, "Reducing our greenhouse gas emissions by 80 percent *[by 2050]* will require California to develop new technologies that dramatically reduce dependence on fossil fuels, and shift into a landscape of new ideas, clean energy, and green technology. The measures and approaches in this plan are designed to accelerate this necessary transition, promote the rapid development of a cleaner, low carbon economy… ."

*California Climate Action Registry General Reporting Protocol*

The California Climate Action Registry is a program of the Climate Action Reserve and serves as a voluntary GHG registry. The California Climate Action Registry was formed in 2001 when a group of chief executive officers, who were investing in energy efficiency projects that reduced their organizations' GHG emissions, asked the state to create a place to accurately report their emissions history. The California Climate Action Registry publishes a General Reporting Protocol, which provides the principles, approach, methodology, and procedures to estimate such emissions.

*California Air Resource Board Proposed Mandatory Reporting Regulation*

The Air Resources Board approved a mandatory reporting regulation in December 2007, which became effective January 2009 (which appears at sections 95100-95133 of Title 17, California Code of Regulations), which require the mandatory reporting of GHG emissions for specific industries emitting more than 25,000 $MTCO_2E$ or 10,000 $MTCO_2E$ for combustion and process source emissions.

*California Air Resource Board Proposed Cap-and-Trade Regulation*

The California Air Resource Board has recently implemented a program, as per the AB-32 directed Scoping Plan, to develop a cap-and-trade type system applicable to specific industries that emit more than 25,000 $MTCO_2E$. The AB 32 Scoping Plan identifies a Cap-and-Trade program as one of the strategies California will employ to reduce the greenhouse gas (GHG) emissions that cause climate change. Under cap-and-trade, an overall limit on GHG emissions from capped sectors will be established by the Cap-and-Trade program and facilities subject to the cap will be able to trade permits (allowances) to emit GHGs. The program started on January 1, 2012, with an enforceable compliance obligation beginning with the 2013 GHG emissions for GHG emissions from stationary sources. The petroleum and natural gas systems sector is covered starting in 2013 for stationary and related combustion, process vents and flare emissions if the total emissions from these sources exceed 25,000 $MTCO_2E$ per year. Suppliers of Natural Gas and transportation fuels are covered beginning in 2015 for combustion emissions from the total volume of natural gas delivered to non-covered entity or for transportation fuels.

CARB's rationale for adopting Cap-and-Trade was prominently noted by the Court of Appeals' opinion upholding the ARB Scoping Plan as follows:

> The final scoping plan explains the Board's rationale for recommending a cap-and-trade program in combination with the so-called "complementary measures" by citing the rationale outlined by the market Advisory committee and quoting from the report of the economic and technology advancement advisory committee, in part, as follows: " 'A declining cap can send the right price signals to shape the behavior of consumers when purchasing products and services. It would also shape business decisions on what products to manufacture and how to manufacture them. Establishing a price for carbon and other GHG emissions can efficiently tilt decision-making toward

cleaner alternatives. This cap and trade approach (complemented by technology-forcing performance standards) avoids the danger of having government or other centralized decision-makers choose specific technologies, thereby limiting the flexibility to allow other options to emerge on a level playing field. [¶] ... Complementary policies will be needed to spur innovation, overcome traditional market barriers ... and address distributional impacts from possible higher prices for goods and services in a carbon-constrained world.' " (*AIR* 206 Cal.App.4th at p. 1499.)

### 5.1.2.3 SME Project Impact Discussion

[No changes from the proposed Final EIR to Impacts SME AQ.1 – SME AQ.3.]

| **Will the proposal result in:** | **Poten. Signif.** | **Less than Signif. with Mitigation** | **Less Than Signif.** | **No Impact** | **Reviewed Under Previous Document** |
|---|---|---|---|---|---|
| **a.** The violation of any ambient air quality standard, a substantial contribution to an existing or projected air quality violation, or exposure of sensitive receptors to substantial pollutant concentrations (emissions from direct, indirect, mobile and stationary sources)? | | X | | | |
| **b.** The creation of objectionable smoke, ash or odors? | | X | | | |
| **c.** Extensive dust generation? | | X | | | |
| **Greenhouse Gas Emissions** | **Poten. Signif.** | **Less than Signif. with Mitigation** | **Less Than Signif.** | **No Impact** | **Reviewed Under Previous Document** |
| **d**. GHG emissions reductions equal to or greater than a prescribed level from **stationar**y, mobile, and indirect **sources** during long-term operations? | | X | | | |
| **e.** Emissions equivalent to or greater than 1,100 MT of $CO_2e$ per year or 4.6 MT $CO_2e$/Service Population (residents + employees) per year from **other than stationary sources** during long-term operations? | | | | X | |
| **f.** Emissions equivalent to or greater than 6.6 MT $CO_2e$/Service Population (residents + employees) per year for **plans** (General Plan Elements, Community Plans, etc.)? | | | | X | |

The approach taken in this EIR to assess baseline and required mitigation levels are as follows:

1. Quantify the baseline GHG emissions associated with the current emissions (not including the 26 wells in the pilot project) at the field. CEQA Guideline Section 15125(a) states that: "The environmental setting will normally constitute the baseline physical conditions by which the lead agency determines whether an impact is significant." In this case, an exception has been made not to include the environmental impacts from the temporary 26-well pilot project as a part of the baseline, even though those wells were in operation when the Notice of Preparation for this EIR

was issued. The 26-well pilot project was permitted as a temporary use with a termination date. This preliminary permitting action allowed SME the opportunity to experiment with the cyclic steaming process in order to understand the response of the oil-bearing diatomite in the Orcutt field to that process. This understanding was a necessary prelude to designing the long-term production plan. The permitting process for the pilot project did not identify and analyze the long-term emissions, whether criteria pollutants or greenhouse gases. Rather, it was understood that, once the producer was able to design the long-term production plan, the entire project of 136 wells and associated operations, including conversion of the 26 pilot wells to permanent wells, would be analyzed as the proposed project. (These long-term emissions have not been considered in a previous environmental document.) Therefore, the pilot project impacts are considered throughout this EIR to provide full disclosure of the potential impacts of the action requested of the decision-makers.

2. In order to assess the level of mitigation required, the GHG emissions from the Proposed Project are estimated with the proposed criteria pollutant mitigation measures included (Table 5.1-12 and 5.1-13).

3. The level of mitigation required is then obtained by calculating the required reduction of the Proposed Project GHG emissions (item 2 above) for the threshold used. This amount of emissions must be produced as mitigation, either from onsite or offsite sources.

| Impact # | Impact Description | Residual Impact |
|---|---|---|
| SME. AQ.4 | Operational activities could increase GHG emissions. | Class II |

The majority of the GHG emissions come from the combustion of fossil fuels associated with the steam generators. Stationary combustion equipment at the facility would create the largest percentage of GHG emissions. The steam generators would produce approximately 94 percent of the GHG emissions associated with the project.

GHG associated with operations include emissions from combustion sources (e.g., flare, steam generators, drilling engines, etc), offsite vehicles, and fugitive emissions that contain $CO_2$ and methane. In addition, electrical use at the facility has been included as indirect emissions. Table 5.1-12 shows the GHG emissions for operations under the Proposed Project full build-out. See Air Quality Appendix 12.2.B for detailed calculations.

**Table 5.1-12 Proposed Project Annual GHG Emissions – No Mitigation**

| Activity | MTCO2E |
|---|---|
| ***Construction*** | |
| Onsite Grading and Construction | 907 |
| Pipeline Installations (Crude, Gas Connections) | 139 |
| Pipeline Installation (Water to Laguna) | 531 |

| **Activity** | MTCO2E |
|---|---|
| Offsite: Grading/Construction | 222 |
| Offsite: Pipelines Crude/Gas | 15 |
| Offsite: Pipeline Water | 113 |
| Total | 1,926 |
| | |
| ***Operations*** | |
| Processing Site Combustion Sources | 82,892 |
| Processing Site Fugitive Emissions | 135 |
| Drilling Emissions | 672 |
| Offsite: Operations | 382 |
| Offsite: Crude Hauling | 758 |
| Offsite: Water Hauling | 470 |
| Indirect: Electrical Generation | 2,564 |
| | |
| Total Operations | 87,874 |

*Note: GHG emissions for peak year, projected to be 2015. Assumes all crude oil and water are hauled by truck.*

The emissions tabulated in Table 5.1-12 are the emissions during the peak year in 2015. Emissions of GHG would decrease thereafter due to a decrease in crude production. The allowances required to be purchased under the Cap-and-Trade program would increase over time due to the lowering "cap" and the reduced efficiency of the enhanced recovery technique as the field ages (more steam per bbl of crude produced). After a certain point, the number of allowances required to be purchased by the Applicant under the Cap-and-Trade program in combination with the onsite reductions, would exceed the GHG threshold established by the lead agency for this project, unless a threshold of zero were applied. Table 5.1-13 shows different thresholds along with the estimated year that the Cap-and-Trade purchased allowance would fulfill all of the threshold requirements, along with the average costs of the "credits" (not the Cap-and-Trade purchased allowances, as they would be required under current regulations) over that timeframe.

Figures 5.1-4 through 5.1-7 show the estimated GHG emissions through the year 2030 along with the "credits" and allowances used as part of the threshold reduction requirement under the Cap-and-Trade program and other, offsite or onsite reductions. (The 16 percent BAU threshold is not shown as, under the use of the 16 percent threshold, all reductions would be accomplished with onsite reductions).

The increasing number of Cap-and-Trade purchased allowances over time shown in the graphs is based on two components: the reduction over time in the amount of allocated "free" allowances (a reduction in the "cap") and the reduced efficiency in the recovery of crude oil at the field, requiring more steam per bbl of crude oil recovered (the allocated "free" allowances are allocated based on the amount of crude oil produced). These two items produce the need for the Applicant to purchase an increasing amount of allowances.

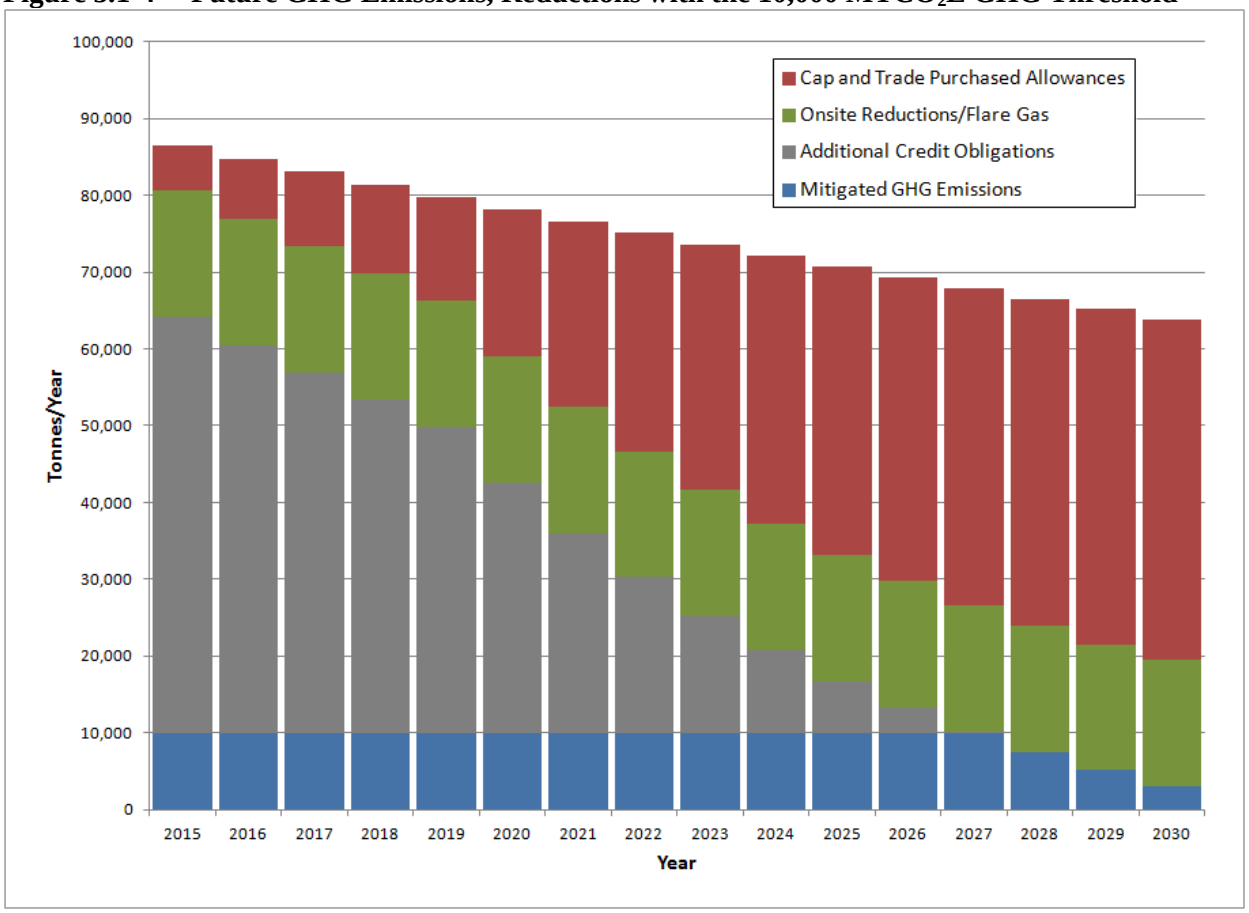
The cost estimates in the figures are based on a cost curve that would increase the costs of allowances and credits over time in a curve shape that was estimated to be similar to the curve shape that has historically been seen with the SCAQMD RECLAIM program. The RECLAIM cost curve showed an increase of 10 times in the costs per credit (for NOx and SOx in the RECLAIM program) over 15 years. The costs of GHG credits may act similarly, or could be substantially different and costs could range substantially higher or lower, depending on the market conditions and the availability of GHG credits. While the RECLAIM program is different than the Cap-and-Trade program (RECLAIM has no price floor or reserve pricing), it is a market based approach and its cost curve over time could be similar, although there is a high degree of uncertainty associated with estimating future costs. It is also assumed that the Cap-and-Trade program would continue after the year 2020, with a reduction in the cap level equal to the reduction rate seen prior to the year 2020.

**Table 5.1-13 Proposed Project Credit Requirements and Costs**

| Threshold | Year of C&T Full Coverage | Average Costs of Credits Only, annual | Average Cost per bbl, Credits Only |
|---|---|---|---|
| 10,000 $MTCO_2E$ | 2028 | $704,981 | $0.79 |
| 16% Below BAU | 2015 | $0 | $0.00 |
| 29% Below BAU | 2017 | $19,206 | $0.02 |
| 50% Below BAU | 2021 | $234,433 | $0.21 |
| 90% Below BAU | 2029 | $765,450 | $0.92 |

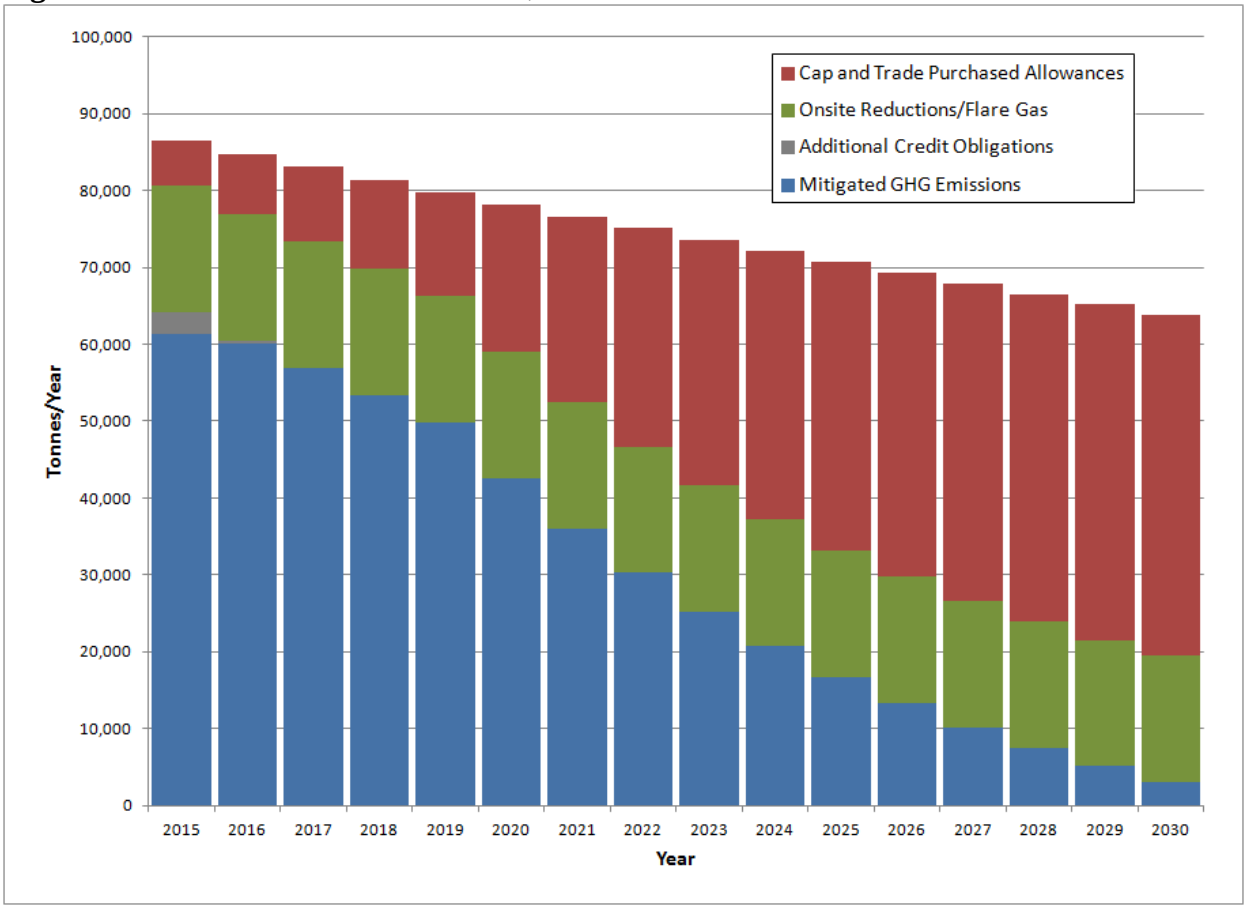
*Note: These costs do not include the costs to purchase Cap-and-Trade allowances, which would be required under the Cap-and-Trade program regardless of the threshold used. Average price per bbl of crude oil $96-$128 EIA reference price between 2015 and 2029.*

**Figure 5.1-4 Future GHG Emissions, Reductions with the 10,000 $MTCO_2E$ GHG Threshold**



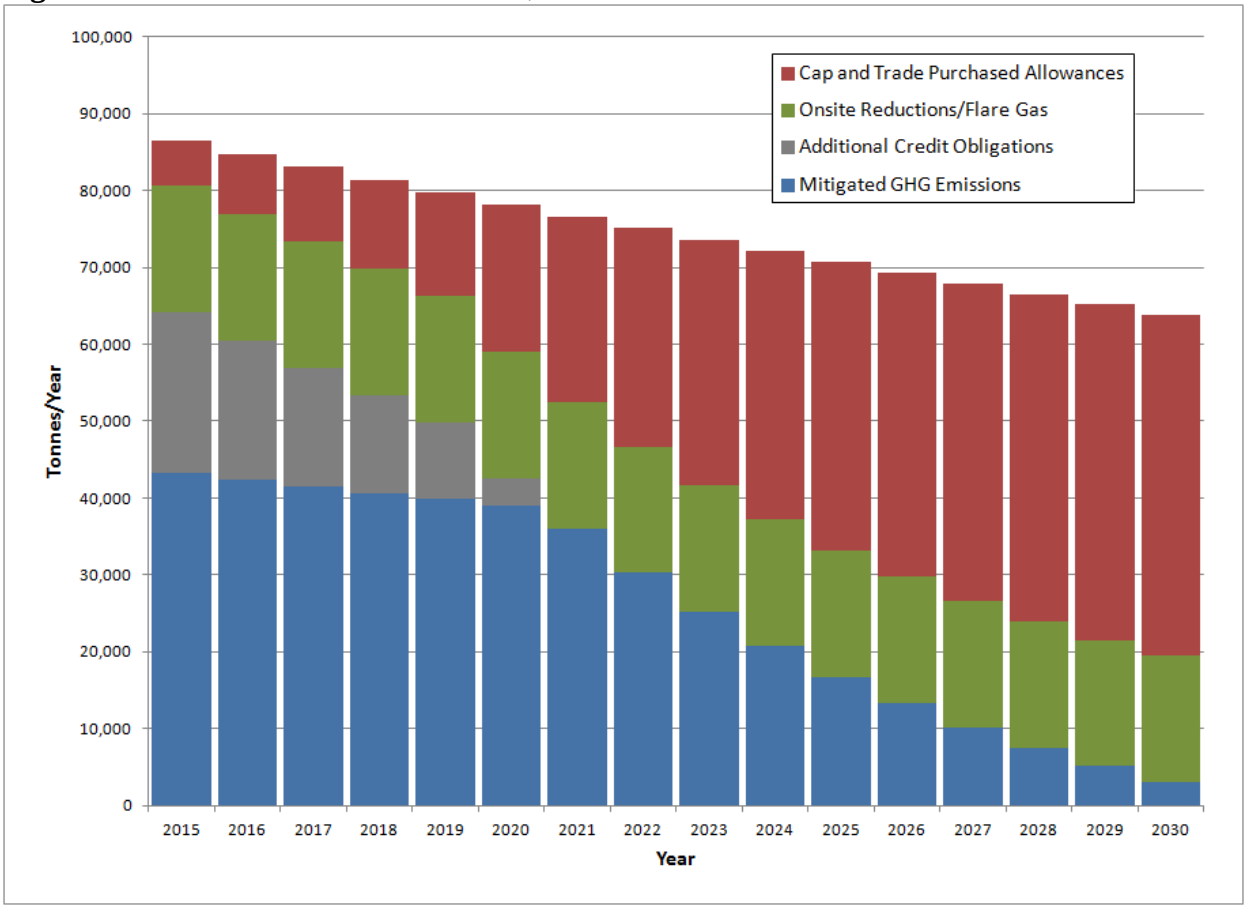

Under the 10,000 $MTCO_2E$ threshold, initial offsite credit purchases would be substantial, but would decrease until the year 2027, when the requirements under the Cap-and-Trade program, along with the onsite reductions, would most likely provide all of the reductions needed to achieve the 10,000 $MTCO_2E$ threshold. Average credit costs over that period would be in excess of $700,000 annually, with a cost per bbl of about $0.79. Note that this scenario produces similar emission reductions as the 90 percent BAU threshold.

**Figure 5.1-5 Future GHG Emissions, Reductions with the 29% BAU GHG Threshold**



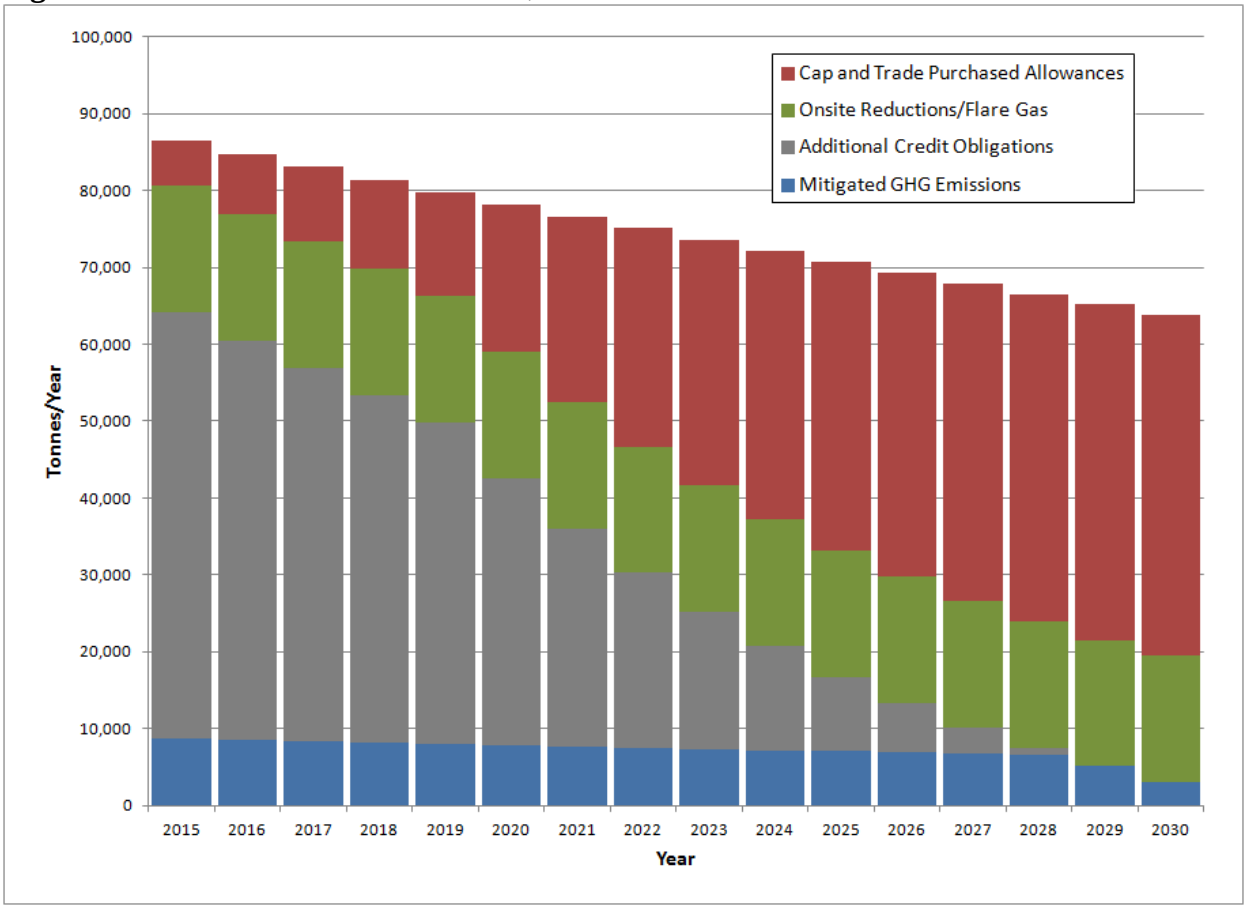

Under the 29 percent BAU threshold, initial offsite credit purchases would be nominal, as most of the 29 percent would be accomplished through the Cap-and-Trade requirements and onsite reductions. The requirements under the Cap-and-Trade program, along with the onsite reductions, would provide all of the reductions needed to achieve the threshold by 2017. Average credit costs over that period would be about $19,000 annually, with an average cost per bbl of about $0.02.

**Figure 5.1-6 Future GHG Emissions, Reductions with the 50% BAU GHG Threshold**




Under the 50 percent BAU threshold, initial offsite credit purchases would be moderate, and would decrease until the year 2021, when the requirements under the Cap-and-Trade program, along with the onsite reductions, would provide all of the reductions needed to achieve the threshold. Average credit costs over that period would be in excess of $230,000 annually, with an average cost per bbl of about $0.21.

**Figure 5.1-7 Future GHG Emissions, Reductions with the 90% BAU GHG Threshold**




Under the 90 percent BAU threshold, initial offsite credit purchases would be substantial, and would decrease until the year 2029, when the requirements under the Cap-and-Trade program, along with the onsite reductions, would provide all of the reductions needed to achieve the threshold. Average credit costs over that period would be in excess of $760,000 annually, with an average cost per bbl of about $0.92.

### 5.1.2.4 Cumulative Air Quality Impacts – Criteria Pollutants

The Santa Barbara County Environmental Thresholds Manual defines a significant cumulative impact if a project's total emissions of the ozone precursors NOx or ROC exceed the long-term thresholds. For projects that do not have significant ozone precursor emissions or localized pollutant impacts, emissions would need to have been taken into account in the Clean Air Plan growth projections in order for cumulative impacts to be considered insignificant.

No residential projects would be constructed near the proposed Project area, so there would be no operational localized impacts associated with cumulative projects and non-GHG pollutants. Operational regional impacts from criteria pollutants could be produced, however, as multiple projects would emit into the same air basin at the same time. Although the proposed Project would produce less than

significant impacts with mitigation, cumulative impacts associated with the combined projects could be significant.

Since none of the residential cumulative projects would be constructed near the proposed Project area, there would be no cumulative impacts associated with odors or toxic emissions.

Cumulative climate change impacts are addressed under impact SME AQ.4. Because global climate change is a cumulative impact, the GHG-related analysis in Section 5.1.2.5 of this EIR (Mitigation and Residual Impact) applies to this section as well. The project would be contributing to reductions in GHG emissions through the proposed mitigation measures listed in this document. As per CEQA Guidelines §15130, a project's contribution is less than cumulatively considerable if the project is required to implement or fund its fair share of a mitigation measure or measures designed to alleviate the cumulative impact.

Consistency with the Clean Air Plan, for the projects subject to these guidelines, means that stationary source and vehicle emissions associated with the project are accounted for in the Clean Air Plan's emissions growth assumptions. The 2010 APCD Clean Air Plan estimates that oil production within the County would decrease between 2007 and 2020 by 30 percent with the corresponding NOx and ROC emissions decreasing by a similar amount. However, with the implementation of controls and the APCD control measures, emissions from the oil and gas sector within Santa Barbara County could be reduced even with a growth in the oil production levels and the project would not be cumulatively significant based on reasonably foreseeable projects. Due to the uncertainties of future oil and gas growth, cumulative impacts associated with future projects could be significant.

CEQA Guidelines §15130(c) (CCR Title 14) acknowledges that "[w]ith some projects, the only feasible mitigation for cumulative impacts may involve the adoption of ordinances or regulations rather than the imposition of conditions on a project-by-project basis." Global climate change is this type of issue, as the very causes and effects of global climate change are not determined on a local or regional scale.

**Cumulative Mitigation Measures:** No mitigation is required to address cumulative impacts.

**Residual Cumulative Impacts:** Cumulative air quality impacts would be less than significant (Class III).

### 5.1.2.5 Mitigation and Residual Impact

[No changes to impacts SME AQ.1- SME AQ.3 from the proposed Final EIR]

#### IMPACT SME AQ.4 (GHG EMISSIONS) MITIGATION MEASURES AND RESIDUAL IMPACTS

Mitigation for GHG emissions would rely on a reporting and reduction program that would require the Applicant to align their compliance periods with the Cap-and-Trade compliance periods. Reductions, or mitigation measures, could include a wide variety of measures, including onsite increased efficiency, to offsite programs implemented in the community verifiable "credits" purchased on the market, and allowances purchased as part of the Cap-and-Trade program.

**Reductions not taken as part of BAU**

The implementation of mitigation measures listed above for criteria pollutants and the elimination of vehicle trips associated with transportation of the project-related crude oil and water by pipelines, would reduce GHG $CO_2e$ emissions by approximately 1,400 $MTCO_2E$ per year. This has not been credited to the reduction target as it would be required under the normal CEQA permitting process. However, credit has been given for the reductions associated with pipeline transportation of the current production from the Monterey formation.

In addition, the Applicant has proposed the use of high efficiency steam generators, which, under the San Joaquin Valley APCD program, would be considered a best performance standard for GHG emissions. The San Joaquin Valley APCD has established a program utilizing the BAU approach that requires oil and gas producers to implement best performance standards in order to reduce GHG emissions to less than significant. However, as the use of high-efficiency steam generator technology has been proposed by the Applicant in order to avoid a net emissions increase in criteria pollutants that would trigger APCD offset for the stationary source, it is considered to be a permitting constraint, and is not credited to the reduction target. Furthermore, the applicant proposed operations of the more efficient steam generators would not result in a reduction in fuel use (as it was proposed to gain more steam), and consequently would not reduce GHG.

Also, all future GHG emissions associated with any Monterey gas produced above the amount produced in 2011 would not be credited towards the reduction targets. Most likely, future levels of Monterey gas production would increase.

**MM SME AQ-4. GHG Reporting and Reduction:** The Applicant shall implement a program to quantify and reduce greenhouse gas emissions associated with operations to achieve a reduction to the required level. A GHG Reporting and Reduction Plan shall be submitted to the APCD and County detailing the measures to be implemented to achieve the required reductions, updated annually, and shall include pre-qualification of any offsite mitigation component of this plan including specifications on the protocol, vintage, and registry for the offsite mitigation. The Applicant shall obtain prior approval from APCD and the County for acceptable offsite mitigation credits.

Measures to implement shall include the following:

1) Required use of all produced gas at the lease for steam production (if capacity allows);
2) Using high efficiency pumps and electrical devices to reduce field-wide electrical use,
3) Requiring all crude oil produced at the site to utilize pipeline transport, except during short-term pipeline outages;
4) Additional onsite or offsite measures, as required, that could offset greenhouse gas emissions.

Operations stationary and mobile GHG emissions levels shall be quantified and reported to the County and to the APCD as per the Cap-and-Trade reporting period and the Mandatory Reporting Rule period for the total GHG emissions. In addition to the GHG emissions, documentation shall be provided of the GHG emission reductions achieved through the above and/or additional programs/credits/allowances that would equal the required reductions.

**PLAN REQUIREMENTS AND TIMING**: Prior to Zoning Clearance, the GHG Reporting and Reduction Plan shall be reviewed and approved by P&D and APCD.

**MONITORING:** P&D monitoring staff shall ensure compliance during field inspections.

**Residual Impact**

Mitigation measure SME.AQ-4 requires submittal of a GHG Reporting and Reduction Plan with reported of emissions to the County and to the APCD as per the Cap-and-Trade reporting period and the Mandatory Reporting Rule period. The Plan requires documentation of the reductions obtained through increased efficiency and, if needed, offsite credits with pre-approval of any offsite credits. The State already requires reporting of GHG emissions. The total amount of reductions required to achieve different thresholds is listed in Table 5.1-13. Several measures could be implemented to reduce GHG emissions, potentially including the following measures:

**Required Use of Flare Gas**

The existing field operations generate flare gas that could be used in the steam generators. The Applicant indicates that some gas for the steam generators would be purchased pipeline quality gas. Current and future produced gas would require some sulfur removal in order to meet APCD specifications as well as requirements in this EIR for meeting the sulfur emissions limits. Requiring that all produced gas is cleaned and used in the steam generators would ensure that only the minimum amount of gas is purchased from the utility and would minimize increases in GHG emissions. The 2011 produced gas from the Monterrey formation (existing field activities) generated about 16,444 $MTCO_2E$ (includes flared gas and the gas used in the pilot plant steam generator from the Monterrey wells only). This level would be applied as a GHG credit against the BAU. Future increases above this level in Monterrey or any diatomite produced gas would not be counted towards the GHG credit.

**Table 5.1-14 Peak Annual GHG Emissions and Reductions**

| Activity | $MTCO_2E$ |
|---|---|
| Total Proposed Project Operations, peak year | 87,874 |
| Effect of Criteria Pollutant Mitigation Measures (SME.AQ.2) | -1,400 |
| Total Project Operations with Mitigation Measure SME.AQ.2 | 86,474 |
| Reduction Target (16 percent below BAU) | 72,628 |
| Reduction Target (29 percent below BAU) | 61,396 |
| Reduction Target (50 percent below BAU) | 43,437 |
| Reduction Target (90 percent below BAU) | 8,647 |
| Reduction Target (10,000 $MTCO_2E$/yr) | 10,000 |
| | |
| Potential Emissions Reductions | |
| Use of all produced gas (based on 2011 produced gas levels) | 16,444 |
| Pipeline transport of existing crude production | 265 |
| Onsite efficiency gains | 250 |
| Total Onsite Reductions | 16,958 |

**Table 5.1-14 Peak Annual GHG Emissions and Reductions**

| Activity | $MTCO_2E$ |
|---|---|
| Percent Reduction from BAU of Onsite Measures | 19.6% |
| Cap-and-Trade allowances, future range (through 2030, estimated) | 5,800 to 45,000 |
| Additional Reductions Required from other Onsite or Offsite programs (through 2030, estimated) | 2,800 to 55,000 |

***Notes:*** *Peak year is projected to occur in 2015. GHG emissions from project operations include mitigation measures listed for criteria pollutants. While the table above shows that thresholds above 19.6% below BAU have not been met by onsite measures, it is expected that for most compliance periods under the Cap and Trade program, SME will be required to obtain GHG allowances in amounts that would achieve substantial reductions. (For a detailed quantification of the stationary source cap-and-trade allowance obligations, see Applicants GHG emissions and reductions estimate through 2020 in the AQ Appendix 12.2.B).*

**Onsite Efficiency Improvements**

Reducing energy use from existing and proposed direct sources would reduce GHG emissions from fuel combustion and electrical generation. The field currently uses an estimated 1 MW of electricity. Replacing pumps and other electrical equipment with the most efficient equipment could produce a reduction in electricity use of up to 10-20 percent, depending on the equipment types and arrangements. This could reduce GHG by an estimated 250 - 500 $MTCO_2e$ per year.

Reducing water use, raw material use, and waste generation and increasing recycling would also reduce GHG emissions by reducing the energy used to transport and pump water, produce goods, and truck trips.

**Other Mitigation Measures**

Emissions reductions from these onsite requirements are tabulated in Table 5.1-13. With all proposed onsite mitigation measures, the project emissions are projected to be at about a 19.6 percent reduction level. Additional reductions would have to be documented and reported to the County and the APCD as per the mitigation measure above (Cap-and-Trade purchased allowances, additional measures or offsite reductions). With additional requirements, the project would be less than significant with mitigation (Class II). Additional measure could include the following:

**Additional Measures**

The Applicant proposes to use a small gas fired heater to heat the crude oil tanks. The use of a best performance heater or the use of excess steam from the steam generators instead of a heater would increase the efficiency and reduce GHG emissions. The SJV APCD best performance standard for heaters indicates a savings in GHG emissions of 1.5 percent. This would produce a savings of about 10 $MTCO_2E$ per year.

The Applicant proposes the use of a 95 percent efficient vapor recovery. The use of a higher efficiency vapor recovery (as per SJV best performance standards) of up to 99 percent would reduce GHG emissions by a few $MTCO_2E$ per year.

Utilizing onsite co-generation could also reduce emissions of GHG by simultaneously producing electricity and steam. However, as the GHG emissions from the PG&E system are already quite low, and below the levels that could be achieved with natural gas combustion, due to the use of hydroelectric and nuclear in the PG&E mix, reductions in GHG emissions with the use of cogeneration might be minimal. In addition, the site does not use a lot of electricity.

**Offsite Reductions**

Offsite reduction could be used to satisfy all or a portion of the reductions that might be needed in future years. These reduction levels would vary depending on the type of program pursued. Offsite programs would most likely be managed by the Applicant but overseen and monitored by the County of Santa Barbara in coordination with the SBCAPCD. The program could tie in to the Board of Supervisors' March 2009 direction (BOS Resolution 09-059) "to take immediate, cost effective, and coordinated steps to reduce the County's collective GHG emissions" and the Counties Climate Action Strategy Phase 2: Energy and Climate Action Plan. The Climate Action Plan identifies measures that could be funded by the Applicant to reduce GHG emissions. As an example, the San Luis Obispo APCD (SLOAPCD) has established a GHG Mitigation Measure "toolbox" that includes measures municipalities could implement to reduce GHG, including

- Energy retrofit programs;
- Title 24 Incentives;
- Photovoltaic Incentive programs;
- Bicycle and pedestrian network expansions;
- Transit system expansion and retrofits;
- Tree planting; and
- Grant programs.

The reductions in GHG would be quantified for each program and credited towards the Applicant's requirements for credits. As an example, energy retrofit programs, involving auditing homes and businesses in the community and installing more efficient lighting and appliances, could save close to 2,000 $MTCO_2e$ annually if 1,000 homes and business were included in the program (as per the SLOAPCD toolbox analysis). Due to the energy savings per year from a program like this, the net 5 year costs (including administrative costs) could potentially be nominal, with net capital costs per home or business being about $500 or $2,200 each (including rebates), with a net annual savings equaling $100-$1,200.

Other options for programs that could reduce GHG emissions include the following:

- Obtaining offset credit through the Climate Action Reserve or through the voluntary SCAQMD Regulation XXVII, would decrease GHG emissions impacts. This offset program establishes standards for the development, quantification, and verification of GHG emissions reduction projects; issues carbon offset credits known as Climate Reserve Tonnes generated from such projects; and tracks the transaction of credits. The CARB participates in the program. The Climate Action Reserve has issued more than 10 million Climate Reserve Tonnes.
- CAPCOA is currently developing a system that would allow for the registration of emissions GHG reductions to help sources locate and buy GHG reductions. To achieve this goal, CAPCOA is developing protocols and verification systems.

- Planting trees removes $CO_2$ from the atmosphere as the tree grows. Trees remove $CO_2$ from the atmosphere through photosynthesis and store, or sequester, the carbon in the tree trunk, branches, and leaves. Tree carbon calculators indicate that a sycamore, 20 inches in diameter (at 4.5 feet height) and 50 feet tall, stores approximately 2.2 $MTCO_2E$ and grows at a rate that sequesters approximately 0.1 $MTCO_2E$ per year. Protocols for forest carbon sequestration would be utilized to ensure reductions are legitimate, such as those developed by the Climate Action Reserve. The SCAQMD, through their Regulation XXVII program, current has reforestation projects available associated with the Station Fire forest-fire burn area revegetation.

**Cap and Trade Allowance/Offsets**

The project, as it emits more than the 25,000 $MTCO_2E$ per year CARB threshold, would be a part of the CARB cap-and-trade program. Any project in operation in 2012 and subject to Cap-and-Trade was issued emission allowances and required to reduce the GHG emissions starting in 2013, or purchase allowances or offsets. (Because SME has not begun operation, no allowances have been issued.) These reductions would vary from year to year up to an estimated maximum of more than 26,000 $MTCO_2E$ annually in 2020 (with potentially higher beyond the year 2020, see Appendix 12.2.B for details). The Applicant would have to obtain these credits on the open market or develop these reductions onsite. As these allowances/offsets would equal reductions in other locations, these would serve as effective credits towards meeting the reduction targets required under the adopted threshold.

**Solar Installations**

Emission reductions could also be achieved through the installation of solar facilities on or near the site. These types of projects would require substantial permitting and could generate significant impacts related to biological resources or to agricultural resources.

Installation of photovoltaic's to produce the required onsite electricity would reduce GHG emissions. The Applicant indicates that the field electricity demand would total about 1.0 MW. The generate that level of energy with photovoltaic's (24 MWhr per day) would require a high density array totaling an area of approximately 26 acres. This is about the size of the open field located on the south side of the creek in the same area that the water storage and treatment plant is proposed for. By covering this field in PV modules, along with electrical equipment to convert the electricity to grid power, enough electricity could be generated to supply the field electrical power during the day with enough excess to feed back to the grid and utilize the grid for nighttime electrical needs. This would reduce the GHG emissions by an estimated 2,500 $MTCO_2e$ per year.

Installation of thermal-solar systems to produce steam could reduce GHG emissions. Utilizing mirror systems, the sun can be concentrated to produce high enough temperature to produce steam. This steam could then be used to supply steam to the project. The amount of steam that would need to be produced would equal the amount of steam that is produced from the purchased natural gas. The produced gas would continue to be utilized for steam production. Assuming 5 hours per day of steam production, a solar thermal plant covering approximately 100 acres could produce enough steam to offset the steam produced by the purchased natural gas. The area of 26 acres within the project site where the water plant is proposed could also be used to produce approximately 25 percent of the steam that would be produced by the purchased natural gas. Or, the area between the project site and Highway 135, currently agricultural fields, could be utilized for the full 100 acres. Either of these projects would reduce GHG emissions by 7,000 to 28,000 $MTCO_2e$ per year, respectively. Emissions would still be associated with

the combustion of produced gas at the site. Chevron is currently implementing a program similar to this in Coalinga to produce some steam for their thermal wells.

**Discussion**

The impacts of GHG emissions are worldwide. Climate change could occur at many different locations throughout the world due to, in very small part, the additional GHG emissions from this project site. A lifecycle approach to understanding the effects of this project on global GHG emissions is very complex in nature. For example, driving a more efficient automobile would reduce GHG emissions from automobiles here, with more reductions in GHG emissions at an area refinery due to processing less crude oil to make the gasoline and fewer emissions of ocean tankers to bring the crude oil from Saudi Arabia, for example, and fewer emissions from drilling and production of the crude oil in Saudi Arabia. However, the hybrid automobile might require special batteries and more manufacturing effort and more recycling efforts, thereby increasing GHG emissions.

In addition, markets are evolving, with higher crude oil prices increasing domestic production, regulations requiring cleaner fuels and energy sources, etc, that could substantially alter the environment for fuels in the near future. It is understandably very complex.

The Applicant has proposed a number of "credit" activities in their application submittals, such as credits for producing natural gas and crude oil locally (not having to transport gas or crude oil from out-of-state or out-of-country). Although these credit activities may have some validity, they are not generally recognized when submitting GHG inventory information to the State or Federal Agencies and are not included when assessing requirements under the "cap-and-trade" system in California (see Regulatory section above). From a CEQA standpoint, generally these types of "out-of-state" credits are not assessed.

A combination of the mitigation measures reduces the GHG emissions to below any of the thresholds discussed above (depending on the level of offsite credits obtained or on onsite improvements), and, therefore, results in an impact that is less than significant. If a significance threshold more stringent than about 20 percent of BAU is adopted, the Applicant would be required to obtain offsite "credits". Based on the cost estimates developed above, with costs generally less than $1 per bbl, these costs appear to be feasible for oil and gas production facilities in California at the current market conditions. The listing of possible mitigation measures appears feasible and quantifiable and cost-effective for the project; therefore, the impacts would be *less than significant with mitigation, Class II*.

### 5.1.3 LAGUNA COUNTY SANITATION DISTRICT'S PHASE 3 RECYCLED WATER PIPELINE

[Item "d" in the Impact Discussion table below is revised and new references have been added in sub-section 5.1.3.6.]

### 5.1.3.3 Impact Discussion

| Will the proposal result in: | Potentially Significant | Less than Significant with Mitigation | Less than Significant | No Impact | Reviewed Under Previous Document |
|---|---|---|---|---|---|
| **a.** The violation of any ambient air quality standard, a substantial contribution to an existing or projected air quality violation, or exposure of sensitive receptors to substantial pollutant concentrations (emissions from direct, indirect, mobile and stationary sources)? | | | X | | |
| **b.** The creation of objectionable smoke, ash or odors? | | | X | | |
| **c.** Extensive dust generation? | | | X | | |
| **d**. GHG emissions reductions equal to or greater than a prescribed level from **stationar**y, mobile, and indirect **sources** during long-term operations? | | | | X | |
| **e.** Emissions equivalent to or greater than 1,100 MT of $CO_2e$ per year or 4.6 MT $CO_2e$/Service Population (residents + employees) per year from **other than stationary sources** during long-term operations? | | | | X | |
| **f.** Emissions equivalent to or greater than 6.6 MT $CO_2e$/Service Population (residents + employees) per year for **plans** (General Plan Elements, Community Plans, etc.)? | | | | X | |

### 5.1.3.6 New References

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# 9.0 MITIGATION MEASURES

Revised Mitigation Measure SME AQ-4, identified in Table I, Mitigation Monitoring Plan, sub-section 9.1, is shown below.

**I. SME PROJECT**

| Mitigation Measure | Requirements | Method | Timing | Responsible Party |
|---|---|---|---|---|
| **Air Quality** | | | | |
| **SME AQ.4** | **Quantify GHG emissions associated with operations and reduce emissions to an annual level that is equal to or less than a prescribed threshold selected by decision-makers.** | **Approval of GHG plan and field inspections** | **Prior to operations** | **APCD** |

Revised Mitigation Measure SME AQ-4, identified in sub-section 9.2, Mitigation Measures, is shown below.

| Mitigation Measure # | Mitigation |
|---|---|
| **SME AQ.4** | **GHG Reporting and Reduction*:*** The Applicant shall implement a program to quantify GHG emissions associated with operations and reduce emissions to an annual level that is equal to or less than a prescribed threshold selected by decision. Measures to implement shall include the following:<br><br>1) Required use of all produced gas at the lease for steam production (if capacity allows);<br>2) Using high efficiency pumps and electrical devices to reduce field-wide electrical use,<br>3) Requiring all crude oil produced at the site to utilize pipeline transport, except during short-term pipeline outages;<br>4) Additional onsite or offsite measures, as required, that could offset greenhouse gas emissions.<br><br>Operations stationary and mobile GHG emissions levels shall be quantified and reported to the County and to the APCD as per the Cap-and-Trade reporting period and the Mandatory Reporting Rule period (annually), including a quantification of the GHG emission reductions achieved through the above and/or additional programs<br><br>**PLAN REQUIREMENTS AND TIMING**: Prior to Zoning Clearance, the GHG Reporting and Reduction Plan shall be reviewed and approved by P&D and APCD.<br><br>**MONITORING:** P&D monitoring staff shall ensure compliance during field inspections. |


August 15, 2013

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**RE: Draft Recirculation Document; Greenhouse Gas Emissions Analysis for the Air Quality Section of the Proposed Final Environmental Impact Report for the Proposed Santa Maria Energy Oil Drilling Production Plan And Development Plan & Laguna County Sanitation District Phase 3 Recycled Water Pipeline**

Dear Ms. Minick,

The following comments on the proposed Draft Recirculation Document are submitted by the Environmental Defense Center (EDC) on behalf of Get Oil Out! (GOO!), the Los Padres Sierra Club (Sierra Club), People United for Economic Justice Building Leadership Through Organizing (PUEBLO) and the Santa Barbara County Action Network (SB *CAN*).

We appreciate the work that has gone into this Draft Recirculation Document, which provides additional information regarding greenhouse gas (GHG) emission thresholds that could be applied to the Santa Maria Energy Project.

As we have noted in previous correspondence and at Planning Commission hearings in April and May, some of the thresholds which are described in the Draft Recirculation Document are not appropriate for this Project, in part because they do not address the entirety (or even majority) of the Project's lifetime. For example, the threshold for a project which is expected to operate well past 2060 should be based on a longer-term planning horizon –2050 or later as opposed to 2020.[1] The Draft Recirculation Document itself acknowledges this on page 11: "As the S-3-05 Executive Order sets a goal of an 80 percent reduction by 2050, higher reduction levels than the 16

[1] "The estimated life of successful wells is 50 years." (Proposed Final EIR, at p. 1-2.) Assuming that the Project is approved in 2013 and production starts in 2014, the Project could last until approximately 2064.

or 29 percent as detailed in the Scoping Plans would be required beyond 2020 in order to achieve that longer term goal." Other options are based on air quality permitting and reporting requirements and are not relevant as thresholds of significance.

As we have asserted previously, the Project's Environmental Impact Report (EIR) should discuss and ultimately rely on a "zero emissions" threshold, as this is the only threshold that addresses all of the significant impacts of the Project's GHG emissions. The EIR should also identify alternative thresholds which address the full life of the Project (for example, thresholds which are based minimally on 2050 targets for GHG reductions) and those which, when applied across the County, capture 90 to 95 percent of the GHG emissions generated by new projects.

We offer several specific comments on the Draft Recirculation Document below. Please note that our previous comment letters regarding this Project are incorporated herein by reference.

**5.1.1.3 GHG Emission Thresholds**

The EIR should include a zero emissions threshold. The concentration of GHGs in our Earth's atmosphere recently crossed the 400 parts-per-million (ppm) threshold; experts predict that current trends will cause global temperatures to rise at least two degrees, causing potentially catastrophic changes.[2] In other words, GHG emissions must be reduced from their current global levels, and *any* new input of GHG emissions exacerbates that global problem. CAPCOA explains:

> The scientific community overwhelmingly agrees that the earth's climate is becoming warmer, and that human activity is playing a role in climate change. Unlike other environmental impacts, climate change is a global phenomenon in that all GHG emissions generated throughout the earth contribute to it. Consequently, both large and small GHG generators cause the impact. While it may be true that many GHG sources are individually too small to make any noticeable difference to climate change, it is also true that the countless small sources around the globe combine to produce a very substantial portion of total GHG emissions.
>
> A zero threshold approach is based on a belief that, 1) all GHG emissions contribute to global climate change and could be considered significant, and 2) not controlling emissions from smaller sources would be neglecting a major portion of the GHG inventory.

[2] *See, e.g.*, Neela Banerjee, "Carbon Dioxide in the Atmosphere Crosses Historic Threshold," *L.A. Times*, May 10, 2013, *available at* http://articles.latimes.com/2013/may/10/science/la-sci-sn-carbon-atmosphere-440-ppm-20130510.

> CEQA explicitly gives lead agencies the authority to choose thresholds of significance. CEQA defers to lead agency discretion when choosing thresholds. Consequently, a zero emission threshold has merits.[3]

According to a Los Angeles County Superior Court:

> Under an analysis by [CAPCOA], the only two standards that they believe to be effective in reducing emissions and highly consistent with AB 32 are a threshold of zero, or a quantitative threshold designed to capture 90 percent or more of likely future discretionary projects.[4]

The court noted that "a 40,000 to 50,000 ton project would have low consistency with AB 32." At least one state agency, the California State Lands Commission, has used a zero emission threshold to measure the significance of GHG emissions in an EIR.[5]

This EIR should use a zero emissions threshold, as well, in order for it to be most consistent with CEQA's requirement that *all* potentially significant impacts of a proposed project be evaluated and mitigated or avoided where feasible.

***Numeric Bright-Line Thresholds***

The Draft Recirculation Document identifies two valid options for a "bright-line threshold" which could be applied in the County of Santa Barbara – 3,000 $MTCO_2e/yr$ to capture 95 percent of new emissions, or 10,000 $MTCO_2e/yr$ to capture 90 percent of new emissions.[6]

**3,000 $MTCO_2e/yr$**

While not as stringent as a zero emission threshold, a threshold that captures 95 percent of new GHG emissions would be consistent with S-3-05 and could be modeled on the approach adopted by the Bay Area Air Quality Management District.[7]

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[3] California Air Pollution Control Officers' Association (CAPCOA), "CEQA and Climate Change: Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act" (2008), attached to EDC November 2012 letter, at p. 27.
[4] *Center for Biological Diversity v. California Department of Fish and Game* (Oct. 15, 2012) Superior Court of the State of California for the County of Los Angeles, p. 30, fn. 52.
[5] *Venoco Ellwood Marine Terminal Lease Renewal Project Final Environmental Impact Report*, California State Clearinghouse (SCH) No. 2004071075, CSLC EIR No. 743, April 30, 2009; *Draft Environmental Impact Report for the Venoco Ellwood Oil Development and Pipeline (Full Field) Project*, State Clearinghouse No. 2006061146, CSLC EIR No. 738, June 2008.
[6] Draft Recirculation Document, p. 6.
[7] *Id*., at p. 6.

**10,000 $MTCO_2e/yr$**

The Draft Recirculation Document states that a 10,000 $MTCO_2e/yr$ threshold "would be consistent with S-3-05"[8] and "is a reasonable threshold to apply if a numeric, bright-line threshold were considered for this project."[9]

As noted in the Draft Recirculation Document, other jurisdictions have adopted a 10,000 $MTCO_2e/yr$ threshold, including the Bay Area Air Quality Management District (intended to capture 95 percent of GHG emissions from new projects), South Coast Air Quality Management District (intended to capture 90 percent of GHG emissions from new projects) and the County of San Luis Obispo (intended to capture 94 percent of combustion-related emissions)

The EIR should also include a reference to other *County of Santa Barbara* documents which use or refer to a bright-line threshold of 10,000 $MTCO_2e/yr$. For example, the recently approved La Goleta Storage Field Enhancement project relied on a 10,000 $MTCO_2e/yr$ threshold for GHG emissions.[10]

**25,000 $MTCO_2e/yr$**

The Draft Recirculation Document refers to California Air Resources Board (CARB) and federal reporting thresholds which are established at 25,000 $MTCO_2e/yr$. According to CAPCOA, however, "CARB proposed to use the 25,000 metric tons/year value as a reporting threshold, not as a CEQA significance threshold that would be used to define mitigation requirements."[11] Similarly, Federal EPA's mandatory reporting threshold is not synonymous with a CEQA threshold, and its use as such is not supported by substantial evidence.[12]

***BAU Thresholds***

BAU thresholds which are less than 90 percent, such as 50, 29 or 16 percent, are not appropriate for this Project. Executive Order S-3-05, signed by Governor Schwarzenegger in 2005, requires California to reduce state-wide emissions to 80 percent below 1990 emissions levels by 2050; to reach the S-3-05 *reduction target* "would require an estimated 90 percent reduction (effective immediately) of [BAU] emissions."[13] Concomitantly, AB 32 requires California to reduce state-wide emissions to 1990 levels by 2020.[14] Current (post-AB 32) models suggest that the more extensive cuts required by

[8] *Id*., at p. 4.
[9] *Id*., at p. 8.
[10] Revised Draft Environmental Impact Report for the Southern California Gas Company La Goleta Storage Field Enhancement Project (Dec. 2012), p. 4.3-14.
[11] CAPCOA 2008, p. 45.
[12] *See*, *e.g.*, California Natural Resources Agency, "Final Statement of Reasons for Regulatory Action," p. 26 (2009).
[13] CAPCOA, *supra*, at p. 33.
[14] *Id*., at p. 32.

S-3-05 will be necessary to effectively combat climate change.[15] Courts have agreed that local governments are "obligated to discuss impacts beyond the 2020 horizon" of AB 32.[16]

A Los Angeles County Superior Court stated that the use of BAU is "contrary to the Guidelines and to CEQA" in part because it relies on an improper baseline:

> When looking at greenhouse gas emissions and asking whether the project may result in a significant cumulative contribution to climate change, a lead agency must consider the "extent to which the project may increase or reduce greenhouse gas emissions as compared to the existing environmental setting." Guidelines § 15064.4(b)(1). This baseline must focus on impacts to the existing environment, not hypothetical situations. *County of Amador v. El Dorado County Water Agency* (1999) 76 Cal.App.4th 931, 955.
>
> . . . .
>
> In the context of global climate change analysis, lead agencies shall also consider "the extent to which the project may increase or reduce [greenhouse gas] emissions as compared to the *existing* environmental setting." CEQA Guidelines § 15064.4(b)(1) (emphasis added). It is only against this baseline that any significant environmental effects can be determined. *County of Amador v. El Dorado County Water Agency* (1999) 76 Cal.App.4th 931, 955.[17]

As indicated by the court, one critical flaw in the BAU approach is that it skews the baseline determination of "existing environmental conditions." Under CEQA, an EIR "must focus on impacts to the existing environment, not hypothetical situations."[18] This tenet was confirmed in *Communities for a Better Environment v. South Coast Air Quality Management Dist.* (2010) 48 Cal.4th 310, 320-21.

The County is required to issue discretionary land use approvals before this Project can proceed; therefore, it will not be built as a matter of right or as a matter of course. "Business as usual" should only be defined by the existing operational emissions

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[15] Shortly after AB 32 was signed into law in 2006, climate scientists began to assess the long-term climate implications of the various emission targets. In *Long Term Climate Implications of 2050 Emission Reduction Targets*, Andrew J. Weaver, et al. used a coupled atmosphere-ocean-carbon cycle model to demonstrate the global climate response to given emission targets. Weaver A., Zickfeld K., Montenegro A., and Eby M. "Long term climate implications of 2050 emission reduction targets" *Geophysical Reaseach Letters*, October 6, 2007: 1-4. Their results confirmed that preventing significant global climate change would require not only drastically reducing emissions, but also carbon sequestration. As scientists learn more about the earth systems and their ability to process carbon dioxide, estimates of the natural limitations become more accurate, and less optimistic than previously envisioned.

[16] *Cleveland National Forest Foundation, v. San Diego Association of Governments* (Dec. 3, 2012) Superior Court of the State of California for San Diego County at pp. 11-12 (citations omitted).

[17] *Center for Biological Diversity, supra*, at pp. 25-30.

[18] *Sunnyvale West Neighborhood Assn. v. City of Sunnyvale* (2010) 190 Cal.App.4th 1351, 1373.

from the SME pilot project, and all new emissions should be counted against that measure.

**5**0 **Percent Below BAU**

The Draft Recirculation Document discusses approaches based on 50 and 90 percent reduction from BAU on pages 11 and 12. The discussion of a 50 percent reduction scenario references the 2008 CAPCOA report, which determined that "it would have a high level of consistency with AB 32, a medium level of effectiveness but a medium/high level of uncertainty."[19] As noted above, however, the AB 32 2020 target is not appropriate for this Project, which will have impacts for decades thereafter. Therefore, this approach must be eliminated from the EIR.

**90 Percent Below BAU**

According to CAPCOA, the 90 percent reduction target scores "high" on "GHG emissions reduction effectiveness," "medium" on "economic feasibility," "high" on consistency with AB 32 and S-3-05" and "medium" on "cost effectiveness."[20]

***EIR Significance Determination***

The Draft Recirculated Document states on page 12 that if "project emissions are mitigated to a level that will be consistent with AB 32, then the cumulative GHG impacts contributed to by the project will be found to be less than significant." This statement ignores the fact that AB 32 does not address a majority of the Project's expected lifetime; it ignores the mandates of Executive Order S-3-05 and lacks evidentiary support on its own. The EIR *must* consider and address the cumulative impacts of GHG emissions which will occur throughout the life of the Project.

**Conclusion**

We continue to assert that a zero emissions threshold is most appropriate for this Project and for other projects in the County of Santa Barbara. If a zero emissions threshold is not applied, the County should follow the Bay Area Air Quality Management District (BAAQMD) and adopt a threshold based on a 95 percent market capture rate. If it is too complicated to apply the market capture calculus to this project, without going through a larger public process, the County could use a 90 percent reduction from BAU target; this approach is predicated on requirements found in Executive Order S-3-05. For this Project, a 90 percent reduction is approximately commensurate with the 10,000 MT/yr threshold which the County has used as an "interim threshold" and for at least one recently approved project.

[19] CAPCOA 2008, pp. 33-34.
[20] Id.

There is no rational reason for the County to prefer a BAU approach predicated on the outdated AB 32 reduction target. As we have noted, that approach will only address a portion of the Project's impacts in the first 8 of 50 years of its expected life. It is critical that the EIR address (and mitigate) *all* of the Project's impacts for the entirety of its operations.

Thank you for making these requested revisions and additions. Please do not hesitate to contact us with any questions or concerns.

Sincerely,

Nathan G. Alley
Staff Attorney

Cc: Get Oil Out!
Los Padres Sierra Club
People United for Economic Justice Building Leadership Through Organizing
Santa Barbara County Action Network
Community Environmental Council