

### 12.1 INTRODUCTION

Section 15126.6 of the California Environmental Quality Act (CEQA) Guidelines requires that an Environmental Impact Report (EIR) describe and comparatively evaluate a range of reasonable alternatives to a project, or location of the project, that would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the project's significant effects. Thus, the range of alternatives evaluated in the following analysis is dictated by the range of project significant impacts identified in this EIR. Evaluated alternatives are limited to those that would reduce or eliminate identified environmental impacts.

This EIR identified 21 significant impacts that would occur with implementation of the proposed Oliveira Dairy Expansion project, including: construction-related emissions; the generation of ozone precursor emissions; the exposure of nearby residents to substantial air pollutant concentrations for both toxic air contaminants and criteria air pollutants; adverse odor from project operations; nest disturbance and loss of foraging habitat for Swainson's hawk; loss of foraging and nesting habitat for sensitive and migratory bird species; loss of nesting habitat for tricolored blackbird; loss of habitat for the San Joaquin kit fox and/or American badger; the effects of trace compounds on biological resources; substantial adverse change in the significance of a historical, archaeological, or paleontological resource; accidental discovery and disturbance of human remains; increased fly production and related nuisance effects; degradation of water quality during construction; groundwater contamination from dairy expansion operations; risk release of pollutants due to project inundation in flood zones; impacts to water quality at off-site locations that receive manure; impacts to water quality due to septic systems; land use compatibility with existing off-site residential uses adjacent to the project; and cumulative impacts to air quality, and hydrology and water quality. The environmental analysis concluded that all significant impacts could be reduced to a less-than-significant level with implementation of mitigation measures outlined in the EIR, except for impacts from ozone precursor emissions, groundwater contamination from dairy expansion operations, impacts to water quality at off-site locations as a result of project operations, and a significant contribution to cumulative air quality and water quality impacts. These impacts would remain significant and unavoidable. Accordingly, two alternatives, in addition to the required No Project alternative, were formulated to illustrate the range of project alternatives that could be implemented as an alternative to the proposed Oliveira Dairy Expansion project.

This chapter also summarizes the alternatives considered but rejected, and evaluates the environmental impacts of the No Project Alternative, the On-Site Anaerobic Digester Alternative, and the Reduced Herd Size Alternative. CEQA does not require the environmental review of alternatives to be at the same level of detail as that for the proposed project [CEQA Guidelines Section 15126.6(d)]. The review must be at a sufficient level, however, to allow for a meaningful comparison of the environmental merits of each.

To provide this meaningful comparison, Table 12-6 (shown at the end of this chapter) summarily compares the identified alternatives. The alternatives, as well as their comparative merits, are described below.

### **12.1.1 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER ANALYSIS**

In accordance with CEQA Guidelines Section 15126.6(f), several alternatives were considered for the Oliveira Dairy Expansion project, but rejected as infeasible.

#### **ADDITIONAL ACREAGE FOR EXPORTED MANURE DISPOSAL ALTERNATIVE**

Under the Additional Acreage for Exported Manure Disposal Alternative, additional acreage would be required for the application of all manure exported from the Oliveira Dairy Expansion. This alternative would reduce impacts to water quality at off-site locations as a result of manure export from the dairy facility. With the proposed expansion as reported in the NMP, a total of 7,500 tons of separated solids and solid manure and 6,000,000 gallons of wastewater slurry<sup>1</sup> would be exported from the dairy facility. If a field double-cropped in corn and oats is relying only on dry manure as its fertilizer, it would use approximately 500 pounds of nitrogen per acre. Therefore, to apply this manure on-site, approximately 1,037 acres would be required. In a review of real estate available in the south of Merced area (Trulia.com 2019), there was one agricultural parcel for sale in the project vicinity consisting of 101 acres for \$1,799,990. Using the per acre cost of this one parcel as a basis (\$17,822/acre), the cost of the additional 1,037 acres required would approximate \$18,481,414. Based on the potentially large amount of acreage required to apply all exported manure on-site, the high price of acreage, and the lack of available agricultural real estate in the project vicinity, the project applicant cannot reasonably acquire additional land. Because the project applicant does not own, or cannot reasonably acquire, additional acreage for the disposal of currently exported manure, this alternative was considered infeasible and rejected from further analysis.

#### **ALTERNATIVE SITES OUTSIDE THE SAN JOAQUIN VALLEY**

The alternative involving the relocation of dairy facilities to alternative sites outside the San Joaquin Valley was also eliminated, despite the fact that siting outside of the San Joaquin Valley Air Basin might speculatively lessen the incremental effect of air emissions and potential air quality cumulative effects. However, because these properties would be outside the jurisdiction of the County; the project applicant does not own, or cannot reasonably acquire an additional dairy site outside of the San Joaquin Valley; and relocation of existing facilities would be costly, this alternative was considered infeasible and rejected from further analysis.

#### **ORGANIC DAIRY FARM MANAGEMENT ALTERNATIVE**

Under the Organic Dairy Farm Management Alternative, the existing Oliveira Dairy would implement operational improvements and an expanded herd as included in the project description, but would implement an alternative management system by conversion to an organic dairy. The Organic Dairy Farm Management Alternative would reduce impacts from greenhouse gases and minimize potential environmental impacts from pesticides and antibiotics. Organic farms rely heavily on pasture for at least several months every year, and the key environmental benefits of the Organic Dairy Farm Management Alternative are linked to grazing. Greenhouse gas emissions for grazing operations are minimized by: reducing the loss of manure methane during storage, since a

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<sup>1</sup> Based on the NMP, approximately 518,326 pounds of nitrogen would be exported from the facility.

portion of the manure would be deposited in pasture; indirectly reducing reliance on corn in feed rations; and soil sequestration of carbon within pastures.

In order to be certified as an organic dairy, the United States Department of Agriculture's (USDA) National Organic Program requires that animals must be able to obtain at least 30 percent of their daily feed intake from pasture during the grazing season, and all animals over six months of age must have daily access to pasture during the grazing season (USDA 2012). A University of Missouri Extension paper on pasture-based dairies found that the acreage required to adequately pasture cows ranged from 0.3 acres per cow to 3 acres per cow (Horner, J. and R. Milhollin 2012). With the proposed expansion, there would be approximately 3,650 cows over six months of age needing pasture. Therefore, based on the USDA study survey, the proposed dairy under an organic dairy management scenario could require from 1,095 to 10,950 acres of pasture.

As described under Additional Acreage for Exported Manure Disposal Alternative (above), the project vicinity has limited agricultural land availability. Based on the potentially large amount of acreage required for pasture and the lack of available agricultural real estate in the project vicinity, the project applicant cannot reasonably acquire additional land.

In addition, current federal farm policies could make organic farming difficult to implement. The USDA's National Organic Program certification of a farming operation can be a complicated process in which the farm must go through a three-year transition period where they manage their farm as if already certified organic. The pasture and cropland providing feed for organic dairies during the three-year transitional phase may not be labeled or marketed as organic, and the farmer would not see a return on the initial investment for several years. Current standards also require the dairy herd to be fed 100 percent organic feed and to be provided organic health care for 12 months before being certified. Grazing is required for all animals over six months of age, with a required amount of feed from pasture of at least a 30 percent dry matter intake for the entire grazing season. As a result, organic operations must undergo three years of higher costs before the higher organic milk prices are received. In addition, detailed production records must be kept for five years post-certification for a farm to be in compliance with the regulations, and access to these records must be provided to USDA and its certifying agents (USDA 2012).

According to a study by the USDA, certification paperwork and compliance costs were reported by 40 percent of producers surveyed as the most challenging aspect of organic milk production, followed by finding new organic input sources (dairy replacement and feed), higher costs of production, and maintaining animal health (since antibiotics cannot be routinely administered). The volume of organic inputs needed on large farms in the West may account for the level of concern with sourcing inputs. Access to pasture for dairy feed also had a strong influence on whether a dairy becomes organic (USDA 2009). The study also found that larger organic dairies could reduce production costs due to economies of size; however, the additional costs of complying with pasture requirements and securing organic inputs in large volume may limit the cost advantages of larger organic operations (USDA 2009).

Based on the potentially large amount of acreage required for pasture and the lack of available agricultural real estate in the project vicinity, the project applicant cannot reasonably acquire additional land. In addition, current federal farm policies could make organic farming difficult to implement. For each and every reason identified above, this alternative was considered infeasible and rejected from further analysis.

## **SOLID-SCRAPE MANURE MANAGEMENT ALTERNATIVE**

Under the Solid-Scrape Manure Management Alternative, the existing dairy would be modified from a flush water lagoon system to a solid-scrape dry manure management system. All other improvements and the herd size increase associated with the proposed dairy expansion project would also occur under the Solid-Scrape Manure Management. This alternative was selected to further reduce greenhouse gas emissions and to consider a strategy that may be adopted in the future as a result of the ARB's Short-Lived Climate Pollutant Strategy (2017) proposed actions for the methane reductions from the dairy sector.

Dairy methane emissions may be significantly reduced by switching from flush water lagoon systems (anaerobic bacterial breakdown) to solid-scrape or dry manure management practices (aerobic bacterial breakdown). The use of manure management systems such as vacuum or scrape would allow for easier transport of manure off fields to centralized digester systems, or to localized storage for onsite digesters. Scrape systems are probably best used by dairies that are land constrained, or those that wish to expand their herd without expanding their land footprint, and therefore need to export their manure in order to be in compliance with the General Order (ARB 2017).

In many cases, converting to scrape systems at dairies may not yet be cost-effective. Many California dairies operate flush systems because they tend to have lower labor and operating costs, require less frequent maintenance of floors, and allow for the distribution of nutrients onto fields with lagoon water. For large dairy facilities, flush systems save on manual labor since it is easier to move liquid around to multiple barns by hydraulics rather than manually transporting solid manure to extensive farm areas (Sustainable Conservation 2015).

Using dry or scrape-based manure management systems at existing dairies would reduce methane emissions by keeping manure out of lagoons, but depending on conditions, solid manure management practices could lead to increased emissions of PM<sub>10</sub>, ammonia, nitrous oxide, and volatile organic compounds (VOC). The feasibility and indirect implications of switching to solid-scrape manure management is currently being explored by the ARB (ARB 2017).

The ARB issued the Short-Lived Climate Pollutant (SLCP) Reduction Strategy (Strategy) in March 2017, which lays out a range of options to accelerate SLCP emission reductions in California, including regulations, incentives, and other market-supporting activities. Recent legislation (AB 1613 and SB 859) includes a spending plan for Cap-and-Trade revenues that specifically target SLCP emission reductions. These include \$5 million for black carbon wood smoke reductions, \$40 million for waste reduction and management, \$7.5 million for Healthy Soils, and \$50 million for methane emission reductions from dairy and livestock operations.

As stated in the Strategy, California can cut methane emissions by 40 percent below current levels in 2030 by capturing or altogether avoiding methane from manure at dairies, meeting national industry targets for reducing methane emissions from enteric fermentation, effectively eliminating disposal of organics in landfills, and reducing fugitive methane emissions by 40-45 percent from all sources. California will aim to reduce methane emissions from dairy manure management by at least 20 percent in 2020, 50 percent in 2025, and 75 percent in 2030. To accomplish this, the State will encourage and support near-term actions by dairies to reduce emissions through market support and financial incentives. At the same time, ARB will initiate a rulemaking process to develop regulations for dairy manure management in California (ARB 2017).

More data is needed regarding the overall emissions impacts of conversion from flush- to scrape-based manure management systems, in addition to water use impacts and economics. Switching from one manure management practice to another could result in both increased and decreased impacts across the environmental spectrum (Sustainable Conservation 2015).

In summary, while dairy methane emissions may be significantly reduced under this alternative, converting to scrape systems at dairies may not yet be cost-effective, and solid manure management practices could lead to increased emissions of PM<sub>10</sub>, ammonia, nitrous oxide, and VOCs. Further, additional data and supporting regulations are needed before switching to solid-scrape manure management. For each and every reason identified, this alternative was considered infeasible and rejected from further analysis.

## **DAIRY DIGESTER PIPELINE CLUSTER ALTERNATIVE**

The dairy digester cluster concept involves gathering raw dairy biogas from a cluster of existing dairy operations and transferring it to a centralized hub where gas cleaning and conditioning occurs. Under the Dairy Digester Cluster Alternative, an anaerobic digester would be constructed at the existing Oliveira Dairy, or the existing wastewater lagoons would be covered and re-constructed as an anaerobic digester. Underground pipeline would also be installed to transport the biogas from the dairy to a biogas upgrading facility. All other improvements and the herd size increase associated with the proposed dairy expansion project would also occur under the Dairy Digester Pipeline Cluster Alternative. This alternative was selected to further reduce greenhouse gas emissions and to consider a strategy that may be adopted in the future as a result of the ARB's Climate Change Scoping Plan recommended actions for the agriculture sector.

In addition to generating renewable energy, anaerobic digestion leads to reduced odor pollution, a decrease in manure pathogens, and reduced greenhouse gas emissions. However, this alternative could result in increased impacts to biological resources and/or unknown cultural resources during construction of the proposed pipeline. This alternative would not result in increased operational air criteria emissions, since there would be no combustion of biogas for energy recovery. Rather, the biogas would be transported to a biogas upgrading facility, where it would be injected into a regional utility pipeline. In the case of the Oliveira Dairy, however, there is currently no existing dairy digester cluster network in the area to join.

The Central Valley Regional Water Quality Control Board (CVRWQCB) regulates dairy digester facilities in its region under Waste Discharge Requirements (WDR). Existing dairies currently covered under the WDR General Order for Existing Milk Cow Dairies (Dairy General Order) that construct and operate a manure-only digester using only manure generated onsite could retain regulatory coverage under the Dairy General Order. Prior to implementation of this alternative, review and/or approval from the San Joaquin Valley Air Pollution Control District (SJVAPCD) and CVRWQCB would be required.

Another important consideration in this alternative is the financial feasibility of installing manure digesters at dairies in the San Joaquin Valley (this general topic is explored more fully under Alternative 2 – On-Site Anaerobic Digester Alternative, below). A study looking at the overall viability of dairy digester clusters, including a specific case study in Kern County, concluded that financial feasibility is highly dependent on state and federal government assistance. However, connection to a dairy digester pipeline cluster project may be considered more attractive to a dairy operator, since the cluster is usually formed by an outside entity that assists in permit and grant

applications, and generally takes on maintenance responsibilities. In late 2018, California launched its first dairy digester pipeline cluster in Tulare County, organized by Calgren Renewable Fuels in partnership with Maas Energy Works and a dozen or so dairy operators. The cluster includes 22 miles of pipeline and 75,000 cows that contribute to the interconnected system. The system is estimated to reduce approximately 1,867,651 metric tons of CO<sub>2</sub> equivalents over 10 years. The digesters and the cluster project were made possible in part by grants in 2017 and 2018 from California Department of Food and Agriculture's (CDFA) Dairy Digester Research and Development Program totaling approximately \$16 million, with an additional \$17.5 million in matching funds provided by the dairies and Calgren Renewable Fuels.

In summary, while dairy methane emissions may be significantly reduced under this alternative, the dairy digester pipeline alternative would be considered infeasible because no such system currently exists in the project vicinity, and the Oliveira Dairy operator has no control over whether a dairy digester cluster will be established within a reasonable distance of the Oliveira Dairy or within the time frame for the permitting and development of a digester cluster. In and of itself, a digester may not yet be cost-effective, though there are grant funds available for these types of projects. For each and every reason identified, this alternative was considered infeasible and rejected from further analysis.

## **12.1.2 EVALUATION OF ALTERNATIVES**

### **ALTERNATIVE 1 - NO PROJECT ALTERNATIVE**

CEQA Guidelines require discussion of the "No Project" alternative to allow decision makers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project [CEQA Guidelines Section 15126.6(e)]. Under the No Project Alternative, construction of the Oliveira Dairy Expansion would not occur. The existing dairy facility and agricultural operations currently developed on the project site would continue under the No Project Alternative. The existing herd size of 2,218 animals, including approximately 1,063 milk cows, would be maintained on the project site in addition to continued use of the existing wastewater management system. Uses permitted under the General Agriculture zoning designation without discretionary approval by Merced County are limited to crop production, including orchards and vineyards. Thus, the agricultural activities permitted by Merced County zoning designations and the facilities currently developed on the project site would continue under the No Project Alternative.

There are 21 significant impacts that would occur with implementation of the proposed Oliveira Dairy Expansion project. Of these, five impacts would remain significant and unavoidable after the implementation of all feasible mitigation measures - two for air quality and three for water quality. The No Project Alternative would reduce the magnitude of anticipated environmental impacts associated with the proposed project. The No Project Alternative would avoid the increment of increase for air quality impacts, groundwater contamination, and impacts to water quality at off-site locations from manure export as a result of the proposed project. The No Project Alternative would not create any construction impacts or provide a source of additional odors. The No Project Alternative would reduce the magnitude of impacts related to air quality; biological and cultural resources; greenhouse gas emissions and energy; nuisance insects; hydrology and soil erosion; and land use compatibility. Based on the foregoing, the No Project Alternative would result in fewer environmental effects than the proposed Oliveira Dairy Expansion project. Table 12-1 includes an evaluation of the relative impacts of implementing Alternative 1 - No Project Alternative compared to the proposed project.

**Table 12-1 Evaluation of Alternative 1 – No Project Alternative**

Impact	Level of Impact for Project	Level of Impact of Alternative 1 Compared to Proposed Project
<b>Air Quality and Odors</b>		
Construction-related emissions	PS/LS	Reduced magnitude and significance from project since no additional dairy facilities would be constructed on the project site
Carbon monoxide emissions from operational equipment and increased traffic	LS	Reduced magnitude but not significance from project since there would be no increase in traffic
Ozone precursor emissions from dairy operations, farm equipment, and increased traffic	SU	Reduced magnitude and significance from project since there would be no increment of increase
PM <sub>10</sub> and PM <sub>2.5</sub> emissions from fugitive dust during project operations	LS	Reduced magnitude but not significance from project since there would be no increment of increase
Expose nearby residents to substantial pollutant concentrations from the emissions of toxic air contaminants from project construction and operations	PS/LS	Reduced magnitude and significance from project since there would be no increment of increase
Expose nearby residents to substantial pollutant concentrations from emissions of criteria air pollutants	PS/LS	Reduced magnitude and significance from project since there would be no increment of increase
Adverse odor from project operations	PS/LS	Reduced magnitude and significance from project since there would be no increment of increase
Conflict with or obstruct implementation of the applicable air quality plan	LS	No change from project
<b>Biological Resources</b>		
Nest disturbance and loss of foraging habitat for Swainson’s hawk	PS/LS	Reduced magnitude and significance from project since there would be no construction or conversion of cropland
Loss of foraging and nesting habitat for sensitive and migratory bird species	PS/LS	Reduced magnitude and significance from project since there would be no construction or conversion of cropland
Loss of nesting habitat for tricolored blackbird	PS/LS	Reduced magnitude and significance from project since there would be no construction or conversion of cropland
Loss of habitat for the San Joaquin kit fox and/or American badger	PS/LS	Reduced magnitude and significance from project since there would be no construction or conversion of cropland
Impacts to additional special-status wildlife species	LS	No change from project since there are none located within the area that would be disturbed by construction
Loss and/or degradation of special-status plant species	LS	No change from project since there is no suitable habitat located within the area that would be disturbed by construction
Loss and/or degradation of riparian habitat or wetlands	LS	No change from project since there are none located within the area that would be disturbed by construction
Interference with on-site wildlife movement corridor	LS	No change from project since there is a considerable amount of open space in the greater vicinity of the project site that can be used for wildlife movement
Potential selenium and heavy metals effects to on-site biological resources	PS/LS	Reduced magnitude and significance from project since there would be no increment of increase in the amount of feed

<b>Table 12-1 Evaluation of Alternative 1 – No Project Alternative</b>		
<b>Impact</b>	<b>Level of Impact for Project</b>	<b>Level of Impact of Alternative 1 Compared to Proposed Project</b>
Conflict with local policies or ordinances protecting biological resources	LS	No change from project
<b>Cultural Resources and Tribal Cultural Resources</b>		
Cause a substantial adverse change in the significance of a historical, archaeological, or paleontological resource, or a unique geological feature	PS/LS	Reduced magnitude but not significance from project since cropping activities could result in discovery of unknown cultural resources
Result in the accidental discovery and disturbance of human remains	PS/LS	Reduced magnitude but not significance from project since cropping activities could result in accidental discovery of human remains
Cause a substantial adverse change in the significance of a tribal cultural resource	LS	No change from project since no traditional cultural properties were identified
<b>Greenhouse Gas Emissions and Energy Use</b>		
Greenhouse gas emissions from project construction and operation	LS	Reduced magnitude but not significance from project since there would be no increment of increase
Wasteful or inefficient use of energy	LS	Reduced magnitude but not significance from project since there would be no increment of increase
Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions, or conflict with or obstruct a state or local plan for renewable energy or energy efficiency	LS	No change from project
<b>Nuisance Conditions from Insects</b>		
Increased fly production and related nuisance effects	PS/LS	Reduced magnitude and significance from project since there would be no increment of increase
Create significant nuisance conditions due to increased mosquito production	LS	Reduced magnitude but not significance from project since there would be no increment of increase
<b>Hydrology, Water Quality, and Soil Erosion</b>		
Degradation of water quality due to storm water runoff during project construction	PS/LS	Reduced magnitude and significance from project since no additional dairy facilities would be constructed on the project site
Degradation of surface water quality from dairy expansion operations	LS	Reduced magnitude but not significance from project since there would be no increment of increase
Groundwater contamination from dairy expansion operations	SU	Reduced magnitude and significance from project since there would be no increment of increase
Decrease groundwater supplies	LS	Reduced magnitude but not significance from project since there would be no increment of increase in groundwater use
Modification of surface water drainage patterns and an increase in runoff	LS	Reduced magnitude but not significance from project since no additional dairy facilities would be constructed on the project site
Risk release of pollutants due to project inundation in flood zones	PS/LS	Reduced magnitude but not significance from project since some of existing dairy production areas are currently subject to inundation



**Table 12-1 Evaluation of Alternative 1 – No Project Alternative**

<b>Impact</b>	<b>Level of Impact for Project</b>	<b>Level of Impact of Alternative 1 Compared to Proposed Project</b>
Water supply pathways for pollutant migration	LS	No change from project since existing wells are not a conduit for contamination
Impacts to water quality at off-site locations as a result of project operations	SU	Reduced magnitude and significance from project since there would be no increment of increase in exported manure
Impacts to water quality due to septic systems located in limited on-site soils	PS/LS	Reduced magnitude and significance from project since there would be no change in septic systems
Conflict with or obstruct implementation of the applicable water quality or groundwater management plan	LS	No change from project
<b>Land Use Compatibility</b>		
Consistency with Merced County Land Use Plans and policies	LS	No impact since no additional dairy facilities would be constructed on the project site
Land use compatibility with existing off-site residential uses adjacent to the project	PS/LS	Reduced magnitude and significance from project since there would be no increment of increase
Land use compatibility with existing wildlife uses adjacent to the project area	LS	No change from project since there are no wildlife areas adjacent to the project
<b>Cumulative Impacts</b>		
Aesthetics	LS	No change from project
Agricultural Resources	LS	No change from project
Air Quality	SU	No change from project
Biological Resources	LS	No change from project
Cultural Resources	LS	No change from project
Geological Resources	LS	No change from project
GHG Emissions	LS	No change from project
Hazards	LS	No change from project
Hydrology and Water Quality	SU	No change from project
Land Use	LS	No change from project
Mineral Resources	LS	No change from project
Noise	LS	No change from project
Population and Housing	LS	No change from project
Transportation	LS	No change from project
Utilities and Service Systems	LS	No change from project
Growth Inducement & Secondary Effects	LS	No change from project
Irreversible Commitment of Resources	LS	Reduced magnitude but not significance from project
Potential Environmental Damage from Accidents	LS	No change from project

Notes: LS = Less than significant impact PS = Potentially significant impact SU = Significant and unavoidable impact

Implementation of the No Project Alternative may not fully meet the following goals of the project applicant in proposing the Oliveira Dairy Expansion project.

- *To maintain a modern, efficient, and competitive dairy operation that operates in full compliance with applicable county, state, and federal laws and regulations.* Under this alternative, no dairy expansion would be developed. Smaller dairy farms in the U.S. are observed to have higher costs per unit of milk produced than larger farms, largely due to farm inefficiencies and economies of size (Tauer and Mishra 2005). Larger farms realize lower production costs for a number of reasons, including fixed capital costs spread over more units of output, access to better technologies, specialization at larger farms, and volume discounts for input items such as feed. The cost advantages of a larger size allow large dairy farms to be more profitable than smaller operations (USDA 2007).
- *To generate dry manure and manure slurry that can be land applied and/or sold as a commodity for use as fertilizer in the region.* Since the dairy expansion would not occur, reduced amounts of dairy process water and manure would be generated and exported off site. Exported solid manure applied to off-site agricultural fields not owned by the project applicant would increase from 3,800 tons to 7,500 tons with the proposed expansion. (DEIR, Chapter 3, *Project Description*, page 3-12)
- *To provide year-round employment opportunities, at competitive wages, for Merced County residents. Unlike other agricultural operations, which provide only seasonal employment, dairies provide year-round employment.* The dairy under existing operations currently employs a staff of approximately 7 workers; with implementation of the proposed expansion, the number of employees would increase to approximately 14 workers. Since the dairy expansion would not occur under this alternative, no additional employees beyond those existing would be required. (DEIR, Chapter 3, *Project Description*, page 3-16)

## **ALTERNATIVE 2 – ON-SITE ANAEROBIC DIGESTER ALTERNATIVE**

Under the On-Site Anaerobic Digester Alternative, an anaerobic digester would be constructed at the existing dairy, or the existing wastewater lagoons would be covered and re-constructed as an anaerobic digester. All other improvements and the herd size increase associated with the proposed dairy expansion project would also occur under the On-Site Anaerobic Digester Alternative. This alternative was selected to further reduce greenhouse gas emissions and to consider a strategy that may be adopted in the future as a result of the ARB's Climate Change Scoping Plan (ARB 2014) recommended actions for the agriculture sector.

In addition to generating renewable energy, anaerobic digestion leads to reduced odor pollution, fewer pathogens, and reduced greenhouse gas emissions. There is little change in the nutrient value of the manure and organic matter that passes through the process, which can then be used as fertilizer (eXtension 2015). Methane produced from the collected manure (termed "biogas") can be captured with an estimated effectiveness of 95 percent. It is estimated that combustion of biomethane for energy recovery will convert up to 99 percent of the methane into carbon dioxide. Taking the effect of the CO<sub>2</sub> produced from the combustion of CH<sub>4</sub> into account, an overall reduction of 63.5 percent of fugitive CH<sub>4</sub> emissions can be achieved by the use of properly designed and controlled anaerobic treatment (SJVAPCD 2009). Of the 20 operating anaerobic digesters at California dairies (with data) as reported by the U.S. EPA AgSTAR program in 2018, the average methane emission reduction was approximately 34,516 metric tons of CO<sub>2</sub> equivalents per year (with

a median value of 28,015 metric tons of CO<sub>2</sub> equivalents per year), or an approximate 7.2 metric tons of CO<sub>2</sub> equivalents per year reduction per cow (EPA 2018).

The methane from a digester is destroyed through combustion in an engine, flare, or other devices. Burning biogas reduces greenhouse gas emissions in two ways. First, when manure is stored in a conventional liquid handling system without a digester, it typically emits a certain amount of methane-containing biogas. When that methane is collected in a digester and burned, it then will not escape into the atmosphere and cause warming. Second, electricity generated from that digester biogas will typically replace fossil fuel-generated electricity, and there would be a reduction in CO<sub>2</sub> emissions from not burning that fossil fuel (eXtension 2015; Cuellar 2008).

Despite the benefits of anaerobic digestion systems in relation to greenhouse gases and odors, these systems could result in increased nitrogen oxide emissions, and soil and groundwater contamination.<sup>2</sup> The anaerobic treatment process creates intermediates such as ammonia, hydrogen sulfide, orthophosphates, and various salts, all of which must be properly controlled or captured. In addition, atmospheric releases at locations off-site where biogas is shipped may negate or decrease the benefit of emissions controls on-site. Thus, while devices such as Selective Catalyst Reduction units can reduce NO<sub>x</sub> emissions and proper treatment system operation can control intermediates, improper design or operation may lead to violations of federal, state, and local air quality regulations as well as the release of toxic air contaminants. With regard to water quality, it is critical that project developers and managers ensure digester integrity, and fully consider and address post-digestion management of the effluent in order to avoid contamination of local waterways and groundwater resources (de Boer 2008). Catastrophic digester failures, leakage from pipework and tanks, and lack of containment in waste storage areas are all examples of potential problems. Further, application of improperly treated digestate and/or improper application timing or rates of digestate to agricultural land may lead to increased nitrogen oxide emissions, soil contamination, and/or nutrient leaching, thus negating or reducing benefits of the project overall (CCAR 2008).

To facilitate the permitting of dairy digesters in the Central Valley, the CVRWQCB adopted the Waste Discharge Regulatory Program for Dairy Manure Digester and Co-Digester Facilities, and evaluated the potential environmental impacts of the program in the Dairy Manure Digester and Co-Digester Facilities Draft Program EIR (Dairy Digester Program EIR) (CVRWCB 2010). In order to evaluate potential construction and operational emissions for the On-Site Anaerobic Digester Alternative, this EIR references the air quality analysis included in the Dairy Digester Program EIR. There are numerous uncertainties regarding details of the anaerobic digester that would be appropriate and preferable for the Oliveira Dairy operation, including but not limited to location, size, engine type, and use of a co-digester<sup>3</sup>, making project-specific quantification of air emissions and air toxics speculative and beyond the scope of this alternative. The emission estimates for a single digester included in the Dairy Digester Program EIR provide adequate information for a meaningful evaluation and comparison with the proposed project, and will be used in this analysis.

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<sup>2</sup> The combustion of biogas could result in increased nitrogen oxide emissions. While devices such as Selective Catalyst Reduction units can reduce NO<sub>x</sub> emissions, uncontrolled emissions from combustion of biogas may contain between 200 to 300 ppm of NO<sub>x</sub> (de Boer 2008).

<sup>3</sup> A dairy digester pipeline cluster alternative is considered in Section 12.1.1 above.

As evaluated in Chapter 6, *Air Quality and Greenhouse Gas Emissions*, of the Dairy Digester Program EIR, construction and operation of a dairy digester is not anticipated to exceed SJVAPCD thresholds of significance in most cases (CVRWCB 2010). Operational emissions of an individual digester would result in no net increase of ROG/VOC emissions<sup>4</sup>, and a net increase in NO<sub>x</sub>, PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, and CO. While the digester itself would not result in an increase in criteria air pollutants that would exceed SJVAPCD criteria, the On-Site Anaerobic Digester Alternative would result in an increase in air pollutant emissions compared to the proposed project that could exceed SJVAPCD criteria.

Prior to implementation of this alternative, as required by the RWQCB Dairy Digester Program EIR, an air quality technical report would be prepared to determine if construction and operation related air pollutant emissions would exceed SJVAPCD thresholds, as well as whether any health risks associated with toxic air contaminants would result. The technical report would evaluate all project emissions according to CEQA, and would include mitigation measures designed to reduce emissions below levels of significance, if necessary. Additional permits would also be required for the digester depending on location and resources affected. An Authority to Construct and Permit to Operate would be required from the SJVAPCD.

Another important consideration in this alternative is the feasibility of installing manure digesters at dairies in the San Joaquin Valley. Several studies have examined the financial feasibility of installing different types of manure digester operations and determined that financial feasibility is highly dependent on state and federal government assistance. In one particular study, most of the project scenarios reviewed had high energy production costs or limited revenues and, as a result, were not economically viable without ongoing assistance (USDA 2013). A different study examining the economic feasibility of six operating dairy methane digester systems in California confirmed that there are great cost challenges to overcome for many California dairy digester projects to become feasible without subsidies under the currently available rate structures (CEC 2013). In that study, only one operation out of the six could be considered feasible when excluding grant money. Additionally, a 2011 CVRWQCB study evaluating the economic feasibility of dairy manure digester and co-digester facilities in the Central Valley concluded that for dairy digester projects to become financially viable, they must cost less to build and run, and they must generate larger revenue streams (CVRWQCB 2011).

The installation of manure digesters to reduce methane emissions was included as a voluntary strategy for the agricultural sector in the ARB Scoping Plan, and will continue to be voluntary at least through 2023. Funds from the Cap-and-Trade Program are allocated to the Greenhouse Gas Reduction Fund to be administered by CDFA to support such projects. Dairy digesters and manure management funding has totaled \$260 million to date (December 2018) through the Dairy Digester Research and Development Program (DDRDP) and the Alternative Manure Management Program (AMMP). Alternative projects could include installation of mechanical manure solids separation on dairies with flush systems, or conversion to dry manure management practices, such as scrape or vacuum systems, combined with composting or solar drying of manure. Current DDRDP projects are expected to reduce greenhouse gas emissions by an estimated 12.9 million metric tons of CO<sub>2</sub>e. The 58 AMMP projects awarded so far are expected to reduce greenhouse gas emissions by an estimated 716,800 metric tons of CO<sub>2</sub>e over 5 years (CDFA 2018).

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<sup>4</sup> While there would be an increase in VOC emissions as a result of vehicle and equipment emissions and biogas combustion, the digester would reduce VOC emissions from the lagoon.

Despite the availability of both federal and state funding for digester construction, policies and initiatives to support the installation of digesters, and the existence of the ARB offset protocol for livestock projects, only a small fraction of California’s dairies currently have working digesters (CalCAN 2015).

There are 21 significant impacts that would occur with implementation of the proposed Oliveira Dairy Expansion project. Of these, five impacts would remain significant and unavoidable after the implementation of all feasible mitigation measures - two for air quality and three for water quality. The On-Site Anaerobic Digester Alternative would reduce the magnitude of anticipated environmental impacts associated with the proposed project. The On-Site Anaerobic Digester Alternative would reduce, but not avoid, odor impacts. Greenhouse gas emissions would also be reduced. There would be an increase in most criteria air pollutant emissions as described above, including an increase in toxic air emissions that could impact sensitive receptors. While the anaerobic digester would reduce pathogens in the liquid manure stored in the lagoon and applied to cropland off site, because the dry manure exported off site is separated from the waste stream and would not be processed in the manure digester, it would not minimize potential impacts from manure pathogen transport off site. The On-Site Anaerobic Digester Alternative would also reduce the magnitude of impacts related to energy use and water quality. Because the digester equipment could require additional area beyond the existing dairy footprint, this alternative could require conversion of cropland for the digester and potentially increased impacts to biological resources. Based on the foregoing, the On-Site Anaerobic Digester Alternative would result in fewer environmental effects than the proposed Oliveira Dairy Expansion project. Table 12-2 includes an evaluation of the relative impacts of implementing Alternative 2 - On-Site Anaerobic Digester Alternative compared to the proposed project.

<b>Table 12-2 Evaluation of Alternative 2 – On-Site Anaerobic Digester Alternative</b>		
<b>Impact</b>	<b>Level of Impact for Project</b>	<b>Level of Impact of Alternative 1 Compared to Proposed Project</b>
<b>Air Quality and Odors</b>		
Construction-related emissions	PS/LS	Increased magnitude but not significance from project since construction of the digester would result in additional emissions
Carbon monoxide emissions from operational equipment and increased traffic	LS	Increased magnitude but not significance from project since there would be additional equipment and vehicle trips associated with the digester
Ozone precursor emissions from dairy operations, farm equipment, and increased traffic	SU	Increased magnitude but not significance from project, since the manure digester could result in increased ozone precursor emissions
PM <sub>10</sub> and PM <sub>2.5</sub> emissions from fugitive dust during project operations	LS	Increased magnitude but not significance from project, since there would be additional vehicle trips associated with the digester
Expose nearby residents to substantial pollutant concentrations from the emissions of toxic air contaminants from project construction and operations	PS/LS	Potentially increased magnitude but not significance from project, since there would be additional air toxic emissions generated by the combustion of biogas
Expose nearby residents to substantial pollutant concentrations from emissions of criteria air pollutants	PS/LS	Potentially increased magnitude but not significance from project, since there would be additional air pollutant emissions from the digester operations

<b>Table 12-2 Evaluation of Alternative 2 – On-Site Anaerobic Digester Alternative</b>		
<b>Impact</b>	<b>Level of Impact for Project</b>	<b>Level of Impact of Alternative 1 Compared to Proposed Project</b>
Adverse odor from project operations	PS/LS	Reduced magnitude but not significance from project
Conflict with or obstruct implementation of the applicable air quality plan	LS	No change from project
<b>Biological Resources</b>		
Nest disturbance and loss of foraging habitat for Swainson’s hawk	PS/LS	Potentially increased magnitude but not significance from project, since there could be additional conversion of cropland for the digester
Loss of foraging and nesting habitat for sensitive and migratory bird species	PS/LS	Potentially increased magnitude but not significance from project, since there could be additional conversion of cropland for the digester
Loss of nesting habitat for tricolored blackbird	PS/LS	Potentially increased magnitude but not significance from project, since there could be additional conversion of cropland for the digester
Loss of habitat for the San Joaquin kit fox and/or American badger	PS/LS	Potentially increased magnitude but not significance from project, since there could be additional conversion of cropland for the digester
Impacts to additional special-status wildlife species	LS	No change from project since there are none located within the area that would be disturbed by construction
Loss and/or degradation of special-status plant species	LS	No change from project since there are none located within the area that would be disturbed by construction
Loss and/or degradation of riparian habitat or wetlands	LS	No change from project since there are none located within the area that would be disturbed by construction
Interference with on-site wildlife movement corridor	LS	No change from project since there is a considerable amount of open space in the greater vicinity of the project site that can be used for wildlife movement
Potential selenium and heavy metals effects to on-site biological resources	PS/LS	No change from project since there would be no change in the amount of feed required
Conflict with local policies or ordinances protecting biological resources	LS	No change from project
<b>Cultural Resources and Tribal Cultural Resources</b>		
Cause a substantial adverse change in the significance of a historical, archaeological, or paleontological resource, or a unique geological feature	PS/LS	Increased magnitude but not significance from project since construction of the digester would result in additional ground disturbance
Result in the accidental discovery and disturbance of human remains	PS/LS	Increased magnitude but not significance from project since construction of the digester would result in additional ground disturbance
Cause a substantial adverse change in the significance of a tribal cultural resource	LS	No change from project since no traditional cultural properties were identified
<b>Greenhouse Gas Emissions and Energy Use</b>		
Greenhouse gas emissions from project construction and operation	LS	Reduced magnitude but not significance from project
Wasteful or inefficient use of energy	LS	Reduced magnitude but not significance from project

**Table 12-2 Evaluation of Alternative 2 – On-Site Anaerobic Digester Alternative**

Impact	Level of Impact for Project	Level of Impact of Alternative 1 Compared to Proposed Project
Increase in GHG emissions that would conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions	LS	Reduced magnitude but not significance from project
<b>Nuisance Conditions from Insects</b>		
Increased fly production and related nuisance effects	PS/LS	Reduced magnitude but not significance from project
Create significant nuisance conditions due to increased mosquito production	LS	Reduced magnitude but not significance from project since the wastewater lagoon would be covered
<b>Hydrology, Water Quality, and Soil Erosion</b>		
Degradation of water quality due to storm water runoff during project construction	PS/LS	Increased magnitude but not significance from project
Degradation of surface water quality from dairy expansion operations	LS	No change from project
Groundwater contamination from dairy expansion operations	SU	Potential increased magnitude but not significance from project since nitrogen from the manure digester may be more readily available to the crops and could result in over application of nitrogen
Decrease groundwater supplies	LS	No change from project
Modification of surface water drainage patterns and an increase in runoff	LS	No change from project
Risk release of pollutants due to project inundation in flood zones	PS/LS	No change from project
Water supply pathways for pollutant migration	LS	No change from project since existing wells are not a conduit for contamination
Impacts to water quality at off-site locations as a result of project operations	SU	No change from project
Impacts to water quality due to septic systems located in limited on-site soils	PS/LS	No change from project
Conflict with or obstruct implementation of the applicable water quality or groundwater management plan	LS	No change from project
<b>Land Use Compatibility</b>		
Consistency with Merced County Land Use Plans and policies	LS	No change from project
Land use compatibility with existing off-site residential uses adjacent to the project	PS/LS	Reduced magnitude but not significance from project
Land use compatibility with existing wildlife uses adjacent to the project area	LS	No change from project
<b>Cumulative Impacts</b>		
Aesthetics	LS	No change from project
Agricultural Resources	LS	No change from project
Air Quality	SU	No change from project
Biological Resources	LS	No change from project

<b>Table 12-2 Evaluation of Alternative 2 – On-Site Anaerobic Digester Alternative</b>		
<b>Impact</b>	<b>Level of Impact for Project</b>	<b>Level of Impact of Alternative 1 Compared to Proposed Project</b>
Cultural Resources	LS	No change from project
Geological Resources	LS	No change from project
GHG Emissions	LS	No change from project
Hazards	LS	No change from project
Hydrology and Water Quality	SU	No change from project
Land Use and Planning	LS	No change from project
Mineral Resources	LS	No change from project
Noise	LS	No change from project
Population and Housing	LS	No change from project
Transportation	LS	No change from project
Utilities and Service Systems	LS	No change from project
Growth Inducement & Secondary Effects	LS	No change from project
Irreversible Commitment of Resources	LS	No change from project
Potential Environmental Damage from Accidents	LS	No change from project

Implementation of the Anaerobic Digester Alternative may not fully meet the following goals of the project applicant in proposing the Oliveira Dairy Expansion project.

- *To maintain a modern, efficient, and competitive dairy operation that operates in full compliance with applicable county, state, and federal laws and regulations.* This alternative is ineffective in reducing impacts of the project compared to the other action alternative (see DEIR Table 12-6 for a relative comparison of alternatives). The dairy digester represents a large capital cost and requires proper management and maintenance to realize a financial return. Further, installation of manure digesters to reduce methane emissions is a voluntary strategy in the ARB Scoping Plan.
- *To construct improvements that can be permitted within a reasonable time frame and would represent commensurate benefit with cost.* This alternative may take additional time to permit with both the SJVAPCD and the CVRWQCB. In addition, recent studies have found installing dairy digesters are generally not financially feasible, especially without the infusion of grant funds.

### **ALTERNATIVE 3 – AIR EMISSIONS LIMITED HERD SIZE**

In general, the amount of air emissions and volume of manure and process water generated at animal confinement facilities are proportional to the number of animals managed at the facilities. A limitation in the number of dairy cows and support stock at the Oliveira Dairy Expansion project would result in a corresponding limitation in manure and associated air emissions, and an overall limitation in the equipment and increased traffic. The alternative would restrict the total herd size to 2,376 animals<sup>5</sup>. This restriction would reduce volatile organic compounds (VOC) emissions, an

<sup>5</sup> While this represents a minimal increase in overall cows, the proposed herd restructuring includes animals with higher emission factors.



ozone precursor, for the proposed project to less-than-significant levels. This alternative would reduce the size of the Oliveira Dairy Expansion herd to approximately 54 percent of the proposed total herd.

Table 12-3 shows the existing and proposed herd size for the Oliveira Dairy Expansion Alternative 3 - Air Emissions Limited Herd Size.

	<b>Milk Cows</b>	<b>Dry Cows</b>	<b>Bred Heifers (15-24 mo.)</b>	<b>Heifers (7-14 mo.)</b>	<b>Calves (4-6 mo.)</b>	<b>Calves (0-3 mo.)</b>	<b>Mature Bulls</b>	<b>Total Animals</b>
Existing	1,063	158	467	344	0	186	0	2,218
Proposed	1,350	216	203	203	203	203	0	2,376
<b>Change</b>	<b>160</b>	<b>102</b>	<b>54</b>	<b>80</b>	<b>25</b>	<b>23</b>	<b>0</b>	<b>158</b>

Note: This evaluation considers maximum buildout.

Source: Project Applicant, April 2017; Existing Conditions Nutrient Management Plan (08/17/2016); Planning Partners 2019.

The VOC Emission Factors used in this analysis are from the dairy emissions calculator spreadsheet provided by the SJVAPCD (dated September 2015). Aggregated VOC emissions for all activities associated with the Oliveira Dairy Expansion Alternative 3 Air Emissions Limited Herd Size are presented in Table 12-4 below.

<b>Emission Source</b>	<b>Existing VOC/ROG Emissions</b>	<b>Proposed VOC/ROG Emissions</b>	<b>Increment of Increase with Alternative 3 Herd</b>
Equipment and Increased Traffic	0.90	0.95	0.05
Manure Management and Feed	24.10	33.97	9.87
<b>Total</b>	25.00	34.92	9.92
SJVAPCD Significance Criterion			<b>10 tons/year</b>
Criterion Exceeded?			<b>NO</b>

Source: Planning Partners 2019.

There are 21 significant impacts that would occur with implementation of the proposed Oliveira Dairy Expansion project. Of these, five impacts would remain significant and unavoidable after the implementation of all feasible mitigation measures - two for air quality and three for water quality. Limiting the size of the Oliveira Dairy Expansion would reduce individual project effects for ozone precursor emissions to a less-than-significant level. The magnitude of water quality effects would also be reduced, in addition to water quality contamination from manure transport off site, and nuisance effects from insects, although the level of significance would remain unchanged. Potential effects related to construction, including PM<sub>10</sub> construction effects, would be reduced under the limited herd alternative since construction of the dairy facilities would result in a smaller facility than the proposed project. Implementation of the Air Emissions Limited Herd Size Alternative would reduce the magnitude of impacts related to air quality; biological and cultural resources; and greenhouse gas emissions and energy.

Assumptions regarding the operational characteristics of the dairy project under the Limited Herd Size alternative would remain the same as for the proposed project. Flushing of the freestall barns and scraping of corrals would generate manure and process water. The process water generated by the dairy would be reused as irrigation for the growing of silage and other crops adjacent to animal confinement facilities, and applied to nearby agricultural fields off site. Dry manure generated by the dairy would be separated from liquids, accumulated on site, and processed for bedding material, or sold and hauled off site for use as fertilizer and soil amendments. The amount of process water and manure generated at the dairy under this alternative would be expected to be proportional to the herd size.

Following is a comparative evaluation of implementing the Air Emissions Limited Herd Size Alternative (see Table 12-5) compared to the effects of the proposed project.

<b>Table 12-5 Evaluation of Alternative 3 – Air Emissions Limited Herd Size Alternative</b>		
<b>Impact</b>	<b>Level of Impact for Project</b>	<b>Level of Impact of Alternative 1 Compared to Proposed Project</b>
<b>Air Quality and Odors</b>		
Construction-related emissions	PS/LS	Reduced magnitude but not significance from project
Carbon monoxide emissions from operational equipment and increased traffic	LS	Reduced magnitude but not significance from project
Ozone precursor emissions from dairy operations, farm equipment, and increased traffic	SU	Reduced magnitude and significance from project
PM <sub>10</sub> and PM <sub>2.5</sub> emissions from fugitive dust during project operations	LS	Increased magnitude but not significance from project, since there would be additional vehicle trips associated with the digester
Expose nearby residents to substantial pollutant concentrations from the emissions of toxic air contaminants from project construction and operations	PS/LS	Reduced magnitude but not significance from project
Expose nearby residents to substantial pollutant concentrations from emissions of criteria air pollutants	PS/LS	Reduced magnitude but not significance from project
Adverse odor from project operations	PS/LS	Reduced magnitude but not significance from project
Conflict with or obstruct implementation of the applicable air quality plan	LS	No change from project
<b>Biological Resources</b>		
Nest disturbance and loss of foraging habitat for Swainson’s hawk	PS/LS	Reduced magnitude but not significance from project
Loss of foraging and nesting habitat for sensitive and migratory bird species	PS/LS	Reduced magnitude but not significance from project
Loss of nesting habitat for tricolored blackbird	PS/LS	Reduced magnitude but not significance from project
Loss of habitat for the San Joaquin kit fox and/or American badger	PS/LS	Reduced magnitude but not significance from project

**Table 12-5 Evaluation of Alternative 3 – Air Emissions Limited Herd Size Alternative**

Impact	Level of Impact for Project	Level of Impact of Alternative 1 Compared to Proposed Project
Impacts to additional special-status wildlife species	LS	No change from project since impacts to these species would not occur
Loss and/or degradation of special-status plant species	LS	No change from project since there are none located within the area that would be disturbed by construction
Loss and/or degradation of riparian habitat or wetlands	LS	No change from project since there are none located within the area that would be disturbed by construction
Interference with on-site wildlife movement corridor	LS	No change from project since there is a considerable amount of open space in the greater vicinity of the project site that can be used for wildlife movement
Potential selenium and heavy metals effects to on-site biological resources	PS/LS	Reduced magnitude but not significance from project since there would be a reduced increment of increase in the amount of feed
Conflict with local policies or ordinances protecting biological resources	LS	No change from project
<b>Cultural Resources and Tribal Cultural Resources</b>		
Cause a substantial adverse change in the significance of a historical, archaeological, or paleontological resource, or a unique geological feature	PS/LS	Reduced magnitude but not significance from project since a smaller facility expansion would occur
Result in the accidental discovery and disturbance of human remains	PS/LS	Reduced magnitude but not significance from project since a smaller facility expansion would occur
Cause a substantial adverse change in the significance of a tribal cultural resource	LS	No change from project since no traditional cultural properties were identified
<b>Greenhouse Gas Emissions and Energy Use</b>		
Greenhouse gas emissions from project construction and operation	LS	Reduced magnitude but not significance from project
Wasteful or inefficient use of energy	LS	Reduced magnitude but not significance from project
Increase in GHG emissions that would conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions	LS	Reduced magnitude but not significance from project
<b>Nuisance Conditions from Insects</b>		
Increased fly production and related nuisance effects	PS/LS	Reduced magnitude but not significance from project
Create significant nuisance conditions due to increased mosquito production	LS	Reduced magnitude but not significance from project
<b>Hydrology, Water Quality, and Soil Erosion</b>		
Degradation of water quality due to storm water runoff during project construction	PS/LS	Reduced magnitude but not significance from project
Degradation of surface water quality from dairy expansion operations	LS	Reduced magnitude but not significance from project
Groundwater contamination from dairy expansion operations	SU	Reduced magnitude but not significance from project
Decrease groundwater supplies	LS	No significant change from project since water use would decrease due to an increase in recycled water usage

**Table 12-5 Evaluation of Alternative 3 – Air Emissions Limited Herd Size Alternative**

<b>Impact</b>	<b>Level of Impact for Project</b>	<b>Level of Impact of Alternative 1 Compared to Proposed Project</b>
Modification of surface water drainage patterns and an increase in runoff	LS	Reduced magnitude but not significance from project
Risk release of pollutants due to project inundation in flood zones	PS/LS	Reduced magnitude but not significance from project
Water supply pathways for pollutant migration	LS	No change from project
Impacts to water quality at off-site locations as a result of project operations	SU	Reduced magnitude but not significance from project
Impacts to water quality due to septic systems located in limited on-site soils	PS/LS	No change from project
Conflict with or obstruct implementation of the applicable water quality or groundwater management plan	LS	No change from project
<b>Land Use Compatibility</b>		
Consistency with Merced County Land Use Plans and policies	LS	No change from project
Land use compatibility with existing off-site residential uses adjacent to the project	PS/LS	Reduced magnitude but not significance from project
Land use compatibility with existing wildlife uses adjacent to the project area	LS	No change from project since there are no wildlife areas within setback standards
<b>Cumulative Impacts</b>		
Aesthetics	LS	No change from project
Agricultural Resources	LS	No change from project
Air Quality	SU	No change from project
Biological Resources	LS	No change from project
Cultural Resources	LS	No change from project
Geological Resources	LS	No change from project
GHG Emissions	LS	No change from project
Hazards	LS	No change from project
Hydrology and Water Quality	SU	No change from project
Land Use and Planning	LS	No change from project
Mineral Resources	LS	No change from project
Noise	LS	No change from project
Population and Housing	LS	No change from project
Transportation	LS	No change from project
Utilities and Service Systems	LS	No change from project
Growth Inducement & Secondary Effects	LS	No change from project
Irreversible Commitment of Resources	LS	No change from project
Potential Environmental Damage from Accidents	LS	No change from project

Implementation of the Air Emissions Limited Herd Size Alternative may not meet the following goals of the project applicant in proposing the Oliveira Dairy Expansion project.

- *To maintain a modern, efficient, and competitive dairy operation that operates in full compliance with applicable county, state, and federal laws and regulations.* As discussed under the No Project Alternative, the cost advantages of a larger size allow large dairy farms to be more profitable than smaller operations. While the dairy facilities would be expanded under this alternative, a reduced herd size would make it difficult for this dairy to realize its full economic potential and to maintain competitive operations.
- *To provide year-round employment opportunities, at competitive wages, for Merced County residents. Unlike other agricultural operations, which provide only seasonal employment, dairies provide year-round employment.* With a reduced herd size, fewer employees may be required under this alternative. While this alternative would increase the number of employees from the 7 existing, not all of the 14 projected employees proposed would be required for a smaller herd. (DEIR, Chapter 3, *Project Description*, page 3-16)

## 12.2 COMPARISON OF THE ENVIRONMENTAL MERITS OF EACH ALTERNATIVE

In Table 12-6, the symbol “-5” means that an alternative has a lower magnitude of impact and level of significance than that for the project (e.g., the adverse environmental condition is less than for the project, so that the impact is less than significant rather than significant). The symbol “-1” means that an alternative has a lower magnitude of impact than that for the project (e.g., the adverse environmental condition is somewhat less than for the project, but the significance of the impact is unchanged). The symbol “0” means that the alternative has an environmental effect that is equal in significance and magnitude to the proposed project. The symbol “+1” means that an alternative has a higher magnitude of impact than that for the project (e.g., adverse environmental condition is more than for the project, but the significance of the impact is unchanged). Finally, the symbol “+5” means that an alternative has a more significant impact than the proposed project (i.e., a significant impact rather than less than significant). These numerical values have been assigned to these categories in order to assess each alternative across a large number of impact areas.

Definition	Numerical Value (as explained below and shown in Table 12-6)
Reduced magnitude and significance of impact compared to proposed project	-5
Reduced magnitude of impact, but no change in level of significance	-1
Same magnitude and significance of impact as proposed project	0
Increased magnitude of impact, but no change in level of significance	1
Increased magnitude and significance of impact compared to proposed project	5

Because the emphasis of the alternatives analysis is on minimizing or avoiding impacts, those categories associated with avoiding or causing impacts not attributable to the project are assigned a value of -5 or 5 respectively. If an alternative lessens or increases the magnitude of an impact without changing its significance, the category is assigned a value of -1 or 1. The number at the bottom of Table 12-6 indicates, for each alternative, the net number of identified impacts of the project that were avoided or reduced by the alternative.

CEQA requires the selection of an environmentally superior alternative; however, if the environmentally superior alternative is the “no project” alternative, the EIR shall also identify an

environmentally superior alternative among the other alternatives (CEQA Guidelines Section 15126.6(e)(2)). Therefore, based on this comparative evaluation, Alternative 3 (Air Emissions Limited Herd Size Alternative) would reduce the magnitude of the most impacts as an action alternative. Several of the significant impacts identified for the project would be reduced, but not eliminated, with implementation of Alternative 3. Alternative 3 would be the environmentally superior alternative.

The Merced County Planning Commission will consider the selection of a preferred project upon review of this EIR and other information in the public record. Identification of an environmentally superior alternative does not require that Merced County choose that alternative. In choosing a preferred project, Merced County is required to make written findings regarding its choice of a project to implement, including the reasons why it chose not to implement an environmentally superior alternative or alternatives, if the selected project is not the environmentally superior alternative. In the findings, Merced County must set forth its reasoning for proceeding with the Oliveira Dairy Expansion project. Such reasoning could include the social, economic, or other benefits provided by the Oliveira Dairy Expansion project. This process allows a lead agency to balance any environmental harm with other factors appropriate in judging the merits of a project.

<b>Table 12-6 Relative Comparison of Alternatives</b>				
<b>Impact</b>	<b>Level of Impact for Project</b>	<b>Alt. 1 – No Project</b>	<b>Alt. 2 – Anaerobic Digester</b>	<b>Alt. 3 – Limited Herd Size</b>
<b>Air Quality and Odors</b>				
Construction-related emissions	PS/LS	-5	+1	-1
Carbon monoxide emissions from operational equipment and increased traffic	LS	-1	+1	-1
Ozone precursor emissions from dairy operations, farm equipment, and increased traffic	SU	-5	+1	-5
PM <sub>10</sub> and PM <sub>2.5</sub> emissions from fugitive dust during project operations	LS	-1	+1	+1
Expose nearby residents to substantial pollutant concentrations from the emissions of toxic air contaminants from project construction and operations	PS/LS	-5	+1	-1
Expose nearby residents to substantial pollutant concentrations from emissions of criteria air pollutants	PS/LS	-5	+1	-1
Adverse odor from project operations	PS/LS	-5	-1	-1
Conflict with or obstruct implementation of the applicable air quality plan	LS	0	0	0
<b>Biological Resources</b>				
Nest disturbance and loss of foraging habitat for Swainson’s hawk	PS/LS	-5	+1	-1
Loss of foraging and nesting habitat for sensitive and migratory bird species	PS/LS	-5	+1	-1
Loss of nesting habitat for tricolored blackbird	PS/LS	-5	+1	-1

<b>Table 12-6 Relative Comparison of Alternatives</b>				
<b>Impact</b>	<b>Level of Impact for Project</b>	<b>Alt. 1 – No Project</b>	<b>Alt. 2 – Anaerobic Digester</b>	<b>Alt. 3 – Limited Herd Size</b>
Loss of habitat for the San Joaquin kit fox and/or American badger	PS/LS	-5	+1	-1
Impacts to additional special-status wildlife species	LS	0	0	0
Loss and/or degradation of special-status plant species	LS	0	0	0
Loss and/or degradation of riparian habitat or wetlands	LS	0	0	0
Interference with on-site wildlife movement corridor	LS	0	0	0
Potential selenium and heavy metals effects to on-site biological resources	PS/LS	-5	0	-1
Conflict with local policies or ordinances protecting biological resources	LS	0	0	0
<b>Cultural Resources and Tribal Cultural Resources</b>				
Cause a substantial adverse change in the significance of a historical, archaeological, or paleontological resource, or a unique geological feature	PS/LS	-1	+1	-1
Result in the accidental discovery and disturbance of human remains	PS/LS	-1	+1	-1
Cause a substantial adverse change in the significance of a tribal cultural resource	LS	0	0	0
<b>Greenhouse Gas Emissions and Energy Use</b>				
Greenhouse gas emissions from project construction and operation	LS	-1	-1	-1
Wasteful or inefficient use of energy	LS	-1	-1	-1
Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions, or conflict with or obstruct a state or local plan for renewable energy or energy efficiency	LS	0	-1	-1
<b>Nuisance Conditions from Insects</b>				
Increased fly production and related nuisance effects	PS/LS	-5	-1	-1
Create significant nuisance conditions due to increased mosquito production	LS	-1	-1	-1
<b>Hydrology, Water Quality, and Soil Erosion</b>				
Degradation of water quality due to storm water runoff during project construction	PS/LS	-5	+1	-1
Degradation of surface water quality from dairy expansion operations	LS	-1	0	-1
Groundwater contamination from dairy expansion operations	SU	-5	+1	-1

<b>Table 12-6 Relative Comparison of Alternatives</b>				
<b>Impact</b>	<b>Level of Impact for Project</b>	<b>Alt. 1 – No Project</b>	<b>Alt. 2 – Anaerobic Digester</b>	<b>Alt. 3 – Limited Herd Size</b>
Decrease groundwater supplies	LS	-1	0	0
Modification of surface water drainage patterns and an increase in runoff	LS	-1	0	-1
Risk release of pollutants due to project inundation in flood zones	PS/LS	-5	0	-1
Water supply pathways for pollutant migration	LS	0	0	0
Impacts to water quality at off-site locations as a result of project operations	SU	-5	0	-1
Impacts to water quality due to septic systems located in limited on-site soils	PS/LS	-5	0	0
Conflict with or obstruct implementation of the applicable water quality or groundwater management plan	LS	0	0	0
<b>Land Use Compatibility</b>				
Consistency with Merced County Land Use Plans and policies	LS	0	0	0
Land use compatibility with existing off-site residential uses adjacent to the project	PS/LS	-5	-1	-1
Land use compatibility with existing wildlife uses adjacent to the project area	LS	0	0	0
<b>Cumulative Impacts</b>				
Aesthetics	LS	0	0	0
Agricultural Resources	LS	0	0	0
Air Quality	SU	0	0	0
Biological Resources	LS	0	0	0
Cultural Resources	LS	0	0	0
Geological Resources	LS	0	0	0
GHG Emissions	LS	0	0	0
Hazards	LS	0	0	0
Hydrology and Water Quality	SU	0	0	0
Land Use and Planning	LS	0	0	0
Mineral Resources	LS	0	0	0
Noise	LS	0	0	0
Population and Housing	LS	0	0	0
Transportation	LS	0	0	0
Utilities and Service Systems	LS	0	0	0
Growth Inducement & Secondary Effects	LS	0	0	0
Irreversible Commitment of Resources	LS	-1	0	0
Potential Environmental Damage from Accidents	LS	0	0	0
<b>Impacts Relative to Project</b>		<b>-96</b>	<b>+7</b>	<b>-28</b>
Notes: LS = Less than significant impact PS = Potentially significant impact SU = Significant and unavoidable impact				