

LETTER 21 - Michael LaSalle, Griswold, LaSalle, Cobb, Dowd, & Gin, L.L.P.

Response to Comment 21-1

The comment is noted for the record. For specific responses to the commentor's concerns regarding air and water quality impacts, the commentor is referred to Responses to Comments 21-2 through 21-34.

Response to Comment 21-2

The commentor's general opinions regarding the significance of methane emissions are noted for the record. The preparers of the PEIR disagree that the discussion in the PEIR of methane as an air pollutant gives the impression that issues related to methane production and its contribution to the accumulation of greenhouse gases and potentially to global warming are well understood at this point. Atmospheric science in general is a very complex discipline and global climatology is extremely complicated. The commentor is referred to Responses to Comments 21-3 through 21-17 for further discussion of the current understanding of methane impacts.

Response to Comment 21-3

The commentor asserts that global warming may not actually be occurring because, as it is stated in the comment, "the majority of all surface air temperatures have been taken at urban sites, such as airports and in cities" and that temperature data collected near urban centers may be biased upward. The commentor does not provide substantiation that the data collected for use in climate change analyses have been collected at urban locations.

The National Research Council¹⁵ indicates that a "diverse array of evidence points to a warming of global surface air temperatures. Instrumental records from land stations and ships indicate that global mean surface temperature warmed by about 0.4 to 0.8 C during the 20th century. The warming trend is spatially widespread and is consistent with the global retreat of mountain glaciers, reduction in snow cover extent, the early spring melting of ice on rivers and lakes, [and] the accelerated rate of rise of sea level during the 20th century..."

Response to Comment 21-4

The commentor refers to a single researcher who has apparently asserted that sea level has increased approximately 0.1 mm since 1900. These data are in sharp contrast to the general consensus of the scientific community. The U.S. EPA reports that sea level has risen worldwide approximately 15 to 20 cm (six to eight inches) in the past century, and at even

¹⁵ National Research Council, 2001, Climate Change Science, An Analysis of Some Key Questions, National Academy Press.

greater rates (25 to 30 cm in the past century) in the United States.¹⁶ The National Oceanic and Atmospheric Administration (NOAA) also indicates that a one to two mm per year average rate of sea level rise over the past 100 years has been documented.¹⁷

Response to Comment 21-5

The commentor questions whether human activity is responsible for the observed and documented increase in global temperatures. It is an accepted fact in the scientific community that global temperatures have varied considerably throughout geologic time (prior to human influence), as evidenced by the recurring ice ages. However, it is the consensus of the scientific community that human activity has resulted in a rapid increase in the *rate* of change. It remains the current thinking of the scientific community that most of the observed warming of the last 50 years is likely to have been due to the increase in greenhouse gas concentrations in the atmosphere.¹⁸

Response to Comment 21-6

Refer to Response to Comment 21-5.

Response to Comment 21-7

The commentor is correct that warmer temperatures tend to increase precipitation. Some climate models indicate that precipitation as snowfall on the polar land masses and ice sheets could offset the increased rates of melting of the ice sheets that would be caused by the warmer conditions.¹⁹ However, this is far from a certainty. More importantly, the thermal expansion of the water in the world's oceans as a result of warming will cause a substantial rise in sea level (which is already rising at 2.5 to 3.0 mm/yr).²⁰

¹⁶ U.S. Environmental Protection Agency, 2001, Global Warming Trends; Sea Level, EPA website: <http://www.epa.gov/globalwarming/climate/trends/sealevel.html>

¹⁷ National Oceanic and Atmospheric Administration, 1999, Global Warming; Frequently Asked Questions, NOAA website: <http://lwf.ncdc.noaa.gov/oa/climate/globalwarming.html>.

¹⁸ National Research Council, 2001, Climate Change Science, An Analysis of Some Key Questions, National Academy Press.

¹⁹ U.S. Environmental Protection Agency, 1995, The Probability of Sea Level Rise, EPA 230-R-95-008, October.

²⁰ Ibid.

Response to Comment 21-8

The commentor correctly indicates that changes in carbon dioxide (CO₂) concentrations in the atmosphere have been studied extensively during research on global climate change. CO₂ is the most important greenhouse gas and anthropogenic sources of increased CO₂ emissions have been the source of much scientific debate. However, it is well documented that CO₂ concentrations have increased dramatically since the start of the Industrial Revolution. In general, the increased CO₂ levels are typically linked to the burning of fossil fuels. Prior to the industrial age, CO₂ concentrations during interglacial periods (as recorded in ice cores) averaged approximately 280 ppmv. By 1958, the average concentration had increased to 315 ppmv and are currently 370 ppmv. The rate is increasing by approximately 1.5 ppmv per year.

The determination of the cause and effect relationship between CO₂ and changes in global temperatures is very complex. The atmospheric CO₂ increase over the past few decades is less than the estimated input from human activities because a fraction of the added CO₂ is removed by oceanic and terrestrial processes. The carbon in CO₂ is absorbed by plants and soil detritus (i.e., "sequestered") and released through complicated chemical and biological processes. Climate variations affect vegetation and soil chemistry, effecting a "feedback" loop (e.g., in some regions, increased temperatures may promote vegetative growth and in others cause drought) that adds to the complexities of carbon sequestration. Therefore, linking the changes in CO₂ concentration with climate change requires continued research.

Response to Comment 21-9

The commentor is correct in observing that wetland environments are an important contributor to methane production. Although the Element promotes the protection of existing wetlands, the Element does not provide for increased wetland development. The County does not attempt to distinguish between "politically correct and incorrect" sources of greenhouse gases. However, existing biological resources are considered important for reasons (e.g., habitat value, protection of special-status species, and aesthetics) other than control of methane production.

Response to Comment 21-10

The preparers of the PEIR recognize that quantification of the significance of increased methane production is not possible at this time. Identification of the impact of increased methane production was included in the PEIR to provide the public and decision makers with information related to potential adverse effects related to implementation of the proposed Element.

Response to Comment 21-11

The estimate presented by the commentor of the average percentage of methane in the atmosphere (0.2 ppmv) is noted for the record as is the “baseballs in a boxcar” analogy. It is important to note that, although methane is present in relatively small percentages in the atmosphere, it is the physiochemical properties of this compound that have attracted the interest and concern of the scientific community.

Response to Comment 21-12

Refer to Response to Comment 21-8.

Response to Comment 21-13

The comment is noted for the record.

Response to Comment 21-14

The information presented by the commentor on global climate change is noted for the record. The preparers of the PEIR concur that interpretation of the benefits or detriment of natural changes in global climate is subjective. Please refer to Response to Comment 21-9 for a discussion of the environmental significance of the impacts of increased methane generation.

Response to Comment 21-15

The mainstream scientific community (including the National Research Council, which was directed by President George W. Bush to evaluate the science associated with global warming) recognizes that human-induced global warming is occurring. The PEIR merely requires mitigation of an identified impact with potentially wide-ranging and long-term cumulative effects; it would be inappropriate not to require mitigation of such a widely recognized environmental impact.

Response to Comment 21-16

The legal opinion presented in the comment is noted for the record. The potential adverse effects of increased methane generation were described in the Draft PEIR (pages 4.2-3 and 4.2-4; 4.2-73 through 4.2-75) and discussed in Responses to Comments 21-2 through 21-15. The preparers of the PEIR consider that the position of U.S. EPA regarding the need to control greenhouse gases, including methane, and recent information provided in the responses to comments, warrant the recognition of the release of large amounts of methane from the project as a significant environmental impact.

Response to Comment 21-17

It is correct that the area used for a dairy facility (not the support cropland) would be expected to consume less water per acre than other irrigated cropland in the County (as described on page 4.3-22 of the Draft PEIR). However, evaporative losses at the dairy facility (which include large shallow lagoons) are likely to be greater than those that would be expected at an irrigated field. Irrigation water is divided between deep infiltration (aquifer recharge), plant tissue nourishment, and evaporation/evapotranspiration (only the latter would contribute substantial water vapor to the atmosphere). At the dairy facility, a relatively small amount of water is used to nourish the cattle while the remainder is used in washing and is stored in open lagoons that are subject to substantial and continuous evaporative losses throughout the year.

Any small difference in the rate of evaporation (whether it is an increase or decrease) at the dairy facility would not have a significant effect on global warming. As correctly stated by the commentor, the amount of water vapor in the air is vast relative to other heat-trapping substances. The amount of water vapor in the air is largely controlled by earth and atmospheric air temperature. Therefore, without a climate forcing,²¹ the amount of water vapor in the air would be maintained at a relative constant.

Release of greenhouse gases to the environment, to which cattle raising has been identified as one of the primary contributors, represents a human-induced forcing. The contribution of methane and other greenhouse gases from a new large dairy would represent a substantial new input to the atmosphere. Human-induced forcings, such as increased releases of methane, tend to be magnified because they result in direct and feedback effects. Water vapor feedback (the additional greenhouse effect accruing from increasing concentrations of atmospheric water vapor as the atmosphere warms) is the most important feedback phenomena. It is estimated that the feedback effect magnifies the temperature response associated with increased greenhouse gases by a factor of 2.5.²²

Response to Comment 21-18

It is common knowledge that reactive organic gases (ROG) are among the most common ozone precursors. According to the California Air Resources Control Board's Air Pollution Glossary, ozone precursors consist of chemicals such as non-methane hydrocarbons (ROG is defined as reactive chemical gas composed of hydrocarbons), occurring either naturally or as a result of human activities, which contribute to the formation of ozone.

²¹ A "forcing" is defined as an imposed perturbation of the Earth's energy balance.

²² National Research Council, 2001, Climate Change Science, An Analysis of Some Key Questions, National Academy Press.

Furthermore, the San Joaquin Valley Air Pollution Control District's Guide for Assessing and Mitigating Air Quality Impacts Technical Document dated 20 August 1998 indicates that ozone is a photochemical pollutant that is not emitted directly into the atmosphere, but is formed by a complex series of chemical reactions between reactive organic gases as well as other gases, oxides of nitrogen, and sunlight.

Response to Comment 21-19

The comment is noted for the record.

Response to Comment 21-20

The commentor should be aware that there are only three Kings County monitoring stations operated by the California Air Resources Board: 1) South Irwin Street Station in Hanford; 2) Van Dorsten Station in Corcoran; and 3) Patterson Station in Corcoran. The last three years (1998 through 2000) of ambient air quality data available for these monitoring stations have already been summarized in Table 4.2-3 of the PEIR. The commentor should further be informed that ozone is only monitored at the South Irwin Street Station in Hanford, as indicated in Table 4.2-3 of the PEIR.

All the Kings County monitoring stations referenced in the PEIR are operated by SJVUAPCD. Furthermore, the data presented in the PEIR reflect data published by the California Air Resources Board. Data collected from these monitoring stations are subject to rigorous quality assurance conducted by the California Air Resources Board to ensure that data collected are in compliance with procedures and regulations set forth by the U.S. EPA and can be considered good quality data and data-for-record. Quality assurance is an integrated system of management activities involving planning, implementation, assessment, and corrective action. The objectives of quality assurance are to provide accurate and precise data, minimize the loss of air quality data due to malfunctions, and to assess the quality of the air monitoring data to provide representative and comparable data of known precision and accuracy. Criteria for the accuracy, precision, completeness, and sensitivity of the measurement have been met and documented.

Response to Comment 21-21

The commentor is inaccurate in stating that reactive organic gases that would be generated in process water lagoons would be completely transformed into other products prior to becoming atmospheric emissions. There is a distinct difference between anaerobic lagoons and controlled manure anaerobic digestion. One main difference between these two processes is the generation and emission of reactive organic gases into the atmosphere. It is true that, in anaerobic lagoons, organic acids formed during the intermediate stage are converted into methane and carbon dioxide. Because of the uncovered design of this

system, however, the organic acids are not completely converted into methane and carbon dioxide. These acids are also converted into reactive organic gases.

However, under controlled anaerobic digestion of manure, reactive organic gases are trapped in the enclosed digestion system. These gases are then allowed to remain in the liquid phase, due to the nature of the system, and are eventually consumed by bacteria used to generate the end gases, which consist mainly of methane and carbon dioxide.

While process water lagoons are widely used in the dairy industry, covered lagoons are not. Therefore, release of reactive organic gases would not necessarily be eliminated from dairy facilities due solely from the implementation of process water lagoons.

Response to Comment 21-22

The commentor should be aware that the preparers of the PEIR acknowledged the validity of the emission factor currently published in CARB's Emission Inventory Procedural Manual, Methods for Assessing Area Source Emissions. The Draft PEIR (page 4.2-33) indicates that the ROG emission factor was developed more than ten years ago and was based on limited available data. However, because of the lack of more recent ROG emission factors from CARB or other research agencies, the preparers of the PEIR were limited to using CARB's published reactive organic gas emission factors in calculating reactive organic gas emissions from manure decomposition.

The types of dairy manure treatment systems currently being used in Kings County do not typically include mechanisms to capture or reduce reactive organic gases. As of the preparation of the PEIR, only one facility in Kings County was known to have used an aerobic treatment system (six month pilot study, as discussed in the PEIR). Therefore, the assumption in the PEIR calculation of reactive organic gas emissions for existing conditions that none of the dairy facilities is currently treating manure to reduce reactive organic gas emissions is considered to be appropriate.

As discussed in Response to Comment 21-18, it is common knowledge that reactive organic gases are an ozone precursor. Contrary to the commentor's remark, the PEIR does indicate that reactive organic gases are transformed to ozone through photochemical reactions.

The commentor further indicates that the PEIR fails to identify the quantity of ozone emissions that would result from reactive organic gas reactions. The commentor is accurate in stating that the PEIR did not quantify ozone emissions from dairy operations. Instead, the PEIR estimated ROG emissions from dairy-related activities. According to the San Joaquin Valley Unified Air Pollution Control District's Guide for Assessing and Mitigating Air Quality Impacts dated August 20, 1998, the setback acknowledges that current atmospheric ozone models "are only sensitive enough to register changes caused

by the largest projects.” The setback further indicates that project-related ozone impacts are to be evaluated by comparing the setback’s established threshold levels with the project’s ozone precursor emissions (i.e., reactive organic gases), rather than ozone emissions. The PEIR’s ozone impact analysis was conducted in accordance with the San Joaquin Valley Unified Air Pollution Control District’s guidelines.

Response to Comment 21-23

As indicated on page 4.2-73 of the Draft PEIR, hydrogen sulfide is included as a contaminant under the California Air Toxics “Hot Spots” Information and Assessment Act. Currently, estimation of emissions of hydrogen sulfide, required by the Act, cannot be accurately performed for dairy operations. In addition, the emission of hydrogen sulfide contributes to potential odor emissions from dairy operations. Finally, the significance of the potential for exceedance of the California ambient air quality standard for hydrogen sulfide cannot be accurately determined but any additional emission could impact future attainment of air quality standards. The significance of the emission of this compound, which is known to occur during decomposition of manure, is appropriately assumed to be significant.

Response to Comment 21-24

Emissions of ammonia from dairy facilities that could be developed under the Element are significant or potentially significant for at least three reasons. Ammonia emissions contribute to the potential for adverse odors. The emission of ammonia also presents the potential for the formation of ammonium nitrate particles, which would result in an increase in the fine fraction of PM₁₀, an air pollutant for which the San Joaquin Valley Air Basin is not in attainment. In addition, ammonia emissions at livestock facilities, if not controlled, could result in long-term exposure of workers and potential health impacts that cannot be determined on the basis of existing data. The commentor is correct in pointing out that worker exposure to ammonia is under the jurisdiction of Cal OSHA, an indication of the potential health impacts associated with this air pollutant.

Response to Comment 21-25

The comment is noted for the record. The Draft PEIR (pages 4.2-72 and 4.2-74) acknowledges that ammonia emissions may be reduced under aerobic conditions. Under uncontrolled anaerobic conditions that could occur in stacked solid manure or anaerobic lagoons, ammonia emissions would occur. Although ammonia emissions would be limited during appropriate land application of manure, emission of ammonia could occur in flood irrigation unless appropriate controls are in place.

Response to Comment 21-26

The comment is noted for the record.

Response to Comment 21-27

Policy DE 5.1 (now **5.1i**) requires the estimation of NO_x emissions because this air pollutant (which is an ozone precursor) is generated by the operation of combustion engines. The development of dairies would increase these emissions through operation of heavy equipment at dairies and the increased vehicular traffic generated by dairy operation.

Response to Comment 21-28

The PEIR discusses the impacts associated with odors from cattle manure. The preparers of the PEIR do not have evidence of other major odor sources associated with dairy operations.

Response to Comment 21-29

The commentor's general opinion is noted for the record. Please refer to Responses to Comments 21-16, 21-18 through 21-28, 21-30, and 21-31.

Response to Comment 21-30

The opinion expressed by the commentor is noted for the record but is not supported by quantitative evidence. The document presents reasonable and substantial evidence to support the air quality mitigations proposed by the Element. Proper application of water as a dust suppressant is a standard method of controlling particulate matter emissions. Application of water by sprinklers would not necessarily require additional combustion engines. Indeed, this methodology is acknowledged as feasible and appropriate mitigation for unpaved areas by the newly adopted performance standards in the most recent SJVUAPCD's Regulation VIII. The emissions from equipment required to implement the advanced manure treatment requirements proposed by the Element cannot be accurately estimated as the options for meeting the requirements at individual dairies developed under the Element are not known. However, **Policy DE 5.1j** (now **5.1i**) of the Element requires the applicants for new or expanded dairy developments to present estimates of air emissions from proposed dairies, which would include emissions from all dairy operation equipment. There is no information in the comment to support the assumption that emissions from implementation of mitigation measures proposed by the Element would result in emissions in excess of uncontrolled impacts. Any emissions caused by operating equipment for mitigation would not outweigh the benefit of the mitigation.

Response to Comment 21-31

CEQA does not require the economic costs of all mitigation measures to be presented in an EIR. However, CEQA does require that proposed mitigation measures be feasible. Section 15364 of the CEQA Guidelines defines the term feasible as meaning "capable of being accomplished in a successful manner in a reasonable period of time, taking into account

economic, environmental, legal, social, and technological factors.” It is noted for the record that many of the mitigation measures cited in the comment are currently implemented at dairy facilities in California, the U.S., and the world. The most expensive of the mitigations, such as lagoon covers or digestion systems, are most typically implemented at facilities that are attempting to correct a problem, such as odor control. Required implementation of the most costly mitigation measures (e.g., advanced manure treatment and lagoon liners) proposed by the Element and analyzed in the PEIR are directed toward control of known significant environmental impacts, such as severe air quality conditions and potential water quality problems affecting the San Joaquin Valley.

Response to Comment 21-32

The commentator’s opinion regarding the RWQCB’s responsibility for protecting water quality is noted for the record. The County fully appreciates and supports the RWQCB’s efforts in minimizing the potential for water quality degradation resulting from the management of dairy manure and process water. The RWQCB permitting process was described in the PEIR. **Policy DE 3.2k** (now **3.2j**) of the Element requires compliance with RWQCB Waste Discharge Requirements. Although the RWQCB has the primary responsibility for protection of water quality, the County is also responsible for the protection of human and environmental health within the County. The standards presented in the Element which relate to water quality protection have been included following review of minimum State requirements and potential residual impacts that could result following implementation of those requirements. It is noted for the record that the RWQCB has submitted comments on the PEIR (Comment Letter 7) and those comments do not express concern with the adaptation of Element’s proposed policies or mitigation measures.

Response to Comment 21-33

The County concurs with the commentator’s opinion that the dairy industry provides important economic opportunities for Kings County. One of the stated primary objectives of the Element is to ensure that the dairy industry of Kings County continues to grow and contribute to the economic health of the County.

Response to Comment 21-34

The comment is noted for the record. During the public review process, the Planning Commission and Board of Supervisors will consider making findings of overriding consideration for environmental impacts described in the PEIR.