

DRAFT
ENVIRONMENTAL IMPACT REPORT
for the
VAN DER KOOI DAIRY
SCH # 2006011107



San Joaquin Valley Air Pollution Control District
1990 East Gettysburg Avenue
Fresno, California 93726-0244

November 2006

Draft Environmental Impact Report
VAN DER KOOI DAIRY

November 2006

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EXECUTIVE SUMMARY

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Project Description

The project proponent has applied to the SJVAPCD for permits for the establishment and operation of a 3,200 Holstein milk cow dairy. This milk cow herd will be supported by 480 dry cows, 2,060 heifers and 380 calves. Utilizing California Regional Water Quality Control Board, Central Valley Region factors, the Holstein cow animals on the dairy site at full development constitute 6,646 animal units.^a

The project site is located in a Fresno County AE-20 (Exclusive Agriculture 20-Acre Minimum) zone. The proposed 110-acre dairy facilities site is located on Elkhorn Avenue between Howard and Madera Avenues. The remaining acreage will remain in current agricultural production as 1,132 net farmable acres of alfalfa and corn silage/wheat (double cropped). The location of the project site is shown on Figures ES-1 and ES-2.

The dairy is designed to maximize the available land for the production of feed to meet the dairy's forage needs, thereby minimizing the necessity for imported feed. Utilization of manure water will provide necessary nutrients for on-site feed production, and reduce the need for groundwater usage for irrigation.

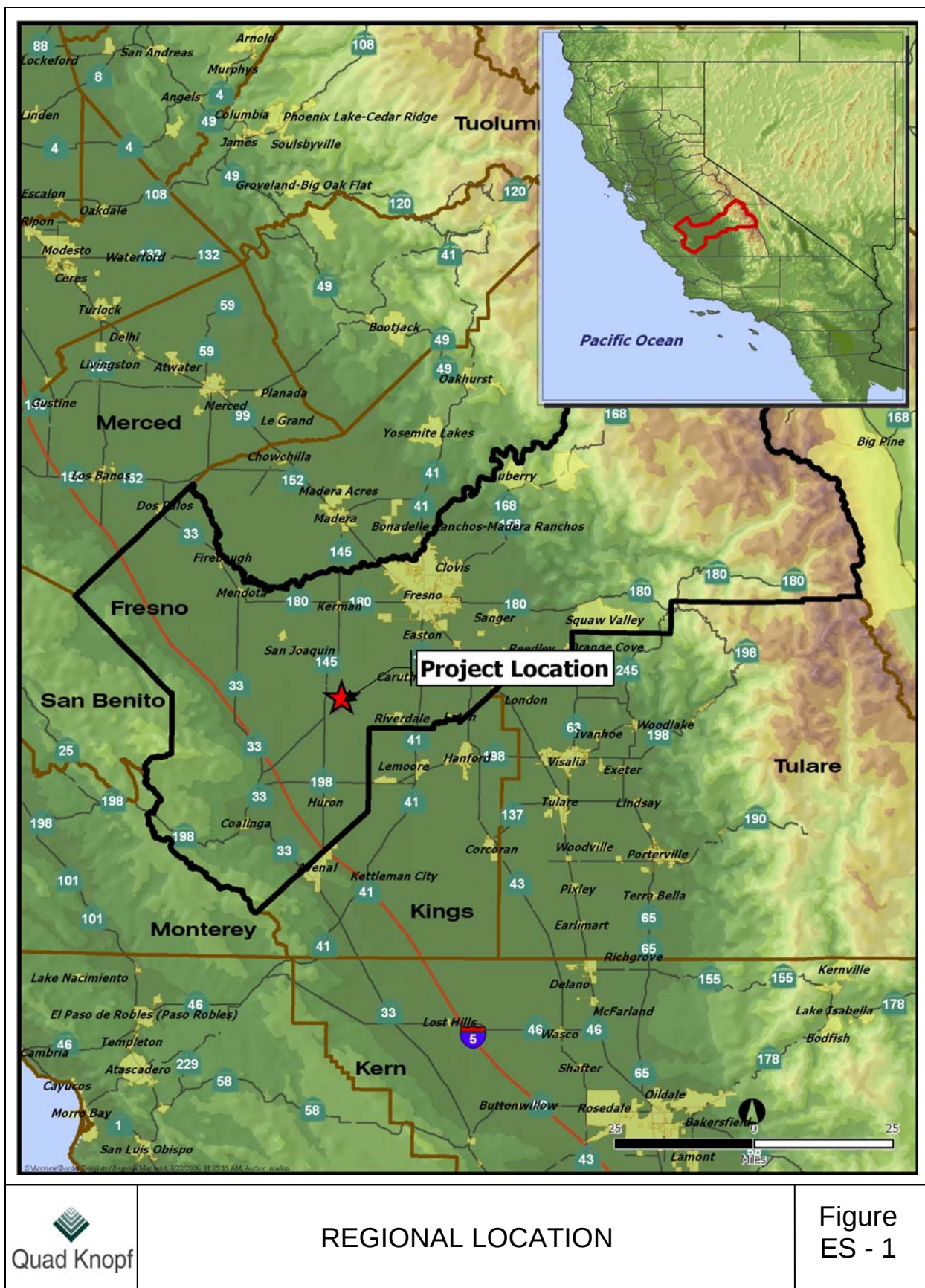
The dairy facility will house milking cows in freestall barns with flush systems and dry cows in corrals with flushed alleys. Liquid waste will be processed through separator basins, which remove solids from liquids, and liquids will flow into wastewater lagoons (see Figure 2-3 for facility component locations). At maximum-design dairy operation, approximately 1,829 tons per year of manure will be hauled offsite and sold as a fertilizer and soil amendment.

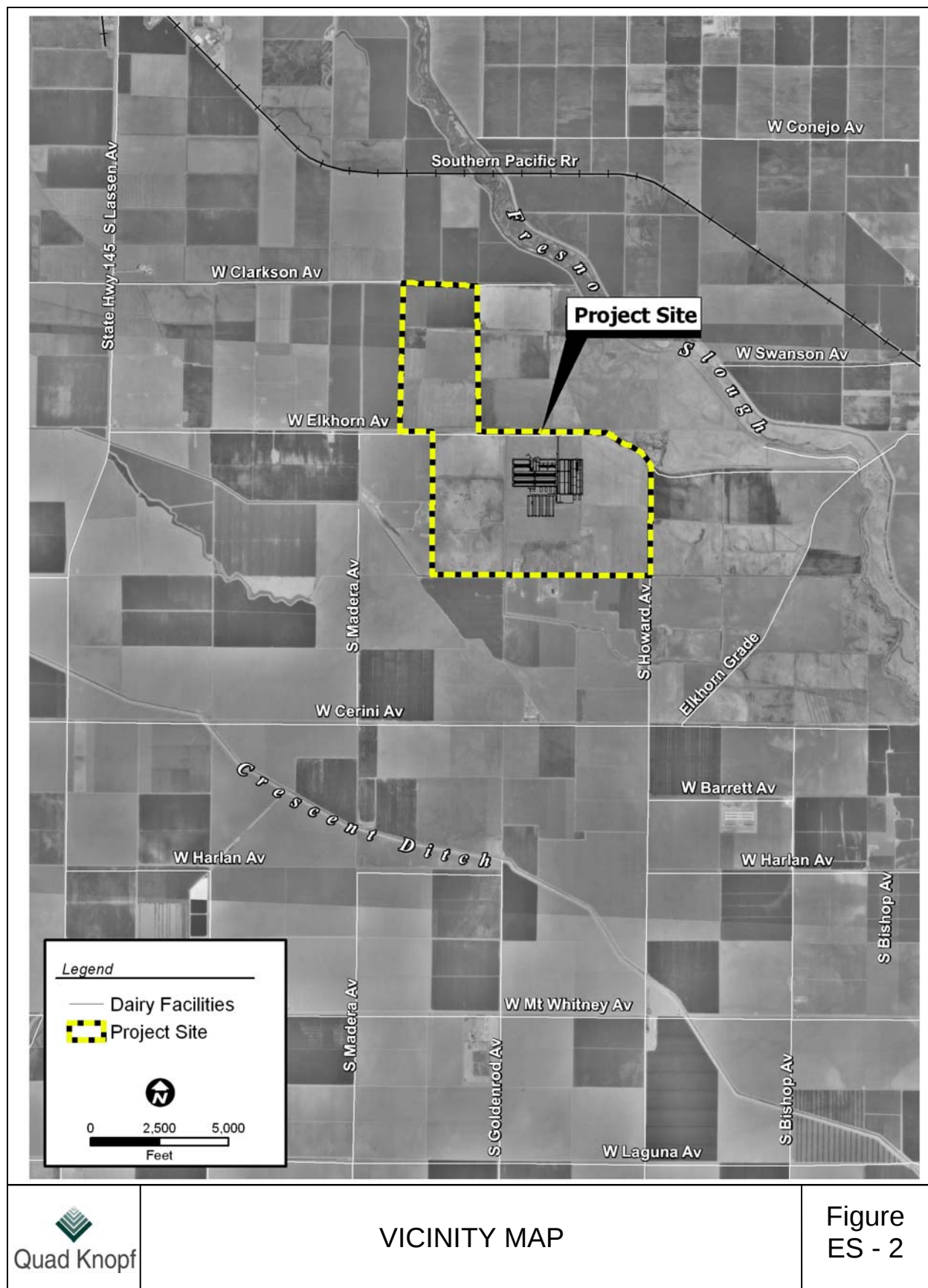
The structures to be constructed – barns, freestalls, etc. – will be metal frame. Each milking cow will be provided an individual bedded-stall in the freestall structure. The milking cows are generally kept in the stalls except when they are walked to the milking barn on concrete walk lanes three times a day.

The floors of the freestalls will be concrete. Curbs will separate the feed lane from the freestalls in order to facilitate flushing and enclose feed. All dairy facilities areas will be sloped to prevent ponding of water and to divert and convey rainfall runoff to the separator basins and wastewater lagoons. A substantial percentage of the forage feed – corn and wheat – will be produced on agricultural land at the project site. All fields have return water facilities. The remainder of the forage feed, and feed concentrate, will be imported to the site from outside sources. The feed will be stored in hay barns and on a concrete pad.

Further descriptive details regarding the project are contained, for relevance to environmental analysis, in the appropriate topical areas of Chapter Three of this Draft EIR.

^a “Animal units” are calculated based upon a factor that has been adopted by the California Regional Water Quality Control Board, Central Valley Region. These factors are: 1.0 for milk cows; 0.75 for dry cows and bred heifers; 0.7 for heifers (1-year to breeding); 0.4 for calves (3 mos.-1 yr.); and baby calves 0.25. For additional information on determining animal units see SWRCB Waste Discharge Requirements in Appendix C.





Project Objective

It is the objective of the project to build and operate an economically viable and competitive dairy facility in compliance with applicable laws and regulations, optimally utilizing the available land resource, and mitigating environmental impacts to the extent feasible and as required by CEQA.

Summary of Impacts and Mitigation Measures

Section 15123(b)(1) of the *Guidelines for Implementation of the California Environmental Quality Act* (State CEQA Guidelines) provides that the summary shall identify each potentially significant effect with proposed mitigation measures that would reduce or avoid that effect. This information is summarized in Table S-1, Summary of Potential Impacts, Mitigation Measures, and Mitigation Monitoring Agencies, at the end of this Executive Summary, and in Table S-2, Summary of Impacts Which Remain Significant After Mitigation.

Potential Areas of Controversy and Issues to be Resolved

The following issues are most likely to produce controversy in reviewing and considering the proposed project:

- Air Quality
- Biological Resources
- Hazards and Hazardous Materials/Health Risks/Vectors
- Water Quality Impacts
- Alternatives Analysis
- Cumulative Impacts

Alternatives to the Proposed Project

Section 15126.6 of the State CEQA Guidelines requires the EIR to describe a reasonable range of alternatives to the project or to the location of the project which would reduce or avoid significant impacts, and which could feasibly accomplish the basic objectives of the project, and to evaluate the comparative merits of the alternatives. Alternatives that would reduce or avoid significant impacts represent environmentally superior alternatives to the proposed project. However, if the environmentally superior alternative is the ‘no project’ alternative, the EIR must also identify an environmentally superior alternative among the other alternatives.

The EIR evaluates the following alternatives:

- No Project - With this alternative, the dairy facilities would not be built. This alternative does not achieve the basic objective of the project, although any dairy-related air quality impacts are eliminated. Impacts associated with continuation of row-crop or other agriculture will occur.
- Relocated Sites – Under these alternatives, site relocation elsewhere in the San Joaquin Valley Air Basin (SJVAB), and outside the Valley are evaluated. No significant impact

reductions compared to the project could be identified. The usage of such alternative sites has been economically evaluated and found to be infeasible (see Appendix L).

- Reduced Herd Size Alternatives – Reduction of herd size alternatives effect roughly proportional reduction in air quality impacts (although not to less than significance) and in cumulative predator habitat loss while only partially meeting the project objective of operating an economically viable dairy (see Impact #3.8.8.3, Chapter Four, and Appendix L).

Based upon the analysis contained and documented in this EIR, the no-project alternative is environmentally superior. Apart from this alternative, a Reduced Herd Size Alternative (1,566 animal units) is, based upon the analysis contained and documented in this EIR, determined to be environmentally superior, although it only partially achieves the project objective, does not eliminate all significant impacts, and is economically infeasible.

The economic infeasibility of the reduced herd size alternatives is summarized and reiterated here on the basis of information provided and analyzed in Chapter 4 and Appendix L of the EIR:

- Relying upon then-existing regulations, the project applicant acquired the 1,242-acre project site with sufficient acreage to permit onsite utilization of liquid manure and feed cropping for the proposed herd size.
- The costs of land purchase, testing and consulting services to meet Regional Board requirements, and SJVAPCD permit environmental processing have been significant.
- The above factors preclude economically feasible alternative project site development or project site usage for a reduced herd size dairy.

Impacts Summarization

Table S-1, beginning on the following page, is a summary of impacts deemed not to be significant and of potentially significant impacts and mitigation measures therefore, noting the level of significance after mitigation and the mitigation monitoring agency.

Table S-1
Summary of Potentially Significant Impacts and, Mitigation Measures,
and Mitigation Monitoring Program

Impact No.	Impact	Page Number in EIR	Mitigation Number	Mitigation Measure	Level of Significance After Mitigation	Monitoring Agency
AESTHETICS						
3.1.1	Light and Glare	3-2 to 3-5	3.1.1	All lighting shall be principally under roofs and designed to be directed downward and inward to illuminate specific areas.	Less than Significant	▪ SJVAPCD
AIR QUALITY AND ODORS						
3.3.1	Particulate Matter (PM10) and Fine Particulate Matter (PM2.5) Impacts	3-24 to 3-25	None	None	None	None
3.3.2	Construction Emissions (Carbon Monoxide (CO), Reactive Organic Gases (ROG), Nitrogen Oxide (NOx), Sulfur Dioxide (SO2), Particulate Matter (PM10) Fine Particulate Matter (PM2.5))	3-25 to 3-28	3.3.2	As a condition of the Authority to Construct by the SJVAPCD, and to be monitored by such Agency, the owner/operator and construction crew shall ensure that the following control measures are implemented prior to and during construction activities to reduce exhaust emissions from construction related equipment: 1. Attend a preconstruction meeting at the District. 2. The idling time of all construction equipment used at the site shall not exceed ten minutes. 3. The hours of operation of heavy-duty equipment shall be minimized. 4. All equipment shall be properly tuned and maintained in accord with manufacturer's specification.	Less than Significant	▪ SJVAPCD

Impact No.	Impact	Page Number in EIR	Mitigation Number	Mitigation Measure	Level of Significance After Mitigation	Monitoring Agency
				5. When feasible, alternative fueled or electrical construction equipment shall be used at the project site. 6. The minimum practical engine size for construction equipment shall be used. 7. When feasible, electric carts or other smaller equipment shall be used at the project site. 8. Gasoline-powered equipment shall be equipped with catalytic converters. 9. The facilities construction contractor shall comply with Rule 4641 of the SJVAPCD.		
3.3.3.A	Operational Emissions of Criteria Pollutants, Particulate Matter (PM10) and Fine Particulate Matter (PM2.5)	3-28 to 3-31	3.3.3.A	The applicant shall perform the following BACT control measures: 1. Maintain a manure pack less than two inches deep. 2. Refrain from spreading dry manure on nutrient application areas when wind speeds exceed 10 miles per hour. 3. Remove mud or dirt which originates from project operations, on project-adjacent roads within 24 hours of deposition. 4. Protect dry feed storage on three sides to prevent material loss and transport due to wind action. 5. Plant trees downwind around the dairy facilities site. 6. Provide shade areas in corrals.	Less than Significant	▪ SJVAPCD

Impact No.	Impact	Page Number in EIR	Mitigation Number	Mitigation Measure	Level of Significance After Mitigation	Monitoring Agency
				In addition, the applicant shall purchase emission offsets to mitigate for the remaining 2.52 tons of PM10.		
3.3.3.B	Operational Emission of Criteria Pollutants, Reactive Organic Gas (ROG)	3-31 to 3-35	3.3.3.B	The project applicant shall, in construction and operation of the project, comply with the following BACT control measures as agreed with the San Joaquin Valley Air Pollution Control District: 1. Use of phototrophic (red) lagoon and associated nutrient management practices. 2. Flush or spray down milking area with each batch milked, and flush holding pen and wash pens at least 4 times daily. 3. Flush feedlanes, walkways, etc. at least 4 times daily. In addition, the applicant shall purchase emission offsets to mitigate for the remaining 3.76 tons of ROG in exceedance of the SJVAPCD threshold of 10 tons per year.	Less than Significant	▪ SJVAPCD
3.3.4	Operational Emissions of Criteria Pollutants, Nitrogen Oxide (NOx)	3-35 to 3-36	3.3.4	Although project impacts are less than significant the following mitigation measures are recommended to further reduce NOx emissions. 1. Idling time of on-site project farming and dairy operations equipment shall be minimized. 2. All on-site equipment shall be properly tuned and maintained in accord with manufacturer's specifications.	Less than Significant	▪ SJVAPCD

Impact No.	Impact	Page Number in EIR	Mitigation Number	Mitigation Measure	Level of Significance After Mitigation	Monitoring Agency
				3. Whenever feasible, alternative fueled or electrical on-site equipment shall be utilized. 4. Minimum practicable on-site engine sizes shall be used. 5. On-site gasoline powered equipment shall be equipped with catalytic converters. 6. Employees will be encouraged to carpool-travel to and from the project site. The above measures are excerpted and extrapolated from the SJVAPCD's Guide for Assessing and Mitigating Air Quality Impacts, January 10, 2002. No other feasible mitigation measures exist.		
3.3.5	Methane (CH ₄) Generation	3-36 to 3-37	3.3.5	The project applicant shall, in construction and operation of the project, comply with the following BACT control measures as agreed with the San Joaquin Valley Air Pollution Control District: 1. Use of phototrophic (red) lagoon and associated nutrient management practices. 2. Flush or spray down milking area with each batch milked, and flush holding pen and wash pens at least 4 times daily. 3. Flush feedlanes, walkways, etc. at least 4 times daily.	Less than Significant	▪ SJVAPCD
3.3.6	Ammonia (NH ₃)	3-37 to 3-38	3.3.6	Nevertheless, the project applicant shall, in construction and operation of the project, comply with the following BACT control measures as agreed with the San Joaquin Valley Air Pollution Control District:	Less than Significant	▪ SJVAPCD

Impact No.	Impact	Page Number in EIR	Mitigation Number	Mitigation Measure	Level of Significance After Mitigation	Monitoring Agency
				1. Use of phototrophic (red) lagoon and associated nutrient management practices. 2. Flush or spray down milking area with each batch milked, and flush holding pen and wash pens at least 4 times daily. 3. Flush feedlanes, walkways, etc. at least 4 times daily.		
3.3.7	Hydrogen Sulfide (H ₂ S)	3-38 to 3-39	3.3.7	The project applicant shall, in construction and operation of the project, comply with the following BACT control measures as agreed with the San Joaquin Valley Air Pollution Control District: 1. Use of phototrophic (red) lagoon and associated nutrient management practices. 2. Flush or spray down milking area with each batch milked, and flush holding pen and wash pens at least 4 times daily. 3. Flush feedlanes, walkways, etc. at least 4 times daily.	Less than Significant	▪ SJVAPCD
3.3.8	Odor Emissions	3-39 to 3-43	None	None	None	None
3.3.9	Local Carbon Monoxide (CO) Concentrations	3-43 to 3-44	None	None	None	None
3.3.10	Ambient Air Quality Analysis (AAQA and Risk Management Review (RMR)	3-44	3.3.10	As mentioned in Mitigation Measure #3.3.3.A, the applicant will purchase PM10 offsets (2.52 tons) to reduce PM10 emissions to zero.	Less Than Significant	▪ SJVAPCD

Impact No.	Impact	Page Number in EIR	Mitigation Number	Mitigation Measure	Level of Significance After Mitigation	Monitoring Agency
3.3.11	Cumulative Air Quality Impacts	3-44 to 3-45	None	None	None	None
BIOLOGICAL RESOURCES						
3.4.1	Substantial Adverse Effect on Candidate, Special-Status or Sensitive Species	3-59 to 3-62	3.4.1.1	The following mitigation measures shall be followed: 1. Construction of a barrier fence along the southern and western edges of the construction site which would exclude kangaroo rats from entering the construction area. The fence would be constructed of a 3 foot-high metal flashing supported by t-posts. The lower edge of the fencing would be buried approximately 6 inches below the ground surface; and, 2. Construction related traffic outside of the fenced area would be limited to daylight hours. Continued agricultural operations would also have the potential to impact kangaroo rats and other sensitive species. Mitigation measures that would need to be implemented to avoid take of kangaroo rats and reduce impacts to sensitive species to less than significant include: 1. Agricultural operations must not encroach into the existing oil well pad sites; 2. Construction of irrigation facilities such as canals, ditches, and retention basins will not proceed until the specific construction sites are inspected by a biologist and determined to be free of kangaroo rats. The construction of	Less than Significant	▪ SJVAPCD

Impact No.	Impact	Page Number in EIR	Mitigation Number	Mitigation Measure	Level of Significance After Mitigation	Monitoring Agency
				barrier fencing at such construction sites may be required; 3. The application of rodenticides within 0.25 miles of the site occupied by kangaroo rats will only be applied using raised "T"-type bait stations which are approved for use in areas occupied by endangered kangaroo rats (Appendix D of the Biological Report); and, 4. Retain all existing stands of trees, individual trees, and snags.		
			3.4.1.2	To avoid impacts to the San Joaquin kit fox, Standardized Recommendations for the protection of San Joaquin kit fox (Appendix C of the Biological Report) shall be followed. These include: 1. Project-related vehicles should observe a 20-mph speed limit in all project areas, except on county roads and State and Federal highways; this is particularly important at night when kit foxes are most active. To the extent possible, nighttime construction should be avoided. Off-road traffic outside of designated project areas should be prohibited. 2. To prevent inadvertent entrapment of kit foxes or other animals during the construction phase of the project, all excavated, steep-walled holes or trenches more than 2 feet deep should be covered at the close of each working day by plywood or similar materials, or provided with one or more escape ramps constructed of earth fill or wooden planks. Before such holes or trenches are filled, they should be	Less than Significant	▪ SJVAPCD

Impact No.	Impact	Page Number in EIR	Mitigation Number	Mitigation Measure	Level of Significance After Mitigation	Monitoring Agency
				thoroughly inspected for trapped animals. If at any time a trapped or injured kit fox is discovered, the procedures under numbers 8 and 9 of this section must be followed.		
			3.	Kit foxes are attracted to den-like structures such as pipes and may enter stored pipe, becoming trapped or injured. All construction pipes, culverts, or similar structures with a diameter of 4-inches or greater that are stored at a construction site for one or more overnight periods should be thoroughly inspected for kit foxes before the pipe is subsequently buried, capped, or otherwise used or moved in anyway. If a kit fox is discovered inside a pipe, that section of pipe should not be moved until the USFWS has been consulted. If necessary, and under the direct supervision of the biologist, the pipe may be moved once to remove it from the path of construction activity, until the fox has escaped.		
			4.	All food-related trash items such as wrappers, cans, bottles, and food scraps should be disposed of in closed containers and removed at least once a week from a construction or project site.		
			5.	No firearms shall be allowed on the project site.		
			6.	To prevent harassment, mortality of kit foxes or destruction of dens by dogs or cats, no pets should be permitted on project sites.		
			7.	A representative shall be appointed by the project proponent who will be the contact source for any employee or contractor who		

Impact No.	Impact	Page Number in EIR	Mitigation Number	Mitigation Measure	Level of Significance After Mitigation	Monitoring Agency	
				might inadvertently kill or injure a kit fox or who finds a dead, injured or entrapped individual. The representative's name and telephone number shall be provided to the USFWS. 8. In the case of trapped animals, escape ramps or structures should be installed immediately to allow the animal(s) to escape, or the USFWS should be contacted for advice. 9. Any contractor, employee(s), or military or agency personnel who inadvertently kills or injures a San Joaquin kit fox shall immediately report the incident to their representative. This representative shall contact the CDFG immediately in the case of a dead, injured or entrapped kit fox. The CDFG contact for immediate assistance is State Dispatch at (916) 445-0045. They will contact the local warden or biologist. 10. The Sacramento Fish and Wildlife Office and CDFG will be notified in writing within three working days of the accidental death or injury to a San Joaquin kit fox during project related activities. Notification must include the date, time, and location of the incident or of the finding of a dead or injured animal and any other pertinent information. The USFWS contact is the Chief of the Division of Endangered Species, 2800 Cottage Way, Suite W2605, Sacramento, CA 95825-1846, and (916) 414-6620. The CDFG contact is Mr. Ron Schlorff at 1416 9th Street, Sacramento, CA 95814, (916) 654-4262.			

Impact No.	Impact	Page Number in EIR	Mitigation Number	Mitigation Measure	Level of Significance After Mitigation	Monitoring Agency
3.4.2	Loss of Habitat to Special-Status Plants	3-62	None	None	None	None
3.4.3	Loss of Habitat for Special-Status Animals	3-62 to 3-63	None	None	None	None
3.4.4	Interference with Movement of Native Wildlife	3-63	None	None	None	None
3.4.5	Disturbance to Jurisdictional Waters	3-63 to 3-64	None	None	None	None
3.4.6	Degradation of Water Quality in Seasonal Creeks, Reservoirs and Downstream Waters	3-64	3.4.6	Site plan design should ensure that the grading of the project prohibits offsite drainage. Once accomplished, the proposed project is expected to have no effect on water quality in the Stinson Canal or any seasonal creeks, reservoirs, or other downstream waters.	Less than Significant	▪ SJVAPCD
3.4.7	Disturbance to Active Raptor Nests from Construction Activities	3-65	3.4.7	The implementation of the following measures will ensure that raptors (hawks and owls) are not disturbed during the breeding season. 1. A qualified biologist/ornithologist will conduct a pre-construction survey for nesting raptors on site within 30 days of the onset of ground disturbance, if ground disturbance is to occur during the breeding season (February 1 to September 15). These surveys will be based on the accepted protocols (e.g., as for the burrowing owl) for the target species. If a nesting raptor were detected, an appropriate construction buffer would be needed (up to 250 feet or more). The actual size of the	Less than Significant	▪ SJVAPCD

Impact No.	Impact	Page Number in EIR	Mitigation Number	Mitigation Measure	Level of Significance After Mitigation	Monitoring Agency
				buffer would depend on the type of construction activity that would occur in the vicinity of the nest.		
				2. If burrowing owls are detected on site during the non-breeding season, they can be passively relocated by placing one-way doors in the burrows and leaving them in place for a minimum of three days. Once it has been determined that owls have vacated the site, the burrows can be collapsed and ground disturbance can proceed.		
3.4.8	Disturbance of Nesting Migratory Bird Treaty Act Species from Construction Activities	3-65 to 3-66	None	None	None	None
3.4.9	Local Policy/Ordinances Conflict	3-66	None	None	None	None
3.4.10	Habitat Conservation Plan or Other Plan Conflict	3-66	None	None	None	None
CULTURAL RESOURCES						
3.5.1	Disturbance of Cultural or Historic Resources, Skeletal Remains	3-68 to 3-69	3.5.1	If, in the course of project construction any archaeological or historical resources are uncovered, discovered, or otherwise detected or observed, activities within 50 feet of the find area shall cease. A qualified archaeologist shall be contacted and advised the SJVAPCD of the site's significance. If the findings are deemed significant by the SJVAPCD, appropriate mitigation measures shall be required prior to any resumption of work in the affected area of the project.	Less than Significant	▪ SJVAPCD

Impact No.	Impact	Page Number in EIR	Mitigation Number	Mitigation Measure	Level of Significance After Mitigation	Monitoring Agency
				If, in the course of project construction or operation, any skeletal remains are uncovered, discovered, or otherwise detected or observed, activities in the affected area shall cease. A qualified archaeologist, the SJVAPCD and local Native American organizations shall be consulted, and appropriate measures shall be required that may include avoidance of the burial site or reburial of the remains.		
GEOLOGY, SOILS AND MINERAL RESOURCES						
3.6.1	Seismic Effects	3-73	None	None	None	None
3.6.2	Landslides	3-73	None	None	None	None
3.6.3	Soil Erosion, Topsoil Loss	3-74	None	None	None	None
3.6.4	Soil Instability	3-74	None	None	None	None
3.6.5	Expansive Soil Hazards	3-74	None	None	None	None
3.6.6	Unsuitable Soils for Domestic Waste Disposal; Soil Contamination	3-74 to 3-75	None	None	None	None
3.6.7	Mineral Resources	3-75	None	None	None	None
HAZARDS AND HAZARDOUS MATERIALS/HEALTH RISKS/VECTORS						
3.7.1	Operational Hazards	3-77 to 3-78	3.7.1	Prior to issuance of the Authority to Operate for the dairy, the owner/operator shall submit documentation to the SJVAPCD that appropriate permits and notifications regarding the storage, transport, use and disposal of hazardous materials have been completed and acquired. The	Less than Significant	▪ SJVAPCD ▪ Regional Water Quality Control Board

Impact No.	Impact	Page Number in EIR	Mitigation Number	Mitigation Measure	Level of Significance After Mitigation	Monitoring Agency
				documentation shall include, at minimum, evidence of compliance with:		
				1. An employee safety program in accord with California Labor Code Section 6401.7.		
				2. The RWQCB requirements, including a Storm Water Pollution Prevention Plan incorporating provisions for the safe storage, use, and disposal of hazardous wastes.		
				3. The permitting requirements of the California Department of Pesticide Regulation.		
3.7.2	Site Hazards	3-78	None	None	None	None
3.7.3	Airport Hazards	3-78	None	None	None	None
3.7.4	Emergency Evacuation and Wildland Fires	3-79	None	None	None	None
3.7.5	Other Health Hazards	3-79	None	None	None	None
3.7.6	Vector Generation	3-79 to 3-83	3.7.6	1. As a condition of project approval, the project operator shall agree to follow Consolidated Mosquito Abatement District requirements concerning mosquito control at the dairy facility. The following are requirements established by the District: (a) Wastewater holding ponds shall not exceed 150 feet in width. (b) All dairy wastewater holding and solid separator ponds shall be surrounded by lanes at least fourteen feet in width and	Less than Significant	▪ SJVAPCD ▪ Fresno County Department of Health Services ▪ Consolidated Mosquito Abatement District

Impact No.	Impact	Page Number in EIR	Mitigation Number	Mitigation Measure	Level of Significance After Mitigation	Monitoring Agency	
				nothing (e.g., calf pens, utility lines, hay stacks, silage, tires, ag equipment, etc.) shall be placed in the area of the holding ponds which would prevent passage or use of vector control equipment. (c) Any fencing placed around the wastewater and solids ponds shall be placed on the outside of the fourteen foot lanes and gates provided for access. (d) All interior banks of holding and separation ponds shall be graded 1:1 or steeper for the first ten feet, soil type permitting, but not greater than 1:2 (horizontal:vertical). (e) All wastewater designs shall include a solids separation system. If separator ponds are the exclusive means of solids removal, two or more separator ponds are required. These ponds shall not be more than sixty feet in width. (f) No drainage lines shall bypass the separator ponds, except those which provide for normal corral runoff. All such drain inlets must be sufficiently graded to prevent solids accumulation in the holding ponds. (g) Floatage of any solid substance which could provide harborage for immature mosquito stages shall be kept out of all wastewater holding ponds.			

Impact No.	Impact	Page Number in EIR	Mitigation Number	Mitigation Measure	Level of Significance After Mitigation	Monitoring Agency
				(h) The owner shall be responsible for keeping vegetation growth from all areas of the wastewater and solids separation ponds. This includes access lanes, interior pond embankments, and any weed growth that might become established on the pond surface. (i) Dairy wastewater discharged for irrigation purposes shall be managed so it does not stand for more than three days. (j) Any variance desired from these requirements must be submitted to the District for prior review and approval.		
			2.	As a condition of project approval, the project operator shall implement the following fly abatement program: (a) Project dairy facilities design and construction will include concrete-base freestalls and walk lanes, and water drainage to separator facilities. (b) Utilization of manure water shall be in thin layers, blending such manure water with irrigation groundwater in compliance with the nutrient management plan appended hereto. (c) Manure in corrals shall be scraped as required for effective fly control. (d) Feed lanes shall be cleared daily.		

Impact No.	Impact	Page Number in EIR	Mitigation Number	Mitigation Measure	Level of Significance After Mitigation	Monitoring Agency
				(e) Owner/operator must comply with RWQCB requirements, or permits. Monitoring well design, locations and sampling program shall be approved by the Regional Water Quality Control Board. (f) All manured areas shall be sloped to prevent ponding and to convey all precipitation and moisture to drainage systems, including the lagoons. The applicant shall, at a minimum of once per year, backfill any slope loss with compacted, non-manured material, to maintain pre-existing slopes. (g) All water systems shall be checked weekly to look for breaks, leaks, and overflows, including the water pressure systems, water troughs and mister lines. (h) The owner/applicant shall submit to the Fresno County Health Services Division and to the CMAD before construction of dairy operations, and shall continuously and fully implement during dairy operations, an Integrated Pest Management Plan for fly control which contains the following specific requirements: (1) Manure and feed storage maintenance, and prompt dead animal disposal, to minimize fly breeding.		

Impact No.	Impact	Page Number in EIR	Mitigation Number	Mitigation Measure	Level of Significance After Mitigation	Monitoring Agency
				(2) Utilization of parasitoids, and judicious use of pesticides, for fly suppression as needed based on monitoring results.		
				(3) Maintenance of records onsite, for regulatory agency inspection, regarding monitoring results, maintenance and disposal activities and parasitoid and pesticide suppression.		
3.7.7	Cumulative Fly Generation	3-83	None	None	None	None
HYDROLOGY AND WATER QUALITY						
3.8.1	Drainage Pattern Alternation	3-91	None	None	None	None
3.8.2	Surface Runoff Increase or Pollution	3-92	None	None	None	None
3.8.3	100-year Flood Hazards	3-92	None	None	None	None
3.8.4	Dam Failure	3-92	None	None	None	None
3.8.5	Seiche, Tsunami, Mudflow Impacts	3-92 to 3-93	None	None	None	None
3.8.6	Violation of Water Quality Standards or Waste Discharge Requirements	3-93 to 3-94	3.8.6	Project lagoons and separator ponds shall be elevated or shall be lined to effectively preclude leakage to groundwater.	Less than Significant	▪ SJVAPCD ▪ Regional Water Quality Control Board
3.8.7	Depletion of Groundwater Supplies	3-94 to 3-95	None	None	None	None

Impact No.	Impact	Page Number in EIR	Mitigation Number	Mitigation Measure	Level of Significance After Mitigation	Monitoring Agency
3.8.8.1	Groundwater Degradation from Dairy Facilities	3-95 to 3-100	3.8.8.1	- Owner/operator shall construct pond and lagoon lining in accord with Regional Water Quality Control Board groundwater separation standards (including NRCS Standards, Appendix R hereto and Title 27), and/or shall line ponds and lagoons with manure water prior to operation to reduce percolation. - A monitoring well sampling and testing program shall be established if required by the Regional Water Quality Control Board. Samples shall be tested to determine the presence of measurable contaminant leakage, including pathogens, and significant continuing increase in nitrate nitrogen, from separation ponds and lagoons. Testing shall include tests for soil moisture content and electrical conductivity and nitrogen compounds. Evidence of contaminant increase, based on such testing, shall be the basis for required additional lining, or relining, of ponds and lagoons. - The domestic well supplying dairy facilities shall be regularly sampled by the Fresno County Health Department for pathogen detection. Evidence of leakage shall be the basis for required additional lining, or relining of ponds and lagoons. - Owner/operator must comply with all applicable RWQCB Waste Discharge Requirements, or permits, as required by Title 27 or other applicable water quality control	Less than Significant	Regional Water Quality Control Board

Impact No.	Impact	Page Number in EIR	Mitigation Number	Mitigation Measure	Level of Significance After Mitigation	Monitoring Agency
				laws. Monitoring well design, locations and sampling program shall be approved by the Regional Water Quality Control Board.		
				5. All manured areas shall be sloped to prevent ponding and to convey all precipitation and moisture to drainage systems, including the lagoons. The applicant shall, at a minimum of once per year, backfill any slope loss with compacted, non-manured material, to maintain pre-existing slopes.		
				6. Salt in animal rations should be limited to the amount required to maintain animal health and optimum production.		
3.8.8.2	Groundwater Contamination from Cropped Areas of the Project Site	3-100 to 3-102	None	None	None	None
3.8.8.3	Groundwater Contamination at Manure Re-Use Sites	3-102	3.8.8.3	1. The dairy facilities operator will provide to each manure hauler from the project site an invoice stipulating that manure re-use shall be undertaken only in full compliance with all applicable State and Federal laws and regulations. 2. Records of tonnage of manure sold will be kept by the dairy facilities operator on site for review upon request by the SJVAPCD or the Regional Water Quality Control Board.	Less than Significant	▪ Regional Water Quality Control Board
CUMULATIVE IMPACTS						
5.1	Air Quality Degradation	5-4 to 5-9	None	None	None	None

Impact No.	Impact	Page Number in EIR	Mitigation Number		Mitigation Measure	Level of Significance After Mitigation	Monitoring Agency
5.2	Water Quality Degradation	5-9 to 5-12	None	None		None	None
5.3	Loss of Habitat for Special Status Species	5-12	None	None		None	None

CHAPTER ONE

INTRODUCTION

CHAPTER ONE – INTRODUCTION

1.1 *Proposed Action*

The project is to construct and operate a 6,646 animal unit (3,200 milk cow) dairy on 1,242 gross acres. The net farmable acreage includes approximately 1,132 acres. The 110-acre dairy facilities site will be located on Elkhorn Avenue between Howard and Madera Avenues. Situated in western Fresno County, the dairy facilities site is located approximately 3 miles west of the community of Burrel.

The proposed actions for which this Environmental Impact Report (EIR) is being prepared include an application to San Joaquin Valley Air Pollution Control District (SJVAPCD) for an Authority to Construct (ATC) and acceptance by the California Regional Water Quality Control Board, Central Valley Region of a Report of Waste Discharge.

PROJECT OBJECTIVE

It is the objective of the project to build and operate an economically viable and competitive dairy facility in compliance with applicable laws and regulations, optimally utilizing the available land resource, and mitigating any environmental impacts to the extent feasible and as required by CEQA.

1.2 *Procedures*

The SJVAPCD has determined that an EIR must be prepared for the proposed project in accordance with the requirements of CEQA. On January 26, 2006 a Notice of Preparation (NOP) was circulated for review and comment by responsible, trustee, and local agencies. Copies of the Notice of Preparation, comments received and responses to these comments are included in Appendix A of this EIR. A scoping meeting was duly noticed and held on February 9, 2006.

Section 15121(a) of the *Guidelines for Implementation of the California Environmental Quality Act* (State CEQA Guidelines) defines an EIR as an informational document that will:

...inform public agency decision-makers and the public generally of the significant environmental effects of a project, identify possible ways to minimize the significant effects, and describe reasonable alternatives to the project.

As defined by Section 15378 of the State CEQA Guidelines, a “project” is any action that “...has a potential for resulting in either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment...” Section 15093 of the State CEQA Guidelines requires decision-makers to balance the benefits of a proposed project against any unavoidable adverse environmental effects of the project.

Under CEQA, the Lead Agency is usually the public agency which has the principal responsibility for carrying out or approving a project. In this case, the San Joaquin Air Pollution Control District will act as Lead Agency with authority to certify the EIR.. Under *Section 15381* of the *CEQA Guidelines*, a “Responsible Agency” is a public agency other than the Lead Agency

that has discretionary approval authority over the project, and will utilize the EIR prepared for the SJVAPCD. Among the responsible agencies in this instance are the California Regional Water Quality Control Board, Central Valley Region, and the California Department of Food and Agriculture, Milk and Dairy Food Control Division.

The CEQA process requires that the Lead Agency seriously consider input from other interested agencies, citizen groups, and individuals. In this regard, a Notice of Preparation for the project was circulated and a scoping hearing was noticed and held. CEQA provides for a public process requiring full public disclosure of the expected environmental consequences of the proposed action. The public must be given a meaningful opportunity to comment. CEQA also requires monitoring to ensure that mitigation measures are carried out.

1.3 Methodology

The SJVAPCD has determined that a project level EIR should be prepared for the Van Der Kooi Dairy project. A project level EIR is described in *Section 15161* of the *State CEQA Guidelines* as one that examines the environmental impacts of a specific development project. A project level EIR must examine all phases of the project, including planning, construction, and operation.

1.4 Potentially Significant Environmental Effects

It has been determined, based on the analysis and findings in the Initial Study, that the EIR will focus on the environmental aspects below:

Aesthetics. This topical area of the EIR will discuss adverse effects on scenic vistas, degradation of the existing visual character, and new sources of light and glare.

Air Quality. This topical area of the EIR addresses potential short and long-term air quality impacts associated with the project.

Biological Resources. The topical area on biological resources addresses potential impacts to special status plant and animal species related to the proposed project. Results of biological field surveys are discussed.

Cultural Resources. There may be a disturbance or destruction of cultural or historical resources resulting from activities associated with the project.

Geology and Soils. This topical area of the EIR summarizes and analyzes the soils-related findings of a geohydrologic investigation for the project site.

Hazards/Hazardous Materials. Hazardous materials usage on and transport to the project site will be discussed. In addition, any vector impacts (flies and mosquitoes) will be analyzed.

Hydrology and Water Quality. This topical area of the EIR summarizes and analyzes the groundwater-related results of the geohydrologic studies. Issues related to surface water quality impacts, to alteration of drainage patterns, to stormwater runoff, and to flood potential are evaluated.

Utilities/Service Systems. This topical area of the EIR includes consideration of utilities and services such as wastewater treatment, stormwater drainage, water supply, and solid waste removal.

Cumulative Impacts. Such impacts are analyzed in Chapter Five of the EIR.

Other topical areas are discussed where environmental analysis warrants EIR inclusion.

1.5 *Effects Found Not to be Significant*

As a result of the Initial Study/Notice of Preparation process the following potential environmental effects were found to be less than significant:

Agricultural Resources. The project is a dairy, an agricultural use. The majority of the project site will continue to be farmed and irrigated with a blend of dairy wastes and irrigation water. Operation of a dairy is permitted within the AE-20 District. The entire project site is within a Williamson Act-contracted agricultural preserve. The proposed project, as an agricultural use, does not conflict with zoning or with the provisions of the applicable Williamson Act Contract.

Land Use/Planning. The Fresno County Zoning Ordinance designates the site as AE-20 Exclusive Agriculture District. The minimum parcel size is 20 acres. The designation is intended to be an exclusive district for agriculture and for those uses which are necessary and an integral part of the agricultural operation. The District is intended to protect the general welfare of the agricultural community from encroachments of non-related agricultural uses which by their nature would be injurious to the physical and economic well-being of the agricultural district. The dairy will be in compliance with existing land use and planning regulations.

Mineral Resources. The petroleum resources underlying the site are being utilized by existing onsite and site-adjacent oil wells. Project development and operation will have no impact on these facilities or the existing oil leases. No other mineral resources have been identified on or underlying the site.

Noise. The dairy operation will result in an increase in the noise level in the immediate project vicinity. The County General Plan Noise Element identifies a normal acceptable range of 50 to 75 dBA for agricultural land uses. The agricultural zone, where housing is considered as an allowable use supporting agricultural, is one where normal activities are anticipated to generate noises. All surrounding properties are General Plan-designated, and zoned for agricultural use. In addition, there are no residences or sensitive receptors within 1 mile of the dairy facilities site.

Population and Housing. The project is not designed to induce growth and will not result in substantial direct or indirect growth inducement. The dairy is located in an agricultural area developed with other confined animal operations, including dairies. Therefore, it will not result in a new or different type of land use for the area. The project will not impact any infrastructure serving the site or region. The project is consistent with existing land use plans, and no modification of land use and development policies is necessary. No existing infrastructure or institutional barriers to growth will be removed.

Public Services.

Fire Protection – The dairy will be constructed in compliance with the County’s building and fire code requirements including provisions for necessary access and water for fire protection. Fire protection needs will be de minimus and similar to those of other dairy facilities in the area.

Sheriff Protection – The addition of a dairy to the existing farming operation is not expected to result in additional calls for service, and no feature of the proposed dairy operation would pose unusual sheriff protection demands.

Schools – As needed, employees are expected to be drawn from the local labor pool; no increases in population will result from the proposed dairy. Thus, no increase in the demand for schools is expected.

Recreation. No increases in population will result from dairy operation. The project will thus have no impact on existing parks and will not create demand for additional parks.

Transportation/Traffic. A typical net increase in automobile/pickup traffic for a dairy of this size is 40 trips per day (Bitter Root Dairy EIR, Tulare County). A typical net increase in truck traffic for a dairy of this size and acreage is 16 trips per day (Bitter Root Dairy EIR, Tulare County).

Existing traffic volumes on the County road serving the project (Elkhorn Avenue) is approximately 300 vehicles per day. The nearest major intersection, on Elkhorn Avenue, to the project is at Elkhorn Avenue and SR 145, which is approximately 2.5 miles from the dairy’s facility site. The project-induced increase in traffic is not substantial with respect to increase in vehicle trips, volume-to-capacity ratio, or congestion at intersections, and thus is not considered a significant impact.

1.6 Organization of the EIR

CHAPTER ONE

Chapter One of the EIR briefly describes the proposed project, delineates the procedures and methodology for environmental evaluation of the project, outlines the contents of the project EIR, and lists agency actions and permits required for project implementation.

CHAPTER TWO

Chapter Two of the EIR describes the project in greater detail and summarizes the general characteristics of the project location. The project objectives are also presented. The project’s environmental setting is briefly described, and the regulatory context within which the project is evaluated or must be approved is outlined.

CHAPTER THREE

The subsections of the Chapter are organized as outlined below.

Introduction

Each environmental topic is preceded by either a brief description of the topic-related environment or a brief statement of the rationale for addressing the topic.

Impact Evaluation Criteria

Impact Evaluation Criteria are the standards or thresholds by which impacts are measured, with the objective being the determination of whether an impact will be significant.

Setting

This section provides a description of the environment which may be affected by the project, by topic, and may also include a discussion of the regulatory environment that may be applicable to the project.

Impacts

Each impact associated with a subject area is described and listed by number for future reference.

Conclusion

This is a statement identifying whether the impact is significant or less than significant. If found to be significant, the conclusion states whether the impact can be avoided or reduced to an acceptable level through implementation of mitigation measures, or whether the impact is unmitigable, unavoidable, cumulative and/or irreversible.

Mitigation Measures

Each proposed or recommended legal, feasible and enforceable mitigation measure is described and listed by number.

Effectiveness of Measure

This is a statement that identifies whether the recommended measure will substantially reduce significant environmental impacts, based on the impact evaluation criteria.

Implementation/Monitoring

This is a statement of how the measure will be implemented and monitored.

CHAPTER FOUR

Chapter Four describes and evaluates alternatives to the proposed project. The proposed project is compared to each alternative, and the environmental ramifications of each are analyzed.

CHAPTER FIVE

Chapter Five describes the cumulative effects of the proposed project.

CHAPTER SIX

Chapter Six evaluates or describes CEQA-required subject areas: growth inducement and significant environmental effects that cannot be avoided.

CHAPTER SEVEN

Chapter Seven provides a monitoring and reporting program that summarizes the environmental issues, the mitigation measures, and the agency or agencies responsible for monitoring and reporting on the implementation of the mitigation measures.

APPENDICES

Following the text of this Draft EIR, several appendices and technical studies have been included to facilitate full environmental review of the proposed project.

1.7 Uses of the EIR and Required Agency Actions and Permits

If the SJVAPCD approves the proposed project, subsequent actions, permits, and approvals may be necessary. This EIR may be used, when certified, for evaluation of such subsequent actions.

- Acceptance of a Report of Waste Discharge, or other applicable approval such as an NPDES permit, by the Central Valley Regional Water Quality Control Board.
- Issuance of an Authority to Construct (ATC) and a Permit to Operate (PTO) by the San Joaquin Valley Air Pollution Control District.
- Approval of a Storm Water Pollution Prevention (construction) Permit by the Central Valley Regional Water Quality Control Board.
- Issuance of a Dairy Permit by the California Department of Food and Agriculture, Milk and Dairy Food Control Division.
- Issuance of a well permit, for any new project-related well, by the Fresno County Environmental Health Division.
- Issuance of an encroachment permit, for any new drive approaches to County roadways, by the Fresno County Resources Division.
- Compliance with other Federal, State and local requirements.
- Compliance with the regulations of the Consolidated Mosquito Abatement District.
- Compliance with SJVAPCD Conservation Management Practices for Dairy Operations (Appendix B).

CHAPTER TWO

PROJECT DESCRIPTION AND ENVIRONMENTAL SETTING

CHAPTER TWO – PROJECT DESCRIPTION AND ENVIRONMENTAL SETTING

2.1 Project Location

The 1,242-acre Van Der Kooi Dairy project site is located in western Fresno County approximately 3 miles west of the community of Burrel (see Figure 2-1). The 110-acre dairy facilities site (corrals, barns, lagoon, etc.) is on Elkhorn Avenue, between Howard and Madera Avenues. The project site is within the Five Points Quadrangle of USGS topographic map in Section 31 of Township 16S, Range 18E and Sections 5 and 6 of Township 17 south, Range 18 east, Mount Diablo Base and Meridian, and occupies Fresno County APNs 041-100-045, 050-016-013, and 050-016-016.

2.2 Project Objective

It is the objective of the project to build and operate an economically viable and competitive dairy facility in compliance with applicable laws and regulations, optimally utilizing the available land resource, and mitigating environmental impacts to the extent feasible and as required by CEQA.

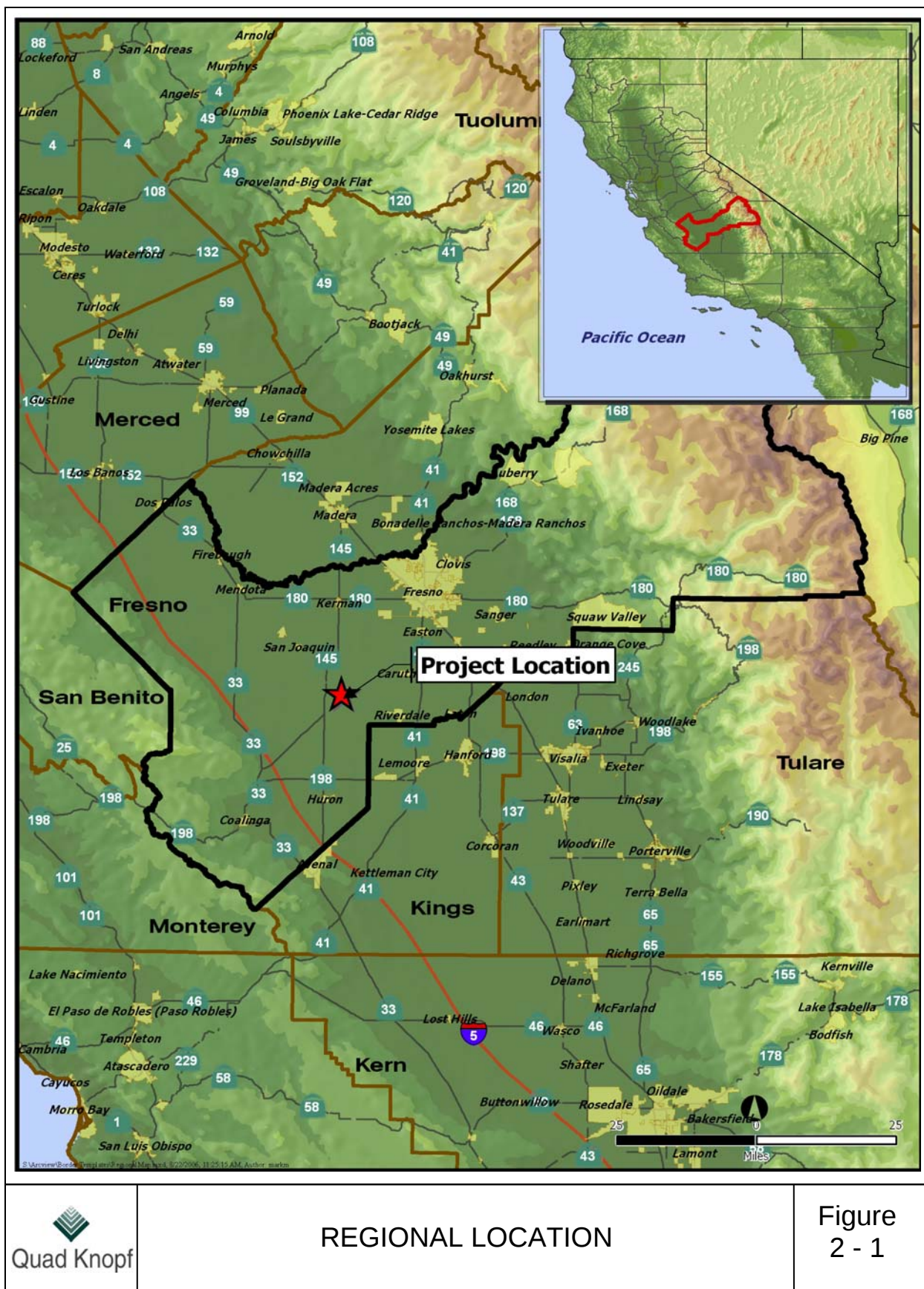
2.3 Project Background

The project will be an additional component of Fresno County's and the San Joaquin Valley dairy industry. Statistics provided by the Fresno County Agricultural Commissioner in the 2005 Annual Crop Report detail the financial impact of the dairy industry on the local economy. Milk production values in Fresno County were \$334,383,000 in 2005.

The dairy industry, including dairy farms and dairy products processing facilities, accounted for \$8,314,000,000 of economic impact annually in the 8-county San Joaquin Valley in 2000, and its impact has increased since that estimate. It employed an estimated 66,774 persons. (Community Alliance for Responsible Environmental Stewardship, "CARES", 'More Than Milk', October 2001, see Appendix C). The dairy industry and its primary customer, the cheese manufacturers, support year-round, permanent job placement, adding stability and sustainability to a predominately seasonal agricultural industry. The proposed project will add an estimated 18 year-round, permanent, jobs to the Fresno area.

It is reported that 122,000 jobs are sustained in the State by the dairy industry, 67,000 in the eight-county San Joaquin Valley region. The total annual economic impact of California's dairy industry has been calculated to be \$17.5 billion (CARES, October, 2001; Appendix C).

As an example of the value of dairies, the Ohio State University Department of Animal Sciences has prepared a report on the economic impact of a new dairy with 2,500 cows (Throan et. al.). The monies spent during the construction phase totaled \$8.6 million (includes \$5 million spent for construction and \$3.6 million additional stimulation in local economy) and resulted in 102 construction-related jobs. In operating the new 2,500-cow dairy the annual economic impact was estimated to total \$13.5 million (including \$7.6 million annual sales, \$4.3 million direct sales to the dairy and \$1.6 million in new household spending) and includes 128 permanent jobs.



2.4 Description of the Project

The project proponent has applied to the SJVAPCD for a permit for the establishment and operation of a 3,200 Holstein milk cow dairy on the above described property. This milk cow herd will be supported by 480 dry cows, 2,060 heifers and 380 calves. Utilizing California Regional Water Quality Control Board, Central Valley Region conversion factors, Holstein cow animals on the dairy site at full development will constitute 6,646 animal units.^a

The project site is located in a Fresno County AE-20 (Exclusive Agriculture 20-Acre Minimum) zone. The proposed dairy facilities will occupy 110 acres of the total site. The remaining acreage will remain in current agricultural production as 1,132 net farmable acres of alfalfa and corn silage/wheat (double cropped).

The location of the dairy facilities with respect to the balance of the project site is shown on Figure 2-2. The dairy facilities site plan is depicted on Figure 2-3 and Figure 2-4.

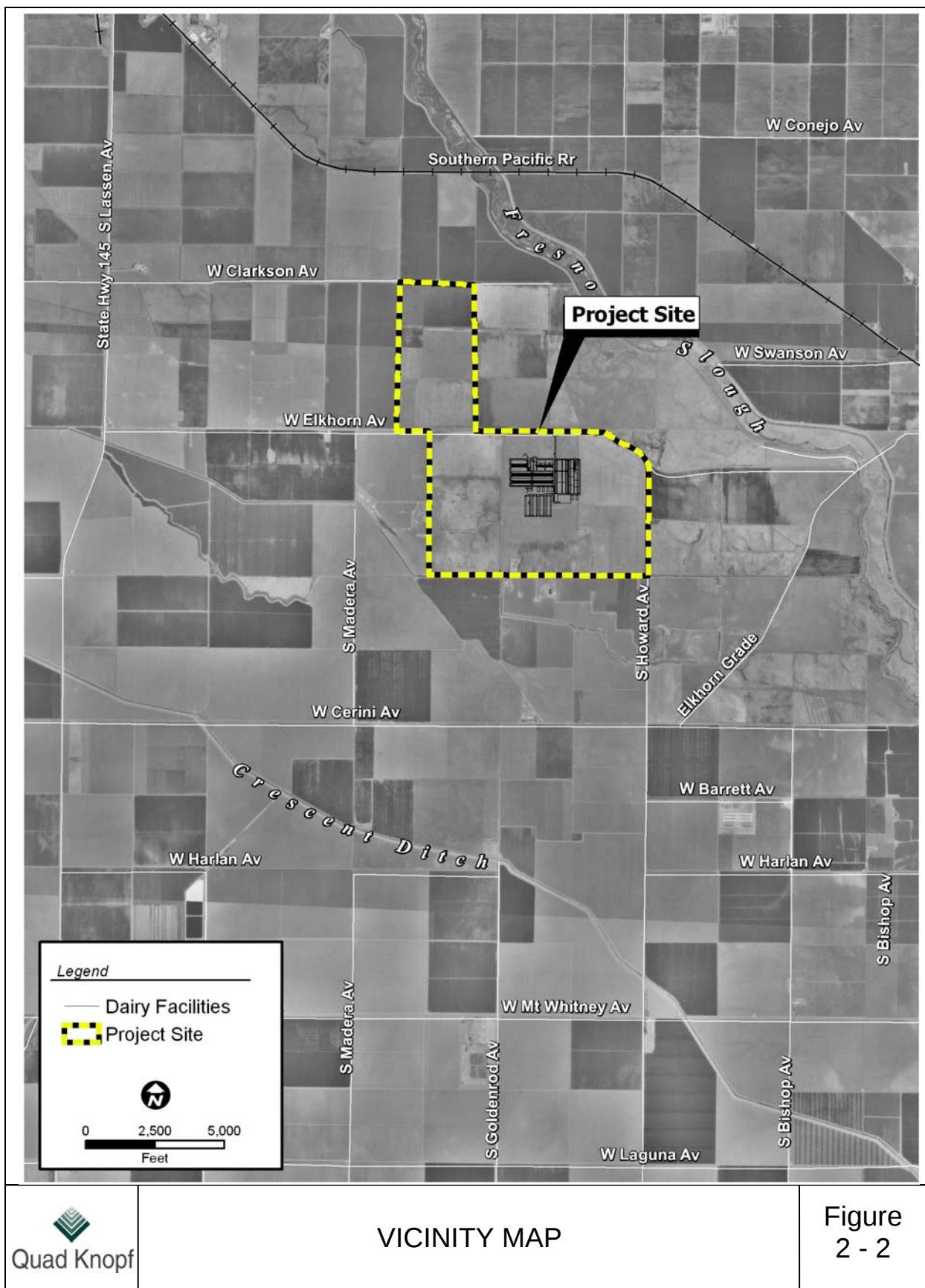
The dairy is designed to maximize the available land for the production of feed to meet the dairy's forage needs, thereby minimizing the necessity for imported feed. Utilization of manure water will provide necessary nutrients for on-site feed production, and reduce the need for groundwater usage for irrigation.

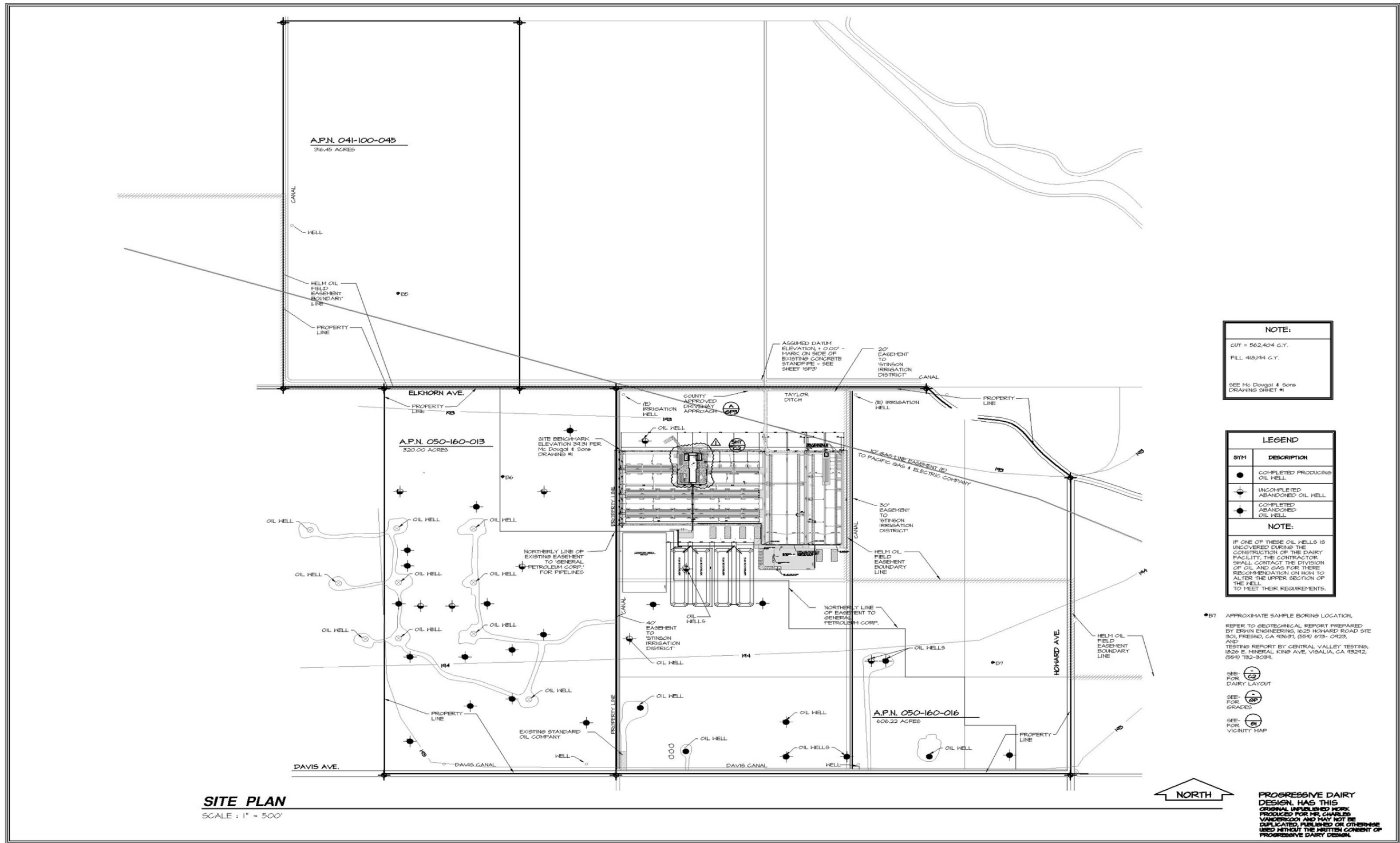
The dairy facility will house milking cows in freestall barns with flush systems and dry cows in corrals with flushed alleys. Liquid waste will be processed through separator basins, which remove solids from liquids, and liquids will flow into wastewater lagoons (see Figure 2-3 for facility component locations). At maximum-design dairy operation, approximately 1,829 tons per year of manure will be hauled offsite and sold as a fertilizer and soil amendment.

The structures to be constructed – barns, freestalls, etc. – will be metal frame. Each milking cow will be provided an individual bedded-stall in the freestall structure. The milking cows are generally kept in the stalls except when they are walked to the milking barn on concrete walk lanes three times a day.

The floors of the freestalls will be concrete. Curbs will separate the feed lane from the freestalls in order to facilitate flushing and enclose feed. All dairy facilities areas will be sloped to prevent ponding of water and to divert and convey rainfall runoff to the separated basins and wastewater lagoons.

^a "Animal units" are calculated based upon a factor that has been adopted by the California Regional Water Quality Control. These factors are: 1.0 for milk cows; 0.75 for dry cows and bred heifers; 0.7 for heifers (1-year-breeding); 0.4 for calves (3 mos.-1 yr.); and baby calves 0.25. For additional information on determining animal units see SWRCB Waste Discharge Requirements in Appendix D.





PROGRESSIVE DAIRY DESIGN HARLAN WESTERLOK TULARE, CA 93274 (559) 688-0287	
REVISIONS 3-18-06 BY AV	
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SITE PLAN A NEW DAIRY FACILITY FOR CHARLES VAN DERKOOI IN FRESNO COUNTY, CALIF.	
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PROJECT SITE

Figure
2 - 3

A substantial percentage of the forage feed – corn and wheat – will be produced on agricultural land at the project site. All fields have return water facilities. The remainder of the forage feed, and feed concentrate, will be imported to the site from outside sources. The feed will be stored in hay barns and on a concrete pad.

Further descriptive project details relevant to the environmental analysis are provided in the appropriate topical areas of Chapter Three of this Draft EIR.

2.5 Environmental Setting

As set forth in Section 1512(a) of the State CEQA Guidelines: “An EIR must include a description of the physical environmental conditions in the vicinity of the project as they exist at the time the Notice of Preparation is published, at the time environmental analysis is commenced, from both a local and regional perspective. This environmental setting will normally constitute the baseline physical conditions by which a lead agency determines whether an impact is significant. The description of the environmental setting shall be no longer than is necessary to provide an understanding of the significant effects of the proposed project and its alternatives.”

Chapter Three, Setting, Impacts and Mitigation Measures contains topic-specific additional information on the environmental and regulatory setting together with analysis of the project’s effect on this setting.

Located in a rural farm area in Fresno County, the project area is zoned AE-20. The land surrounding the site is dedicated to field crops such as corn, wheat, and alfalfa which will in part be used as fodder for the herd. The Fresno County General Plan Land Use Element shows this portion of the County as agricultural.

The climate of the project area is characteristic of that of the Southern San Joaquin Valley. The summer climate is hot and dry, while the winters are cool and periodically humid. Mean daily maximum temperatures range from a low of approximately 57 degrees F in December and January to a high of about 99 degrees F in July.

Rainfall is concentrated during the six months from November to April. December and January typically experience heavy fog, mostly nocturnal, caused when moist cool air is trapped in the valley by high-pressure systems. In extreme cases, this fog may last continuously for two or three weeks. Its depth is usually less than 3,000 feet.

The project area is subject to characteristic seasonal airflows. During the summer, air currents from the Pacific Ocean enter the Valley through the San Francisco Bay and Delta region and are forced down the valley. These air movements are primarily to the southeast at velocities of six to ten miles per hour. During the winter, cold air flowing off the surrounding mountains results in currents toward the northwest and velocities ranging from zero to five miles per hour. These airflows result in extensive horizontal mixing of air masses in the Valley. However, vertical dispersion is constrained by temperature inversions, an increase in air temperature in a stable atmospheric layer, which may occur throughout the year.

The project lies within the Fresno County portion of the San Joaquin Valley Air Basin (SJV Air Basin). The air quality of the Valley is directly related to the ability of the atmosphere to dilute and transport pollutants. The climate and meteorology within the Valley are conducive to the creation and entrapment of air pollution. Air pollution within the Valley is, in part, a result of the enclosed air basin, which experiences long periods of inversion, a relatively light wind flow, and a generous amount of sunlight. The SJV Air Basin is comprised of eight counties: San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, Tulare and central and western Kern. The Basin periodically exceeds State and/or federal standards for levels of ozone and fine particulate matter.

The natural vegetation communities of the southern San Joaquin Valley historically supported a diverse assemblage of plant and animal species. The conversion of native and naturalized plant communities by agricultural development, road construction, dam construction, and urbanization has significantly reduced available wildlife and plant habitat. As a result of this conversion, several species of both plants and animals have been extirpated from the southern San Joaquin Valley, and populations of other species have declined significantly. As a result, and as directed by State and federal legislation, the California Department of Fish and Game and the United States Fish and Wildlife Service have listed many southern San Joaquin Valley species as threatened, endangered, candidates for state or federal listing, “sensitive species”, “special-status species”, or “species of concern.” The likelihood of their appearance at this site is reduced by the conversion of native vegetation in the project area to intensive agriculture.

The topography of the project area is essentially flat with slopes, prior to agricultural land leveling, averaging five feet to the mile toward the southwest. The Federal Emergency Management Flood Insurance Rate Map shows the site is not within any flood zones (Fresno County FIRM Map, Panel 1375B, September 1986).

The southern San Joaquin Valley, approximately 10,000 square miles, is a broad structural trough bordered by the Sierra Nevadas on the east, the Coastal Ranges on the west and the Transverse Range on the south. The occurrence of groundwater is directly related to the geology and soils in the region. Fresh groundwater is principally contained in the unconsolidated continental deposits of the Pliocene to the Holocene age, which extend to depths ranging from less than 100 to more than 3,000 feet.

The ultimate source of groundwater in the San Joaquin Valley is precipitation on the valley and its tributary drainage basins. Replenishment of the unconfined and semi-confined groundwater bodies can be by seepage from streams and by underflow in permeable materials flooring the river and stream canyons that border the valley.

The groundwater basin in this portion of the southern San Joaquin Valley is the Tulare Lake Basin which covers the area south of the San Joaquin River and includes Kings County and the western (valley portions) of Fresno, Fresno and Kern Counties.

2.6 Regulatory Context

The construction and operation of the dairy will require the following regulatory actions:

- Acceptance of a Report of Waste Discharge, or other applicable approval such as an NPDES permit, by the Central Valley Regional Water Quality Control Board.
- Issuance of an Authority to Construct and Permit to Operate by the San Joaquin Valley Air Pollution Control District.
- Approval of a Storm Water Pollution Prevention (construction) Permit by the Central Valley Regional Water Quality Control Board.
- Issuance of a Dairy Permit by the California Department of Food and Agriculture, Milk and Dairy Food Control Division.
- Issuance of a permit for any on-site treatment and disposal system (septic tank and leach lines) by the Fresno County Environmental Health Division.
- Issuance of a well permit, for any new project-related well, by the Fresno County Environmental Health Division.
- Compliance with other Federal, State and local requirements.
- Compliance with the regulations of the Consolidated Mosquito Abatement District.
- Issuance of building permits by the Fresno County Resources Division.
- Compliance with the SJVAPCD's Conservation Management Practices for Dairy Operations (Appendix B).

CHAPTER THREE

SETTING, IMPACTS AND MITIGATION MEASURES

CHAPTER THREE – SETTING, IMPACTS AND MITIGATION MEASURES

Introduction

This section of the EIR addresses topics required by the *California Environmental Quality Act (CEQA)*. Each topic (e.g., biological resources, air quality) includes a description of existing environmental or regulatory conditions for the proposed project in the setting section for each topic. The Impacts and Mitigation Measures section for each topic addresses impacts specifically related to the project.

Corresponding mitigation measures, unless otherwise noted, will be assumed to be sufficient to reduce impacts to a less-than-significant level. When more than one mitigation measure is recommended for a specific impact, all the measures will be required to reduce the impact to a level of insignificance unless the word “or” or “alternatively” appears in the list of mitigation measures. Although not specifically required by *CEQA*, less-than-significant impacts have also been discussed. No mitigation is mandated by *CEQA* for less-than-significant impacts.

The applicant must comply with the mitigation measures, including all reporting requirements, as a condition of approval of the project. Failure to fully comply with all required mitigation measures is potential cause for enforcement action by the SJVAPCD which may include permit modification or revocation. When monitoring of mitigation measures is to be carried out by the SJVAPCD, the project applicant/operator shall maintain complete performance records on file for each measure for Agency review.

Each impact is briefly described (“headed”) and numbered in bold lettering. Text then follows to provide discussion and analysis. At the end of the impacts discussion, mitigation measures are listed and numbered to correspond to the numbered impact. The summary table in the Executive Summary includes the same text heading and the mitigation measures.

Focus. The EIR and the discussions in this Chapter have been focused in accord with the scoping process provided for in *Public Resources Code 21080.4(a)* and *CEQA Guidelines 15082*, relying upon the Notice of Preparation and Initial Study circulated by SJVAPCD and the responsible agency/trustee agency responses thereto. Discussion of *CEQA*-required topics not identified by this process as requiring analysis in depth has not been eliminated but has been appropriately reduced to that essential for environmental analysis. A scoping meeting to assist in the determination was duly noticed and held by the SJVAPCD on February 9, 2006 (see Appendix A).

Determination of Significance. Under *CEQA*, a significant impact is defined as a substantial, or potentially substantial, adverse change in the environment (*Public Resources Code 21068*). The guidelines implementing *CEQA* direct that this determination be based on substantial evidence in light of the whole record. The criteria for determining significance of a particular impact are identified prior to the impact discussion in each topical section, and are consistent with significance criteria set forth in *Appendix G* of the *CEQA Guidelines* and with any applicable SJVAPCD criteria and procedures.

3.1 Aesthetics

INTRODUCTION

This section addresses project impacts on the visual and aesthetic character of the project site and vicinity. Issues include potential impacts to scenic views and vistas, potential disturbance of rural characteristics, alteration of agricultural uses (from the perspective of aesthetics), and impacts associated with an increase in light sources. As discussed in the Initial Study, there are no impacts associated with adverse effects on scenic vistas, scenic resources, or the degradation of the existing visual character. These impacts will not be discussed in the EIR.

IMPACT EVALUATION CRITERIA

CEQA Guidelines criteria for evaluating impacts associated with an increase in light sources are:

Would the project:

- a) *Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?*

SETTING

The proposed 110-acre dairy facilities site is located on Elkhorn Avenue, between Howard Avenue and Madera Avenue 3 miles west of the community of Burrel. The 1,242-acre project site is surrounded by land that has been leveled and improved for intensive agricultural use. Structures include low-rise agricultural and dairy buildings and rural farm dwellings. Photographs documenting the existing views in the area are depicted on Figures 3.1-1 through 3.1-2.

IMPACTS

Impact #3.1.1: Light and Glare [Evaluation Criteria (a)]

Development of the dairy will include lighting. The effects of this lighting could result in a loss of darkness in the night sky that may be noticeable to residents in the area; some sky glow and light ‘spillage’ could occur.

Conclusion: Rural residents within the view of the dairy will experience a change in the night sky due to the project. Although these residents are already experiencing night-time lighting effects from passing vehicles on Elkhorn Avenue and existing dairies in the area, the impact is considered to be potentially significant.



Photograph 1: Looking at the dairy facilities site from the northeast corner.



Photograph 2: Looking at the dairy facilities site from Elkhorn Avenue.

SITE PHOTOS

Figure
3.1 - 1



Photograph 3: Looking north from the project site.



Photograph 4: Looking at the project site from the east.

Mitigation Measure #3.1.1: All lighting shall be principally under roofs and designed to be directed downward and inward to illuminate specific areas.

Effectiveness of Measure: The implementation of this measure will reduce the project's light and glare impact to less than significant.

Implementation/Monitoring: The mitigation measure shall be incorporated in the conditions of approval for the Authority to Construct and shall be the responsibility of the applicant and applicant's contractor. Monitoring will be the responsibility of the SJVAPCD.

3.2 *Agricultural Resources*

As discussed in the Initial Study, the proposed dairy facility is an agricultural use. The proposed project does not conflict with zoning or with the provisions of the Williamson Act contract. There is no impact.

3.3 *Air Quality and Odors*

INTRODUCTION

This section describes the impacts of the proposed project on local and regional air quality. Because Phase I (2,000 cows) of the dairy is considered to be an existing operation, all emissions units associated with Phase I have been grandfathered into permits by the SJVAPCD. The air quality section of the EIR evaluates a project herd size of 3,916 animal units (4,120 head) as the new dairy, "the project" for air quality purposes. This section of the EIR describes existing air quality in the San Joaquin Valley; project related direct and indirect emissions; health effects; the impacts of these emissions on both the project and cumulative/regional scale; and potential mitigation measures which would reduce or eliminate identified significant impacts.

In addition to the criteria set forth in Appendix G of the CEQA Guidelines as implemented by the SJVAPCD, the SJVAPCD has established guidelines as to what it considers significant air quality impacts. For the purposes of this EIR both CEQA and district significance criteria will be reviewed.

IMPACT EVALUATION CRITERIA

CEQA criteria for evaluating adverse impacts on air quality are:

Would the project:

- a) Conflict with or obstruct implementation of the applicable air quality plan?*
- b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?*
- c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality*

standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

- d) Substantially alter air movement, moisture, or temperature, or cause any substantial change in climate?*
- e) Expose sensitive receptors to substantial pollutant concentrations?*
- f) Create objectionable odors affecting a substantial number of people?*

The San Joaquin Valley Air Pollution Control District (SJVAPCD) (the “District”) is the agency that regulates the emissions of stationary sources in the San Joaquin Valley; mobile sources are regulated by the California Air Resources Board (CARB). Historically, agricultural operations such as dairies had not been defined as stationary sources that are subject to regulation. Section 42310(e) of the Health and Safety Code specifically exempted agricultural operations from regulation. However, in response to an EPA request to remove such exemptions, the SJVAPCD adopted an amendment to its Section 4.1 Exemption Rule removing reference to agricultural operations.

The Federal Clean Air Act (CAA) required air districts that fail to achieve PM10 standards by December 2001, such as the SJVAPCD, to submit a new plan by December 31, 2002, and to reach attainment at the earliest practical date. A plan to achieve federal ozone standards was due in May 2002, but the SJVAPCD was unable to identify sufficient reductions to achieve the standards by the 2005 deadline. The SJVAPCD had to choose between facing CAA sanctions for failing to submit a plan that would obtain ozone standards, or being reclassified as ‘extreme’ so that it could extend the deadline to 2010 to ward off those sanctions for a period of time; it chose reclassification. Dairies have come under scrutiny in the context of these regulations because of the industry size and because dairy emissions can contribute to air pollution. The existing information indicated that research attention to dairies is merited, but that so far, not enough was known to reasonably quantify the impact dairies have on Valley air quality. Accordingly, the SJVAPCD staff promulgated an air emissions plan for California dairies. The plan addresses the development and usage of Best Available Control Technologies (BACTs) to reduce dairy air contaminant emissions. The staff proposed an effective date of July 1, 2004, at which date all new or expanded dairies having “1,954 cows” or more would have to apply for a permit requiring compliance with the defined BACTs. A dairy industry group, Western United Dairymen, filed suit against the SJVAPCD, claiming that State legislation (SB-700, Florez; see Appendix E) requiring SJVAPCD permits for new or expanded dairies gives the industry until July 1, 2006 as the date when such permits are to be required. Questions were raised by commentators on the proposed BACTs as to the basis for their selection and implementation. A settlement agreement was reached between the parties regarding the imposition and effective date of the proposed BACTs; the agreement is included in Appendix F of this EIR. The agreement (as amended) delayed until August 1, 2005 the adoption of revised or confirmed volatile organic compounds (VOCs) emission factors to be utilized to determine whether or not digesters or other mitigation measures will be required for any new or expanded dairy facilities for which building permits were obtained after January 1, 2004. This project will require an Authority to Construct from the San Joaquin Valley Air Pollution Control District.

It is clear that certain types of agricultural operations result in emissions of materials that are defined as pollutants. For this reason, the SJVAPCD's standards for determining when a proposed source's project-level emissions are "significant" for the purposes of CEQA is used, although these levels are generally not associated with agricultural sources and estimates of emissions levels from agricultural sources vary widely (see footnotes to Table 3.3-4 in this EIR, for example).

The District has established the following standards of significance for use in CEQA documents (SJVAPCD, Guide for Assessing and Mitigating Air Quality Impacts, Chapter Four, 2002). These standards indicate that a project potentially results in significant effects to the environment when:

- *A project results in estimated carbon monoxide concentrations exceeding the California Ambient Air Quality Standard of 9 parts per million averaged over 8 hours and 20 ppm for 1-hour.*
- *A project results in new direct or indirect emissions of ozone precursors (ROG or NOx) in excess of 10 tons per year.*
- *Any project with the potential to frequently expose members of the public to objectionable odors will be deemed to have a significant impact.*
- *Any project with the potential to expose sensitive receptors (including residential areas) or the general public to substantial levels of toxic air contaminants would be deemed to have a potentially significant impact.*
- *The SJVAPCD significance threshold for construction dust impacts is based on the appropriateness of construction dust controls. The SJVAPCD guidelines provide feasible control measures for construction emission of PM10 beyond that required by district regulations. If the appropriate construction controls are implemented, then air pollutant emissions for construction activities would be considered less-than-significant.*

While San Joaquin Valley Air Pollution Control District CEQA guidance recognizes that PM10 is a major air quality issue in the basin, it has to date not established numeric thresholds for potential impact significance. However, for the purposes of this analysis, a PM10 emission of 15 tons per year was used as a significance threshold. This emission is the SJVAPCD threshold level at which new stationary sources requiring permits for the District must provide emissions "offsets". This threshold significance for PM10 is consistent with the ROG and NOx thresholds of 10 tons per year, which are also offset thresholds established in *SJVAPCD Rule 2201 New and Modified Stationary Source Review Rule*.

An additional measure of significance is derived from *Public Resources Code Section 21083(d)* and *14 CCR 15065(d)*, which require a finding of significance if there is a substantial effect on human beings. Under case law, the issue is not whether [the action] will affect particular persons, but whether [the action] will adversely affect the environment of persons in general. *Topanga Beach Renters Assn. v. Dept. of General Services* (1976) 58 Cal.App.3d 188,195.

SETTING

Air Pollution Climatology. The project is located in the San Joaquin Valley Air Basin, which is defined by the Sierra Nevada in the east, the Coast Ranges in the west, and the Tehachapi mountains in the south. The San Joaquin Valley Air Basin is comprised of San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, and Tulare Counties and the valley portion of Kern County, approximately 25,000 square miles (see Figure 3.3-1).

The climate of the project area is typical of inland valleys in California, with hot dry summers and cool, mild winters. Daytime temperatures in the summer often exceed 100 degrees, with lows in the 60's. In winter, daytime temperatures are usually in the 50's, with lows around 35 degrees. Radiation (Tule) fog is common in the winter, and may persist for days. Winds are predominantly up-valley (from the north) in all seasons, but more so in the summer and spring months. Winds in the fall and winter are generally lighter and more variable in direction but generally blow towards the south and southeast.

Because of the Valley's unique physical characteristics, its pollution potential is very high. Surrounding elevated terrain, in conjunction with temperature inversions, frequently restricts lateral and vertical dilution of pollutants. Abundant sunshine and warm temperatures in summer are ideal conditions for the formation of photochemical oxidants, and the Valley becomes a frequent scene of photochemical pollution.

Air pollution transported from the San Francisco Bay and Sacramento areas is believed to account for 27 percent of measured ozone levels in the northern portion of the air district (San Joaquin, Stanislaus, and Merced Counties). The percentage drops to about 11 percent in the mid-valley counties (Fresno, Tulare, Madera and Kings Counties SJVAPCD website, March, 2003).

Regulatory Framework. The California Air Resources Board (CARB) is responsible for enforcing the federally required State Implementation Plan (SIP) in an effort to achieve and maintain the national ambient air quality standards. SIP is the plan prepared by states and submitted to U.S. EPA describing how each federal nonattainment area will attain and maintain national ambient standards. SIPs include the technical foundation for understanding the air quality (e.g. emission inventories and air quality monitoring), control measures and strategies, and enforcement mechanisms. The SIP incorporates the individual nonattainment plans for air quality districts. In addition, CARB has established State Ambient Air Quality Standards for the Federal "criteria" pollutants as well as for other pollutants for which there are no corresponding Federal standards. CARB is responsible for determining air basin attainment designations in California, and has the authority over mobile sources of pollutants.

A State Implementation Plan (SIP) is the plan prepared by states and submitted to U.S. EPA describing how each federal nonattainment area will attain and maintain national ambient air quality standards. SIPs include the technical foundation for understanding the air quality (e.g. emission inventories and air quality monitoring) control measures and strategies, and enforcement mechanisms. In addition, CARB has established State Ambient Air Quality Standards for the Federal "criteria" pollutants as well as for other pollutants for which there are no corresponding Federal standards. CARB is responsible for determining air basin attainment designations in California, and has authority over mobile sources of pollutants. The SIP incorporates the individual nonattainment plans for air quality districts.



CALIFORNIA AIR BASINS AND COUNTIES

Figure
3.3-1

The San Joaquin Valley *PM10 Attainment Demonstration Plan* (PM10 ADP) acknowledges that agricultural activities may represent a significant source of fugitive dust and supports continued research to characterize emissions from these activities. The PM10 ADP addressed control of particulate emissions from agricultural operations by implementation of voluntary “agricultural conservation practices”. Certain aspects of the operation of dairies are covered by revised Regulation VIII PM10 requirements.

The SJVAPCD’s most recent ozone attainment demonstration plan, the 2004 Extreme Ozone Attainment Demonstration Plan (EOADP), includes control measure Rule 4570, Concentrated Animal Feeding Operations. This rule is intended to control confined animal facility (CAF) emissions of volatile organic compounds (VOCs), which are precursors to ozone. This plan was submitted by ARB as part of the State Implementation Plan. This control measure was effective July 1, 2006. Rule 4570 is also intended to meet the requirements of SB 700, which amended sections of the California Health and Safety Code, specifically CH&SC Section 40724.6 (b), to require air districts which are designated as federal nonattainment areas for ozone to adopt, implement, and submit for inclusion in the State Implementation Plan a rule or regulation requiring large CAFs to obtain a permit from the District and to reduce, to the extent feasible, emissions of air contaminants from the facilities. This control measure applies to all new and existing dairies which have or will have VOC emissions greater than one-half of major source thresholds and will require Best Available Retrofit Control Technologies.

The SJVAPCD is the local air quality agency and is responsible for preparing regional air quality plans under the state and federal Clean Air Acts. The District’s boundaries are contiguous with the San Joaquin Valley Air Basin. In addition to planning responsibilities, SJVAPCD has permitting authority over stationary sources of pollutants. The State Health and Safety Code exempted agricultural and livestock operations from local air districts’ permitting regulations (Section 42310), opacity limits from plumes (Section 41704), and odor nuisance (Section 41705). Thus, the District’s authority with respect to such operations was limited to review of CEQA documents, enforcement in nuisance situations, and identification of significant thresholds. However, since the agricultural exemption is now repealed pursuant to SB 700 (Florez), the applicant must comply with any newly adopted regulations by the SJVAPCD and obtain necessary air quality permits from the APCD, or any other area-responsible air quality regulatory authority (for a chaptered copy of SB 700, see Appendix E). The SJVAPCD adopted in 2004 Rules (3190 and 4550) for PM10 “conservation management fees” and for implementation of selected PM10 reduction programs for agricultural operations. The project applicant must comply with these rules. A copy of these rules is provided in Appendix B.

The SJVAPCD is a major participant in the Central California Air Quality Studies (CCAQS). The CCAQS is comprised of two studies, the California Regional Particulate Air Quality Study (CRPAQS) and the Central California Ozone Study (CCOS). CRPAQS is a multi-year effort including meteorological and PM10/PM2.5 air quality monitoring, emission inventory development, data analysis, and air quality simulation modeling. The Central California Ozone Study (CCOS) consists of a field program, data analysis, emission inventory development, and modeling. The objectives of CRPAQS are to: 1) provide an improved understanding of emissions, PM10 and PM2.5 composition and dynamic atmospheric processes; 2) establish a strong scientific foundation for informed decision making; 3) develop methods to identify the

most efficient and cost-effective emission control strategies to achieve the PM₁₀ and PM_{2.5} standards in Central California.

The 1990 Federal Clean Air Act Amendment (CAAA) included a Federal permitting program for “major” sources of emissions. In the San Joaquin Valley, this was any facility with 25 tons or more per year of ozone precursors (NO_x and ROG). This was presented in Title V of the CAAA and was thus called “Title V Permitting”. CARB and EPA have reached an agreement regarding removal of Title V agricultural exemptions. One of EPA’s conditions was the California Legislature’s revision of the Health and Safety Code to eliminate the provision that exempts “any animals” from the requirement to obtain a permit. All local Districts modified their permitting system appropriately.

The EPA anticipates that the vast majority of stationary agricultural sources will not require Federal permitting and expects that the program will not impose any substantive new restrictions on agricultural operations. Sources that may require permits include facilities with large stationary diesel engines and large animal feeding operations. Applicability of the Title V permit program depends on where sources are located, and the air quality rating of that area. EPA issued rules in October 2002 and gave farmers until May 14, 2003 to submit applications for permits governing engines. EPA set a deadline of November 13, 2003 for other major stationary sources. EPA has not as yet established, other than Title V regulations, air quality requirements for dairies, thus further emphasizing the current difficulty in scientifically determining appropriate limits on dairy emissions.

No dairy-related emission reduction credit or Title V permitting program has been put in place in California to date by any Federal or State agency. The SJVAPCD staff has, however, promulgated Best Available Control Technology (BACT) determinations for dairy operations, effective July 1, 2004, governing the issuance of permits from the District for all dairies emitting volatile organic compounds (VOCs) in excess of one-half of major source emissions (12.5 tons per year).

Regional Air Quality Plans. Federal and state air quality laws require identification of areas not meeting the ambient air quality standards. These areas must develop regional air quality plans to eventually attain the standards. Under both the federal and state Clean Air Acts the San Joaquin Valley Air Basin is a non-attainment area (standards have not been attained) for ozone and PM_{2.5}. The air basin is either attainment or unclassified for other ambient standards.

The Basin is currently in serious non-attainment for PM₁₀ and serious non-attainment for 8-hour ozone (the previous extreme non-attainment for 1-hour ozone has been revoked by the US EPA effective Jun 15, 2005 as specified in Federal Register Vol. 69 No. 84 Friday April 30, 2004 Rules and Regulations). The attainment deadline for PM₁₀ is 2010, however the SJVAPCD recently submitted a request to the EPA to reclassify the area as in attainment for PM₁₀. In order to meet the standard, the District had to provide three years of data showing that PM₁₀ concentrations did not exceed 24-hour and annual caps. The EPA’s declaration of attainment for PM₁₀ is the final step in reaching this milestone. Since 1990, emissions of PM₁₀ and its precursors have dropped 36 percent as a result of the commitments undertaken by the Air District and the Valley’s businesses, citizens and local governments. It is not yet known if the SJVAPCD’s request for reclassification will be granted. Environmental groups are currently

challenging the data showing notable reductions in PM₁₀. Until the EPA makes a determination (sometime in October, 2007), the Valley remains a serious non-attainment area.

Ambient Air Quality Standards. Under the federal *Clean Air Act*, 42 U.S.C. Section 7401 *et. seq.* (1970) (as amended 1990), the federal government originally established National Ambient Air Quality Standards (“NAAQS”) for “criteria” pollutants. Both the U.S. Environmental Protection Agency and the California Air Resources Board have established ambient air quality standards for such criteria pollutants. These ambient air quality standards are maximum levels of contaminants, which are intended to represent safe levels that avoid specific adverse health effects associated with each pollutant. The ambient air quality standards cover what are called “criteria” pollutants because the health and other effects of each pollutant are described in criteria documents. The air quality criteria pollutants under state and federal law include ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, PM₁₀, PM_{2.5}, lead, and hydrogen sulfide.

The federal and California state ambient air quality standards are summarized in Table 3.3-1 on the following page. The federal and state ambient standards were developed independently with differing purposes and methods, although both processes are intended to avoid health-related effects. As a result, the federal and state standards differ in some cases. In general, the California state standards are more stringent. This is particularly true for ozone and PM₁₀.

The U.S. Environmental Protection Agency in 1997 adopted new national air quality standards for ground-level ozone and for fine Particulate Matter. The existing one-hour ozone standard of 0.12 PPM was phased out and replaced by an eight-hour standard of 0.08 PPM. New national standards for fine Particulate Matter (diameter 2.5 microns or less) have also been established for 24-hour and annual averaging periods. The current PM₁₀ standards were retained, but the method and form for determining compliance with the standards were revised. Additionally, a PM_{2.5} state standard was adopted effective July 5, 2003. The San Joaquin Valley is non-attainment for both the State and Federal PM_{2.5} standards.

The passage of SB 700 (Florez) in 2003 changed the California Health and Safety Code (Section 39011.5) and removed agriculture’s permitting exemption. As a result, new and modified dairies with the potential to emit half of the major source threshold (12.5 tons of criteria pollutants) or more annually are required to obtain pre-construction and operating permits from the District. In addition, SB 700 included language requiring districts to adopt Best Available Retrofit Control Technology to reduce pollutants from large confined animal facilities.

The proposed project will need to submit an application for an Authority to Construct (ATC) permit and receive the ATC prior to any construction. The proposed project will be subject to District Rule 2201 (new and Modified Stationary Source Review Rule), which requires Best Available Control Technology (BACT) for new emissions units which result in an increase in permitted emissions greater than 2.0 lbs/day. The proposed project will trigger BACT requirements for VOC, hydrogen sulfide (H₂S), and ammonia (NH₃).

**Table 3.3-1
Federal and State Ambient Air Quality Standards –2005**

Pollutant	Averaging Time	California Standards^a Concentration^c	Federal Standards^b Primary^{c, d}
Ozone	1 Hour	0.09 ppm (180 µg/m ³)	--
	8 Hour	0.07 PPM (137 MG/ m ³)	0.08 ppm (157 µg/m ³) ^e
Respirable Particulate Matter (PM10)	24 Hour	50 µg/m ³	150 µg/m ³
	Annual Arithmetic Mean	20 µg/m ³	50 µg/m ³
Fine Particulate Matter (PM2.5)	24 Hour	65 µg/m ³	65 µg/m ³
	Annual Arithmetic Mean	12 µg/m ³	15 µg/m ³
Carbon Monoxide (CO)	8 Hour	9.0 ppm (10 µg/m ³)	9 ppm (10 mg/m ³)
	1 Hour	20 ppm (23 mg/m ³)	35 ppm (40 mg/m ³)
	8 Hour (Lake Tahoe)	6 ppm (7 µg/m ³)	--
Nitrogen Dioxide (NO₂)	Annual Arithmetic Mean	--	0.053 ppm (100 µg/m ³)
	1 Hour	0.25 ppm (470 µg/m ³)	--
Sulfur Dioxide (SO₂)	Annual Arithmetic Mean	--	0.030 ppm (80 µg/m ³)
	24 Hour	0.04 ppm (105 µg/m ³)	0.14 ppm (365 µg/m ³)
	1 Hour	0.25 ppm (655 µg/m ³)	--
Lead	30 Day Average	1.5 µg/m ³	--
	Calendar Quarter	--	1.5 µg/m ³
Visibility Reducing Particles	8 Hour	f	--
Sulfates	24 Hour	25 µg/m ³	--
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m ³)	--
Vinyl Chloride	24 Hour	0.010 ppm (26 µg/m ³)	--

^a California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, suspended particulate matter – PM10, PM2.5 , and visibility reducing particles, are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

^b National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest eight hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM10, the 24 hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m³ is equal to or less than one. For PM2.5 , the 24 hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact U.S. EPA for further clarification and current federal policies.

^c Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

^d National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

^e New federal 8-hour ozone and fine particulate matter standards were promulgated by U.S. EPA on July 18, 1997.

^f Statewide VRP Standard (except Lake Tahoe Air Basin): Particles in sufficient amount to produce an extinction coefficient of 0.23 per kilometer when the relative humidity is less than 70 percent. This standard is intended to limit the frequency and severity of visibility impairment due to regional haze and is equivalent to a 10-mile nominal visual range.

Current Air Quality. The estimated population within the SJVAB is three million persons, according to SJVAPCD's Planning Division. The SJVAB has one of the most severe air pollution problems in the State. The surrounding topographic features restrict air movement through and out of the basin and, as a result, impede the dispersion of pollutants from the basin. Inversion layers are formed in the San Joaquin Valley air basin throughout the year. During the summer, the San Joaquin Valley experiences daytime temperature inversions at elevations from

2,000 to 2,500 feet above the valley floor. During the winter months, inversions occur from 500 to 1,000 feet above the valley floor (Cal. Air Resources Board, 1974).

The California Air Resources Board operates a series of monitoring stations, including a monitoring site in Fresno. The San Joaquin Valley Air Pollution Control District also operates the Hanford and Visalia monitoring sites which are relatively close to the project site. The Visalia air monitoring station is located approximately 45 miles to the southeast, the Fresno station is 25 miles northeast, and the Hanford station is 25 miles southeast of the project site. The Visalia monitoring site measures several gaseous pollutants as well as PM₁₀, and the Hanford site measures ozone, nitrogen dioxide and PM₁₀. A summary of air quality data from the Visalia, Fresno, and Hanford monitoring sites is shown in Table 3.3-2 on the following page.

Although the San Joaquin Valley Air Basin is often in violation of state and federal ozone ambient air quality standards and PM₁₀ thresholds, data collected over the past ten years by the California Air Resources Board shows that air quality in the Valley is, in general, improving. However, the federal ozone attainment designation of the air basin was officially changed from 'serious' to 'severe' on December 10, 2001. Under this designation, the San Joaquin Valley air basin was required to meet the federal ozone standards by November 15, 2005. The SJVAPCD prepared the 2002 and 2005 Rate of Progress Plan as required by this designation change, but the Plan concluded that the actions identified within the Plan would not fulfill the EPA's requirements for a plan that will demonstrate attainment by November 15, 2005. Failure to meet the attainment deadline could have resulted in increased offset requirements for new industrial sources and potential sanctions, including withholding of federal grants for capacity-expanding transportation projects and new transportation plans, and ultimately terminate all federally funded transportation projects in the District, except safety projects. The District has now requested and received approval of Federal standard reclassification to 'extreme' nonattainment, which will delay the attainment date to 2010, but will result in even stricter controls for stationary sources of pollutants.

PM₁₀ concentrations in this area of the air basin have been trending downward slowly since monitoring began in 1989. The calculated number of days at the Hanford station exceeding the national standard was 30 in 1989 and none in 2005. The calculated number of days of exceedance of the state standard was 198 in 1989 and 110 in 2005. The air basin is designated as a 'serious' nonattainment area for federal PM₁₀ ambient air quality standards. Under this designation, the air district is required to meet the 24-hour and annual PM₁₀ standards by December 31, 2006. Failure to meet the attainment deadline could, again, result in increased offset requirements for new industrial sources and potential sanctions, including withholding of federal grants for capacity-expanding transportation projects and new transportation plans, and could ultimately stop all federally funded transportation projects in the District, except safety projects.

**Table 3.3-2
Ambient Air Quality**

Year	Days Exceeding Standards													
	State Ozone	Fresno – 1 st Street Federal Ozone	State PM10 ¹	Federal PM10 ¹	Federal PM2.5	State Ozone	Federal Ozone	State PM10 ¹	Federal PM10 ¹	State Ozone	Federal Ozone	Visalia State PM10 ¹	Federal PM10 ¹	Federal PM2.5
1989	-	-	-	-	-	13	1	198	30	69	10	228	24	-
1990	36	8	-	-	-	4	-	144	18	37	1	240	6	-
1991	76	27	185	0	-	15	-	174	36	31	1	198	6	-
1992	56	12	-	0	-	1	-	150	0	23	2	150	0	-
1993	59	11	134	0	-	29	-	66	0	60	9	180	0	-
1994	56	7	-	-	-	9	-	156	0	52	10	156	0	-
1995	65	14	-	0	-	2	-	150	6	48	2	168	0	-
1996	59	15	64	0	-	78	8	108	0	53	4	150	0	-
1997	30	1	71	0	-	23	2	102	0	24	1	66	0	-
1998	46	15	77	0	-	27	3	90	0	54	6	102	6	-
1999	53	4	110	0	19	28	2	102	0	52	1	174	0	12
2000	48	5	72	0	-	48	0	99	1	46	1	180	0	8
2001	51	5	98	6	14	21	1	156	14	36	2	162	0	4
2002	45	11	90	0	17	29	1	172	1	35	1	178	0	5
2003	56	5	80	0	0	19	0	149	0	43	0	108	0	0
2004	23	0	30	0	2	7	0	101	0	17	1	91	0	0
2005	31	3	58	0	17	6	0	110	0	27	0	146	0	-

Source: Air Resources Board Aerometric Data Analysis and Management System (ADAM)

⁽¹⁾ Measurements of PM10 are made every sixth day. Data is the estimated number of days that the standard would have been exceeded had measurements been collected every day.

Criteria Pollutants

Ozone, (O₃). Ozone is not emitted directly into the environment, but is generated from complex chemical reactions that occur in the presence of sunlight. One of the primary components of the chemical reactions is nitrogen oxide (NO_x), which is referred to as an ozone precursor. NO_x generators in the San Joaquin Valley include mobile sources, solvents and fuel combustion. Another ozone precursor is reactive organic gases (ROGs), which are generated by anaerobic decomposition of organic substances such as manure and as fossil fuel exhaust components. NO_x and ROG's are potential dairy emissions.

Ozone exposure causes eye irritation and damage to lung tissue in humans. Ozone also harms vegetation, and reduces crop yields. There is no quantifiable, peer-reviewed, scientific literature available, however, as to the comparative impact of various ozone levels on San Joaquin Valley forage crop production. It accelerates deterioration of paints, finishes, rubber products, plastics, and fabrics. The San Joaquin Valley Air Basin is currently in non-attainment (the Federal one-hour, ozone attainment level is classified extreme) for the Federal and State standards for ozone; the Hanford area (see Table 3.3-2), for example, exceeded State Standards for ozone concentrations in ambient surface atmosphere on 6 days during 2005.

Carbon Monoxide (CO). Unlike ozone, carbon monoxide is released directly into the atmosphere by stationary and mobile sources. CO is an odorless, colorless gas formed by the incomplete combustion of fuels. CO combines with hemoglobin in the blood and reduces the oxygen-carrying capacity of the blood when inhaled at high concentrations. Only the urbanized area of Fresno is currently in non-attainment for the State CO standard. In 1998, the urbanized areas of Fresno, Stockton, Modesto, and Bakersfield were reclassified from non-attainment to attainment status for the Federal CO standard. Carbon monoxide is found at high concentrations only very near the source. Carbon monoxide from dairy operation is generated by operation of trucks, mobile equipment, and automobiles. The major source of carbon monoxide, a colorless, odorless, poisonous gas, is automobile traffic. Elevated concentrations are usually only found near areas of high traffic volumes.

Carbon monoxide concentrations are seasonal, with the highest concentrations occurring in the winter. This may be due to the fact that automobiles create more carbon monoxide in colder weather and partly due to the very stable atmospheric conditions that exist on cold winter evenings when winds are calm. Concentrations typically are highest during stagnant air periods within the period November through January.

Carbon monoxide's health effects are related to its affinity for hemoglobin in the blood. At high concentrations, carbon monoxide reduces the amount of oxygen in the blood, causing heart difficulties in people with chronic diseases, reduced lung capacity and impaired mental abilities.

Nitrogen Dioxide (NO₂). Nitrogen dioxide is a reddish-brown gas that discolors the air, formed during combustion. Its health effects include increased risk of acute and chronic respiratory disease. Major sources are automobile and diesel truck exhaust, industrial processes, and fossil-fueled power plants. The SJVAPCD is an attainment area for the state/federal nitrogen dioxide standards. It is an important pollutant, however, because nitrogen dioxide is one of several

oxides of nitrogen (NO_x) that participate in the formation of photochemical ozone and PM_{2.5} and may be a component of dairy emissions.

Respirable Particulate Matter (PM₁₀). Particulate matter evaluated herein with respect to this project, is released directly into the atmosphere by stationary and mobile sources. PM₁₀ consists of a wide range of solid and liquid particles, including smoke, dust, aerosols, and metallic oxides. Major sources of PM₁₀ include vehicles, power generation, industrial processing, wood burning, road dust, construction/farming activities, and fugitive windblown dust. The 1995 PM₁₀ emission inventory for the San Joaquin Valley Air Basin indicated that fugitive windblown dust, farming operations and road dust were the three leading sources of PM₁₀ (SJVAPCD, 2002). The San Joaquin Valley Air Basin is currently in non-attainment (Federally classified as serious) for the Federal and State PM₁₀ standards. The effects of high concentrations on humans include aggravation of chronic disease and heart/lung disease symptoms. Non-health effects include reduced visibility and soiling of surfaces.

Fine Particulate Matter (PM_{2.5}). Like PM₁₀, fine particulate matter (similarly evaluated with respect to this project) is also released directly into the atmosphere by stationary and mobile sources. It is also created in the atmosphere by photochemical and chemical processes acting on precursor pollutants. Sources of PM_{2.5}, the fine fraction of PM₁₀ include ammonia, vehicles, power generation, industrial processes, and wood burning. The health effects of PM_{2.5} are similar to those of PM₁₀; they can impair proper lung function and may contribute to the development of chronic bronchitis. They are a health concern because they easily reach the deepest recesses of the lungs. Scientific studies have linked particulate matter (alone or in combination with other air pollutants) with a series of health problems, including premature death, respiratory related hospital admissions or emergency room visits, aggravated asthma, chronic bronchitis, decrease lung functions, and work and school absences. Those who are most at risk are the elderly, individuals with preexisting heart and lung disease, children, and asthmatics and asthmatic children.

Regular monitoring of PM_{2.5} in the atmosphere in California began in early 1999. The available data show that the highest 24-hour and annual average PM_{2.5} concentrations are found in the South Coast Air Basin and San Joaquin Valley Air Basin. On average, the highest 24-hour concentrations in 1999 and 2000 occurred in November, December and January, while the lowest concentrations occurred between March and August. This seasonality was most pronounced in the San Joaquin Valley Air Basin, where the December-January concentrations were on the order of four to five times greater than those for March through August.

In July 1997, the EPA adopted an annual PM_{2.5} standard set at 15 µg/m³ and a new 24-hour PM_{2.5} standard set at 65 µg/m³. On May 3, 2002, the California Air Resources Board (CARB) staff recommended establishing an annual standard for PM_{2.5} (particulate matter 2.5 micrometers in diameter and smaller). The new state standard became effective on July 5, 2003.

Measured levels of PM_{2.5} at the closest monitoring station (Fresno) show that the state and federal standards have been frequently exceeded in the project vicinity. The highest 24-hour concentrations at this station during the period 1998-2005 was 19 micrograms per cubic meter. The San Joaquin Valley Air Basin has been designated non-attainment for PM_{2.5} for both the state and federal standards.

There is currently very limited speciation data for PM_{2.5}. Based on PM₁₀ speciation data, the CARB estimates that during the peak months of November, December and January, at Central Valley monitoring sites (Bakersfield, Fresno and Sacramento) carbon constitutes approximately 20 to 25 percent of the PM₁₀ mass, while nitrate constitutes approximately ten to 15 percent of the PM₁₀ mass (CARB, 2001). A study using the Chemical Mass Balance (CMB) model to determine source contributions for samples taken in the San Joaquin Valley in the fall and winter of 1995 concluded that secondary ammonium nitrate was generally the largest contributor at all sites during the winter study and second largest contributor during the fall study, comprising 30-50 percent of the PM₁₀ mass during the winter and 15-20 percent of the mass during the fall. Secondary ammonium nitrate contributions were very uniform across all sites and displayed similar absolute concentrations during both the fall and winter, suggesting a regional, rather than local influence. Such contributions do not primarily affect next-door neighbors to ammonia emission sources (Magliano, K.L., 1999).

Hydrogen Sulfide, (H₂S). Hydrogen sulfide, a potential project emission, is generated by the anaerobic decomposition of manure. It has a distinct odor and can cause dizziness, nausea, and headaches at low concentrations, and more serious effects at higher concentrations. It is naturally emitted in geothermal areas and is also associated with certain industrial processes. There is a state ambient air quality standard for hydrogen sulfide but no corresponding national standard. Concentrations of this pollutant are not monitored within the San Joaquin Valley Air Basin.

Lead and Sulfur Dioxide, (Pb and SO₂). Dairies and related activities are not significant contributors of these criteria pollutants (U.S. Dept. of Ag., 2000) which are therefore not analyzed in this EIR.

Ammonia, (NH₃). Although not a criteria pollutant, ammonia NH₃ is evaluated with respect to this project and considered a precursor to the newest criteria pollutant, PM_{2.5}. Ammonia is considered an air toxic under the *Air Toxics "Hot Spots" Information and Assessment Act California Health and Safety Code sections 44300, et seq., 1987, Connelly* program. Ammonia is generated during anaerobic decomposition of manure; in high concentrations it can severely irritate the eye, ear and throat. It is a strong alkali that can react in the atmosphere to produce fine particulate in the form of ammonium nitrate or ammonium sulfate. Ammonia concentrations are not monitored in California, but the California Air Resources Board is currently developing inventories for ammonia as part of the state PM_{2.5} planning process (Gaffney and Shimp, 1999).

Ammonia gas (a base) is known to react with acids in the atmosphere (typically nitric or sulfuric acid) to form ammonium nitrates or sulfates, which are particles. In the eastern portions of the country sulfates predominate because of the burning of sulfur-containing fuels, while in California the nitric acid predominates. Nitric acid is a product of photochemical reactions in the atmosphere. Ammonia is thus a potential secondary source of fine particulate matter, since the particulates result from a chemical reaction in the atmosphere.

While it is known that the release of ammonia gas is a participant in the formation of ammonium nitrate, there is currently no capability to forecast how much ammonium nitrate would be created by a release of a certain amount of ammonia. The reaction that forms ammonium nitrate is

dependent on the presence of other chemicals which are in turn part of a complex photochemical process occurring in the atmosphere. At the same time, both ammonia and ammonium nitrate are subject to removal processes that constantly remove the pollutants from the atmosphere (e.g., deposition, removal by rain, participation as nuclei, etc.).

Given the current uncertainty in emission rates for ammonia and the lack of a scientific method of calculating PM_{2.5} conversion from ammonia emissions, any calculation of secondary PM_{2.5} would be speculative. The DEIR has reported the best estimate of ammonia emission and identified these emissions as a precursor of PM_{2.5} in the atmosphere. This is analogous to the quantification of emissions of ROG and NO_x as precursors to the formation of ozone. Since it is not possible to convert new emissions of these ozone precursors into amounts or concentrations of ozone in the atmosphere, the significance of ozone precursor emissions must be based on comparison of precursor emissions to a threshold of significance recommended by the SJVAPCD, CARB, or EPA.

Other Air Pollutants Generated by Dairies

Some pollutants are not associated with health effects but are suspected of contributing to “global warming.” Global warming has occurred in the past as a result of natural influences, but the term is now often used to refer to the warming predicted by computer models to occur as a result of increased emissions of greenhouse gases. Greenhouse gases include carbon dioxide, methane, chlorofluoro-carbons, nitrous oxide, ozone, and water vapor. Methane is a greenhouse gas that will result from this project.

Methane, (CH₄). Methane is an odorless greenhouse gas that absorbs and reflects terrestrial radiation back to the earth. The recent phenomenon of rising temperatures reportedly related to greenhouse gases is known popularly as global warming. Methane is emitted into the environment from various sources including ruminant livestock and manure decomposition. Methane released from domesticated ruminant livestock accounts for about 30 percent (about 80 million metric tons per year) of the anthropogenic methane generated in the United States; (U.S. EPA, Final Report on U.S. Methane Emissions 1990-2020: Inventories, Projections, and Opportunities for Reduction, EPA 430-R-99-013, September 1999).

Methane generation from ruminant animals is influenced by feed quality, essential nutrients in the feed, quantitative feeding level and feed schedule, and animal health. Methane is released through the animal’s mouth, nostrils and digestive system and from anaerobic decomposition of livestock manure. Of the major greenhouse gases, methane has a relatively short lifespan in the atmosphere. Removal from the atmosphere occurs due to chemical reactions in the atmosphere, as well as from microbial uptake by soils.

There are no state or national ambient air quality standards for methane, and it is not considered a precursor of any other pollutant. Regulatory requirements for the reduction of control of methane emissions have not been established on the Federal, State, or local levels. However, EPA prepares methane emission source inventories as required by the CAA amendments. The five major anthropogenic sources of methane in the United States have been identified to be (in order of contribution): landfills, domesticated livestock, natural gas and oil production, coal mining, and livestock manure (U.S. EPA, 1998). Methane has been determined to be only the

second most significant greenhouse gas that reportedly contributes to global warming, the first being CO₂. Nevertheless, it is evaluated herein as an air pollution concern.

Health Effects

Summarized brief health effects of air pollutants include:

Ozone (O₃) exposure may cause eye irritation and damage to lung tissue in humans. Ozone also harms vegetation, reduces crop yields, and accelerates deterioration of paints, finishes, rubber products, plastics, and fabrics. The San Joaquin Valley Air Basin is currently in non-attainment for the Federal and State standards for ozone.

Carbon monoxide's (CO) health effects are related to its affinity for hemoglobin in the blood. At high concentrations, carbon monoxide reduces the amount of oxygen in the blood, causing heart difficulties in people with chronic diseases, reduced lung capacity and impaired mental abilities.

Nitrogen dioxide (NO₂) is a reddish-brown gas that discolors the air; it is formed during combustion. Its health effects include increased risk of acute and chronic respiratory disease.

The effects of high concentrations of Respirable Particulate Matter (PM₁₀) on humans include aggravation of chronic disease and heart/lung disease symptoms. Non-health effects include reduced visibility and soiling of surfaces.

The health effects of Fine Particulate Matter (PM_{2.5}) are similar to those of PM₁₀; they can impair proper lung function and may contribute to the development of chronic bronchitis. They are a health concern because they easily reach the deepest recesses of the lungs. Scientific studies have linked particulate matter (alone or in combination with other air pollutants) with a series of health problems, including premature death, respiratory related hospital admissions or emergency room visits, aggravated asthma, chronic bronchitis, decrease in lung functions, and work and school absences. Those who are most at risk are the elderly, individuals with preexisting heart and lung disease, children, and asthmatics and asthmatic children.

Numeric relationships between vapor and particulate emissions and public health impacts, with pertinent reference to San Joaquin Valley conditions and dairy emissions, are included in Appendix G of the EIR.

Hydrogen sulfide (H₂S) has a distinct odor and can cause dizziness, nausea, and headaches at low concentrations, and more serious effects at higher concentrations.

Ammonia (NH₃) is generated during anaerobic decomposition of manure; in high concentrations it can severely irritate the eye, ear and throat.

In subsequent subsections [Impact #3.3.1 through Impact 3.3.10] of this chapter, various project-related air pollutants will be evaluated as to whether they create or constitute project-level or cumulative significant impacts. Such significance will be determined on the basis of whether project emissions exceed designated threshold levels; contribute to an existing violation of an identified Basin-wide air quality standard, or contribute to recognized global air quality concerns. Additionally, potential health impacts with respect to any nearby residents, based on

air quality modeling parameters, are discussed in a concluding subsection (Health Impacts Modeling) of this Air Quality section. Health effects are further discussed in the referenced FEIR approved by Tulare County for the Hilarides Dairy project (2002) and by the Madera County-approved Diamond H Dairy project EIR.

With respect to such determinations of significance, there are concomitant threats to human health associated with the pollutants being evaluated. A further review of the types of health effects associated with key project-related pollutant emissions is useful:

Ozone

Reactive organic gasses (ROGs) and oxides of nitrogen (NO_xs), both evaluated herein with respect to dairy emissions, are precursors of ozone formation. Ozone has been described as having the following health effects:

Ambient tropospheric ozone pollution at sufficient levels can cause upper and lower respiratory irritative symptoms, restrictive and obstructive spirometric changes, and increased responsiveness to methacholine and allergen bronchoprovocation. In epidemiologic studies, ozone has been associated with increased de novo development of chronic respiratory illness and increased incidence of emergency department visits and hospitalizations for asthma and respiratory disease. Animal studies suggest increased susceptibility to bacterial infection. Some evidence supports an association between ambient ozone exposure and increased daily mortality rates. Ozone induced illness is probably very infrequently recognized as such, but may be suspected especially during formation and especially persistence of relatively stagnant hot ambient air masses. Since bright sunlight is present driving the chemical reactions, health effects from heat exposure are concomitant.

Great inter-individual variability exists in ozone responsiveness, with a few individuals suffering clinically important reactions, most persons experiencing mild responses, with the remainder little affected. Persons at risk include persons with asthma or chronic lung disease, and those who are active outdoors for prolonged periods. Examples of this latter group are athletes, children at play, and outdoor workers such as laborers, policemen and firemen, farmers, linemen, loading dock workers, construction workers, and foresters. Ozone related spirometric compromise is more marked in individuals with chronic obstructive lung disease, then in otherwise healthy smokers. Increasing evidence suggests that asthmatics, after exposure to ozone, have increased bronchial reactivity to subsequent allergens. Some non-asthmatics show a similar pattern (Dr. Dickey, J.H., Health M.D., Greater Boston PSR; Effects of Air Pollution).

Recent studies (American Lung Association, State of the Air, 2001) have further validated and documented the adverse health effects of ozone with respect to respiratory disease, and the increase in such effects with respect to asthmatics, children and the elderly.

Particulate Matter (PM₁₀) and Fine Particulate Matter (PM_{2.5})

Particulates are similarly evaluated as potential dairy farming emissions:

Epidemiologic studies associate PM10 with adverse health effects. However, more recent epidemiologic studies have contributed to understanding the size specificity of health effects, and have increasingly implicated the gasses and smaller particles as the more relevant components of hazardous particulate exposure.

Acute symptoms and signs include restricted activity (including days lost from school and work due to respiratory illness), respiratory illnesses, and exacerbations of asthma and pulmonary diseases. Clinical observations include declines in lung function, increased asthma medication use, increased emergency department visits, increased hospitalization, increased cardiac and respiratory mortality. Although asthmatics seem to increase bronchodilator use during acid aerosol air pollution episodes, they see relatively little improvement in their peak flow meter recordings. Groups at particular risk of acute illness include the elderly (65 years), and persons with chronic heart and lung diseases.

Clinical associations with chronic particulate pollution observed in epidemiologic studies include bronchitis, chronic cough, respiratory illness, pulmonary diseases and asthma exacerbations, decreased longevity, and lung cancer.

Testimony before the Committee on Science, House of Representatives, on May 8, 2002 by a series of expert witnesses (Mr. Daniel S. Greenbaum, President, Health Effects Institute; Dr. Ronald E. Wyzga, Technical Executive, Electric Power Research Institute, and Dr. Joel Schwarz, Associate Professor of Environmental Epidemiology, Harvard School of Public Health) confirmed the findings described in Dr. Dickey's excerpted statement above.

Ammonia has been identified as a precursor to small-particle (PM2.5) particulate matter.

Nitrogen Dioxide (NO₂)

In addition to being a precursor to ozone formation, high concentrations of nitrogen dioxide have, although not likely as dairy emissions, been identified as having direct health effects.

Very high concentrations are very dangerous, causing lung injury, fatal pulmonary edema, and bronchopneumonia. Lower concentrations cause impaired mucociliary clearance, particle transport, macrophage function, and local immunity . . . (and) have been associated with a significant increase in acute respiratory infections, sore throat, colds and absences from school... While ambient NO₂ levels have been associated in epidemiologic meta-analyses with declines in spirometry and cardio respiratory events, NO₂ is less clearly implicated than particulate, sulfur dioxide, and ozone (Dickey, J.H., Health Effects of Air Pollution).

Appendix G further describes air contaminant health impacts in the Central Valley.

Sensitive Receptors. One of the criteria for significance includes potential impacts on sensitive receptors. The SJVAPCD [Guide for Assessing and Mitigating Air Quality Impacts (GAMAQI), Section 3, January 10, 2002] defines a sensitive receptor as a location where human populations, especially children, seniors, and sick persons are present and where there is a reasonable expectation of continuous human exposure to pollutants.

Sensitive receptors normally refer to land uses with heightened sensitivity to localized, rather than regional, pollutants. Examples include emissions of criteria or toxic air pollutants that have health effects (PM₁₀, ammonia, H₂S), and to a lesser extent odors or odorous compounds such as ammonia and H₂S. Sensitive receptors would not be directly affected by emissions of regional pollutants such as ozone precursors (ROG and NO_x).

The term “sensitive receptor” does not have a distance associated with it; its “sensitivity” is a function of the land use and not necessarily the presence or lack of nearby sources. SJVAPCD CEQA guidance does offer some “screening” distances between various sources and sensitive receptors, but these are useful only for determining when no analysis is required, not for determining significance of impacts. For example, the SJVAPCD “screening” distance for a dairy is given as one mile; within that distance further study per Section 5 of GAMAQI need not be undertaken.

Summary of SJVAPCD Rules and Processes Applicable to Project. The SJVAPCD has indicated that the following are among those applicable:

- The construction phase of this project can generate emissions from the movement of soil, use of heavy equipment, bulk materials handling, asphalt paving and other related activities. As a result, this project is subject to District Regulation VIII (Fugitive PM₁₀ Prohibitions, Rules 8011-8081). The purpose of Regulation VIII is to reduce the amount of fine particulate matter (PM₁₀) entrained into the ambient air from man-made sources. If a non-residential project is 5.0 or more acres in area, a plan must be submitted as specified in Section 6.3.1 of Rule 8021. A template of the District’s Dust Control Plan is available at: <http://www.valleyair.org/busind/comply/PM10/forms/DCP-Form%20-%2010-14-2004.pdf>.
- Rule 4550 Conservation Management Practices (CMP). This program reduces fugitive dust from agricultural operations. The rule requires the preparation of a CMP Plan that must be submitted to the District.
- Paving operations of this project will be subject to Rule 4641 (Cutback, Slow Cure, and Emulsified Asphalt, Paving and Maintenance Operations). This rule applies to the manufacture and use of cutback asphalt, slow cure asphalt and emulsified asphalt for paving and maintenance.
- An operation of this size is subject to the permitting requirement of the District under Rule 2201. Any equipment/operation subject to the District’s Permit to Operate requirements must obtain an Authority to Construct (ATC) from the District. This project will also be subject to Best Available Control Technology (BACT), requirements by the District.

Currently, there is no final BACT guideline for dairy operations. The SJVAPCD must perform a detailed “Top-Down” BACT analysis for VOC, PM₁₀ H₂S, and NH₃ as a part of its evaluation of the dairy’s Authority to Construct (ATC) application. This analysis entails a listing of all available control technologies, in order of lowest emissions. Each control technology is

evaluated, starting with the cleanest, to see if it is cost effective to install on a given dairy. In other words, the District will first review the lowest VOC, PM₁₀, H₂S, and NH₃ technologies available in today's market and, if not cost effective, would then look at the next cleanest technologies. This continues until the District finds a technology that is cost effective or until the project reaches an emissions level that the District considers "achieved-in-practice."

Possible Receptors. There are no dwelling units within the project site and no off-site dwellings within one mile of the dairy facilities sites.

IMPACTS

Project impacts will be evaluated both on the basis of CEQA Appendix G criteria and SJVAPCD significance criteria. In order, the impacts to be evaluated will be those involving construction, operational emissions of criteria pollutants (Particulate Matter (PM₁₀) and reactive organic gas precursors to ozone), methane, ammonia and hydrogen sulfide, odors, carbon monoxide, and cumulative air quality impacts. Because the area is non-attainment for ozone, PM₁₀, and PM_{2.5}, a major criteria for review is whether the project will result in a significant net increase of ozone precursor pollutants and Particulate Matter (PM₁₀) and Fine Particulate Matter (PM_{2.5}). Where environmental impacts are found to be significant or potentially significant, mitigation measures are identified to mitigate or avoid significant environmental effects.

In addition to the site-specific mitigation measures delineated for this project, the applicant shall be required to implement reasonably feasible management practices required by the San Joaquin Valley Air Pollution Control District, or any other federal or state air quality regulatory agency, for the purpose of mitigating any significant impacts from the emission of Particulate Matter, Fine Particulate Matter, Reactive Organic Gases, Nitrogen Oxide, Methane, Ammonia, Hydrogen Sulfide, and any other criteria air pollutant or precursor emanating from the construction or operation of this dairy.

Impact #3.3.1 Particulate Matter (PM₁₀) and Fine Particulate Matter (PM_{2.5}) Impacts: [Evaluation Criteria (a), (b), (c); SJVAPCD Criteria S-5]

Project construction will result in numerous activities that generate dust. The silty soils in the project area exacerbate the potential for dust, particularly in the summer months. Grading, earthmoving and excavation are the activities that generate the most PM₁₀ and PM_{2.5} emissions.

Construction activities associated with project development include site preparation, soil excavation, grading, equipment traffic on paved and unpaved surfaces, and the construction of dairy structures. The duration of construction for this project is projected to be six to nine months.

Because prediction of PM₁₀ /PM_{2.5} generation depends on a large number of variables which may change from project to project or from day to day, the SJVAPCD has recommended a qualitative, rather than a quantitative, approach to assessing impact significance for PM₁₀/PM_{2.5} construction activity emissions.

The air district has implemented Regulation VIII, which provides a menu of PM10/PM2.5 controls that define the minimum content of a construction dust control program. Regulation VIII contains several rules (8011-8081) that outline control measures required for all construction projects to reduce the amount of PM10/PM2.5 emissions generated from fugitive dust sources (see Appendix H).

Regulation VIII, last amended in August 2004 was adopted by the SJVAPCD to reduce ambient concentrations of Particulate Matter by requiring actions to prevent, reduce, or mitigate anthropogenic fugitive dust emissions. Prior to the start of construction activities at the 110-acre dairy facilities site, the owner/operator will be required to file a Dust Control Plan with the SJVAPCD in accordance with Section 6.3 of Rule 8021.

Conclusion: In review of the relatively large project area and projected intensity of dust-producing activities during construction, PM10/PM2.5 emissions generated during construction are deemed to constitute a temporary potentially significant impact, possibly exposing residents downwind to elevated PM10 concentrations and contributing to the regional PM10/PM2.5 emission burden.

From the perspective of the SJVAPCD, compliance with Regulation VIII for all sites will constitute sufficient mitigation to reduce PM10 impacts to a level below significance (see Section 4, Guide for Assessing and Mitigating Air Quality Impacts, SJVAPCD, January 10, 2002).

Regulation VIII procedures of the SJVAPCD are contained in Appendix H. The provisions of Regulation VIII are summarized in Table 3.3-3 on the following page.

Mitigation Measures: Because compliance with Regulation VIII is required by law, no mitigation measures are required.

Impact #3.3.2 Construction Emissions (Carbon Monoxide (CO), Reactive Organic Gases (ROG), Nitrogen Oxide (NOx), Sulfur Dioxide SO₂), Particulate Matter (PM10) Fine Particulate Matter (PM2.5)):
[Evaluation Criteria (a), (b), (c); SJVAPCD Criteria S-4]

Several pieces of diesel-powered heavy equipment typically operate during the site preparation phase of the project. Site preparation activity emissions have been estimated based on a construction vehicle fleet of two scrapers, a grader, a dozer, a loader, and two water trucks. The results of this calculation are shown in Table 3.3-4, expressed in tons per year. The construction project will be less than one year in duration.

Table 3.3-3
Mandatory Control Measures for Construction, Excavation, Extraction,
and Other Earthmoving Activities. A Summary of Regulation VIII.

Pre-Activity:

- Pre-water site sufficient to limit Visible Dust Emissions (VDE) to 20% opacity
- Phase work to reduce the amount of disturbed surface area at any one time.

During Active Operations:

- Apply water or chemical/organic stabilizers/suppressants sufficient to limit VDE to 20% opacity
- Construct and maintain wind barriers sufficient to limit VDE to 20% opacity. If utilizing wind barriers, control measure B1 above shall also be implemented.
- Apply water or chemical/organic stabilizers/suppressants to unpaved haul/access roads and unpaved vehicle/equipment traffic areas sufficient to limit VDE to 20% opacity and meet the conditions of a stabilized unpaved road surface.

Temporary Stabilization During Periods Of Inactivity:

- Restrict vehicular access to the area
- Apply water or chemical/organic stabilizers/suppressants, sufficient to comply with the conditions of a stabilized surface. If an area having 0.5 acres or more of disturbed surface area remains unused for seven or more days, the area must comply with the conditions for a stabilized surface area as defined below:
Stabilized Surface: any disturbed surface area or open bulk material storage pile that is resistant to wind blown fugitive dust emissions. A surface is considered to be stabilized if it meets at least one of the following conditions:
 - o A visible crust; or
 - o A threshold friction velocity (TFV) for disturbed surface areas corrected for non-erodible elements of 100 centimeters per second or greater; or
 - o A flat vegetative cover of at least 50 percent that is attached or rooted vegetation; or unattached vegetative debris lying on the surface with a predominant horizontal orientation that is not subject to movement by wind; or
 - o A standing vegetative cover of at least 30 percent that is attached or rooted vegetation with a predominant vertical orientation; or
 - o A standing vegetative cover that is attached or rooted vegetation with a predominant vertical orientation that is at least 10 percent and where the TFV is at least 43 centimeters per second when corrected for nonerodible elements; or
 - o A surface that is greater than or equal to 10 percent of non-erodible elements such as rocks, stones, or hard-packed clumps of soil.

Speed Limitations and Posting of Speed Limit Signs

- Limit the speed of vehicles traveling on uncontrolled unpaved access/haul roads within construction sites to a maximum of 15 miles per hour.
- Post speed limit signs that meet State and Federal Department of Transportation standards at each construction site's uncontrolled unpaved access/haul road entrance. At a minimum, speed limit signs shall also be posted at least every 500 feet and shall be readable in both directions of travel along uncontrolled unpaved access/haul roads.

Wind Generated Fugitive Dust Requirements

- Cease outdoor construction, excavation, extraction, and other earthmoving activities that disturb the soil whenever VDE exceeds 20% opacity. Indoor activities such as electrical, plumbing, dry wall installation, painting, and any other activity that does not cause any disturbances to the soil are not subject to this requirement.
- Continue operation of water trucks/devices when outdoor construction excavation, extraction, and other earthmoving activities cease, unless unsafe to do so.

Carryout and Trackout:

- Prevent or cleanup carryout and trackout as per SJVAPCD rule 8041.
 - o The use of blower devices, or dry rotary brushes or brooms, for removal of carryout and trackout on public roads is expressly prohibited.
 - o The removal of carryout and trackout from paved public roads does not exempt an owner/operator from obtaining state or local agency permits which may be required for the cleanup of mud and dirt on paved public roads.
-

**Table 3.3-4
Construction Equipment Exhaust Emissions (Tons/Year)**

Equipment	CO	ROG	NOx	SOx	PM10	PM2.5
Scrapers (2)	0.72	0.16	2.22	0.27	0.24	0.22
Grader	0.03	0.01	0.13	0.02	0.01	0.01
Dozer	0.32	0.04	1.75	0.07	0.01	0.01
Loader	0.10	0.04	0.34	0.03	0.03	0.03
Water Truck (2)	0.21	0.04	0.14	Negl.	0.01	0.01
Total (tons)	1.38	0.29	4.58	0.39	0.30	0.28
SJVAPCD Threshold*	n/a	10.0	10.0	n/a	15.0	n/a

CO = Carbon Monoxide

ROG = Reactive Organic Gases

NOx = Nitrogen Oxides

SOx = Sulfur Oxides

PM10 = Particulate Matter, 10 Microns

*Guide for Assessing and Mitigating Air Quality Impacts, San Joaquin Valley Air Pollution Control District, January 10, 2002; Section 4, Table 4-1.

Additionally, paving operations on the site may result in asphalt-derived emissions.

Conclusion: Since dairy construction will take less than one year, the Table 3.3-4 figures are conservative comparing the estimated emissions to the governing SJVAPCD total thresholds. The project impacts are considered less than significant because they are less than the thresholds.

The emissions which may result from onsite dairy facilities paving will be de minimus because of the typically limited dairy facilities area to be paved, and cannot be calculated at this time pending the development of detailed construction plans and specifications.

Since project emissions are less than significant, cumulative impacts of construction-related are deemed by the District to be less than significant.

Mitigation Measure #3.3.2: As a condition of the Authority to Construct by the SJVAPCD, and to be monitored by such Agency, the owner/operator and construction crew shall ensure that the following control measures are implemented prior to and during construction activities to reduce exhaust emissions from construction related equipment:

1. Attend a preconstruction meeting at the District.
2. The idling time of all construction equipment used at the site shall not exceed ten minutes.
3. The hours of operation of heavy-duty equipment shall be minimized.
4. All equipment shall be properly tuned and maintained in accord with manufacturer's specification.

5. When feasible, alternative fueled or electrical construction equipment shall be used at the project site.
6. The minimum practical engine size for construction equipment shall be used.
7. When feasible, electric carts or other smaller equipment shall be used at the project site.
8. Gasoline-powered equipment shall be equipped with catalytic converters.
9. The facilities construction contractor shall comply with Rule 4641 of the SJVAPCD.

Effectiveness of Measures: It should be noted that these mitigation measures are not required to reduce project construction exhaust emissions to less than significant, but are recommended to further reduce such impacts. Since the project emissions are less than significant, cumulative impacts of construction emissions are deemed by the District to be less than significant.

Implementation/Monitoring: The mitigation measures shall be implemented by the construction contractor, and shall be a condition of the Authority to Construct. Monitoring shall be the responsibility of the SJVAPCD.

Impact #3.3.3.A Operational Emission of Criteria Pollutants, Particulate Matter (PM10) and Fine Particulate Matter (PM2.5):
[Evaluation Criteria (a), (b), (c); SJVAPCD Criteria S-2, S-4]

PM10/PM2.5 will be generated by several activities associated with dairy operations including principally PM10 emissions from cattle movement on and periodic maintenance of unpaved surfaces, and continued farming operations.

PM2.5 emissions are calculated based on conversions of PM10 to PM2.5, multiplying CARB-derived fractions for each source category (see Air Quality Methodology and Calculations – Appendix I).

Ammonia gas (a base) is known to react with acids in the atmosphere (typically nitric or sulfuric acid) to form ammonium nitrates or sulfates, which are particles. In the eastern portions of the country, sulfates predominate because of the burning of sulfur-containing fuels, while in California nitric acid predominates. Nitric acid is a product of photochemical reactions in the atmosphere.

Ammonia is thus a potential secondary source of particulates, since the particulates result from a chemical reaction in the atmosphere.

While it is known that the release of ammonia gas is a participant in the formation of ammonium nitrate, there is currently no capability to forecast how much ammonium nitrate would be created by release of a certain amount of ammonia. The reaction that forms ammonium nitrate is dependent on the presence of other chemicals which are in turn part of a complex photochemical process occurring in the atmosphere. At the same time, both ammonia and ammonium nitrate are subject to removal processes that constantly remove the pollutants from the atmosphere (e.g., deposition, removal by rain, participation as nuclei, etc.)

Table 3.3-5 shows the best estimate of ammonia emissions; these emissions would act as a precursor of PM2.5 in the atmosphere. This is analogous to the quantification of emissions of ROG and NOx as precursors to the formation of ozone. Just as it is not possible to convert new emissions of ozone precursors into amounts or concentrations of ozone in the atmosphere, it cannot be done for ammonia-related PM2.5. The District recognizes that ammonia emissions are a concern because they are a secondary source for the formation of ammonium nitrate particulate matter, however recent research findings for the California Regional Particulate Air Quality Study (CRPAQS) indicates that a control strategy focused on NOx reductions alone would be most effective. This is because the limiting component in the formation of ammonium nitrate in the Central Valley is nitric acid, so the reduction in NOx or to lesser extent VOC will lead to less ammonium nitrate formation.¹¹ Therefore the added ammonia emissions will not contribute significantly to a decline in air quality. The District would consider the ammonia emissions to have a less than significant impact. Given the current uncertainty in emission rates for ammonia and the lack of a method of calculating PM2.5 conversion from ammonia emissions, any calculated quantification of secondary PM2.5 would be speculative.

Absent such speculation, and based on best available data for PM10 emissions from fugitive dust, annual emissions of PM10 and PM2.5 have been estimated and are included in Table 3.3-5. New project-related, emissions are estimated to be 37.3 tons per year for PM10 and 7.7 ton per year for PM2.5. Existing, farming-related PM10 emissions which would continue as a part of the project are estimated to be 26.4 tons per year for PM10 and 6 tons per year for PM2.5. For comparative purposes, estimates of current Air Basin PM10 emissions are 356.5 tons/day (130,123 tons/year). The methodology and assumptions used in estimating PM10 emissions are detailed in Appendix I.

The SJVAPCD has adopted, for all agricultural operations within its purview, Rule 4550 requiring compliance with “one or more” of a list of Management Practices designed to reduce agricultural fugitive dust emissions. The Rule was effective as of May 20, 2004 (see Appendix B).

Conclusion: The project will result in a mitigated net increase of 10.9 tons of PM10 per year and a net increase of 1.6 tons of PM2.5 per year. There is no adopted threshold for PM10. As the Basin is in non-attainment for PM10, a reduction of PM10 emission levels down to zero will reduce the PM10 emission impacts to a less than significant level. The following mitigation measures are required.

Mitigation Measure #3.3.3.A, PM10/PM2.5:

The applicant shall perform the following BACT control measures:

1. Maintain a manure pack less than two inches deep.

¹ Herner, John, Jeremy Aw, Oliver Gao, Daniel P. Chang, and Michael J. Kleeman, “Size and Composition of Airborne Particulate Matter in Northern California: Particulate Mass, Carbon, and Water-Soluble Ions”, *Journal of Air and Waste Management Association*, vol. 55, January 2005.

2. Refrain from spreading dry manure on nutrient application areas when wind speeds exceed 10 miles per hour.
3. Remove mud or dirt which originates from project operations, on project-adjacent roads within 24 hours of deposition.
4. Protect dry feed storage on three sides to prevent material loss and transport due to wind action.
5. Plant trees downwind around the dairy facilities site.
6. Provide shade areas in corrals.

In addition, the applicant shall purchase emission offsets to mitigate for the remaining 10.9 tons of PM10.

**Table 3.3-5
Operational Emissions of Pollutants (Tons/Year)***

Source	ROG	NOx	PM10	PM2.5	NH ₃	CH ₄
Existing Sources³:						
Farm Equipment	0.80	5.68	0.38	0.35	---	---
Land Preparation	---	---	2.97	0.66	---	---
Crop Harvesting	---	---	1.73	0.38	---	---
Windblown Dust	---	---	15.55	3.45	---	---
Unpaved Road Dust	---	---	5.61	1.19	---	---
Truck Exhaust	0.05	0.51	0.20	0.04	---	---
Total Emissions	0.85	6.19	26.44	6.07		
Proposed Project:						
Farm Equipment	1.14	7.69	0.44	0.41	---	---
Land Preparation	---	---	4.13	0.92	---	---
Crop Harvesting	---	---	1.69	0.37	---	---
Windblown Dust	---	---	15.98	3.54	---	---
Unpaved Road Dust	---	---	6.63	1.41	---	---
Truck Exhausts	0.07	0.66	0.27	0.06	---	---
Employee Travel	0.06	0.07	0.51	0.09	---	---
Cattle Housing	---	---	7.68	0.88	---	---
Manure Decomposition/ Digestion	13.87 ¹	(26.4) ²	---	---	93.39	460.82
Total Emissions	15.13	8.42	37.34	7.66	93.39	460.82
Net Change	14.28	2.23	10.90	1.6	93.39	460.82
SJVAPCD Threshold	10.0	10.0	15.0	---	---	---

*See Appendix I for calculations.

ROG = Reactive Organic Gases

NOx = Nitrogen Oxides

PM10 = Particulate Matter, 10 Microns

PM2.5 = Particulate Matter, 2.5 Microns

NH₃ = Ammonia

CH₄ = Methane

Source: John Castleberry, Air Quality Specialist

1. ROG tonnage based on SJVAPCD emission factor of:
 - Milk Cow: 21.0 lb/head/yr
 - Dry Cow: 11.9 lb/head/yr
 - Heifer (15-24 months): 8.3 lb/head/yr
 - Heifer (7-14 months): 7.2 lb/head/yr
 - Heifer (4-6 months): 6.6 lb/head/yr
 - Calf (under 3 months): 6.2 lb/head/yr
2. Parenthetical ROG tonnage based on CARB emission factor of 12.8 lb/head/yr
3. See Appendix J for existing agricultural records

Effectiveness of Measure(s): The implementation of the described operational PM10 mitigation measure(s) will reduce incremental PM10 impacts to less than significant. Cumulative PM10 impacts are therefore deemed by the District to be less than significant.

Implementation/Monitoring: The mitigation measure(s) shall be implemented by the dairy facility/farm operator and shall be a condition of the Authority to Construct. Monitoring shall be the responsibility of the SJVAPCD.

Impact #3.3.3.B Operational Emission of Criteria Pollutants, Reactive Organic Gas (ROG): [Evaluation Criteria (a),(b),(c); SJVAPCD Criteria S-2, S-4]

Project-related reactive organic gases are principally generated by direct emissions from cows (see Appendix I) and by manure decomposition.

The SJVAPCD will consider various “Best Available Control Technology” mitigation measures as conditions of issuance of an Authority to Construct (ATC) the dairy facility. These measures are listed below:

A. Feed and silage practices shall incorporate at least five (5) of the following mitigation measures:	
1.	a. Feed according to NRC guidelines, or b. Feed animals probiotics designed to improve rumen function according to the manufacturer’s recommendations.
2.	a. Remove feed from feed lanes prior to it becoming spoiled.
3.	a. Cover the horizontal surface of silage piles, except for the area where feed is being removed from the pile.
4.	a. Remove silage from piles in a manner that minimizes the disturbed surface area and that is approved by the APCO, ARB, and US EPA.
5.	a. Enclose silage in a bag vented to a control device with at least 80% VOC control efficiency, or b. Enclose silage in a structure vented to a control device with at least 80% VOC control efficiency.
6.	a. Collect leachate from the silage piles and send it to a waste treatment system such as a lagoon at least once every twenty-four (24) hours.
7.	a. Implement an alternative mitigation measure(s), not listed above.
B. Milk parlor practices shall incorporate at least one (1) of the following mitigation measures:	
1.	a. Flush milk parlor after each milking, or
2.	b. Use an alternative mitigation measure.

C. Cattle housing or corral practices shall incorporate at least eight (8) of the following mitigation measures:	
1.	a. Vacuum or scrape freestalls after each milking, or b. Flush freestalls more frequently than milking schedule.
2.	a. Clean manure from corrals at least four (4) times per year with at least sixty (60) days between cleaning, or b. Clean open corrals at least once between October and December, or c. Clean concreted areas such that the depth of manure does not exceed twelve (12) inches at any point or time.
3.	a. Slope the surface of the pens at least 3%
4.	a. Maintain corrals to ensure drainage and prevent water from standing more than forty-eight (48) hours after a storm, or b. Maintain corrals and drylots so that there are not indentions in the surface where puddles may form.
5.	a. Use lime or a similar absorbent material in the pens according to the manufacturer's recommendations to minimize moisture in the pens, or b. Apply thymol to corral soil in accordance with the manufacturer's recommendation, or c. Apply eugenol to corral soil in accordance with the manufacturer's recommendation.
6.	a. Harrow pens sufficiently to maintain a dry surface, unless the corrals have not held animals in the last thirty (30) days.
7.	a. Scrape or flush feed aprons in all heifer corrals at least once every seven (7) days.
8.	a. Use a non-manure-based bedding for freestalls (i.e. mate or waterbeds).
9.	a. Install floats on the troughs or use another method approved by the APCO, ARB, and US EPA to ensure that the water in the troughs does not intentionally or unintentionally overflow or spill onto the ground.
10.	a. Inspect water pipes and troughs and repair leaks daily.
11.	a. Install shade structures constructed with a light permeable roofing material (i.e. woven shade cloth).
12.	a. House animals in an enclosure vented to a biofilter or control device certified by the District to achieve at least 80% control efficiency.
13.	a. Implement an alternative mitigation measure(s), not listed above.
D. Solid manure/separated solids handling and storage practices shall incorporate at least two (2) of the following mitigation measures:	

1.	a. Store all removed manure in an enclosure vented to a biofilter or a control device with at least 80% control efficiency.
2.	a. Cover manure piles outside the pens with a waterproof covering from October through May except for times, not to exceed twenty-four (24) hours per year, when wind events remove the covering.
3.	a. Cover separated solids outside the pens with a waterproof covering from October through May except for times, not to exceed twenty-four (24) hours per year, when wind events remove the covering.
4.	a. Compost manure removed from pens with an aerated static pile vented to a biofilter or other control device with at least 80% control efficiency.
5.	a. Implement an alternative mitigation measure(s), not listed above.
E. Liquid Manure Management practices shall incorporate at least one (1) of the following mitigation measures:	
1.	a. Manage the facility such that lagoons only contain waste from the milking parlor.
2.	a. Use phototrophic lagoons, or b. Use microbial lagoon additive designed to reduce VOC emissions from lagoons in accordance with manufacturer recommendations, or c. Use an anaerobic treatment lagoon designed to NRCS standards, or d. Use an aerobic lagoons designed to NRCS standards, or e. Maintain a dissolved oxygen content of 2.0 mg/L or greater through design, management and/or mechanical aerators in lagoons, or f. Use microaerobic biological nutrient management practices on lagoons.
3.	a. Remove solids from the waste system with a mechanical solid separation system prior to the waste stream entering the lagoon.
4.	a. Cover the lagoon and vent to a biofilter or a control device with at least 80% control efficiency.
5.	a. Implement an alternative mitigation measure(s), not listed above.
F. Application of manure to cropland practices shall incorporate at least two (2) of the following mitigation measures:	
1.	a. Land incorporate all manure within seventy-two (72) hours of removal, or b. Only apply manure that has been treated with an anaerobic digestion process.
2.	a. Allow water to stand in the fields no more than twenty-four (24) hours after irrigation.
3.	a. Only apply manure that has a moisture content of less than 50%.
4.	a. Implement an alternative mitigation measure(s), not listed above.

Reactive organic gases (ROGs) will be generated at any location where cattle are housed or where manure undergoes anaerobic (oxygen-deficient) decomposition. ROGs are a subset of total organic gases (TOGs). Reactive organic gases, also known as volatile organic compounds, are photochemically reactive hydrocarbons that are precursors of ozone formation. In order to derive most conservative values for ROG (and methane) production, it has been assumed that all manure, liquid or solid, on the project site decomposes anaerobically, although thin-layer manure applications to crops may actually result in aerobic decomposition. TOGs are mostly methane, which is photochemically non-reactive and is not considered an ozone precursor. It is discussed below separately as greenhouse gas. ROG emissions from manure decomposition were estimated using emission factors, stratified by animal size, provided by the San Joaquin Valley Air Pollution Control District (SJVAPCD, 2006). The ROG emissions factors are:

Milk Cow	21.0 lb/head/year
Dry Cow	11.9 lb/head/year
Heifer (15-24 months)	8.3 lb/head/year
Heifer (7-14 months)	7.2 lb/head/year
Heifer (4-6 months)	6.6 lb/head/year
Calf (under 3 months)	6.2 lb/head/year

The total ROG emissions are 15.13 tons per year for this project (see Table 3.3-5); net project ROG emissions have been calculated as 14.28 tons per year. Total and net ROG emissions have been calculated (see Table 3.3-5) incorporating the reductions effected by the mitigation measures listed below. For comparison purposes, total ROG emissions for the Air Basin have been estimated as 394 tons per day, 143,810 tons per year.

Conclusion: The project would result in a net increase of 14.28 tons of ROG per year. This increase in ROG emissions is primarily or directly from cows and from manure decomposition and would exceed the SJVAPCD threshold of significance. This impact is considered significant.

Mitigation Measure #3.3.3.B: The project applicant shall, in construction and operation of the project, comply with the following BACT control measures as agreed with the San Joaquin Valley Air Pollution Control District:

1. Use of phototrophic (red) lagoon and associated nutrient management practices
2. Flush or spray down milking area with each batch milked, and flush holding pen and wash pens at least 4 times daily.
3. Flush feedlanes, walkways, etc. at least 4 times daily.

In addition, the applicant shall purchase emission offsets to mitigate for the remaining 4.28 tons of ROG in exceedance of the SJVAPCD threshold of 10 tons per year.

Effectiveness of Measures: The implementation of the described ROG mitigation measures will reduce ROG emission impacts to a less than significant level.

Implementation/Monitoring: The implementation by the applicant of the listed three measures, is required as conditions of approval of the Authority to Construct by the SJVAPCD, plus the purchase of the 4.28 tons of offsets. Monitoring shall be by the SJVAPCD.

Impact #3.3.4 Operational Emission of Criteria Pollutants, Nitrogen Oxide (NOx):

The existing source of NOx emissions which will continue during project operations is from farm equipment exhaust (5.68 tons per year); net new sources including project-related truck exhausts and employee vehicles are (2.23 tons per year), (see Table 3.3-5).

Conclusion: The net new NOx emissions of the project, including those from existing and continuing farming equipment usage, 2.23 tons per year, are less than the SJVAPCD significance threshold level of 10.0 tons per year. All existing stationary equipment must now comply with SJVAPCD Rule No. 2201 if modified or replaced. Incremental project, NOx emissions are less than significant; stationary equipment at the dairy facilities will be electrically powered. However, because the Basin is in non-attainment for both Federal and State ozone standards, and NOx is an ozone precursor, NOx emissions are cumulatively significant, and considerable.

Methods of estimating NOx emissions vary by emission type and characteristic. Because of the predominance of mobile sources in California, methodologies for estimating mobile source emissions are well documented and easiest to prepare. The State of California and San Joaquin Valley Air Pollution Control District have developed computer programs able to estimate mobile source emissions for on-road vehicles that are flexible and adaptable to a wide variety of vehicle types, climate types and operating conditions.

The state of knowledge and reliability/accuracy of other sources of emissions associated with dairies is far more variable. These sources are largely area sources. The emission rates for area sources vary. Both the U.S. Environmental Protection Agency and the California Air Resources Board maintain indexes of methodologies for estimating area and other sources to be used in the preparation of emissions inventories. Not all emission types are covered in these indexes, so factors prepared by industry groups are often the best information available.

An emission factor is a mathematical relationship between the amount of pollution produced and the amount of raw material processed or burned or some other action. NOx = 18.14 lbs/year/acre is the agricultural row crop emission factor used herein. This factor was multiplied by the area to remain under cultivation within the site to estimate annual emissions from this source.

Mitigation Measure #3.3.4:

Although project impacts are less than significant the following mitigation measures are recommended to further reduce NOx emissions.

1. Idling time of on-site project farming and dairy operations equipment shall be minimized.
2. All on-site equipment shall be properly tuned and maintained in accord with manufacturer's specifications.

3. Whenever feasible, alternative fueled or electrical on-site equipment shall be utilized.
4. Minimum practicable on-site engine sizes shall be used.
5. On-site gasoline-powered equipment shall be equipped with catalytic converters.
6. Employees will be encouraged to carpool-travel to and from the project site.

The above measures are excerpted and extrapolated from the SJVAPCD's Guide for Assessing and Mitigating Air Quality Impacts, January 10, 2002. No other feasible mitigation measures exist.

Effectiveness of Measures: The implementation of these measures will reduce, but not eliminate, project-level and cumulative operating equipment/employee trip NO_x impacts on Basin ozone levels. Incremental project impacts remain less than significant. The District therefore deems cumulative NO_x impacts to be less than significant.

Implementation/Monitoring: The listed implementation measures will be a condition of the Authority to Construct for the project. The owner/operator of the project will be responsible for their implementation. Monitoring thereof will be the continuing responsibility of the SJVAPCD.

Impact #3.3.5 Methane (CH₄) Generation:
[Evaluation Criteria (a)(b)(c)(d)(e)]

The breakdown of cellulose fiber by bacteria in cattle stomachs creates methane gas. Smaller amounts of methane are also generated by the decomposition of manure. Project-related emissions of methane are estimated in Table 3.3-5 as 461 tons per year. The project would make an exceedingly small contribution to greenhouse gases in light of all methane sources globally. Project emissions of methane represent a 0.00156 percent increase in emissions from the United States (U.S. EPA, 2000).

Conclusion: In the absence of any local or State guidelines or thresholds of significance for methane the project-level impacts are less than significant. The District therefore deems cumulative methane impacts to be less than significant.

Factors that influence methane production are similar to those which impact milk production and ROG emissions. Methane generation impacts are reduced by the same management procedures that are incorporated in the mitigation measures of Impact #3.3.3B.

Mitigation Measure #3.3.5: The project applicant shall, in construction and operation of the project, comply with the following BACT control measures as agreed with the San Joaquin Valley Air Pollution Control District:

1. Use of phototrophic (red) lagoon and associated nutrient management practices
2. Flush or spray down milking area with each batch milked, and flush holding pen and wash pens at least 4 times daily.

3. Flush feedlanes, walkways, etc. at least 4 times daily.

Effectiveness of Measures: The emission level at which a project's methane emissions would constitute a potentially significant cumulative impact has not been defined, and no definitive significance threshold for methane emissions has been adopted. Therefore, even with application of the above mitigation measures, the proposed project's methane emissions effects and contribution to greenhouse gases are deemed by the District to be less than significant.

Implementation/Monitoring: The implementation by the applicant of the listed mitigation measures, as agreed with the SJVAPCD shall be implemented as a condition of approval of the Authority to Construct for the project by the SJVAPCD. Monitoring will be by the SJVAPCD.

Impact #3.3.6 Ammonia (NH₃):

[CEQA Evaluation Criteria (a), (b), (c), (d); SJVAPCD Criteria S-3, S-4]

Ammonia is a chemical that gives urine its characteristic odor. Ammonia emissions, when combined in the atmosphere with other pollutants may produce particulate matter that can decrease air quality and visibility.

Project-related generation of ammonia is shown in Table 3.3-5. The proposed project would create 93 tons of airborne ammonia per year.

The ammonia emission estimates shown in Table 3.3-5 utilize emission rates for dairy cows recommended by the California Air Resources Board. Published emission rates for dairy cows range from 17 to over 87 pounds per head per year. Based on tests in Southern California, a value of 20 pound per head per year was developed. Based on European tests, values as high as 87 pounds per head per year were estimated. The Air Resources Board's current estimate, used in this analysis, is 74.0 pound/head per year for dairy cows (Gaffney, P., 2001). This factor is based on research conducted by the University of California at Davis in summer 2001. It is considered to be the most accurate available at this time.

Since ammonia is produced during anaerobic decomposition of manure, and since manure is produced and stored wherever cows are housed and nutrients are collected and stored, ammonia emissions will be dispersed over much of the project site. There is no opportunity for the ammonia to be contained, and therefore it will likely exist in relatively low concentrations and would be unlikely to cause adverse affects in the human population, including sensitive receptors.

Ammonia gas (a base) is known to react with acids in the atmosphere (typically nitric or sulfuric acid) to form ammonium nitrates or sulfates, which are particles. In the eastern portions of the United States sulfates derived particles predominate because of the burning of sulfur-containing fuels, while in California the nitric acid predominates. Nitric acid itself is a product of photochemical reactions in the atmosphere. Ammonia is thus a potential secondary source of particulates, since the particulates result from a chemical reaction in the atmosphere. (Donald Ballanti, Certified Consulting Meteorologist)

While it is known that the release of ammonia gas is a participant in the formation of ammonium nitrate, there is currently no ability to forecast how much ammonium nitrate would be created by a release of a certain amount of ammonia. The reaction that forms ammonium nitrate is dependent on the presence of other chemicals which are in turn part of a complex photochemical process occurring in the atmosphere. At the same time, both ammonia and ammonium nitrate are subject to processes that constantly remove the pollutants from the atmosphere (e.g., deposition, removal by rain, participation as nuclei, etc.). (Ballanti)

Given the current uncertainty in emission rates for ammonia and the lack of a credible method of calculating PM_{2.5} conversion from ammonia emissions, any calculation of secondary PM_{2.5} would be speculative. This DEIR has reported the best estimate of ammonia emissions and identified these emissions as a precursor of PM_{2.5} in the atmosphere. This is analogous to the quantification of emissions of ROG and NO_x as precursors to the formation of ozone. There is, however, unlike ROG and NO_x, no SJVAPCD - identified level at which ammonia, as a PM_{2.5} precursor, is deemed significant.

Conclusion: In the absence of any accepted significance thresholds for ammonia, project emissions of ammonia are deemed by the District to be less than significant at both the project and cumulative levels.

Mitigation Measure #3.3.6: Nevertheless, the project applicant shall, in construction and operation of the project, comply with the following BACT control measures as agreed with the San Joaquin Valley Air Pollution Control District:

1. Use of phototrophic (red) lagoon and associated nutrient management practices
2. Flush or spray down milking area with each batch milked, and flush holding pen and wash pens at least 4 times daily.
3. Flush feedlanes, walkways, etc. at least 4 times daily.

Effectiveness of Measures: The emission levels at which a project's ammonia emission would constitute a significant impact has not been defined. Therefore, even with implementation of one or more of these mitigation measures, the proposed project's ammonia emissions are deemed by the District to remain less than significant at both the project and cumulative levels.

Implementation/Monitoring: The requirement by the SJVAPCD of implementation of the listed mitigation measures shall be incorporated in the Authority to Construct for the project by the SJVAPCD, requiring implementation by the applicant. Monitoring shall be by the SJVAPCD.

Impact #3.3.7 Hydrogen Sulfide (H₂S):

[CEQA Evaluation Criteria (a), (b), (c), (d); SJVAPCD Criteria S-3, S-4]

Hydrogen sulfide is created when sulfur compounds react anaerobically. Hydrogen sulfide, even at low concentrations, has a distinct odor, and is very toxic. The emission rate for hydrogen sulfide during manure decomposition is unknown.

Hydrogen sulfide emissions from animal manure cannot be calculated because a credible emission factor does not exist. (Ballanti) While hydrogen sulfide can present a workplace hazard in confined spaces, open-air areas generally do not present such a risk. The proposed project will utilize non-agitated lagoons that will minimize potential hydrogen sulfide emissions. According to the Minnesota Pollution Control agency in its Feedlot Air Quality Summary dated March 1999, agitation of lagoons increases hydrogen sulfide emissions; that natural crust formations over manure storage systems reduce odors by approximately 60 to 85 percent. The Minnesota Pollution Control Agency notes that the use of such a crust to control odor appears to have promise.

The proposed project includes earthen storage lagoons; the SJVAPCD may require the project to incorporate a digester. The applicant does not propose any aerators or agitation pumps. The solids separation pits are expected, based upon experience, to have a solid crust year-round, thus minimizing hydrogen sulfide emissions.

Conclusion: In the absence of any accepted significance thresholds for hydrogen sulfide and lack of definitive information on project-facility emission rates, project-level emissions of hydrogen sulfide are deemed by the District to be less than significant.

Mitigation Measure #3.3.7: The project applicant shall, in construction and operation of the project, comply with the following BACT control measures as agreed with the San Joaquin Valley Air Pollution Control District:

1. Use of phototrophic (red) lagoon and associated nutrient management practices
2. Flush or spray down milking area with each batch milked, and flush holding pen and wash pens at least 4 times daily.
3. Flush feedlanes, walkways, etc. at least 4 times daily.

Effectiveness of Measures: The emission level at which a project's hydrogen sulfide emissions would constitute a significant impact has not been defined. Therefore, even with implementation of these mitigation measures, the proposed project's hydrogen sulfide emissions remain less than significant direct and cumulative impacts.

Implementation/Monitoring: The requirement by the SJVAPCD of implementation of one or more of the listed mitigation measures shall be incorporated in the Authority to Construct for the project by the SJVAPCD. Monitoring shall be by the SJVAPCD.

Impact #3.3.8 Odor Emissions:
[Evaluation Criteria (e); SJVAPCD Criteria S-3]

Although odors from raising livestock are exempt from direct regulation by the local air quality jurisdiction under California state law [California Health and Safety Code, Section 41705 (a)], odor can still be considered a perceived nuisance and an environmental impact.

Odor formation and transport from dairy operations – corrals, lagoons, freestalls – is a complex process. Odor formation is most rapid during hot weather when anaerobic conditions set in the fastest. Conversely, atmospheric dispersion is best when heated surfaces induce gusty winds and convective turbulence. There is therefore no time of day when odor potential is minimized. Odors “generate” faster in the day, but disperse faster. Slower nocturnal chemistry is offset by more stagnant meteorology.

Odor perception is strongly influenced by exposure duration. A person living on a dairy may be oblivious to the odor unless it is extremely pungent. Dairies historically have a farmhouse where the dairy owner, family, and often employees live, eat, sleep, etc. among the strongest odor concentration without any perceived nuisance. Project-related odor impacts will therefore be noticeable more to passing travelers.

The prevailing wind direction in Fresno County is toward the southeast based upon Fresno-Yosemite Airport wind rose records.

Factors which impact the analysis of the significance of odor impacts include the influence of the proposed dairy’s modern design incorporating concrete-base, flushed, freestalls and walk lanes and water drainage to separator facilities, together with operational mitigation measures for other impacts resulting in odor reduction as a supplemental benefit.

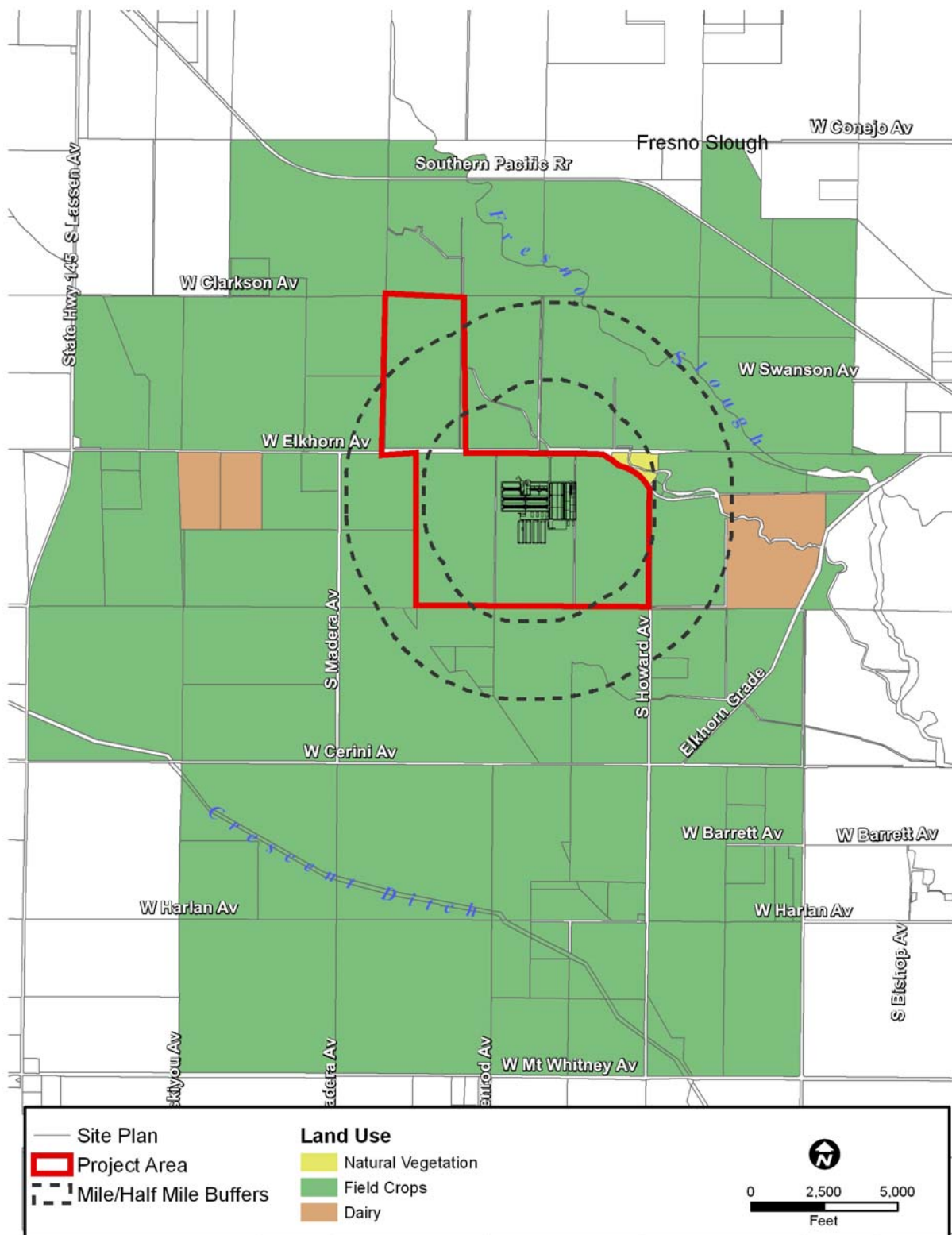
In addition, the operational mitigation measures required by other potential impacts such as those for Impact #3.3.3.B will minimize potential odor problems.

The nearest off-site residential dwelling is approximately 3 miles from the dairy facilities site. There are no residential units in the general vicinity of the dairy facility site (see Figure 3.3-2).

Conclusion: It is concluded, based upon the above data and analysis that the project will not create objectionable odors affecting a substantial number of people, and that the impact of project-generated odors is therefore less than significant.

The procedure outlined for odor analysis in the SJVAPCD’s “Guide for Assessing and Mitigating Air Quality Impacts” (GAMAQI) includes the following:

- *Identify the location of sensitive receptors (including residences).*
- *Compare the distance to the nearest sensitive receptor to the distances in Table 4-2 of the GAMAQI. If the sensitive receptors are further away than the distances given in Table 4-2, no further analysis is required. The results should be documented in the EIR.*
- *Obtain any odor complaints against the facility or similar facilities from the local District office and the count’s environmental health department.*
- *Review the complaints to determine the location of complainants relative to the facility.*
- *Identify any sensitive receptors at similar distances.*
- *Determine if emissions of odiferous compounds will increase or decrease with implementation of the project.*
- *Draw any reasonable conclusions as to the probability that the project will generate odor complaints based on this analysis of complaint history.*



RESIDENTIAL LAND USE RELATIONSHIPS

Figure
3.3-2

In reiteration of the standard analysis contained in the preceding discussion, and in compliance with the GAMAQI process:

- *Identify the location of sensitive receptors (including residences).*

See Figures 3.3-2.

- *Compare the distance to the nearest sensitive receptor to the distances in Table 4.2 of the GAMAQI. If the sensitive receptors are further away than the distances given in Table 4-2, no further analysis is required. The results should be documented in the EIR.*

Table 4-2 and its pertinent accompanying text are:

Table 4-2
Project Screening Trigger Levels
For Potential Odor Sources

Type of Facility	Distance
Wastewater Treatment Facilities	2 miles
Sanitary Landfill	1 mile
Transfer Station	1 mile
Composting Facility	1 mile
Petroleum Refinery	2 miles
Asphalt Batch Plant	1 mile
Chemical Manufacturing	1 mile
Fiberglass Manufacturing	1 mile
Painting/Coating Operations (e.g. auto body shops)	1 mile
Food Processing Facility	1 mile
Feed Lot/Dairy	1 mile
Rendering Plant	1 mile

Because offensive odors rarely cause any physical harm and no requirements for their control are included in state or federal air quality regulations, the SJVAPCD has no rules or standards related to odor emissions, other than its nuisance rule³⁵. Any actions related to odors are based on citizen complaints to local governments and the SJVAPCD. Lead Agencies can make a determination of significance based on a review of District complaint records as described in Section 5. For a project locating near an existing source of odors, the impact is potentially significant when the project site is at least as close as any other site that has already experienced significant odor problems related to the odor source. Significant odor problems are defined as:

- *More than one confirmed complaint per year averaged over a three year period, or*
- *Three unconfirmed complaints per year averaged over a three-year period.*

For projects locating near a source of odors where there is currently no nearby development and for odor sources locating near existing receptors, the determination of significance should be

based on the distance and frequency at which odor complaints from the public have occurred in the vicinity of a similar facility.

There are no dwelling units within one mile of the proposed dairy facilities site.

- *Obtain any odor complaints against the facility or similar facilities from the local District office and the county's environmental health department.*

No such odor complaints have been filed with the Fresno County Environmental Health Department, or the SJVAPCD (see Appendix A).

- *Review the complaints to determine the location of complainants relative to the facility.*

Not applicable.

- *Identify any sensitive receptors at similar distances.*

Not applicable.

- *Determine if emissions of odiferous compounds will increase or decrease with implementation of the project.*

There will be an animal unit-proportional potential for emissions of odiferous compounds occasioned by the conversion of the agricultural land to a dairy.

- *Draw any reasonable conclusions as to the probability that the project will generate odor complaints based on this analysis of complaint history.*

There are no dwelling units within 1 mile of the proposed dairy. The operation of the dairy facility is not expected to generate odor complaints.

Mitigation Measures: None are required.

**Impact #3.3.9 Local Carbon Monoxide (CO) Concentrations:
[Evaluation Criteria (b); SJVAPCD Criteria S-1]**

Concentrations of this pollutant are related to the levels of traffic and congestion along streets and at intersections.

The SJVAPCD's *Guide for Assessing and Mitigation Air Quality Impacts* provides screening criteria to identify situations where modeling is warranted. If neither of the following criteria is met at intersections affected by the project, the project is concluded to have no potential to create a violation of the carbon monoxide standards:

- The Level of Service (LOS) on one or more streets or at one or more intersections in the project vicinity will be reduced to LOS E or F.

- The project will substantially worsen an already existing LOS F on one or more streets or at one or more intersections in the project vicinity.

Although not stated expressly, the above criteria are to be applied to signal controlled intersections rather than stop sign controlled intersections. The project is served by rural streets and highways with stop sign controlled intersections with good levels of service, indicating little potential for exceedance of the carbon monoxide standards. The project would result in a maximum of 32 daily auto trips, a net increase of 17 daily truck trips and will have a less-than-significant effect on traffic congestion (see Section 3.14 of this EIR).

Conclusion: Based on the SJVAPCD criteria and the limited amount of project-related traffic on Avenue 368, the project would have no potential to create a violation of the carbon monoxide standards. Any carbon monoxide concentration increases resulting from the proposed project would be less than significant.

Mitigation Measures: None are required.

Impact #3.3.10 Ambient Air Quality Analysis (AAQA) and Risk Management Review (RMR)

On September 19, 2006, the SJVAPCD performed an Ambient Air Quality Analysis (AAQA) and a Risk Management Review (RMR) to determine the PM10 emission rate that will pass the EPA's significance level for the Ambient Air Quality Standards (AAQS) (Appendix K).

Conclusion: The report concluded that the project is approved without Toxic Best Available Control Technology (T-BACT) meaning that toxics are a less than significant impact to the proposed project. However, hydrogen sulfide was not quantified in the analysis since there is no accurate emission factor. The PM10 project emissions cause the project to fail the AAQA. This is considered a significant impact.

Mitigation Measure #3.3.10: As mentioned in Mitigation Measure #3.3.3.A, the applicant will purchase PM10 offsets (2.52 tons) to reduce PM10 emissions to zero.

Effectiveness of Measure(s): The implementation of the described operational PM10 mitigation measure(s) will reduce PM10 impacts to less than significant.

Implementation/Monitoring: The mitigation measure(s) shall be implemented by the dairy facility/farm operator and shall be a condition of the Authority to Construct. Monitoring shall be the responsibility of the SJVAPCD.

Impact #3.3.11 Cumulative Air Quality Impacts [Evaluation Criteria (c)]:

The California Environmental Quality Act defines cumulative impacts as two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts. Cumulative impacts can result from individually minor but collectively significant projects. According to SJVAPCD's *Guide for Assessing and Mitigation Air Quality*

Impacts (2002) an adequate cumulative impact analysis considers a project over time and in conjunction with other related past, present, and reasonably foreseeable future projects whose impacts might compound or be interrelated with those of the project being assessed.

Air quality impacts that are regional in nature are incrementally cumulative, as are emissions which contribute to criteria pollutant non-attainment conditions. The project was found to have no significant or potentially significant regional impact with respect to particulate matter (PM₁₀), reactive organic gases (ROG), nitrogen oxide (NO_x), ammonia (NH₃), hydrogen sulfide (H₂S), (odors), and methane (CH₄).

Conclusion: It is the position of the SJVAPCD that exceeding the identified significance thresholds of individual impact significance is evidence of a substantial worsening of regional air quality. The fact that adopted significance thresholds are individually exceeded is therefore evidence that the project impact is also cumulatively significant on a regional basis, even though the project would create only a very small increase in basin-wide emissions from dairy operations. Project-level air quality impacts have either been mitigated to less than adopted thresholds, or there are no established thresholds. There are, therefore, no identifiable project-related cumulative air quality impacts.

Mitigation Measures: None are required.

CONTINUING COMPLIANCE

Although this proposed dairy project complies with current SJVAPCD regulations and the adopted State Implementation Plan/attainment plans, it is not possible at this time to determine if it will comply with as yet to be defined and implemented EPA regulations. It will be the responsibility of the project operator, and the SJVAPCD, to assure such continuing compliance.

3.4 Biological Resources

INTRODUCTION

The natural vegetation communities of the central and southern San Joaquin Valley historically supported a diverse assemblage of plant and animal species. This section identifies and addresses potential project-related effects on special-status animal and plant species that could potentially be present on the project site.

IMPACT EVALUATION CRITERIA

Public Resources Code Section 21001(c) finds and declares that it is the policy of the State to prevent the elimination of fish or wildlife species due to human activities, ensure that fish and wildlife populations do not drop below self-sustaining levels, and preserve for future generations representations of all plant and wildlife communities and examples of the major periods of California history. In addition, *Section 15065(a)* of the *CEQA Guidelines* states that a project may have a significant effect on the environment if it has the potential to substantially reduce the habitat of a fish or wildlife species or cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of an endangered, rare or threatened species.

In further definition of these described potential impacts, pertinent criteria for evaluation of biological resources impacts are:

Would the project:

- a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in a local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.*
- b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.*
- c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.*
- d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.*
- e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.*
- f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.*

In the evaluation process, it is noted that Section 15380 of the CEQA Guidelines defines endangered, rare or threatened species as follows:

- 1) "Endangered" when its survival and reproduction in the wild are in immediate jeopardy from one or more causes, including loss of habitat, over-exploitation, predation, competition, disease, or other factors; or*
- 2) "Rare" (all animals designated as rare by the Fish and Game Commission prior to January 1, 1985, were automatically reclassified as threatened by Fish and Game Code Sec. 2067) when either:*
 - (a) Although not presently threatened with extinction, the species is existing in such small numbers throughout all or a significant portion of its range that it may become endangered if its environment worsens; or*
 - (b) The species is likely to become endangered within the foreseeable future throughout all or a significant portion of its range and may be considered "threatened" as that term is used in the Federal Endangered Species Act.*

(c) A species of animal or plant shall be presumed to be endangered, rare or threatened, if it is listed in:

(1) Sections 670.2 or 670.5, Title 14, California Administrative Code of Regulations; or

(2) Title 50, Code of Federal Regulations Sections 17.11 or 17.2 pursuant to the Federal Endangered Species Act as rare, threatened, or endangered.

(d) A species not included in any listing identified in subsection (c) shall nevertheless be considered to be rare or endangered if the species can be shown to meet the criteria in subsection (b).

(e) This definition shall not include any species of the Class Insecta which is a pest whose protection under the provisions of CEQA would present an overwhelming and overriding task to man as determined by:

(1) The Director of Food and Agriculture with regard to economic pests; or

(2) The Director of Health Services with regard to health risks.

SETTING

On February 17, 2006, Quad Knopf biologist Curtis Uptain, conducted a reconnaissance-level biological survey to determine whether special-status plant and animal species or their habitats exist on the project site. The project site was surveyed by driving all access roads on the site. Areas that could potentially contain sensitive wildlife species were walked to locate species or sign of species. Roads in the vicinity of the site were driven. All plants, mammals, and birds were identified and tree locations were recorded using a geo-referenced aerial photo of the site. A copy of the Reconnaissance Level Biological Survey for the Van der Kooi Dairy is attached as Appendix L.

The majority of the project site consists of intensively managed, cultivated, and flood irrigated agricultural fields. The fields were recently planted in grain (which appears to be barley, *Hordium vulgare*) and contained relatively few other native or non-native plant species. A variety of weedy species dominate the canal banks and the edges of the agricultural access roads. Some common plant species identified in these areas include black mustard (*Brassica nigra*), London rocket (*Sisymbrium irio*), Russian thistle (*Salsola tragus*), sunflower, (*helianthus annuus*), horseweed (*Canyza Canadensis*), prickly lettuce (*Lactuca serriola*), and oats (*Avena* sp.). Red-tailed hawks (*Buteo jamaicensis*) and northern harriers (*Circus cyaneus*) were observed foraging over the fields. The grain fields may also provide seasonal foraging and nesting habitat for a variety of migratory birds. California ground squirrels (*Spermophilus beechyi*) were common along most of the canal banks and access roads. American kestrels (*Falco sparverius*), red-winged blackbirds (*Agelaius phoeniceus*), mourning doves (*Zenaida macroura*), and other migratory birds were observed perched on power lines that occur along the perimeter and traverse the site.

Although the project site is primarily covered in grain, the dairy facilities site has been graded and some cement pads have been installed. Because of the recent construction activities at the dairy site, it is almost completely devoid of vegetation and wildlife.

Approximately 35 oil wells are present on the project site, but many of these are abandoned or non-producing. About 10 of the wells are located on well pads of various sizes, some of which are accessible by dirt roads. The well pads and access roads are infrequently traveled, are not cultivated, and are vegetated with a variety of non-native weedy plant species, many of which were not identifiable at the time of the survey. The well pads and access roads provide suitable (although degraded) habitat for a variety of wildlife species. Cottontails (*Sylvilagus audubonii*) and a variety of birds were common at these sites.

There are two stands of Eucalyptus trees on the project site, one at the northeastern corner of the southern parcel near the intersection of Elkhorn Avenue and Howard Avenue and another along the southern perimeter of the project site. There is also a stand of Eucalyptus and Tamarisk trees at the northwest corner of the intersection of Elkhorn Avenue and Howard Avenue. This stand of trees is not on, but is adjacent to, the project site. These stands of trees provide habitat for a variety of wildlife. Red-tailed hawks were observed perching in trees at all of these locations. A pair of Red-tailed hawks were engaged in nest building activities at the Elkhorn Avenue location that is off the site. Cottontails were observed at all of these sites. Other birds and some species of bats are expected to roost in these stands of trees and a variety of small mammals also are expected to be common in the understory of these stands.

Prior to conducting the field survey, a query of the CNDDDB (CDFG 2004a and b) was conducted for the Five Points, San Joaquin Helm, Burrell, Vanguard, Raisin, Westside, Harris Ranch, and Calfax USGS 7.5-Minute Quadrangles. A query of the California Native Plant Society's Electronic Inventory (CNPS 2005) was conducted for the same quadrangles to provide information on additional plant species of concern that may occur in the project area and surrounding vicinity (Table 3.4-1 and Figure 3.4-1). A species list was obtained from the U.S. Fish and Wildlife Service (USFWS) website for the Five Points USGS 7.5-minute quadrangle to provide information on additional special-status species that have the potential to occur in the vicinity of the proposed project. Only those species with the potential to occur on the project site were given consideration in this report. A query of the USFWS National Wetland Inventory (NWI) Map for the Five Points USGS 7.5-minute quadrangle was conducted for information regarding known wetlands in the project area (Figure 3.4-2).

There are 2 sensitive natural communities, 7 sensitive plant species, and 13 sensitive wildlife species that were texturally or graphically identified as being in the vicinity of the project site (Table 3.4-1, Figure 3.4-1). The 2 sensitive plant communities, Valley Sacaton Grassland and Great Valley Valley Oak Riparian Forest, do not occur on or within the immediate vicinity of the project site. Of the 7 sensitive plants that are known from the vicinity, 3 are presumed to be absent from the project site and 4 are considered unlikely to occur (Table 3.4-1). These assessments were based upon the high level of disturbance on the site, the lack of suitable habitat conditions and appropriate soils, and the absence of co-dominant or indicator plant species.

Table 3.4-1
Special-Status Species Reported on the California Natural Diversity Database
and Inventory of Rare and Endangered Plants of California.

Common Name	Scientific Name	Status	Habitat Requirements	Probability of Occurrence and Assessment of Impacts
lesser saltscale	<i>Atriplex minuscula</i>	1B	This annual plant occurs in Chenopod scrubland, grassland, and alkali sink habitats, but it also is known to occur in wet areas.	Unlikely. Marginally suitable habitat exists on some oil well pads and access roads. Additional surveys during the appropriate phenological season would need to be conducted to verify presence/absence of this species in those areas. There is no potential habitat at the proposed dairy site. The proposed dairy will not significantly impact this species. This plant does not occur in the agricultural areas of the project site and continued agricultural operations will not significantly impact this species.
subtle orache	<i>Atriplex subtilis</i>	1B	This annual plant occurs in Chenopod scrubland, grassland, and alkali sink habitats, but it also is known to occur in wet areas.	Unlikely. Marginally suitable habitat exists on some oil well pads and access roads. Additional surveys during the appropriate phenological season would need to be conducted to verify presence/absence of this species in those areas. There is no potential habitat at the proposed dairy site. The proposed dairy will not significantly impact this species. This plant does not occur in the agricultural areas of the project site and continued agricultural operations will not significantly impact this species.
recurved larkspur	<i>Delphinium recurvatum</i>	1B	This plant is found in Chenopod scrublands, grasslands, and foothill woodland.	Unlikely. Marginally suitable habitat exists on some oil well pads and access roads. Additional surveys during the appropriate phenological season would need to be conducted to verify presence/absence of this species in those areas. There is no potential

Common Name	Scientific Name	Status	Habitat Requirements	Probability of Occurrence and Assessment of Impacts
				habitat at the proposed dairy site. The proposed dairy will not significantly impact this species. This plant does not occur in the agricultural areas of the project site and continued agricultural operations will not significantly impact this species.
*Pinnacles buckwhaet	<i>Eriogonum nortonii</i>	1B	Chaparral, valley and foothill grasslands, on sandy soils, often found after recent burns.	Absent. Soils in the project site are not suitable for this species. Even the sandier soils located at some of the oil well pads would likely be too alkaline to support this species. The proposed dairy will not significantly impact this species. This plant does not occur in the agricultural areas of the project site and continued agricultural operations will not significantly impact this species.
heartscale	<i>Atriplex cordulata</i>	1B	This annual plant occurs in Chenopod scrubland and grassland habitats, but it also is known to occur in wet areas. Most common on alkaline soils.	Unlikely. Soils in the project site are generally not suitable for this species. There is no potential habitat at the proposed dairy site. The proposed dairy will not significantly impact this species. This plant does not occur in the agricultural areas of the project site and continued agricultural operations will not significantly impact this species.
*Vernal barley	<i>Hordeum intercedens</i>	3	This annual grass typically occurs in saline flats and depressions in grasslands or with vernal pool basins.	Absent. Soils and habitat characteristics on the project site are not suitable for this species. Significant impacts to this species will not occur.
Munz's tidy tips	<i>Layia munzii</i>	1B	Munz's tidy-tips grows on alkaline clay in low-lying scrublands and on hillsides in grasslands.	Absent. Soils and habitat characteristics on the project site are not suitable for this species. Significant impacts to this species will not occur.

Common Name	Scientific Name	Status	Habitat Requirements	Probability of Occurrence and Assessment of Impacts
molestan blister beetle	<i>Lytta molesta</i>	FSC	This beetle is likely restricted to vernal pool vegetation.	Absent. Habitat characteristics on the project site are not suitable for this species. Significant impacts to this species will not occur.
western spadefoot	<i>Spea (=Scaphiopus) hammondi</i>	CSC	This species is uncommon, but widespread in grassland, scrub, and chaparral habitat. It occurs in seasonally moist areas, including puddles, vernal pools, and roadside ditches.	Absent. Habitat characteristics on the project site are not suitable for this species. Significant impacts to this species will not occur. There is suitable habitat for this species adjacent to the project site, north of the intersection of Elkhorn Avenue and Howard Avenue.
Giant garter snake	<i>Thamnophis gigas</i>	FT, ST	Occurs in dense emergent vegetation near pools of water (which persist throughout the seasonal cycle of activity). Requires open areas along the pool margins to allow for basking and upland habitat with suitable structures for hibernation and escape from flooding.	Absent. Habitat characteristics on the project site are not suitable for this species. Significant impacts to this species will not occur. There is marginally suitable habitat for this species adjacent to the project site, north of the intersection of Elkhorn Avenue and Howard Avenue.
tri-colored blackbird	<i>Agelaius tricolor</i>	CSC	Nests in colonies in marshes, upland habitat and grain fields. Forages over wetlands, marshes, and open country.	Possible. Although this species was not observed on the project site, the grain fields that are present may provide foraging and nesting opportunities during appropriate seasons. Construction of the dairy will reduce the amount of this habitat that is available and thus have an impact on this species. Continued agricultural activities will provide habitat and would not significantly impact this species.
burrowing owl	<i>Athene cunicularia</i>	CSC	This owl is found in open, dry grasslands, agricultural and range lands, and desert habitats often associated with burrowing animals	Possible. Although no burrowing owls were seen on the site, there are areas that are potentially suitable for this species. They could occur along roadways, canal banks, well pads, and other areas that are infrequently

Common Name	Scientific Name	Status	Habitat Requirements	Probability of Occurrence and Assessment of Impacts
				disturbed and where California ground squirrels are common and provide suitable burrowing sites. Because the dairy is located in the cultivated agricultural field, significant impacts to this species will not occur from its construction. Continued agricultural practices will similarly not significantly impact this species.
Swainson's hawk	<i>Buteo swainsoni</i>	CT	This species nests in riparian forests and other forested areas. It will roost in a variety of trees and forage widely over forests, grasslands, and shrublands. This hawk forages over open plains for small mammals, lizards, frogs, and insects. It is easily disturbed by human activities.	Present. A Swainson's hawk was observed soaring over the project site on 2/12/06. The site contains suitable foraging and roosting habitat. Suitable nesting habitat occurs adjacent to the site, north of the intersection of Elkhorn Avenue and Howard Avenue. Suitable habitat also exists along the Fresno Slough, approximately 1 mile to the northeast of the project site. Because these raptors are extremely sensitive to disturbances, construction and operation of the dairy could reduce the potential for nesting and foraging on the site. Significant impacts to this species may occur.
mountain plover	<i>Charadrius montanus</i>	CSC	Inhabits plains and grassy or bare dirt fields. Winters in the Central Valley and coastal valleys where it forages for seed and grain.	Possible. Although this species was not observed during field surveys, it could forage in the grain fields during the winter as a migrant. Construction of the dairy site will remove some potential foraging habitat, but that loss is not considered to be significant. Continued agricultural operations will not significantly impact this species.

Common Name	Scientific Name	Status	Habitat Requirements	Probability of Occurrence and Assessment of Impacts
northern harrier	<i>Circus cyaneus</i>	CSC	Inhabits open plains and fields.	Present. This species was observed foraging over the agricultural areas on the project site. Significant impacts are not expected to occur from construction and operation of the dairy or from continued farming operations.
Loggerhead shrike	<i>Lanius ludovicianus</i>	CSC	Open woodlands, chaparral and grasslands.	Present. Two shrikes were observed perching on a raised embankment on the project site, near the proposed dairy site. Construction of the dairy will remove some foraging habitat., but construction and operation of the dairy and continued agricultural production is not expected to significantly impact this species.
Fresno kangaroo rat	<i>Dipodomys nitratoide exilis</i>	FE, SE	Upland, grassland, and alkali sink habitats. Flooding tends to eliminate this species.	Possible. Kangaroo rat sign was observed at a well pad site in the southern portion of the project site. Trapping would be needed to verify the species that is present. Construction and operation of the dairy is not likely to significantly impact this species. However, continued agricultural production on lands south of the dairy facility, may significantly impact this species.
San Joaquin kit fox	<i>Vulpes macrotis mutica</i>	FE, FT	The San Joaquin kit fox occurs in open, dry grassland and shrub and open forest habitats on the floor of the San Joaquin Valley and surrounding foothills.	Unlikely. This species or its sign (burrows, tracks, scat) were not observed during field surveys. Marginal habitat exists in some limited areas (well pads and uncultivated areas), but the high degree of disturbance and lack of suitable habitat likely precludes its presence. It may occur from time to time as a transient. Construction and operation of the dairy and continued grain farming are not expected to significantly impact this species.

Common Name	Scientific Name	Status	Habitat Requirements	Probability of Occurrence and Assessment of Impacts
American badger	<i>Taxidea taxus</i>	CSC	This mammal is an uncommon, permanent resident found throughout most of California. It is most abundant in dry, open shrublands but also occurs in grasslands and other habitats.	Unlikely. This species or its sign (burrows, tracks, scat) were not observed during field surveys. Marginal habitat exists in some limited areas (well pads and uncultivated areas), but the high degree of disturbance and lack of suitable habitat likely precludes its presence. It may occur from time to time as a transient. Construction and operation of the dairy and continued grain farming are not expected to significantly impact this species.
western mastiff bat	<i>Eumops perotis californicus</i>	CSC	This bat is an uncommon resident in San Joaquin Valley and the Coastal Range. It occurs in many open, semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, annual and perennial grasslands, palm oases, chaparral, desert scrub, and urban areas. It roosts in crevices in cliff faces, high buildings, trees, and tunnels.	Possible. A number of large trees on the site may provide suitable roosting sites. Construction and operation of the dairy and continued farming in the agricultural areas are not expected to significantly impact this species. Additional surveys would need to be conducted in order to determine presence on the project site.
Valley Sacaton Grassland	<i>Valley Sacaton Grassland</i>	SC		Absent.
Great Valley Valley Oak Riparian Forest	<i>Great Valley Valley Oak Riparian Forest</i>	SC		Absent.

Sources:

California Department of Fish and Game. 2005. California Natural Diversity Data Base, California Department of Fish and Game, Sacramento, CA.

California Native Plant Society (CNPS). 2005. Inventory of Rare and Endangered Plants (online edition, v6-05b 4-11-05). Rare Plant Scientific Advisory Committee. California Native Plant Society. Sacramento, CA.

USGS 7.5 Minute Quadrangles:

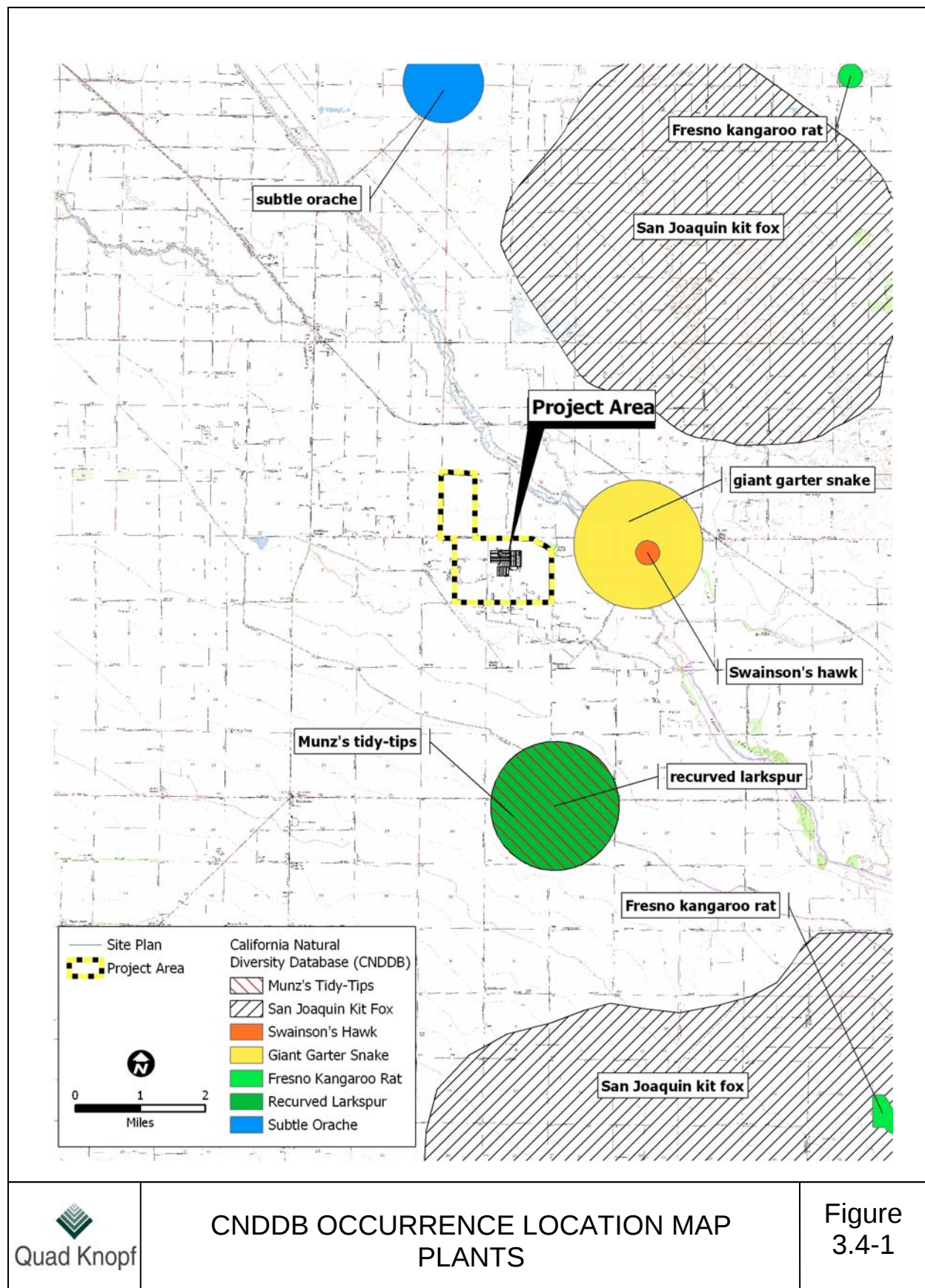
Five Points, San Joaquin, Helm, Burrell, Vanguard, Raisin, Westside, Harris Ranch, Calfax.

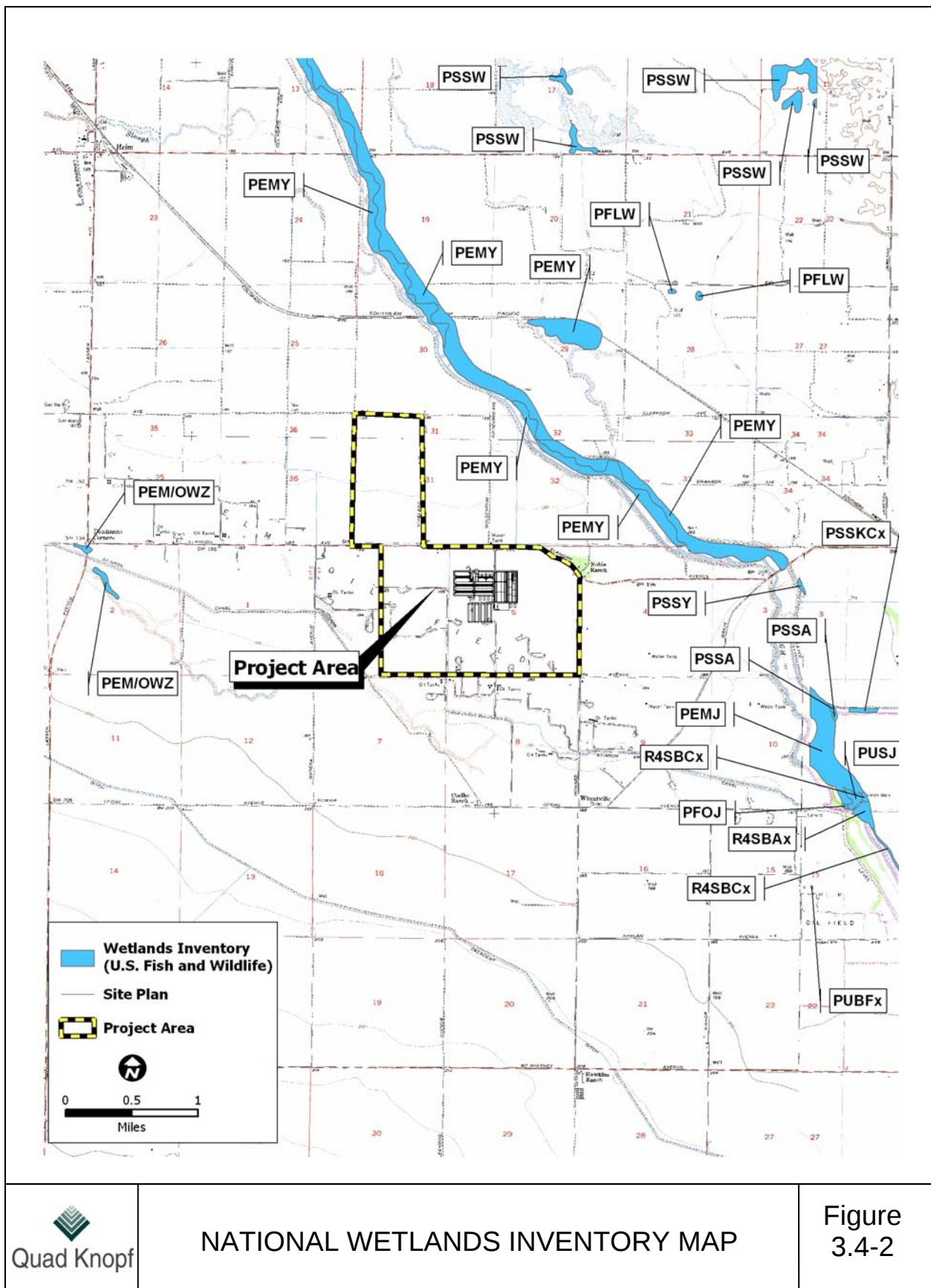
Abbreviations:

FE	Federal Endangered Species
FT	Federal Threatened Species
MBTA	Species Protected Under the Auspices of the Migratory Bird treaty Act
CE	California Endangered Species
CT	California Threatened Species
CR	California Rare Species Afforded Protection Under the Native Plant Protection Act
FSC	Federal Species of Special Concern.
CSC	California Department of Fish and Game Species of Special Concern
1B	California Native Plant Society List 1B Species-Plants Categorized as Rare, Threatened, or Endangered in California and Elsewhere.
SC	California Department of Fish and Game Sensitive Community

*Potential Occurrence Definitions:

Present:	Species or sign of their presence observed on site at time of the field survey.
Likely:	Species not observed on site, but may reasonably be expected to occur there on a regular basis. Or, species not observed on the site, exceptional habitat exists, and additional surveys needed to verify presence.
Possible:	Species not observed on site, but could occur there from time to time. Or, species not observed on the site, suitable habitat exists, and additional surveys needed to verify presence.
Unlikely:	Species not observed on site, and would not be expected to occur there except, perhaps, as a transient. Or, species not observed on the site, marginally suitable habitat exists, and additional surveys needed to verify presence.
Absent:	Species or sign of their presence not observed on site, and precluded from occurring there because habitat requirements are not met.





NATIONAL WETLANDS INVENTORY MAP

Figure 3.4-2

Three sensitive wildlife species were observed on the project site (Table 3.4-1). One Swainson's hawk (*Buteo swainsoni*) was seen soaring over the northern portion of the south parcel on 12 February 2006. Suitable roosting sites exist (the 2 stands of Eucalyptus trees) and there is a potential nesting area adjacent to the site, north of the intersection of Elkhorn Avenue and Howard Avenue. Potential nesting sites also are likely to occur along the Fresno Slough, located approximately 1 mile northeast of the project site. Swainson's hawks are known to occur along the Fresno Slough (Figure 3.4-1). Two northern harriers were observed foraging on the site, one over the eastern portion of the northern parcel and one over the eastern portion of the southern parcel. The grain fields that cover the majority of the project site are prime foraging habitat for this species. Similarly, the alfalfa fields and fallowed grazing lands that surround the project site are prime foraging habitat. This species is expected to be relatively abundant and widespread in the project vicinity. Two loggerhead shrikes (*Lanius ludovicianus*) were seen on the site; they were perched together on a soil embankment near the proposed dairy facility. The grain fields and alfalfa fields on the site and in the vicinity of the site provide foraging habitat for this species. Roosting sites (e.g., transmission poles and lines, oil wells) are abundant. Loggerhead shrikes are expected to be relatively common and widespread in the area.

Five sensitive wildlife species that were not observed, but may sometimes occur on the site (Table 3.4-1, Figure 3.4-1) include tri-colored blackbirds (*Agelaius tricolor*), burrowing owls (*Athene cunicularia*), mountain plovers (*Charadrius montanus*), Fresno kangaroo rats (*Dipodomys nitratoide exilis*), and western mastiff bats (*Eumops perotis californicus*). The tri-colored blackbird could nest and forage on the project site during the nesting season (February 15 - September 15), when the cultivated grain is mature. Burrowing owls could inhabit California ground squirrel burrows that are common along the canals and roadways on the project site. Burrowing owls are both summer and winter residents of the central and southern San Joaquin Valley and foraging and nesting opportunities on the site are adequate to support this species. The mountain plover could occur on the site as an occasional winter migrant and forage in the agricultural fields soon after disking and cultivation. The western mastiff bat could roost in the Eucalyptus trees that are present on the site. Kangaroo rat sign (including burrows, tail drags and footprints, and scat) was found at an oil well pad in the extreme southern portion of the project site. The pad is approximately 2 acres in size, has a substrate of a fine textured sandy soil, contains relatively undisturbed (although non-native) habitat with open scalds, and contains a number of large storage tanks (see photographs 8, 9, and 10 in Appendix A of the Biological Report). Trapping was not conducted to determine which species of kangaroo rat is present at this site, but they could either be Heermann's kangaroo rats (*Dipodomys heermanni*) or Fresno kangaroo rats. Because of the limited distribution of this suitable soil type and because of the limited amount of available habitat, kangaroo rat distribution on the site is confined to this one area. However, kangaroo rats may be more prevalent directly south of the project site where there are considerable expanses of similar oil field pads and fallowed and grazed agricultural lands.

There are 2 sensitive wildlife species that are unlikely to occur on the project site, except perhaps as occasional visitors; the San Joaquin kit fox (*Vulpes macrotis mutica*) and the American badger (*Taxidea taxus*). No sign of these species were found during the site visit, but there are some areas on the site that provide adequate denning and foraging opportunities (particularly

along the dirt roadways, canal embankments, and at the oil well pads). The project site is not within a recognized area of potential kit fox occurrence (Figure 3.4-1). However, the project site lies between 2 designated kit fox areas and it is reasonable to assume that the Fresno Slough and surrounding agricultural lands provide a suitable movement corridor between the 2 kit fox areas. The project site is located within this potential movement corridor.

The project site may provide some foraging opportunities for a number of additional sensitive species including various species of raptors and migratory birds that are protected by the Migratory Bird Treaty Act (Appendix B of the Biological Report). Other species of bats, some of which are considered sensitive, could also forage and roost on the site.

IMPACTS

Impact #3.4.1: Substantial Adverse Effect on Candidate, Special-Status or Sensitive Species [Evaluation Criteria (a)]

Three sensitive species were observed on the site; the Swainson's hawk, the northern harrier, and the loggerhead shrike. There are 5 other sensitive wildlife species that are expected to occur on the site from time to time or may currently exist on the site (tri-colored blackbirds, burrowing owls, mountain plovers, Fresno kangaroo rats, and western mastiff bats). Two sensitive wildlife species could occur on the site as transients (San Joaquin kit fox and American badger). Four sensitive plant species (lesser saltscare, subtle orache, recurved larkspur, and heartscale) are unlikely to, but could, occur on the site. Construction and operation of the proposed dairy and continued farming operations on the site have the potential to impact these species.

Conclusion: The dairy will be built on land that has been previously cultivated in grain and has provided potential foraging and nesting habitat for a variety of sensitive and migratory bird species. Loss of that foraging and nesting habitat is considered to be less than significant because less than 10% of the site (110 acres of 1,242 acres) will be converted to the dairy operation. The remainder of the site will remain in agricultural production and will continue to provide foraging and nesting habitat. Throughout the Valley, the conversion of cultivated farmland to dairies and other developments are resulting in a cumulative and significant loss of foraging and nesting habitat for sensitive and migratory birds. Conversion of this site to a dairy will contribute to that cumulative loss.

Construction activities may disrupt foraging and nesting behaviors of a variety of species and could result in direct mortalities of kangaroo rats. Although the kangaroo rat population that exists on the site is approximately 0.25 miles south of the dairy facility, kangaroo rats are known to conduct nightly foraging excursions of that distance and they can disperse greater distances. Although the intervening habitat and soils are incompatible with permanent habitation, kangaroo rats could none-the-less travel along dirt roadways and canal banks between their population center and the construction area, putting them at risk from construction activities. Several mitigation measures shall be implemented to reduce impacts to less than significant.

In an area where San Joaquin kit fox may occur on a proposed construction site, it is usually customary to recommend that a pre-construction survey be conducted for kit fox dens. This provides an opportunity for biologists to inspect and hand-excavate potential fox dens, thus ensuring avoidance of impacts to foxes. Because construction of this dairy has commenced, this recommendation is not warranted. However, other Standardized Recommendations for the protection of San Joaquin kit fox (Appendix C of the Biological Report) shall be followed.

Mitigation Measure #3.4.1.1: The following mitigation measures shall be followed:

1. Construction of a barrier fence along the southern and western edges of the construction site which would exclude kangaroo rats from entering the construction area. The fence would be constructed of 3 foot-high metal flashing supported by t-posts. The lower edge of the fencing would be buried approximately 6 inches below the ground surface; and,
2. Construction related traffic outside of the fenced area would be limited to daylight hours.

Continued agricultural operations would also have the potential to impact kangaroo rats and other sensitive species. Mitigation measures that would need to be implemented to avoid take of kangaroo rats and reduce impacts to sensitive species to less than significant include:

1. Agricultural operations must not encroach into the existing oil well pad sites;
2. Construction of irrigation facilities such as canals, ditches, and retention basins will not proceed until the specific construction sites are inspected by a biologist and determined to be free of kangaroo rats. The construction of barrier fencing at such construction sites may be required;
3. The application of rodenticides within 0.25 miles of the site occupied by kangaroo rats will only be applied using raised "T"-type bait stations which are approved for use in areas occupied by endangered kangaroo rats (Appendix D of the Biological Report); and,
4. Retain all existing stands of trees, individual trees, and snags.

Effectiveness of Measure: The mitigation measures will reduce any potential impacts on kangaroo rats to a less than significant level.

Implementation/Monitoring: The requirements shall be included in the conditions of approval for an Authority to Construct from the SJVAPCD and shall be implemented by the applicant, and construction contractors. Monitoring shall be performed by the SJVAPCD during project construction.

Mitigation Measures #3.4.1.2: To avoid impacts to the San Joaquin kit fox, Standardized Recommendations for the protection of San Joaquin Kit fox (Appendix C of the Biological Report) shall be followed. These include:

1. Project-related vehicles should observe a 20-mph speed limit in all project areas, except on county roads and State and Federal highways; this is particularly important at night when kit foxes are most active. To the extent possible, nighttime construction should be avoided. Off-road traffic outside of designated project areas should be prohibited.
2. To prevent inadvertent entrapment of kit foxes or other animals during the construction phase of the project, all excavated, steep-walled holes or trenches more than 2 feet deep should be covered at the close of each working day by plywood or similar materials, or provided with one or more escape ramps constructed of earth fill or wooden planks. Before such holes or trenches are filled, they should be thoroughly inspected for trapped animals. If at any time a trapped or injured kit fox is discovered, the procedures under numbers 8 and 9 of this section must be followed.
3. Kit foxes are attracted to den-like structures such as pipes and may enter stored pipe, becoming trapped or injured. All construction pipes, culverts, or similar structures with a diameter of 4-inches or greater that are stored at a construction site for one or more overnight periods should be thoroughly inspected for kit foxes before the pipe is subsequently buried, capped, or otherwise used or moved in anyway. If a kit fox is discovered inside a pipe, that section of pipe should not be moved until the USFWS has been consulted. If necessary, and under the direct supervision of the biologist, the pipe may be moved once to remove it from the path of construction activity, until the fox has escaped.
4. All food-related trash items such as wrappers, cans, bottles, and food scraps should be disposed of in closed containers and removed at least once a week from a construction or project site.
5. No firearms shall be allowed on the project site.
6. To prevent harassment, mortality of kit foxes or destruction of dens by dogs or cats, no pets should be permitted on project sites.
7. A representative shall be appointed by the project proponent who will be the contact source for any employee or contractor who might inadvertently kill or injure a kit fox or who finds a dead, injured or entrapped individual. The representative's name and telephone number shall be provided to the USFWS.
8. In the case of trapped animals, escape ramps or structures should be installed immediately to allow the animal(s) to escape, or the USFWS should be contacted for advice.
9. Any contractor, employee(s), or military or agency personnel who inadvertently kills or injures a San Joaquin kit fox shall immediately report the incident to their representative. This representative shall contact the CDFG immediately in the case of a dead, injured or entrapped kit fox. The CDFG contact for immediate assistance is State Dispatch at (916) 445-0045. They will contact the local warden or biologist.
10. The Sacramento Fish and Wildlife Office and CDFG will be notified in writing within three working days of the accidental death or injury to a San Joaquin kit fox during project related

activities. Notification must include the date, time, and location of the incident or of the finding of a dead or injured animal and any other pertinent information. The USFWS contact is the Chief of the Division of Endangered Species, 2800 Cottage Way, Suite W2605, Sacramento, CA 95825-1846, and (916) 414-6620. The CDFG contact is Mr. Ron Schlorff at 1416 9th Street, Sacramento, CA 95814, (916) 654-4262.

Effectiveness of Measure: The mitigation measures will reduce any potential impacts on kangaroo rats to a less than significant level.

Implementation/Monitoring: The requirements shall be included in the conditions of approval for an Authority to Construct from the SJVAPCD and shall be implemented by the applicant, and construction contractors. Monitoring shall be performed by the SJVAPCD during project construction.

**Impact #3.4.2: Loss of Habitat to Special-Status Plants
[Evaluation Criteria (b)]**

Four sensitive plant species (lesser saltscale, subtle orache, recurved larkspur, and heartscale) are unlikely to, but could, occur on the site. Because of frequent disturbance to the project site for ongoing agricultural production, the proposed dairy construction site currently possesses almost no value to native plants.

Conclusion: Construction of the proposed dairy would have no effect on special-status plants or their regional populations.

Mitigation Measures: There are none required.

**Impact #3.4.3: Loss of Habitat for Special-Status Animals
[Evaluation Criteria (c)]**

Currently, the project site provides suitable habitat for eight of the special-status animal species identified in Table 3.4-1. Six of these are avian species (burrowing owl and tricolored blackbird).

Alfalfa and grain crops are considered preferred foraging habitat for Swainson's hawk which are known to occur throughout the region. A Swainson's hawk was observed soaring over the project site on February 12, 2006. The site contains suitable foraging and roosting habitat. Suitable nesting habitat occurs adjacent to the site, north of the intersection of Elkhorn Avenue and Howard Avenue. Suitable habitat also exists along the Fresno Slough, approximately 1 mile to the northeast of the project site. The grain fields that cover the majority of the project site are prime foraging habitat for this species. Similarly, the alfalfa fields and fallowed grazing lands that surround the project site are prime foraging habitat.

Two loggerhead shrikes were seen on the site; they were perched together on a soil embankment near the proposed dairy facility. Roosting sites (e.g. transmission poles and lines, oil wells) are abundant. Loggerhead shrikes are expected to be relatively common and widespread in the area.

Five sensitive wildlife species that were not observed, but may sometimes occur on the site include tri-colored blackbirds, burrowing owls, mountain plovers, Fresno kangaroo rats, and western mastiff bats. The tri-colored blackbird could nest and forage on the project site during the nesting season (February 15 - September 15), when the cultivated grain is mature. Burrowing owls could inhabit California ground squirrel burrows that are common along the canals and roadways on the project site. Burrowing owls are both summer and winter residents of the central and southern San Joaquin Valley and foraging and nesting opportunities on the site are adequate to support this species. The mountain plover could occur on the site as an occasional winter migrant and forage in the agricultural fields soon after disking and cultivation. The western mastiff bat could roost in the Eucalyptus trees that are present on the site. Kangaroo rat sign (including burrows, tail drags and footprints, and scat) was found at an oil well pad in the extreme southern portion of the project site. The pad is approximately 2 acres in size, has a substrate of a fine textured sandy soil, contains relatively undisturbed (although non-native) habitat with open scalds, and contains a number of large storage tanks. Trapping was not conducted to determine which species of kangaroo rat is present at this site, but they could either be Heermann's kangaroo rats (*Dipodomys heermanni*) or Fresno kangaroo rats. Because of the limited distribution of this suitable soil type and because of the limited amount of available habitat, kangaroo rat distribution on the site is confined to this one area. However, kangaroo rats may be more prevalent directly south of the project site where there are considerable expanses of similar oil field pads and fallowed and grazed agricultural lands.

Conclusion: As the proposed expansion and construction activities will be confined to the 110-acre dairy facilities site, the project will not render a significant loss in habitat for special-status animals.

Mitigation Measure #3.4.3: There are none required.

Impact #3.4.4: Interference with Movement of Native Wildlife
[Evaluation Criteria (e)]

Because the proposed dairy and its associated infrastructure is being constructed on only 110 acres of the 1,132-acres of mature row crops, construction will not affect regional wildlife movement.

Conclusion: The proposed project will have less than significant effects on the regional movements of terrestrial wildlife.

Mitigation Measure: There are none required.

Impact #3.4.5: Disturbance to Jurisdictional Waters
[Evaluation Criteria (f)]

The National Wetlands Inventory Map for the Five Points 7.5-minute USGS quadrangle was reviewed for wetland resources. The NWI identifies no Waters of the United States on the project site. No wetlands or seasonally wet areas were observed on the project site during the

biological survey. There are a number of agricultural irrigation canals and ditches that are present on the site, but these will not be impacted by the construction and operation of the dairy. Although not included in the wetlands inventory, the parcel of land north of the intersection of Elkhorn Avenue and Howard Avenue (that is adjacent to, but off of the project site) contains seasonally wet areas, trees, and other characteristics that appear to be extremely valuable to a variety of wildlife. This area could contain important biological resources, but was not inventoried during the biological survey.

Conclusion: Implementation of this project will not impact any wetlands. The seasonally wet areas located to the north of Elkhorn Avenue are outside of the project boundaries and will not be impacted by the proposed project. In addition, the irrigation canals located on site do not fall under the US Army Corps of Engineers (USACE) survey as jurisdictional waters.

Mitigation Measure: There are none required.

Impact #3.4.6: Degradation of Water Quality in Seasonal Creeks, Reservoirs and Downstream Waters
[Evaluation Criteria (g)]

Site development could result in the excavation of loose soils, which often creates conditions conducive to erosion and the concomitant deposition of sediment in adjacent drainages. Grading associated with construction of the dairies and their associated infrastructures would leave a portion (approximately 110 acres) barren of vegetation. Such areas may be somewhat vulnerable to erosion, although the erosion potential is expected to be low because the site is nearly level.

Conclusion: The proposed project could potentially result in the excavation of loose soils, which could create conditions conducive to erosion and the concomitant deposition of sediment into the Stinson Canal.

Mitigation Measure #3.4.6: Site plan design should ensure that the grading of the project prohibits offsite drainage. Once accomplished, the proposed project is expected to have no effect on water quality in the Stinson Canal or any seasonal creeks, reservoirs, or other downstream waters.

Effectiveness of Measure: The mitigation measures will reduce potential water quality degradation impact to less than significant.

Implementation/Monitoring: The requirements shall be included in the conditions of approval for an Authority to Construct from the SJVAPCD and shall be implemented by the applicant, and construction contractors. Monitoring shall be performed by the SJVAPCD during project construction.

Impact #3.4.7: Disturbance to Active Raptor Nests from Construction Activities [Evaluation Criteria (h)]

No suitable habitat for tree-nesting raptors exists on the project site; however, potential nest trees exist elsewhere in the region. Construction activities that would adversely affect future raptor nesting activity (even off site), or result in mortality of individual birds, would be a violation of state and federal law. Construction activities during the raptor breeding season (February through September) that would result in the abandonment of active nests (if any occurred) or direct mortality to these birds would constitute a significant impact.

Conclusion: The project would not result in a potentially significant impact to nesting raptors (e.g., tree nesting raptors immediately off-site). However, construction activities that would harm or kill a burrowing owl (a ground nesting raptor) during the non-breeding season would also constitute a significant impact. Mitigation measures to reduce this potential impact to a less-than-significant level are:

Mitigation Measure #3.4.7: The implementation of the following measures will ensure that raptors (hawks and owls) are not disturbed during the breeding season.

1. A qualified biologist/ornithologist will conduct a pre-construction survey for nesting raptors on site within 30 days of the onset of ground disturbance, if ground disturbance is to occur during the breeding season (February 1 to September 15). These surveys will be based on the accepted protocols (e.g., as for the burrowing owl) for the target species. If a nesting raptor were detected, an appropriate construction buffer would be needed (up to 250 feet or more). The actual size of the buffer would depend on the type of construction activity that would occur in the vicinity of the nest.
2. If burrowing owls are detected on site during the non-breeding season, they can be passively relocated by placing one-way doors in the burrows and leaving them in place for a minimum of three days. Once it has been determined that owls have vacated the site, the burrows can be collapsed and ground disturbance can proceed.

Effectiveness of Measure: The mitigation measures will reduce the potential impacts to burrowing owls to a less than significant level.

Implementation/Monitoring: The requirements shall be included in the conditions of approval for an Authority to Construct from the SJVAPCD and shall be implemented by the applicant, and construction contractors. Monitoring shall be performed by the SJVAPCD during project construction.

Impact #3.4.8: Disturbance of Nesting Migratory Bird Treaty Act Species from Construction Activities [Evaluation Criteria (i)]

Construction activities during the breeding season, (April through August) for migratory bird species that would result in the abandonment of active nests (if any occur) or direct mortality to these birds would constitute a significant impact.

Conclusion: Migratory Bird Species and their nests are not likely to be impacted from the implementation of the project.

Mitigation Measure: There are none required.

Impact #3.4.9: Local Policy/Ordinances Conflict

There are no applicable or pertinent tree preservation policies or ordinances affecting the project area.

Conclusion: There is no impact.

Mitigation Measure: There are none required.

Impact #3.4.10: Habitat Conservation Plan or Other Plan Conflict

There are no applicable or pertinent habitat conservation plans or natural community preservation plans affecting the project area.

Conclusion: There is no impact.

Mitigation Measure: There are none required.

3.5 Cultural Resources

INTRODUCTION

This section evaluates the potential effect the project may have on historical resources.

The project site has historically been intensively farmed and will remain in use as irrigated agriculture.

IMPACT EVALUATION CRITERIA

Criteria for evaluating adverse effects on cultural resources are:

Would the project:

- a) Cause a substantial adverse change in the significance of an historical resource as defined in Section 15064.5?*
- b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?*
- c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature of paleontological or cultural value?*
- d) Disturb any human remains, including those interred outside of formal cemeteries?*

e) Disturb unique architectural features or the character of surrounding buildings?

Potential effects on cultural resources were considered with respect to local, state, and federal regulations as outlined in the *Public Resources Code, Section 21083.2*. In general, this code seeks to identify “significant” sites and/or properties, determine the possible effects on the resource, and provide ways to avoid or reduce potential impacts. Archaeological importance is generally (although not exclusively) a measure of the archaeological research value of a site which meets one or more of the following criteria:

- *Is associated with an event or person of recognized significance in California or American history or of recognized scientific importance in prehistory.*
- *Can provide information which is both of demonstrable public interest and useful in addressing scientifically consequential and reasonable archaeological research questions.*
- *Has a special or particular quality such as oldest, best example, largest, or last surviving example of its kind.*
- *Is at least 100 years old and possesses substantial stratigraphic integrity (i.e., it is essentially undisturbed and intact).*
- *Involves important research questions that historic research has shown can be answered only with archaeological methods.*

Virtually any physical evidence of past human activity can be considered a cultural resource, although not all such resources are considered to be significant. They often provide the only means of reconstructing the human history of a given site or region, particularly where there is no written history of that area or that period. Consequently, their significance is judged largely in terms of their historical or archaeological interpretive values. Along with research values, cultural resources can be significant, in part, for their aesthetic, educational, cultural and religious values.

Section 15064.5 of the *State CEQA Guidelines* provides guidance for determining the significance of impacts to archaeological and historical resources. This section of the *State CEQA Guidelines* includes the following information:

- *definition of “historic resources”*
- *discussion of significant effects on historical resources*
- *discussion of effects on archaeological sites*
- *identification of procedures to be followed in the event that Native American or other human remains are discovered on a project site.*

SETTING

The proposed dairy is on the floor of the southern San Joaquin Valley. The dairy facilities site and surrounding lands have been intensively farmed for over forty years. In pre-agricultural times, the principal plant communities dominating the valley would have been lower Sonoran Grassland and Freshwater Marsh.

The Native American group inhabiting the San Joaquin Valley were the Yokuts. There were over forty Yokuts tribes, each having a distinct name, dialect, and territory. Yokuts have been separated into three geographical divisions, Northern, Southern Valley and Foothill. The Southern Valley Yokuts occupied the region around the project area.

A cultural resource records search (RS#06-057) of the dairy facilities site was completed by the Southern San Joaquin Valley Historical Resources Information Center on February 13, 2006. According to the Information Center's records, there are no known cultural resources within the subject property or within a half-mile radius of the project site that are listed in the National Register of Historic Places, California Points of Historic Interest, California Historic Resources Inventory or the California State Historic Landmarks (Southern SJV Information Center, November 2001), (Appendix M).

IMPACTS

Impact #3.5.1: Disturbance of Cultural or Historic Resources, Skeletal Remains [Evaluation Criteria PRC §21083.2, CEQA Guidelines § 15064.2]

There could be a disturbance or destruction of cultural or historic resources resulting from activities associated with the project.

Conclusion: Although there is no record evidence of archaeological sites on the project site, the possibility remains that resources exist there and, as such, further investigation may be warranted. This impact is potentially significant, but can be mitigated to a less than significant level.

Mitigation Measure #3.5.1: If, in the course of project construction any archaeological or historical resources are uncovered, discovered, or otherwise detected or observed, activities within 50 feet of the find area shall cease. A qualified archaeologist shall be contacted and advise the SJVAPCD of the site's significance. If the findings are deemed significant by the SJVAPCD, appropriate mitigation measures shall be required prior to any resumption of work in the affected area of the project.

If, in the course of project construction or operation, any skeletal remains are uncovered, discovered, or otherwise detected or observed, activities in the affected area shall cease. A qualified archaeologist, the SJVAPCD and local Native American organizations shall be consulted, and appropriate measures shall be required that may include avoidance of the burial site or reburial of the remains.

Effectiveness of Measure: This measure will assure that appropriate procedures are followed with respect to unidentified skeletal remains or Native American burial grounds that may be

found during project construction or operation. The measure will assure that any Native American burial sites encountered are avoided, treated in accordance with the recommendations of the most likely descendant (for Native American remains), or relocated. This measure will also assure that any historical or cultural resources are properly evaluated, and will reduce this impact to a less than significant level.

Implementation/Monitoring: This requirement shall be included in the conditions of approval and shall be implemented by the applicant, construction contractors, the SJVAPCD, and NAHC or local Native American organizations. Monitoring shall be performed by the SJVAPCD during project construction.

3.6 Geology, Soils and Mineral Resources

INTRODUCTION

This section presents a description of the geology, soils, seismic conditions and mineral resources at the project site and expected impacts associated with implementation of the proposed project. The description of these conditions is based on published and unpublished reports and maps prepared by the U.S. Geologic Survey, the Natural Resources Conservation Service and the County of Fresno's Seismic Safety Element.

IMPACT EVALUATION CRITERIA

The following criteria are used in evaluation of impact significance in this topical area:

Would the project:

- a) *Expose people or structures to potential substantial adverse effects, including the risk of loss, injury or death involving:*
 - i. *Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.*
 - ii. *Strong seismic ground shaking?*
 - iii. *Seismic-related ground failure, including liquefaction?*
 - iv. *Landslides?*
 - v. *Subsidence?*
- b) *Result in substantial soil erosion, siltation, changes in topography, the loss of topsoil or unstable soil conditions from excavation, grading or fill?*

- c) *Be located on a geological unit or soil that is unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?*
- d) *Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1997), creating substantial risks to life or property?*
- e) *Have soils incapable of adequately supporting the use of septic tanks or alternative waste disposal systems where sewers are not available for the disposal of wastewater?*
- f) *Result in substantial soil degradation or contamination?*
- g) *Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?*
- h) *Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?*

SETTING

The project site is located in Zone V3 as defined in the Five-County Seismic Safety Element (Envicom, 1974). The description of this zone is:

Zone V3 includes most of the eastern San Joaquin Valley, and is characterized by a relatively thin section of sedimentary rock overlying a granitic basement. Amplification of shaking that would affect low to medium-rise structures is relatively high, but the distance to either of the faults that are the expected sources of the shaking is sufficiently great that the effects should be minimal. The requirements of the Uniform Building Code should be adequate for normal facilities.

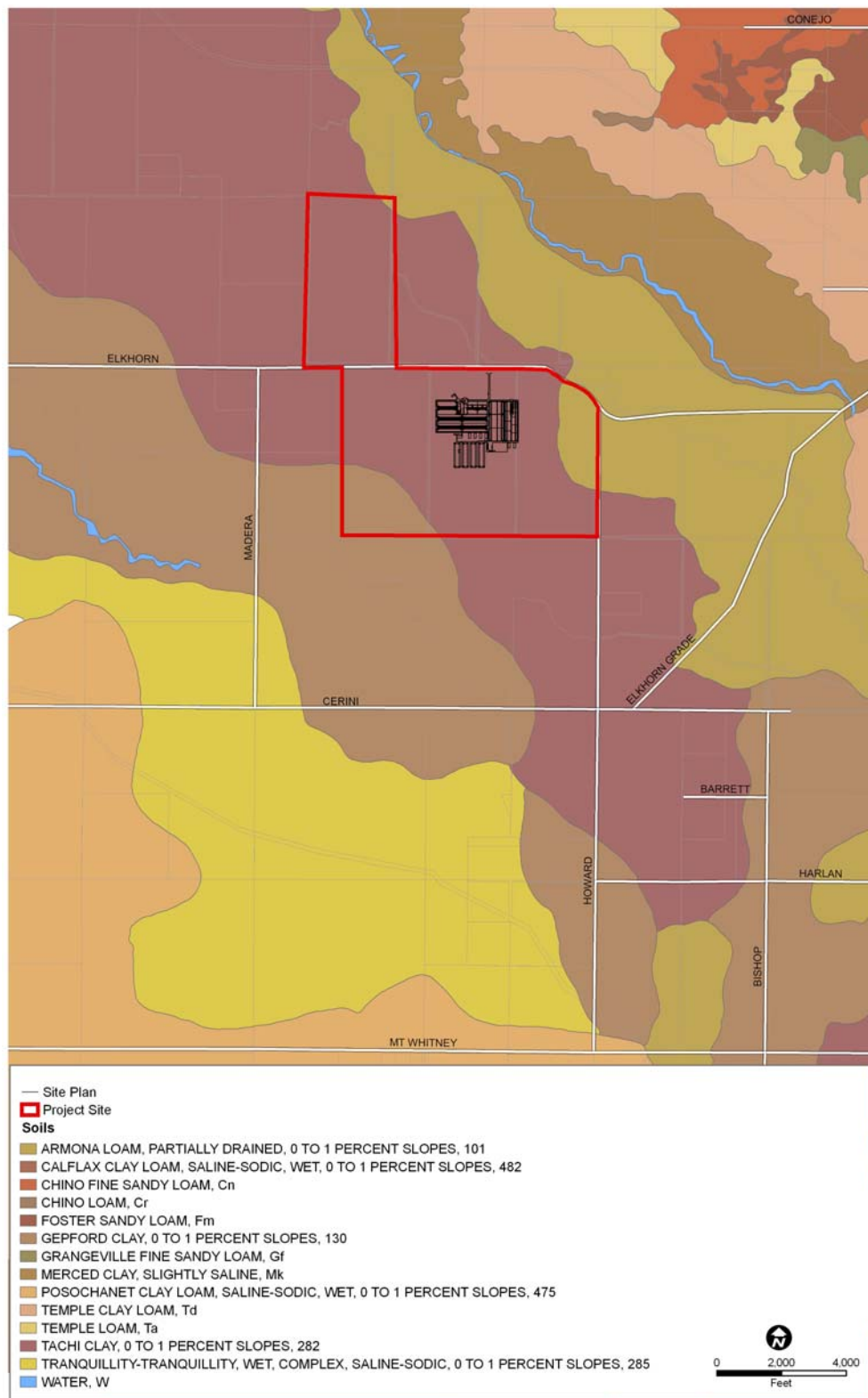
The San Andreas Fault is located 60 miles west of the project site, and the Owens Valley and Garlock faults are located 70 miles east and south of the site, respectively.

The valley fill consists of thick sequences of Jurassic to Holocene aged marine, lacustrine, fluvial, and eolian sediments. The eastern San Joaquin Valley is dominated by extensive alluvial fans and floodplains developed by rivers entering the valley from the Sierra Nevada. These broad, gently sloping, alluvial fans consist predominantly of gravel, sand and silt. The subject site is located on non-marine sedimentary deposits of the Pleistocene Epoch (1.6 million to 10,000 years ago) which are low alluvial terraces of the Kaweah River. These alluvial deposits are often referred to as Older Alluvium.

Information from the United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) (unpublished), Western Fresno County Soil Survey was reviewed to identify soil types present on the project site. The Soil Survey identified the project site soils as Tachi Clay, 0 to 1 percent slopes, Amona loam, and Gipford Clay, 0 to 1 percent slopes. Information regarding these soils is summarized in Table 3.6-1 and their distribution on the site is depicted on Figure 3.6-1.

**Table 3.6-1
Soil Descriptions**

	130	282	101
	Gipford Clay 0-1% slopes	Tachi Clay 0-1% slopes	Armona loam, partially drained 0 to 1 % slopes
Percent of Dairy facility in /Soil Unit	0%	100%	0%
Soil Permeability	Very Slow	Very Slow	Moderately slow
Depth of Soil	Very Deep	Very deep	Very deep
Horizon 1 Depth in Inches)	(0-7) gray silty clay	(0-5)very dark gray clay	(0-9) dark gray
Horizon 2 (Depth in Inches)	(7-13) gray silty clay	(5-14) dark gray	(9-14) gray loam
Horizon 3 (Depth in Inches)	(13-21) gray silty clay	(14-22) variegated dark gray and olive gray clay	(14-19) gray loam
Horizon 4 (Depth in Inches)	(21-31) light olive gray clay	(22-28) variegated dark gray and olive gray clay	(19 to 22) gray sandy loam
Horizon 5 (Depth in Inches)	(31-46) light yellowish-brown silty clay	(28-35) variegated dark gray and light gray clay	(22-25) light gray sandy loam
Horizon 6 (Depth in Inches)	(46-50) light gray silty clay	(35-47) gray clay	(25-30) gray clay loam
Horizon 7 (Depth in Inches)	(50-72) light gray clay	(47-63) dark gray clay	(30-36) olive gray loam
Horizon 8 (Depth in Inches)		(63-70) variegated gray	(36-41) olive gray silt loam
Horizon 9 (Depth in Inches)			(41-60) light gray sand



SOIL CLASSIFICATIONS

Figure
3.6-1

Gipford series soils are formed in mixed alluvium derived dominantly from granitic rocks, and influenced by lacustrine sediments. Gipford soils are on flood plains, basin floors or basin rims. These soils are described as very deep, poorly drained soils. Permeability is very slow.

Tachi Series soils are formed in alluvium derived from igneous and/or sedimentary rocks on flood plains or basin floors. These soils are described as very deep, very poorly drained soils. Permeability is very slow.

Armona loam soils are formed in alluvium from igneous and/or sedimentary rock. These soils are described as very deep poorly drained soils. Permeability is moderately slow or slow.

The geological/hydrological report for the project (see Appendix N) reported that the clay content of the soil samples collected from ground surface to 31 feet below ground surface, ranged from 9% to 44%. The geologic/hydrologic report includes recommendations regarding compliance with clay content requirements during impoundment construction. [Further data will be obtained when the project lagoons are constructed; see Subsection #3.8.8.1 of this EIR].

IMPACTS

Impact #3.6.1: Seismic Effects

[Evaluation Criteria (a) i, ii, iii)]

There are no known earthquake faults, active or inactive, at or near the project site, although several faults are within a 60 to 70-mile radius of the project site.

The Five-County Seismic Safety Element places the project site in an area of minimal ground shaking, with no likelihood of ground failure or liquefaction. Project structures will be required by the SJVAPCD to comply with building code requirements.

Conclusion: There are no significant seismic-related project impacts.

Mitigation Measure: There are none required.

Impact #3.6.2: Landslides

[Evaluation Criteria (a) iv)]

Site topography is essentially level, less than one percent slope prior to land leveling for agricultural production.

Conclusion: There is no potential landslide impact.

Mitigation Measure: There are none required.

Impact #3.6.3: Soil Erosion, Topsoil Loss
[Evaluation Criteria (b)]

Dairy facility site slopes are minimal (0.33% to 4%); and Tachi Series soils are not highly erodible. The balance of the project site, with slopes generally not exceeding two percent, will be double-cropped or maintained in alfalfa.

Conclusion: The project will not create soil erosion or occasion loss of topsoil; there will not be an impact.

Mitigation Measure: There are none required.

Impact #3.6.4: Soil Instability
[Evaluation Criteria (c)]

Landslide potential and liquefaction potential have been discussed, and found to be less than significant, under Impacts #3.6.2 and #3.6.1, respectively. There is no evidence in the geologic record that “Old Alluvium” or its derivative soils are subject to lateral spreading. Subsidence is due to non-compacted, wind-deposited, soils consolidation under load, or to severe ground water overdraft; no such soils or severe overdraft exists at the project site.

Conclusion: There will be no soil instability impact.

Mitigation Measure: There are none required.

Impact #3.6.5: Expansive Soils Hazards
[Evaluation Criteria (d)]

The proposed dairy facilities will be constructed on Tachi Series soils which is classified as medium or high with respect to expansion attributes, as defined in Table 18-1-B of the 1994 Uniform Building Code. No multi-story or pile-supported structures are to be constructed as a part of the project. Design modification of footings or slabs will therefore not be required, but only normal compliance with Uniform Building Code requirements.

Conclusion: There are no expansive soil hazard-related significant impacts.

Mitigation Measure: There are none required.

Impact #3.6.6: Unsuitable Soils for Domestic Waste Disposal; Soil Contamination
[Evaluation Criteria (e), (f)]

No housing is proposed to be located on site. Adequate area for leach line disposal of domestic wastewater is available adjacent to the dairy facilities portion of the site regardless of soil characteristics. Dairy operations will not contaminate underlying soils (see Section 3.9 and Appendix O, Comprehensive Nutrient Management Plan).

Conclusion: There is no impact.

Mitigation Measure: There are none required.

Impact #3.6.7: Mineral Resources
[Evaluation Criteria (f), (g)]

The petroleum resource underlying the site is being utilized by existing onsite and site-adjacent oil wells.

Conclusion: Project development and operation will have no impact on these facilities or on existing oil leases.

Mitigation Measure: There are none required.

3.7 Hazards and Hazardous Materials/Health Risks/Vectors

INTRODUCTION

Will the project introduce hazardous materials, or is the site concurrently considered a hazardous site, are issues discussed in this section. Additionally, public health and environmental risks associated with the proposed project including the development of adverse conditions related to mosquito and fly breeding are analyzed. The potential for release of pathogens associated with dairy operations is analyzed in Section 3.8, Hydrology and Water Quality; the potential for air quality-related health impacts, and mitigation measures related to such impacts, is analyzed in Subsection 3.3 Air Quality.

IMPACT EVALUATION

Hazardous conditions/health risks criteria are:

- a) *Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?*
- b) *Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment or risk of explosion?*
- c) *Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?*
- d) *Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?*
- e) *For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?*

- f) *For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?*
- g) *Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?*
- h) *Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?*
- i) *Expose people to existing or potential hazards and health hazards other than those set forth above?*

With respect to fly impact analysis:

CEQA Guidelines Section 15064.7 defines a threshold of significance as “an identifiable quantitative, qualitative or performance level of a particular environmental effect, non-compliance with which means the effect will normally be determined to be significant by the agency and compliance with which means the effect normally will be determined to be less than significant.”

Since there is no existing regulatory standard applicable to this dairy project, a regulatory threshold of significance was chosen from the California Code of Regulations, Title 14, Article 8, which sets forth agricultural solid waste management standards. The standards are intended to describe levels of performance expected, rather than stating detailed requirements, and is a qualitative rather than quantitative threshold. The project may have a significant effect on the environment if it is a source of excessive vectors as defined in Title 14, Section 17810.4 of the California Code of Regulations, which provides as follows:

The presence of domestic flies, mosquitoes, cockroaches, rodents, and/or any other vectors associated with agricultural waste which:

- (a) Occur as immature stages and adults in numbers considerable in excess of those found in the surrounding environment; and*
- (b) Are associated with design, layout and management of agricultural operations; and*
- (c) Disseminate widely from the property; and*
- (d) Cause detrimental effects on the public health or well-being of the majority of the surrounding population as determined by the applicable enforcement agency.*

Mosquito abatement and vector control districts have the authority (California Health and Safety Code Section 2000 et seq.) to protect Californians against the discomfort and economic effects of vectors and vector-borne diseases, include the regulation of flies and mosquitoes. These districts are charged with the responsibility to prevent public nuisances. Agricultural operations are not a nuisance, even though immature flies may be present, so long as the agricultural operation is designed and managed consistent with the accepted standards and practices for controlling fly

development on similar operations. Accepted standards and practices include all of the following:

1. Proper design and layout of the agricultural operation to minimize the opportunity for fly developments;
2. A comprehensive system for manure management to include storage, removal, and disposal;
3. A comprehensive system for green waste management to include storage, removal, and disposal; and
4. An integrated Pest Management Plan to control the development and harborage of flies, including the components of surveillance, management, containment and control. The standards and practices are to be determined by the University of California Cooperative Extension, the California State Department of Health Services or local public health agencies.

Vector control practices on dairies within their jurisdiction, specifically with respect to flies and mosquitoes, are regulated by the Consolidated Mosquito Abatement District and the Fresno County Environmental Health Department. The District has published dairy vector control requirements which regulate construction and operational requirements for dairies. The District also comments on proposed dairy projects in the environmental review process.

SETTING

The proposed 110-acre dairy facilities site is located on Elkhorn Avenue, between Howard Avenue and Madera Avenue. Land uses in the general site vicinity include primarily field crop lands and dairies.

The site lies within the boundaries of the Consolidated Mosquito Abatement District which is charged with mosquito abatement responsibilities.

IMPACTS

Impact #3.7.1: Operational Hazards [Evaluation Criteria (a), (b), (c)]

Hazardous materials are used for the operation of the dairy and continued agricultural production at the project site, but are applied by contract and not stored on the project site. Fuel stored in aboveground tanks, lubricants, and cleaning solutions are required for the operation and maintenance of equipment during and after construction. Pesticides (for control of vectors) and medicines for dairy cattle are used at the dairy. Agricultural chemicals, including insecticides, herbicides, and fertilizer, are used for continued farming at the site. No such materials or explosives will be stored at the site.

The RWQCB requires that a Storm Water Pollution Prevention Plan (SWPPP) be prepared for the dairy in compliance with the provisions of the General Waste Discharge Requirements for Milk Cow Dairies. The SWPPP is required to include provisions for the safe storage, use, and

disposal of hazardous materials. In addition, all use of restricted agricultural chemicals is controlled by Federal and State laws and regulations enforced by the California Department of Pesticide Regulation (DPR).

Conclusion: Due to the hazardous nature of some materials that are utilized by the dairy, operational hazards are potentially significant.

Mitigation Measure #3.7.1: Prior to issuance of the Authority to Operate for the dairy, the owner/operator shall submit documentation to the SJVAPCD that appropriate permits and notifications regarding the storage, transport, use and disposal of hazardous materials have been completed and acquired. The documentation shall include, at minimum, evidence of compliance with:

1. An employee safety program in accord with California Labor Code Section 6401.7.
2. The RWQCB requirements, including a Storm Water Pollution Prevention Plan incorporating provisions for the safe storage, use, and disposal of hazardous wastes.
3. The permitting requirements of the California Department of Pesticide Regulation.

Effectiveness of Measure: Compliance with the measure will reduce the potential impact to less than significant.

Implementation/Monitoring: This requirement shall be a condition of the SJVAPCD Authority to Construct permit; monitoring thereof shall be the responsibility of the SJVAPCD, and the Regional Water Quality Control Board.

Impact #3.7.2: Site Hazards
[Evaluation Criteria (d)]

The site is not on or near a hazardous waste site, as verified by review of the State of California Hazardous Waste and Substances Sites List (1998).

Conclusion: No evidence exists that the site is a designated hazardous waste site; there is no impact.

Mitigation Measure: There are none required.

Impact #3.7.3: Airport Hazards
[Evaluation Criteria (e), (f)]

The dairy facilities site is located approximately 30 miles northwest of the Lemoore Naval Air Station, an airport owned by the U.S. Navy.

Conclusion: As the dairy facilities are located outside of the airport's restricted zones established in the Fresno County Health and Safety Element, the impact is less than significant.

Mitigation Measure: There are none required.

Impact #3.7.4: Emergency Evacuation and Wildland Fires
[Evaluation Criteria (g), (h)]

The proposed project to be developed on private farmland will not interfere with the County's public emergency evacuation plan. Surrounded by irrigated farmland, the project is not within a recognized wildland fire hazard area.

Conclusion: No environmental impacts will occur.

Mitigation Measures: There are none required.

Impact #3.7.5: Other Health Hazards
[Evaluation Criteria (j), (k)]

The potential for health hazards related to air quality and water quality concerns is discussed in Sections 3.3 and 3.8 of this Chapter and in Chapter 5.

Impact #3.7.6: Vector Generation
[Evaluation Criteria (i), (j), (k)]

The generation and storage of manure, manure-water, animal feed and other organic materials at dairies present the possibility of increased vector activities. Mosquito and fly infestations have been observed at dairies in the past, particularly at manure separation pits and lagoons that have not been properly maintained, and at poorly managed feed areas.

Mosquito infestations can occur as vegetation becomes established around the lagoon perimeter and/or excessive floatable material persists in pits and lagoons.

Nuisance flies associated with confined animal agriculture facilities can be a concern because they potentially carry a large number of disease-causing pathogens such as salmonella bacteria and trachoma virus (bovine pink eye) and may be responsible for infecting animals or people with these pathogens. While high numbers of flies can certainly be a nuisance to nearby residences or businesses, disease transmission by nuisance flies merits greater concern. According to the University of California Cooperative Extension, nuisance fly dispersal behavior is poorly understood and difficult to predict. Accordingly, control of fly development is the only effective means to prevent nuisance fly problems at nearby receptors. (Management of Nuisance Flies: Dairy Design and Operational Considerations, University of California Cooperative Extension, August 2003.)

Inquiries were made in August 2003 (by the preparers of a Supplemental Analysis for an EIR for the Vanderham Dairy in Kern County) of agencies and authorities who are experts in the area of fly control in confined livestock operations, asking each if whether they were aware of a model or predictability method for determination of fly dispersal or fly population at specified distances from a dairy. It was the unanimous opinion of the consulted experts that no such model or predictability method exists.

Studies using marked house flies show that 60 percent to 80 percent of house flies were captured within one mile of their release point. 85 percent to 95 percent were caught within two miles of

the release site within the first four days after they were turned loose (see Vanderham/Kern County Dairy Supplemental Analysis, Superior Court Case Number 5-1500-CV-249185, RDR).

Dairy operators have an incentive to control fly development because nuisance flies are known to cause significant economic losses in the form of reduced milk yields, increased hide damage and higher production costs due to the nuisance and discomfort they cause to both animals and facility employees. Further, the threat of disease transmission to animals and people, as well as the need to maintain good neighbor relations, result in incentives to commercial dairy operators to limit the production of nuisance flies.

Nuisance flies are limited by strict adherence to proper facility design and management considerations and by rapid correction of problem areas. While nuisance fly management is critical to the effective operation of any confined animal facility, it must also be understood that a goal of zero production of nuisance flies is unobtainable.

Mosquito abatement and vector control districts are the public agencies principally responsible for protecting Californians and their communities against the threats of vector-borne diseases and are discharged with the duty to protect the public health, safety and welfare. (California Health & Safety Code Section 2001.) "Vector" is defined under the Mosquito Abatement and Vector Control District law to include mosquitoes, flies, mites and rodents, among others. (California Health & Safety Code Section 2002.) The Consolidated Mosquito Abatement District (CMAD) and the Fresno County Department of Environmental Health are the applicable mosquito abatement and vector control districts with jurisdiction to regulate vectors for the proposed project. The University of California Cooperative Extension has fly development control recommendations concerning dairy design, manure management, organic management and facility maintenance (Management of Nuisance Flies: Dairy Design and Operational Considerations, U.C. Cooperative Extension, August 2003). Proper dairy design and manure management will significantly reduce the number of nuisance flies.

The CMAD provides mosquito abatement services including application of insecticides on a routine basis. CMAD personnel routinely inspect dairies to conduct these services, although it does not provide vegetation or solids removal service. CMAD personnel notify dairy operators in the event vector generation is occurring at the dairy beyond what it can reasonably control or if structural or maintenance work is required. Fines can be levied to ensure such work is undertaken.

The Fresno County Department of Environmental Health provides services related to the abatement of flies. Most fly complaints are generated from dairies which do not adhere to the University of California recommendations regarding dairy design and manure management (Yolanda Laurence, Biologist, Delta Vector Control District).

The nearest off-site residence to the dairy facility is located approximately 3 miles to the northeast. Within a mile radius of the proposed dairy facilities site there are no residences.

Conclusion: Mosquito and fly production are potentially significant impacts of project operation.

Mitigation Measure #3.7.6:

1. As a condition of project approval, the project operator shall agree to follow Consolidated Mosquito Abatement District requirements concerning mosquito control at the dairy facility. The following are requirements established by the District:
 - (a) Wastewater holding ponds shall not exceed 150 feet in width.
 - (b) All dairy wastewater holding and solid separator ponds shall be surrounded by lanes at least fourteen feet in width and nothing (e.g., calf pens, utility lines, hay stacks, silage, tires, ag equipment, etc.) shall be placed in the area of the holding ponds which would prevent passage or use of vector control equipment.
 - (c) Any fencing placed around the wastewater and solids ponds shall be placed on the outside of the fourteen foot lanes and gates provided for access.
 - (d) All interior banks of holding and separation ponds shall be graded 1:1 or steeper for the first ten feet, soil type permitting, but not greater than 1:2 (horizontal:vertical).
 - (e) All wastewater designs shall include a solids separation system. If separator ponds are the exclusive means of solids removal, two or more separator ponds are required. These ponds shall not be more than sixty feet in width.
 - (f) No drainage lines shall bypass the separator ponds, except those which provide for normal corral runoff. All such drain inlets must be sufficiently graded to prevent solids accumulation in the holding ponds.
 - (g) Floatage of any solid substance which could provide harborage for immature mosquito stages shall be kept out of all wastewater holding ponds.
 - (h) The owner shall be responsible for keeping vegetation growth from all areas of the wastewater and solids separation ponds. This includes access lanes, interior pond embankments, and any weed growth that might become established on the pond surface.
 - (i) Dairy wastewater discharged for irrigation purposes shall be managed so it does not stand for more than three days.
 - (j) Any variance desired from these requirements must be submitted to the District for prior review and approval.
2. As a condition of project approval, the project operator shall implement the following fly abatement program:
 - (a) Project dairy facilities design and construction will include concrete-base freestalls and walk lanes, and water drainage to separator facilities.

- (b) Utilization of manure water shall be in thin layers, blending such manure water with irrigation groundwater in compliance with the nutrient management plan appended hereto.
- (c) Manure in corrals shall be scraped as required for effective fly control.
- (d) Feed lanes shall be cleared daily.
- (e) Owner/operator must comply with RWQCB requirements, or permits. Monitoring well design, locations and sampling program shall be approved by the Regional Water Quality Control Board.
- (f) All manured areas shall be sloped to prevent ponding and to convey all precipitation and moisture to drainage systems, including the lagoons. The applicant shall, at a minimum of once per year, backfill any slope loss with compacted, non-manured material, to maintain pre-existing slopes.
- (g) All water systems shall be checked weekly to look for breaks, leaks, and overflows, including the water pressure systems, water troughs and mister lines.
- (h) The owner/applicant shall submit to the Fresno County Health Services Division and to the CMAD before construction of dairy operations, and shall continuously and fully implement during dairy operations, an Integrated Pest Management Plan for fly control which contains the following specific requirements:
 - (1) Manure and feed storage maintenance, and prompt dead animal disposal, to minimize fly breeding.
 - (2) Utilization of parasitoids, and judicious use of pesticides, for fly suppression as needed based on monitoring results.
 - (3) Maintenance of records onsite, for regulatory agency inspection, regarding monitoring results, maintenance and disposal activities and parasitoid and pesticide suppression.

Effectiveness of Measures: Based upon the proposed mitigation measures, the vector impacts will be reduced to less than significant.

Further, the effectiveness of an Integrated Pest Management Plan for flies is well documented, generally resulting in a 50 percent reduction in the number of flies at dairy farms as compared to what would be expected at a dairy without an IPMP in the same geographic area.² Management Plans include such elements as management practices, pest control and monitoring, all focused on breaking the pest life cycle and on population reduction.

² C.J. Geden, D.A. Rutz., R.W. Miller and D.C. Steinkraus, Suppression of Flies on New York and Maryland Dairies Using Releases of MUSCIDIFURAX RAPPRO in an Integrated Management Program; 1992 Entomological Society of America. Donald A. Rutz, David W. Watson, Parasitoids as a Component in Integrated Fly-Management Program on Dairy Farms, Appendix VI.

Monitoring/Implementation: Implementation will be the responsibility of the applicant and operator. Monitoring will be the responsibility of the Consolidated Mosquito Abatement District with regard to mosquito control. Monitoring shall be the responsibility of the SJVAPCD with respect to facilities design and construction, and the Fresno County Department of Health Services with respect to operational practices resulting in fly complaints.

**Impact #3.7.7: Cumulative Fly Generation
[Evaluation Criteria (j), (k)]**

The California Environmental Quality Act defines cumulative impacts as two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts. Cumulative impacts can result from individually minor but collectively significant projects.

The determination of whether there are cumulatively significant vector impacts is made by an analysis of the existing impacts in the area and whether or not the incremental contribution of vectors from the proposed project will result in a cumulatively significant impact. The commonly held belief is that dairy flies will disperse up to one-half mile. University of California Extension Specialists believe that a one-half mile separation between dairies and residences is sufficient to avoid a fly problem, but acknowledge that flies can disperse as much as three miles. (Kern County Dairy Technical Advisory Committee, 1999.) Unlike odors or dust, flies do not disperse from their site of origin in an easily predictable way. They are living organisms with biological needs and are capable of independent flight. The directional fly dispersal appears to be random with movement occurring outward in all directions from a breeding site, though wind direction and speed may dictate in part the number of flies that move in a particular direction. Once dispersing, flies generally will continue their movement until they reach a location that they find desirable. Flies are not likely to sense which sites are desirable from a great distance. It is presumed that they simply stumble upon these desirable locations by chance. Desirable locations include those with food, shelter, vertical resting structure, shade and high humidity. A location need not have all of these attributes to arrest the movement of the fly, but the more of these attributes that are present, the longer the fly will likely remain. If a location is desirable enough, the number of flies arriving at this location will be greater than the number leaving, thereby resulting in the aggregation of flies at this location. At these aggregation sites, the presence of adult flies does not indicate that flies are breeding at the sites.

The Fresno County Environmental Health Department was consulted to determine if any fly complaints have been made at or regarding dairy facilities within a three-mile radius of the proposed project. The results indicate that there have been no complaints of flies in such dispersal area.

Conclusion: Based on evidence that there were no fly problems in the area of the dairy, and based on the dairy location, design and operational considerations of the project being consistent with the University of California Cooperation Extension Guidelines, and the mitigation measures imposed, cumulative fly impacts will be less than significant.

Mitigation Measures: There are none required.

3.8 Hydrology and Water Quality

INTRODUCTION

This subsection of the environmental analyses is premised in part upon data and recommendations from the Geologic/Hydrologic Report (Appendix N), the Comprehensive Nutrient Management Plan and Report of Waste Discharge (Appendix O), the Water Quality Control Plan for the Tulare Lake Basin, Second Edition, 1995 (Basin Plan), and the State Water Resources Control Board (SWRCB) and California Regional Water Quality Control Board, Central Valley Region regulations which ensure protection of the beneficial uses of both surface and groundwaters. These regulations include: the Water Quality Control Plan for the Tulare Lake Basin, Second Edition, 1995 (Basin Plan); Title 27, Division 2, Subdivision 1, California Code of Regulations, Statewide Water Quality Regulations for Dairies; Subchapter 2. Confined Animals, Article 1. SWRCB - Confined Animal Facilities, and the Regional Board regulation implementing the referenced Code section, Order No. 96-270, General Waste Discharge Requirements for Milk Cow Dairies (see Appendix D), and/or subsequent applicable Regional Board regulations. The project will be, under whatever permitting system, required by law to comply with all Federal and State requirements.

IMPACT EVALUATION CRITERIA

Pertinent criteria for evaluation of hydrology and water quality impacts are:

Would the project:

- a. Violate any water quality standards or waste discharge requirements?*
- b. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?*
- c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?*
- d. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?*
- e. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?*
- f. Otherwise substantially degrade water quality?*

- g. *Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?*
- h. *Place within a 100-year flood hazard area structures which would impede or redirect flood flows?*
- i. *Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam, inundation by seiche, tsunami, or mudflow?*
- j. *Inundation by seiche, tsunami, or mudflow?*

SETTING

Surface Waters. The topography of the project site is essentially flat, with slopes 0 to 1 percent to the southwest (see Figure 3.8-1). The proposed grading will maintain the storm water on site. Rivers, streams and lakes within Fresno County, and the site, are depicted on Figure 3.8-2. As shown on Figure 3.8-3 the project site and dairy facilities site are located in Flood Zone X (FEMA, 1986).

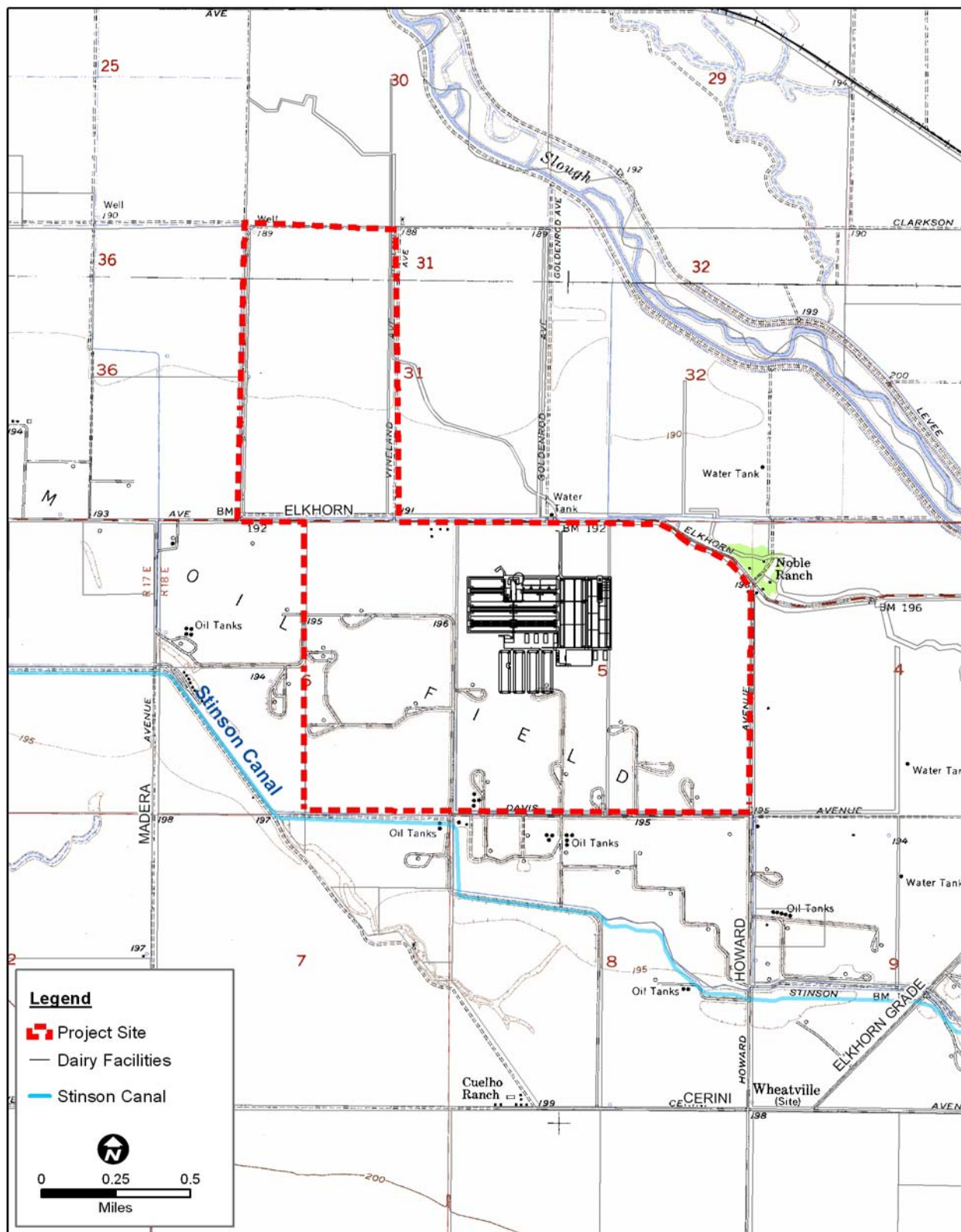
The referenced FEMA Flood Zone X is defined as follows:

“Areas outside the 500-year flood plain with less than 0.2% annual probability of flooding.”

The Stinson Canal flows through the southern and western project site and extends through the northern portion of the site. The Fresno Slough is approximately one mile northeast of the project site.

Groundwater. Groundwater basin boundaries can be estimated based on subsurface geologic conditions and groundwater flow directions. In addition, groundwater quality can be considered (i.e., areas of unusable groundwater quality can be deleted from basin boundaries). Subsurface geologic conditions are important primarily because of constraints on attainable well yields and on groundwater development. Because of the locations of sources of recharge and pumping, groundwater flow divides are important features. These divides are often related to boundaries of areas that have adequate surface water supplies, from which groundwater normally flows out toward cones of depression in other areas. Cones of depressions are normally developed where concentrated pumping is present due to insufficient surface water supplies.

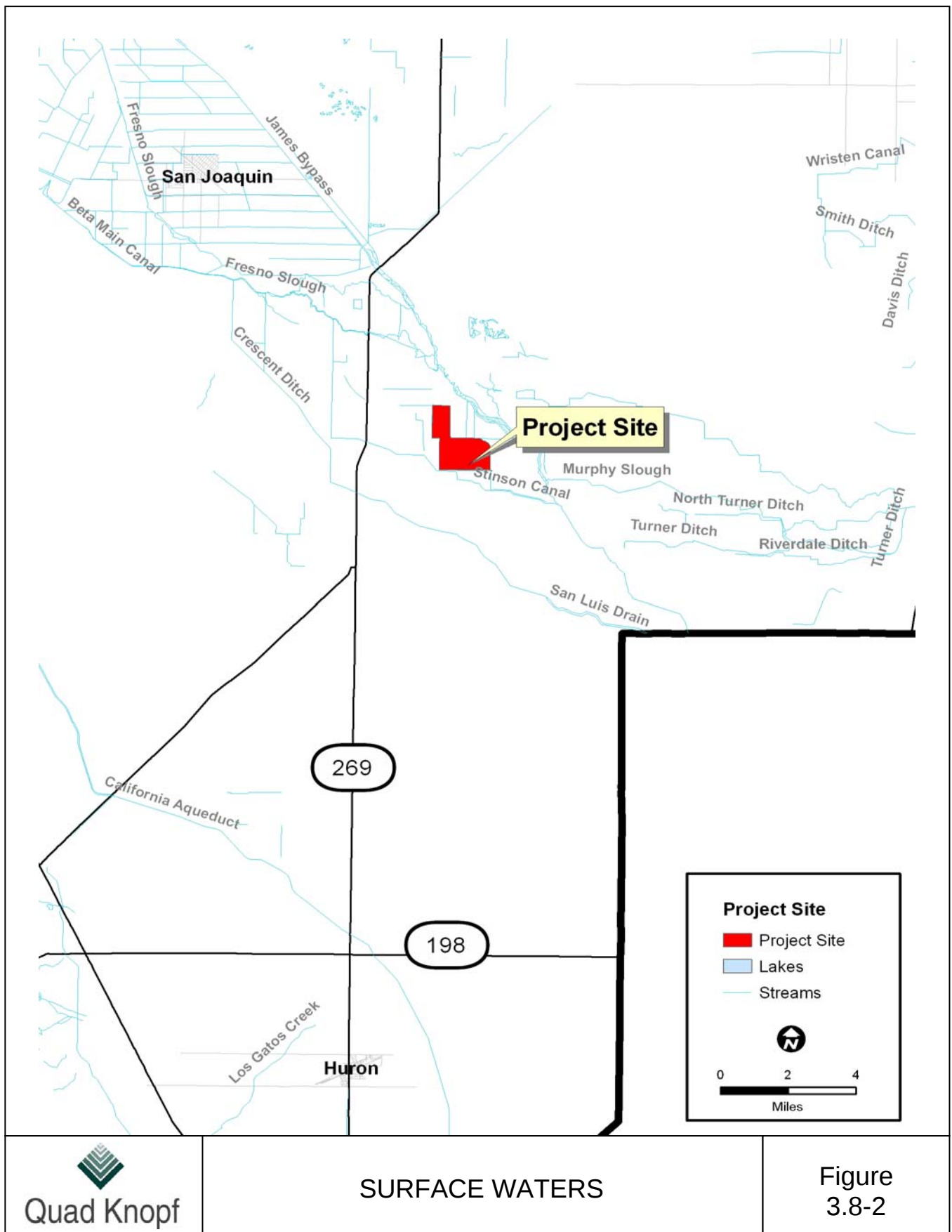
A single groundwater basin can be considered to be present in the San Joaquin Valley and, by extension, in the larger Central Valley. In general, permeable alluvial deposits are present in the Valley, and groundwater in these deposits is hydraulically connected to groundwater in other parts of the basin. The San Joaquin Valley is bounded on the east by the Sierra Nevada Mountains, comprised of hard rock. These mountains are the watershed which provides the source of most of the water that eventually recharges the groundwater in the Valley. This basin is also bounded by the Coast Ranges on the west and the Transverse Range on the south.

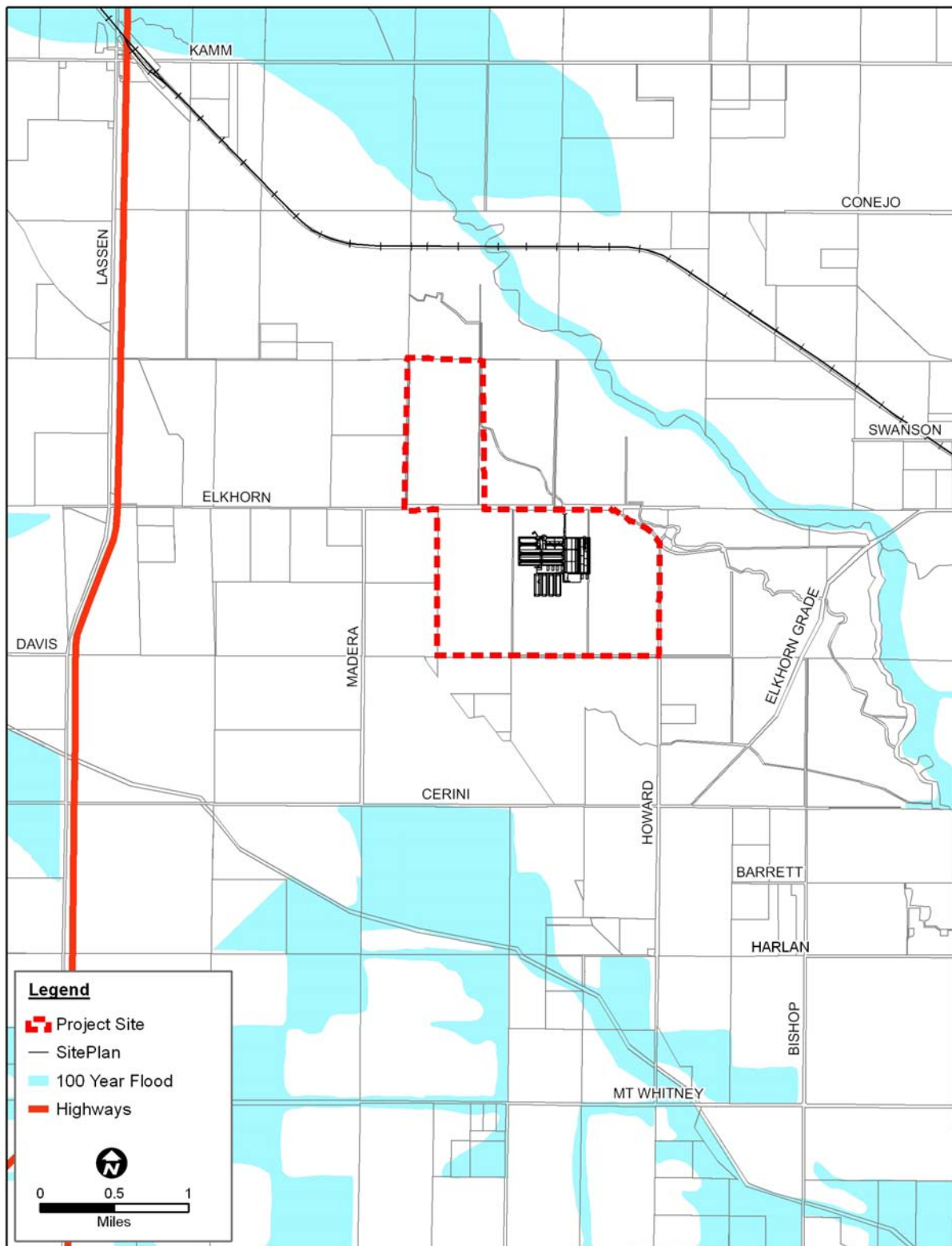



Quad Knopf

TOPOGRAPHY

Figure
3.8-1





Care, however, must be taken in viewing the San Joaquin Valley as one basin for the purpose of groundwater management activities. For example, because of the large size of the basin, and the rate of groundwater flow, activities in one area may have no influence on other, distant parts, of the basin. This is particularly relevant to questions regarding groundwater overdraft. In the San Joaquin Valley, large parts of the basin are not in overdraft – most of the west side of the Valley and the east side of the Valley north of Madera County. Influences on water levels of pumping and recharge in concentrated areas tend to decrease exponentially with increasing distance from the activity. Because of these and other factors, the San Joaquin Valley is viewed by hydrogeologists and by agencies such as the Regional Water Quality Control Board as divided into subbasins, allowing smaller areas to be considered for evaluation and management considerations.

The largest divisions in the Valley are the San Joaquin Basin, generally located north of the San Joaquin River, and the Tulare Lake Basin, located to the south of the River. This division has been used by both the California Department of Water Resources and by the California Regional Water Quality Board, Central Valley Region. The primary support for this division is that the southern part of the Valley, the Tulare Lake Basin, is considered a closed hydrologic basin, with very little outflow, although some outflow occurs in wet years due to floodflows in the Fresno Slough, which connects the Kings River to the San Joaquin River. This distinction has been used to infer that salt buildup in the groundwater could be a major long-term concern in the Tulare Lake Basin, because of the lack of water and salt outflow. Separate water quality control plans have thus been developed for the San Joaquin and Tulare Lake Basins.

A more detailed breakdown of the San Joaquin Valley Basin has been made by the California Department of Water Resources in considering potentially overdrafted groundwater basins in the State. The Kings Subbasin includes the area where water is distributed from the Kings River and its deltaic branches. The Kaweah Subbasin encompasses primarily the area south of the Kings Subbasin and north of the Tule Subbasin. The project is located in the Kings Subbasin (see Figure 3.8-4). These smaller basins are more useful in evaluating local groundwater conditions and management opportunities.

Sources or recharge to groundwater in the vicinity of the project site include seepage from the Kings River's deltaic streams and canals, and from sinking basins northwest of the project site, sheet-flow flooding, and deep percolation of applied irrigation water. Lateral inflow from the east is a major source of aquifer recharge. Discharge (outflow) from the aquifer is to pumping wells and as groundwater outflow to the southwest (see Appendix N).

The project hydrogeologic report (see Geological/Hydrological Report – Appendix N) states that:

Groundwater Levels. The Geological-Hydrological Report for the project calculated groundwater levels in Spring of 2000 as 154 feet below ground surface (Figure 3.8-1). The Report indicates that of the four observed on-site water wells, three of the wells are 40 years or older and well logs were not available. The fourth well was recently constructed to a depth of 590 feet.

Groundwater Quality. Water analyses for two of the four observed onsite wells showed the constituents listed in Table 3.8-2.

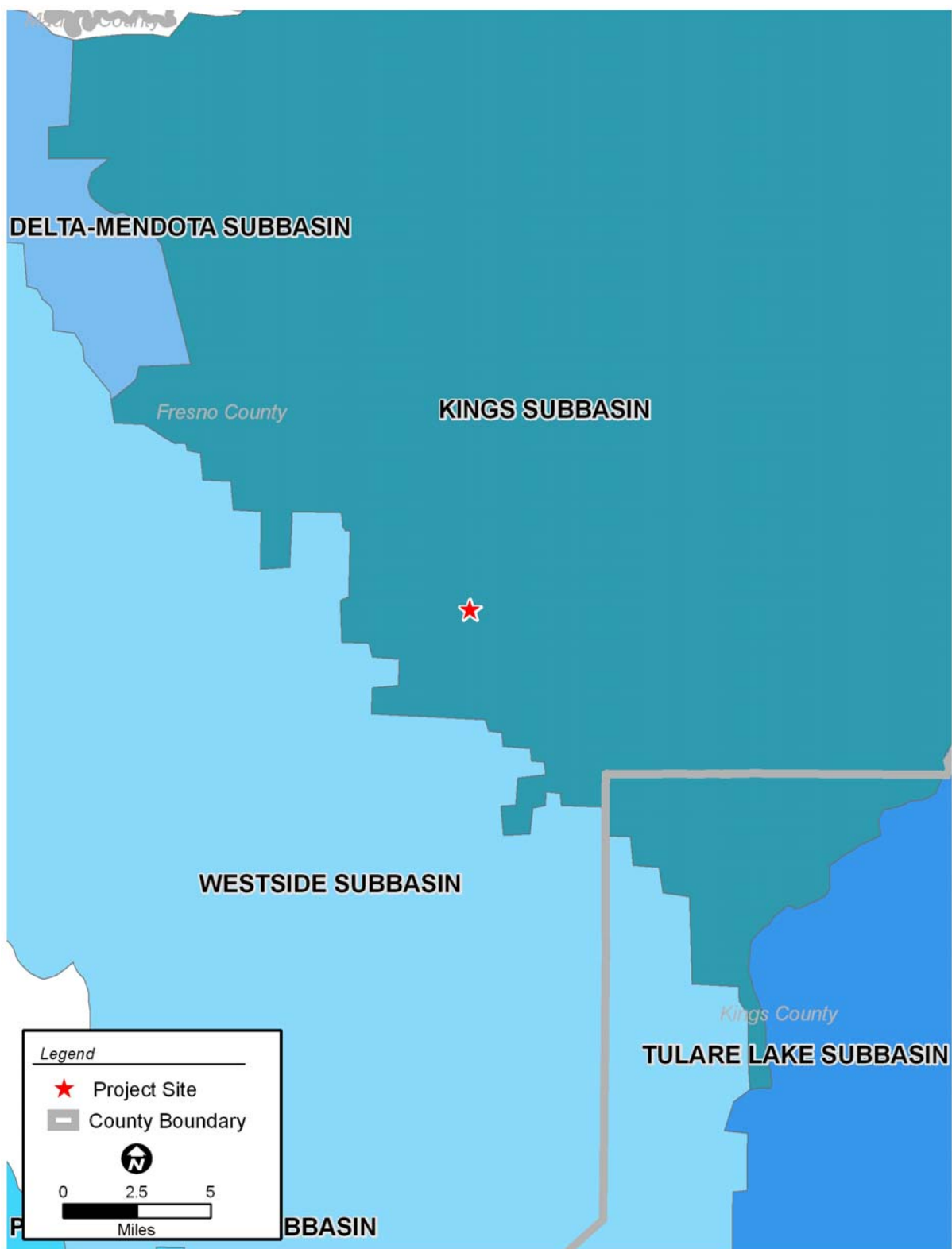


Table 3.8-1
Lines of Equal Depth to Water in Wells
Unconfined Aquifer

Date	Water Surface Depth (feet)
Fall 1987	124
Spring 1988	134
Spring 1996	144
Spring 1998	144
Spring 1999	139
Spring 2000	154

Table 3.8-2
Summary of Selected Inorganic
Constituent Concentrations, Groundwater Samples

Constituent	Well #1 (meq/l)	Well #35 (meq/l)
Sulfate	34	nd
Calcium	9.7	13
Magnesium	0.12	3.5
Sodium	190	240
Carbonate	nd	nd
Bicarbonate	330	350
Chloride	62	140
Potassium	nd	3.0
pH	7.8	7.9
Nitrate	nd	nd
E.C. (umhos/cm)	---	---
Total Dissolved Solids (ppm)	177	137

IMPACTS

Surface Waters

Impact #3.8.1: Drainage Pattern Alternation **[Evaluation Criteria (c), (d)]**

The project, as designed, does not alter or redirect existing drainage patterns consisting of minimal flows toward the southwest. The project area is not within a 100-year flood hazard zone. The borders of land to be irrigated with diluted liquid manure will be bermed to prevent offsite migrations of irrigation water, and provided with an irrigation water return system. All solid manure is to be transported offsite. The project will, therefore not contribute flooding of dairy manure water to the surrounding area.

Conclusion: Project construction and operation will result in no runoff which would exceed onsite storage capacity or provide a source of polluted runoff, nor would it result in siltation or erosion.

Mitigation Measure: There are none required.

Impact #3.8.2: Surface Runoff Increase or Pollution
[Evaluation Criteria (d), (e)]

The project lagoon is designed to retain all storm runoff on-site during a 25-year storm, plus the runoff from 120 days of December through March average rainfall plus all dairy wastewater, discharging such runoff to the wastewater lagoon.

Conclusion: With respect to potential runoff could occur from project fields fertilized with manure, such runoff is, and will be, contained on site with irrigation return systems and bermed fields which will be appropriately designed to prevent offsite discharge of irrigation or rainfall runoff. The project site is not within a mapped 100-year flood plain (see Figure 3.8-3). Thus, project design in compliance with the Basin Plan, as proposed herein, is not expected to result in any significant impact to surface water.

Project construction and operation will result in no runoff which would exceed onsite storage capacity or provide a source of polluted runoff. The likelihood of offsite pollution from irrigation usage of lagoon liquid is less than significant.

Mitigation Measure: None are required.

Impact #3.8.3: 100-year Flood Hazards
[Evaluation Criteria (g), (h)]

The project site is not within a 100-year flood hazard zone (see Figure 3.8-3).

Conclusion: There is no possibility that the project-related placement of structures will impede or redirect flood flows in a 100-year flood hazard area.

Mitigation Measure: None are required.

Impact #3.8.4: Dam Failure
[Evaluation Criteria (i)]

There are no dams or levees which could conceivably affect the dairy site. The nearest dam is the Little Panoche Dam located on the Little Panoche Creek, approximately 45 miles northwest of the project site. The low probability of the occurrence of dam failure, and the distance from the project site makes the impact less than significant.

Conclusion: There will not be any significant flooding due to a dam failure.

Mitigation Measure: There are none required.

Impact #3.8.5: Seiche, Tsunami, Mudflow Impacts
[Evaluation Criteria (j)]

The project is not located near a body of water which could generate seiche or tsunami effects; site topography, as described in the setting portion of this topical analysis, does not permit mudflow events.

Conclusion: There are no possible seiche, tsunami, or mudflow impacts.

Mitigation Measure: There are none required.

Groundwater

Impact #3.8.6: Violation of Water Quality Standards or Waste Discharge Requirements [Evaluation Criteria (a)]

The Basin Plan establishes Water Quality Objectives for Ground Waters (Pages III-7 and III-8). These objectives are further defined in and supplemented by State Water Board water quality control policies and State Water Quality Control Board water quality control plans, as applicable to the Tulare Lake Basin and outlined in Section V of the Basin Plan. It is against this background that possible violation of water quality standards is evaluated. The Regional Water Quality Control Board conducts further evaluation, and establishes project-specific requirements, in permitting dairy operation.

The project applicant has submitted a Comprehensive Nutrient Management Plan (see Appendix O) which demonstrates that the proposed dairy facility will, after offsite disposal of the corral-scraped and separator basin-settled solid wastes, comply with the nitrogen loading and salt loading groundwater protection requirements of the Regional Water Quality Control Board. The Regional Water Quality Control Board staff has indicated with respect to recent dairy projects (Westra Dairy, SCH No. 2000011046, Tulare County) that they will be utilizing data from a report prepared by the University of California Committee of Experts, published in 2005, "Managing Dairy Manure in the Central Valley of California" to determine crop irrigation and total land reuse requirements in consideration of new-dairy nitrogen and salts loadings. Although the precise acreage/cropping constraints which may be required by such utilization cannot yet be calculated, it is conceivable that nitrogen loadings rather than salts loadings may be a controlling factor. If so, the project applicant would be required by the Board to reduce herd size, to modify cropping patterns or herd management practices, or to demonstrate through operation monitoring that manure nitrogen application conforms to agronomic needs.

The Regional Water Quality Control Board, in its comments on a, recent, EIR in Tulare County has commented as follows: *...Water supply wells in proximity to sources of pollution have the potential to act as conduits for the migration of pollutants to groundwater. California Well Standards (Department of Water Resources Bulletin 74-90) state: "When, at the approval of the enforcing agency, a water well is located closer to a source of pollution or contamination than allowed by Section 8, page 12, above (less than 100 feet from an animal enclosure, etc.), the annular space shall be sealed from ground surface to the first impervious stratum if possible. The annular seal for all such wells shall extend to a minimum depth of 50 feet." It should be demonstrated that existing or planned water supply wells located within 100 feet of corrals, wastewater retention components, and/or cropland where dairy wastewater will be applied have been constructed to the standard specified in the California Well Standards.*

The rationale for and efficacy of this requirement is subject to dispute since irrigation supply wells are customarily surrounded by numerous agricultural operations involving fertilizer usage or farm animal husbandry.

Nevertheless, the project applicant will, in accordance with the RWQCB's direction, and as a condition of obtaining Report of Waste Discharge acceptance or project approval under Order No. 96-270, undertake the following steps:

1. Obtain available subsurface geologic and well construction data for all wells "within 100-feet of proposed wastewater retention ponds, corrals or cropland where wastewater will be applied" to determine whether casing seals or other construction details will prevent vertical migration of dairy wastewater.
2. When such positive determination cannot be made from well records, the applicant will:
 - a. Periodically, upon a schedule and with procedures approved by the RWQCB, test wells to assure that vertical migration of dairy wastewater is not taking place, and, when indicated by test results,
 - b. Construct casing seals, as approved by the RWQCB, to prevent such migration.

Since the wells are not associated with an identified or identifiable environmental impact, these procedures are not specified as mitigation measures. However, the applicant agrees to take these voluntary steps as part of compliance with the RWQCB's requirements.

Conclusion: Project construction and operation will result in no violation of water quality standards or waste discharge requirements if impoundments are designed to preclude significant leakage to groundwater.

Mitigation Measures: Project lagoons and separator ponds shall be elevated or shall be lined to effectively preclude leakage to groundwater.

Effectiveness of Measure: Water quality impacts will be less than significant.

Mitigation Monitoring: SJVAPCD and Regional Water Quality Control Board.

Impact #3.8.7: Depletion of Groundwater Supplies **[Evaluation Criteria (b)]**

Water for continued farming and dairy operations on the project site will be provided by onsite wells.

The groundwater in the project area (see Setting in this EIR subsection and Appendix N) is of generally good quality for irrigation and, dependent upon regional rainfall/drought cycles, ranges in depth below ground surface from 124 to 154 feet.

The Comprehensive Nutrient Management Plan (Appendix O) has calculated that the project area being farmed requires approximately (3,962 acre-feet on 1,132 acres), 3 acre-feet per acre of total irrigation water. [If the project dairy facilities site were being similarly farmed, it would require (110 acres x 3) 330 acre-feet per year.] Of the acre-foot project area farming water requirements, the Comprehensive Nutrient Management Plan for the project notes that net dairy water usage will be 243 acre-feet per year (80 gallons per day per milk cow). This is 143 acre

feet less than the ground water usage which would be required if the dairy facilities site were farmed. It represents a less than significant usage of the Kings Subbasin's estimated 10,000,000 acre feet of groundwater between 200 and 600 feet below ground surface. Groundwater usage for the (1,132 acres) cropped area of the project site will be slightly less than at present because of additional dairy facilities water recirculation to the cropped area.

Conclusion: Project construction and operation will result in no significant depletion of groundwater supplies.

Mitigation Measure: There are none required.

Impact #3.8.8: Degradation of Groundwater Quality
[Evaluation Criteria (f)]

Project-related degradation of groundwater quality could conceivably occur as a result of:

1. Groundwater degradation under the dairy facilities site with pathogens or excessive nitrogen or salts resulting from usage of such facilities: corrals, hutches, separation ponds or wastewater lagoons.
2. Groundwater degradation under the project site resulting from excessive application of liquid or solid wastes on cropping areas.
3. Groundwater contamination at another site as a secondary impact of offsite disposal of solid wastes from this project.

In analysis of each of the above potential sources of groundwater quality impacts:

Impact #3.8.8.1: Groundwater Degradation from Dairy Facilities

The project has a number of design and operational features which are intended to prevent groundwater degradation:

The dairy facility design allows for 0.33 to 4.0 percent, or more, design slopes in all unpaved areas and areas not covered by structures, including all corrals, to prevent ponding. These design slopes occupy the flanks of multiple ridge lines upon which the free-stall barn will be built. A concrete apron at grade surrounding the barn will intercept run-off from the barn roof. The apron will divert roof run-off toward inwardly-draining concrete lanes in the barn. The intercepted precipitation will mingle with barn-generated wastewater, and gravity feed through concrete or PVC conveyance piping to a separator pit and a main lagoon. Surface run-off from corral and paved areas will flow downslope to inlets surrounded by concrete aprons; these inlets will attach to wastewater conveyance piping.

Manure is periodically scraped from the corrals. These solid wastes are temporarily stored in piles on the concrete pads or loaded directly to manure spreading trucks. The solid manure is used as an organic fertilizer on croplands and as bedding material in the freestalls.

The project utilizes a water and wastewater management system that promotes recycling of water from dairy operation. Potable well water is pumped to a pressure tank. The pressurized water is used for drinking water and sanitary facilities for workers, to cool milk in refrigeration units at the milk barn, as drinking water for cows, and as supply for the fire hydrant system. Return water from the refrigeration system is pumped to a large storage tank for reuse, supplying water to the dairy cow wash sprinkler system and to wash the floors of the wash and drip pens at the milk barn. All such water flows on concrete walkways and/or in drainpipes to the wastewater ponds.

The freestall barn will be flushed with water pumped from the wastewater pond. The flush water and the solids transported by the water will be returned to a manure separation pond and ultimately to a wastewater lagoon. Following settlement of the solids within the separation pond, the liquid is utilized as a source of irrigation water, supplementing the use of existing on-site agricultural supply wells.

Reference is made to the U.S. Department of Agriculture's Agricultural Waste Management Field Handbook, Appendix 10D, Geotechnical, Design and Construction Guidelines. These Guidelines provide a formula for calculation of discharge from animal waste lagoons: $v = K(H+d)/d$, in which v = rate of discharge expressed as feet per day, H = lagoon or pond depth, d = clay lining thickness, and K = a 1×10^{-7} coefficient (.00028 ft./day) of permeability.

In this instance, then, total annual lagoon/pond discharge would be: $[880,000 \text{ sq. ft.} \times 365 \text{ days} \times 0.00028 \text{ ft./day} \times (13 + 1)/1]/43,560 = 28.9 \text{ acre-feet per year}$.

These calculations assume lagoon construction in accord with current Regional Water Quality Control Board requirements. Such requirements may be based on "10% of clay" standards, or alternatively, may include constructing lagoon lining to full NRCS standards (see Appendix P), including the selection and compaction of liner materials meeting 1×10^{-6} centimeters per second infiltration rates without allowance for sealing by pond or lagoon manure water, 1×10^{-7} with allowance for sealing. In either instance, the ponds and lagoons, as designed and proposed to be maintained, must mitigate both horizontal and vertical seepage in a manner consistent with Title 27. If not so mitigated, based upon monitoring and/or inspection activities disclosing evidence of leakage such that water quality objectives are not being met, then the applicant shall comply with Title 27. Such compliance shall involve taking such measures as are necessary and feasible, including additional lining or relining of ponds and lagoons that will address such impact effectively and meet such objectives.

It has been suggested by opponents of other dairy projects that lagoons and separation pits be lined with plastic or other presumably impervious manufactured materials. Such materials probably display over time, because of operational damage or cracking, no greater impermeabilities than those attainable over the long term by clay lining in accord with the requirements of the California Regional Water Quality Control Board, Central Valley Region. Plastic lining impermeability is difficult to maintain because of damage during solids removal and because of upper-bank solar damage. Although it is theoretically possible to mitigate plastic lining solids removal-damage by utilizing pumped-solids mechanisms, the greater likelihood of long-term leakage control of a clay-liner militates against plastic-liner usage for this project. Therefore, on balance, it is not desirable to use a synthetic (plastic) liner at this time. Regardless

of the lining method utilized, if there is actual evidence of leakage from monitoring and/or inspection activities such that water quality objectives are not being met, then the applicant shall comply with Title 27 and address the impact by additional lining or re-lining of the ponds and lagoons, or by any other feasible and effective measure to meet such objectives.

With respect to migration of contaminants from corrals, the Draft EIR for the Draft Dairy Element of the Kings County General Plan (Kings Co., 2000) presents the following summary analysis:

“The corrals could be locations of significant manure accumulation. Leaching and infiltration may result in introduction of salts to the subsurface. However, since the hydraulic pressure of standing water (which would tend to drive nutrients into the subsurface at the pond locations) would not occur in the corrals or storage areas and annual precipitation is very low, the risk to groundwater quality is reduced relative to infiltration at the ponds. Detailed studies on the fate and transport of nitrogen and salts in feedlots have been conducted by many investigators. It has been demonstrated that, in an active feedlot, a layer (typically two to four inches thick) of trampled manure/soils forms an “excellent moisture seal” (Sweeten, 1993). The sealing layer (typically dark brown to black, often resembling charcoal) is very thin, however, and essentially eliminated when the upper inch is removed (Lehman, et al., 1975). Continued disturbance of this layer, requiring that it be reformed often, may allow substantial infiltration of nutrients. Another study conducted at a level feedlot underlain by silty loam indicated that the feedlot contributed no more nitrate or ammonia to the shallow water table than the adjacent cropland (Elliot, et al., 1972). Soils underlying the areas of heaviest manure accumulation appear to be least impacted by leaching of nitrates, apparently explained by the creation of conditions unfavorable to nitrogen transformation to leachable forms (Chang, et al., 1973). The results of investigations indicate that, at properly managed dairies (particularly in arid environments where infiltration of precipitation is minimal), the corrals should not contribute any more nitrates or salts to the subsurface than the adjacent cropland. In addition, if vertical moisture migration is controlled at the corrals and manure storage areas, substantial vertical pathogen migration would be reduced or eliminated.”

A November, 1996, article on Integrated Animal Waste Management published by the prestigious Council for Agricultural Science and Technology reiterates “Nitrate leaching is not a concern if earthen cattle-feedlots are managed properly, because an impervious seal beneath the feedlot results from salts excreted in manure and compaction by livestock hooves.” Even more critically, the lagoon and corral areas, as designed, have none of the geologic vulnerability conditions deemed significant in the RWQCB’s Title 27 effectiveness evaluation study (Brown-Vence, October 2003): insufficient separation distance between lagoon bottom and seasonal high-water table, coarse-grained soils or sediments above the first significant subsoil clay layer, or discontinuous clay layers embedded with coarse-grained material.

Pathogens (including bacteria, viruses, fungi, protozoa, and parasites) have been demonstrated to be serious contaminants in drinking water supplies, frequently impacting public health (U.S. EPA, 1998). The dairy facilities would generate large volumes of solid and liquid bovine manure, which contains pathogens. Pathogens most commonly associated with bovine manure include cryptosporidium, *Escherichia coli* (*E.coli*), and salmonella. Cryptosporidium (a single cell parasite) and *E. coli* (a bacterium) are found in most dairy cattle manure but elevated levels

commonly occur in manure produced by newborn calves. These pathogens can cause disease within cattle herds and are a health management concern for dairy operations. These pathogens can also be transmitted to humans. Infection with cryptosporidium and *E.coli* can cause gastrointestinal illness, particularly to persons with compromised immune systems.

Physical factors controlling the transport of pathogens include the concentration of the source, natural disinfection ability of the subsurface, and the distance to a sensitive receptor. Pathogens could enter the groundwater system by 1) infiltrating downward through the unsaturated zone, and/or 2) through poorly constructed water supply wells that are not properly sealed at the surface to prevent infiltration into the well casing or surrounding gravel pack. Once in the groundwater aquifer, pathogens could impact on-site wells and/or could be transported off-site to domestic wells.

For pathogens to present a public health impact, the pathogens must reach a sensitive receptor (e.g., a drinking water user).

The distances pathogens can travel in various hydrogeological environments are not well defined, and considerable ranges have been reported in the literature. Setback distances between wells and pollutant sources have long been used by regulating agencies to provide some level of protection for groundwater users.

It is important to note, in evaluating pathogen hazards, that “Because of enhanced disease control and current animal management practices, no disease incidences related directly to animal manure in water sources have been documented” (Integrated Waste Management, 1996).

Normally, the greatest threat to water quality in deep aquifers is infiltration of pollutants through poorly constructed or maintained water supply wells that are not properly sealed at the surface to prevent infiltration into the well casing or surrounding gravel pack.

The owner/operator must have his consultant present to the Regional Water Quality Control Board an engineering evaluation of the wastewater lagoon design to certify it meets the specifications of Title 27, the water quality objectives of the Basin Plan and the performance standards of the anti-degradation policy.

- The Title 27 requirement requires that “*Retention ponds shall be lined with or underlain soils which contain at least 10 percent clay and not more than 10 percent gravel.*” To comply with this specification requires a demonstration of the clay content of soil lining the retention ponds. The acceptable demonstration for compliance with Title 27 requires that soil samples be collected from each type of material exposed in the pond bottom and sides and tested for particle size analysis consistent with the American Society for Testing and Material (ASTM) Method D 422. Prior to approving a retention pond for use, Regional Board staff must observe the soil sampling.
- To meet the specifications of the anti-degradation policy, (because evidence has indicated the minimum Title 27 standard is not always protective of the beneficial use of groundwater), an engineering evaluation of the proposed pond design must be submitted for review and approval prior to construction. The evaluation should demonstrate that the proposed pond

design would protect beneficial uses of underlying groundwater and meet the performance standard of the anti-degradation policy.

- If the pond is modified to meet the soil texture requirements of Title 27 or the performance standards of the anti-degradation policy (with the addition of natural or synthetic liner material), the post construction report needs to be certified by a California Registered Civil Engineer or a Certified Engineering Geologist.

The Regional Water Quality Control Board may similarly require monitoring wells and a monitoring well sampling and testing program. Any such recommended facilities and oversight will be incorporated in waste discharge requirements of the Regional Water Quality Control Board.

Conclusion: The potential for degradation of groundwater from the expansion of dairy facilities on the project site is potentially significant if not mitigated.

Mitigation Measure #3.8.8.1:

1. Owner/operator shall construct pond and lagoon lining in accord with Regional Water Quality Control Board groundwater separation standards (including NRCS Standards, Appendix P hereto and Title 27), and/or shall line ponds and lagoons with manure water prior to operation to reduce percolation.
2. A monitoring well sampling and testing program shall be established if required by the Regional Water Quality Control Board. Samples shall be tested to determine the presence of measurable contaminant leakage, including pathogens, and significant continuing increase in nitrate nitrogen, from separation ponds and lagoons. Testing shall include tests for soil moisture content and electrical conductivity and nitrogen compounds. Evidence of contaminant increase, based on such testing, shall be the basis for required additional lining, or relining, of ponds and lagoons.
3. The domestic well supplying dairy facilities shall be regularly sampled by the Fresno County Health Department for pathogen detection. Evidence of leakage shall be the basis for required additional lining, or relining of ponds and lagoons.
4. Owner/operator must comply with all applicable RWQCB Waste Discharge Requirements, or permits, as required by Title 27 or other applicable water quality control laws. Monitoring well design, locations and sampling program shall be approved by the Regional Water Quality Control Board.
5. All manured areas shall be sloped to prevent ponding and to convey all precipitation and moisture to drainage systems, including the lagoons. The applicant shall, at a minimum of once per year, backfill any slope loss with compacted, non-manured material, to maintain pre-existing slopes.
6. Salt in animal rations should be limited to the amount required to maintain animal health and optimum production.

Effectiveness of Measures: The proposed mitigation measure(s) will reduce possible project-related water quality impacts to less than significant.

Implementation/Monitoring: This requirement shall be a condition of the SJVAPCD Authority to Construct; monitoring of the implementation thereof shall be the responsibility of the Regional Water Quality Control Board.

Impact #3.8.8.2: Groundwater Contamination from Cropped Areas of the Project Site

This impact has been briefly discussed under Impact #3.8.6 above. The Appendix-referenced Comprehensive Nutrient Management Plan demonstrates that a sufficient area is available at the project site to receive the nitrogen application and salt uptake associated with the expected volume of manure water. Current American Society of Agricultural Engineers (ASAE) and Natural Resources Conservation Service (NRCS) design standards are the basis for nutrient balance planning in the CNMP. Recent data provided by the University of California, however, has been selected by the Regional Water Quality Control Board staff as the appropriate basis for land area cropping requirements for Waste Discharge Report processing.

Land application of all “dry” manure generated on-site is not possible since the allowable uptake of salt would be exceeded. The nutrient management plan for the project, Appendix O, indicates that approximately 1,829 tons per year of “dry” manure must be transported to and utilized off-site. If the proposed cropping pattern changed substantially in the future to the extent that the projected application of nitrogen and/or uptake of salts can not be accommodated on-site, additional excess manure would be marketed off-site. The total number of animals that will occupy the site is determined by standards established by the California Regional Water Quality Control Board.

Tailwater on the project site is returned to the head of the irrigation systems, preventing concentrations of manure water/irrigation water.

Manufactured fertilizers and manure generated by livestock contain salts and nitrogen. Salts leaching from manufactured fertilizers and manures contribute to the potential salt loading problem in the groundwater basin. Dairy manure tends to contain more salts than manufactured fertilizers (Table 3.8-3 shows examples of salt contents in fertilizers). Therefore, groundwater underlying agricultural fields fertilized with manure may be more susceptible to salt loading increases.

Excess nitrogen (in its nitrate form) in groundwater is present in some Valley agricultural areas, and as determined by the geological-hydrological report, in this area. The effect of nitrates on human health is a concern. High concentrations of nitrates in drinking water have been known to cause birth defects, cancer, nervous system impairments, and methemoglobinemia in infants (“blue baby” syndrome). To protect human health, California has set the Maximum Contaminant Level (MCL) for nitrate in drinking water sources as 45 mg/L (California Code of Regulations 22-64435) (10 mg/L for total nitrogen).

Table 3.8-3
Comparison of Salt Compositions in Fertilizers

Ion	Regional Mix ¹	15:15:15 Blend ²	Dairy Manure
	(pounds of salts per 100 pounds of nitrogen)		
Calcium (Ca)	126	0	147
Magnesium (Mg)	4	0	67
Sodium (Na)	5	0	292
Potassium (K)	23	80	28
Chloride (Cl ¹)	8	73	82
Sulfate (SO ⁴)	45	173	123
Phosphate (HPO ⁴)	14	143	188
Nitrate (NO ³)	359	443	443
Total Salts	584	912	1,370
Non-nitrogen salts	225	469	927
Non-nitrogen salts/total salts ratio	39%	52%	68%

Source: Borba Farms Dairy EIR, 1999, p. 4.3-9 and RWQCB, Santa Ana Region, 1990, Page III-21.

¹ For the purpose of developing a salt loading unit factor for agricultural uses other than dairies, a regional fertilizer mix was formulated on a weighted basis using fertilizers commonly used within the region.

² Blend consisting of 40% ammonia sulfate, 33% diammonium phosphate, 25% muriate of potash, and 2.5% urea.

The potential for nitrates to leach into groundwater depends on the time of year fertilizer is applied, irrigation efficiency, the water solubility of the nitrogen-based fertilizer or manure, the rate at which the nitrate-containing leachate percolates into the soil, the type of fertilizer, and the depth to the groundwater table. Sandy soils tend to permit greater percolation while clay-based soils inhibit infiltration and leaching to groundwater. Under most circumstances, the majority of the nitrogen is taken up by the crops or residues in the root zone.

The Regional Water control Board's decision to use data from "Managing Dairy Manure in the Central Valley of California," as revised June 2005, authored by a committee of U.C. Berkley and U.C. Davis professors may make it necessary for the operation of the project to be modified within the scope of the EIR. The subject document's data and assumptions regarding the excretion of nitrogen from dairy animals, and the rates of ammonia-nitrogen loss to the atmosphere during dairy operations after excretion differ from those previously utilized in hydrology/nutrient management plan/water quality analyses in this document. As a result, preliminary calculations indicate that herd size and necessary manure removal rates may be more constrained by nitrogen loadings on liquid manure usage acreage than by salts deposition rates on such acreage. The Board will apparently consider such constraint during its permitting process for the project. It is possible that it may require herd size reduction, modification of dairy operation to utilize more scraping and less flushing of manure with greater off-site disposal of dry manure and longer lagoon detention, or increased site-specific soil or groundwater monitoring. None of these potential actions by the Board require EIR modifications.

Conclusion: There will be no degradation of groundwater from the usage of manure or manure water on the agricultural portion of the site in accord with the Comprehensive Nutrient Management Plan. The Regional Water Quality Control Board may elect to require measurement of nutrient and salt uptake by soils during dairy operations. Since available current data evaluated in the Comprehensive Nutrient Management Plan does not indicate that groundwater will be degraded by project operations, such a requirement is not included herein as a mitigation measure. However, if after monitoring and/or inspection activities there is evidence

of groundwater degradation, then the applicant shall comply with Title 27 and take such additional measures that will feasibly and effectively mitigate such condition.

Mitigation Measure: None are required.

Impact #3.8.8.3: Groundwater Contamination at Manure Re-use Sites

There is no way to predict to which agricultural lands in the San Joaquin Valley the project-generated manure which will be sold for off-site usage will be applied. Users of the manure have no incentive to apply the manure at other than proper agronomic rates as such application could be counter-productive, inhibiting crop production, and would be economically impractical; however, there is no way to monitor each application site.

Agricultural areas in the western portion of the south San Joaquin Valley already have high concentrations of salts in the upper aquifers above confining clay layers. Some areas in the McFarland/Delano area of the south San Joaquin Valley have high nitrogen levels in groundwater.

Conclusion: There is no economic incentive to re-use manure offsite at higher than agronomic rates. However, degradation of groundwater from off-site re-use of manure remains potentially significant if transported to and mis-utilized on agricultural land overlying shallow, contaminated, aquitards or with soils already exhibiting marginal or excessive salt or nitrogen concentrations.

Mitigation Measure #3.8.8.3:

1. The dairy facilities operator will provide to each manure hauler from the project site an invoice stipulating that manure re-use shall be undertaken only in full compliance with all applicable State and Federal laws and regulations.
2. Records of tonnage of manure sold will be kept by the dairy facilities operator on site for review upon request by the SJVAPCD or the Regional Water Quality Control Board.

Effectiveness of Measure: The proposed mitigation measure(s) will reduce possible project-related water quality impacts to less than significant.

Implementation/Monitoring: The dairy facilities operator will be responsible for implementation; the Regional Water Quality Control Board will be responsible for ongoing monitoring.

3.9 Land Use and Planning

As discussed in the Initial Study, the project site is not near any established communities. The project is in compliance with applicable Fresno County land use General Plan designations and zoning regulations. No other agency has any applicable land use/environmental programs, ordinances or specific plans affecting the site. There is no impact.

3.10 Mineral Resources

As discussed in the Initial Study, the petroleum resource underlying the site is being utilized by existing onsite and site-adjacent oil wells. Project development and operation will have no impact on these facilities or on existing oil leases. No other mineral resources have been identified on or underlying the site. There is no impact.

3.11 Noise

As discussed in the Initial Study, there are no residences or other sensitive receptors within a mile of the dairy facilities site; there will, therefore, be no noise level standards violations resulting from the project's dairy operations. The project site is currently row-crop farmed; there will be no change in the noise levels occasioned by continued row-crop farming. The project will not expose sensitive receptors to excessive ground borne vibration by either dairy construction and operation or by continued row-crop farming. The operation of the dairy, and the continuation of row-crop farming on the project sit, will not result in any substantial permanent increase in ambient noise levels. The construction of the dairy facilities will, however, occasion substantial temporary increases in ambient noise levels. The lack of any residences or other sensitive receptors within one mile of the dairy facilities site, and normal distance-related attenuation of noise levels created by such construction, mitigate such levels to less than significant.

3.12 Population and Housing

The dairy will employ 18 people who will be recruited from the existing local work force; thus there will be no direct population growth inducement. No road or other infrastructure extensions will be required by the project. In addition, the project will not displace any existing housing or persons. There is no impact.

3.13 Public Services

As discussed in the Initial Study, there will not be any impact on schools, parks, or other population-growth related public facilities and services. Fire protection and police protection requirements of the project will be de minimus and similar to those of other dairy facilities in the area; no additional personnel or equipment for these public safety services is therefore warranted. There is no impact.

3.14 Recreation

As discussed in the Initial Study, there will be no impact on recreational facilities. The project workforce will be recruited from the existing local population. The project does not include recreational facilities or require the construction or expansion of existing facilities. There is no impact.

3.15 Transportation/Traffic

The net increase in automobile/pickup traffic is 35 trips per day. The net increase in truck traffic is 7 trips per day (see Appendix F – Air Quality Methodology and Assumptions, Air Quality Base Data). Existing traffic volumes on the County roads serving the project are approximately 300 vehicles per day. The nearest major intersection to the project is at Elkhorn Avenue and SR 145, which is approximately 2.5 miles from the dairy facilities site. The project-induced increase in traffic is not substantial with respect to increase in vehicle trips, volume-to-capacity ratio, or congestion at intersections, and thus is less than significant.

3.16 Utilities/ Service Systems

As discussed in the Initial Study, the project facilities design must comply with all applicable water quality law and regulations enforced by the California Regional Water Quality Control Board, Central Valley Region. In addition, all storm drainage runoff will be contained onsite. The construction of the required facilities for such containment must be in accord with Regional Water Quality Control Board requirements. Such compliance will assure that construction does not cause significant environmental effects. Water usage calculations for numerous dairy projects located, as is the proposed project, on land currently in intensive agricultural production, have demonstrated that the net usage of water for the dairies is less than if the dairy project site were reclaimed to agricultural crop production. There is, therefore, no water supply impact. The project will not utilize a wastewater treatment provider's facilities. The project will, based upon analyses of typical dairy projects of similar size, produce approximately 2 cubic yards per year of refuse to be disposed of at a landfill. The landfills serving the project area are the Coalinga Disposal Site, located near the City of Coalinga and American Avenue Disposal Site located approximately 5 miles northeast of the City of San Joaquin. The County of Fresno Department of Public Works states that the lifespan limits of these landfills are 2043 and 2029, respectively. The project's impact thereon is therefore less than significant. Regional Water Quality Control Board regulations pertinent to the project limit the onsite usage of liquid and solid manure. Such usage is constrained by the amount of salts or nitrogen which can be utilized by the crops on the site. It has been determined by a nutrient management plan prepared for the project (see Appendix O) that 2,829 tons of solid manure will be hauled off site per year. The project thus creates no solid waste impact. Impacts associated with utilities and service systems are demonstrably less than significant (see Initial Study, Appendix A).

CHAPTER FOUR

EVALUATION OF ALTERNATIVES

CHAPTER FOUR - EVALUATION OF ALTERNATIVES

Introduction

An EIR shall describe a range of reasonable alternatives to the project, or to the location of the project, which could feasibly attain most of the basic objectives of the project, but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives (14 CCR 15126.6). The range of alternatives that needs to be considered includes those which are within the rule of reason. The significant effects of the project – air quality direct emissions, and cumulative impacts associated therewith, cumulative impacts to predator habitat and possible cumulative effects on water quality, dictate the alternatives to be considered. A full range of alternatives to the project are considered herein.

In evaluation of the alternatives to the project, it is useful to again review the project objective:

The objective of the project is building and operating an economically viable and competitive dairy facility in compliance with applicable laws and regulations, optimally utilizing the available land resources, and mitigating environmental impacts to the extent feasible and as required by CEQA.

Among the factors that may be taken into account in addressing the feasibility of alternatives are site suitability, economic viability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries. Another is whether the proponent owns, or can reasonably acquire, control or otherwise have access to an alternative site. [14 CCR 15126.6(f)(1)]

Several alternatives were eliminated as infeasible, including dairy designs incorporating anaerobic and aerobic treatment systems and covered lagoons/ separation basins, and out-of-the-Valley alternative locations. The treatment system/covered lagoon dairy designs were eliminated due to their technical and economic infeasibility. (See Section 3.3 of the EIR.) Alternative sites outside the San Joaquin Valley were also eliminated, despite the fact that such siting might speculatively lessen effects of air emissions; these properties are outside the jurisdiction of the County and of Valley agencies which have responsible-agency jurisdiction over the project, and are too far from the Van Der Kooi Dairy operational headquarters and supply/ distribution infrastructure. In addition, specific alternative sites in the San Joaquin Valley are, in general, not feasible because they are outside the ownership control of the project proponent and there would be no reduction in the identified significant effects (but see possible exception discussed for a larger site size).

Evaluation of the feasibility of alternatives resulted in the selection of alternatives to be assessed in detail. This EIR thus analyzes the following alternatives: the No Project Alternative, two Larger Site alternatives, and two Reduced Herd Size Alternatives. After analysis, the environmentally superior alternative was identified.

A matrix comparing differing environmental impacts of the project (Table 4.1-1) and the alternatives evaluated in this Chapter is presented here in brief summary of the Chapter's analyses. It is recommended that the full Chapter be reviewed to assure understanding of the summary.

4.1 No Project Alternative (Alternative No. 1)

CEQA, through case law and statutory language, requires that "no project" alternatives be evaluated; under Section 15126.6(e)(2), "the No Project Alternative shall discuss the existing conditions at the time the notice of preparation is published . . . as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services."

The purpose of the No Project Alternative is to allow the County to compare the impacts of the proposed project with the impacts of not approving it.

Under the No Project Alternative, the dairy facilities would not be completed. Given the existing zoning, value and location of the property, the land will continue to be used for intensive agricultural cultivation. The project site is currently designated as Agricultural and zoned AE-20 (Exclusive Agricultural, 20-acre minimum), an exclusive zone for intensive and extensive agricultural operations.

Existing conditions and historic agricultural uses at the project site indicate that the most suitable future, non-dairy, agricultural use of the project site will be continued row and field crop production. The crops historically grown at the site (feed grain, alfalfa, cotton) would not typically support development of permanent, large, agricultural processing facilities. Although the choice of agricultural crops could change through time, project site soils and climatic conditions limit the potential for the planting of significantly different crops. Thus, it is assumed that the No Project alternative will not involve a significant change in the cultivation of existing row crops on the project site. In comparison of environmental effects with those of the project:

Continued row and field crop production activities would have similar air emissions to those of existing conditions, replacing confined-animal related emissions from the row crop area. Construction emissions would be eliminated. ROG, methane and ammonia, hydrogen/sulfide and odors would be eliminated. Operational PM10 and PM2.5 impacts could be diminished, depending on the type of crop that is planted and the manner in which it is cultivated. Any avian predator foraging habitat that is currently existing would remain.

Table 4.1-1
Summary Comparison of Environmental Impacts
of the Project and Project Alternatives

Alternatives	Extent to Which Project Objectives Satisfied	Potential Water Quality Impacts	Air Quality Impacts ⁽⁴⁾	Cumulative Impacts (water, avian predator)	Feasibility	Environmental Ranking ⁽³⁾
No-Project (continued row crop agricultural usage)	None	None	Less than Significant	None	No	1
Alternate Sites (A & B)	Partial ⁽¹⁾	None	Less than Significant	Significant	No	2
Reduced Herd Size (2,392 animal units)	Partial ⁽¹⁾	None	Less than Significant ⁽⁴⁾	Significant; reduced	No	3
Reduced Herd Size (1,566 animal units)	Partial ⁽¹⁾	None	Less than Significant	Significant; further reduced	No	3
Project (3,916 animal units)	Total	Potentially Significant ⁽²⁾	Less than Significant ⁽⁴⁾	Significant	Yes	4

(1) Economically infeasible.
(2) Potential impact is water quality degradation because of the inability to control third-party manure applications.
(3) Rankings determined by water quality impacts.
(4) Prior to mitigation.

The possibility of contamination of groundwater from the dairy operations would be replaced with those threats to groundwater that are routinely associated with traditional agriculture such as nitrates and pesticides. Air emissions relative to the use of chemicals, depending on the crops harvested, could be increased over those of the dairy. Also, depending on the types of crops harvested, there will be a difference in the volume of traffic because of increased truck transport of crops to other locations and reductions in direct dairy-related employee and truck traffic. The potential for project-related air quality impacts to cause cumulative effects would be diminished.

In summary, then, of the No-Project Alternative and its comparative impacts:

- Biological Resources

Approximately 110 acres of avian predator foraging habitat would be retained, eliminating project-related biological resources cumulative impacts.

- Water Quality

Possible direct water quality impacts of the project would be eliminated. The application of irrigation water and fertilizers to irrigated agriculture at the project site will continue to have water quality impact potential if mismanaged.

4.2 Alternative Sites (Alternative No. 2)

These alternatives are alternative, larger, sites. The purpose of reviewing alternative sites is to provide the decision-maker with an analysis of other sites where the environmental effects that are expected from the subject project may be reduced.

The CEQA Guidelines state [Sections 15126.6(f)(2)(A) and (B)]: *“The key question and first step in analysis is whether any of the significant effects of the project would be avoided or substantially lessened by putting the project in another location. Only locations that would avoid or substantially lessen any of the significant effects of the project need be considered for inclusion in the EIR...If the lead agency concludes that no feasible locations exist, it must disclose the reasons for this conclusion, and should include the reasons in the EIR.”*

There are alternative locations for the construction of a dairy of this herd size in the San Joaquin Valley Air Basin (SJVAB).

Because of the status of the air quality in the SJVAB, there is no evidence that there are any other sites in the SJVAB which would not have comparable air quality impacts or cumulative biological resource habitat impacts.

There is no evidence that there are any other sites in Fresno County which would have less possibility of cumulative water quality impacts from project-size dairy facilities or direct impacts from on-site manure fertilization.

However, the possible impacts associated with improper application of manure as a fertilizer and soil amendment at offsite locations (see Impact No. 3.8.8.3) could be eliminated if an alternative site were available and selected which had sufficient acreage that all manure could be utilized onsite at agronomic rates. Such a site would require about 1,562 acres under agricultural production with crops similar to those on the project site, an increase of 430 acres over the acreage available at the project site.

To allow a thorough analysis, two typical, larger sites located in the SJVAB have been selected for comparative alternative analysis, even though such sites are not under the control of the project applicant, are in multiple ownership and may not be available for purchase.

(ALTERNATIVE SITE NO. 2.A)

This site is located north of Visalia, south of Tulare County Avenue 384 between Road 86 and Road 108 (see Figure 4-1). It has access to a roadway which is on the County's Select System (Avenue 360). It is assumed to be 1,242 acres in size; it is bordered by a major dairy one-half mile to the east and by other dairies and scattered rural residencies to the south and west. There are no dairies within 1/2 mile. There are no orchards or vineyards located within County "windshed" boundaries, nor is it located in a County-defined Community Windshed. There are no wetlands or areas of native vegetation in the site vicinity; however, burrowing owls were observed on site ditch banks. The majority, not all, of the site is in a 500-year flood zone. Depth to perched groundwater averages from 7 to 20 feet; depth to groundwater approximately 70 feet. Soils are sandy loams. Nitrogen levels in area groundwater range from 8 (deep wells) to 70 (perched groundwater) parts per million of NO₃-N. Shallow water table salinity ranges from 890 to 1620 E_c; deeper water quality salinity is satisfactory.

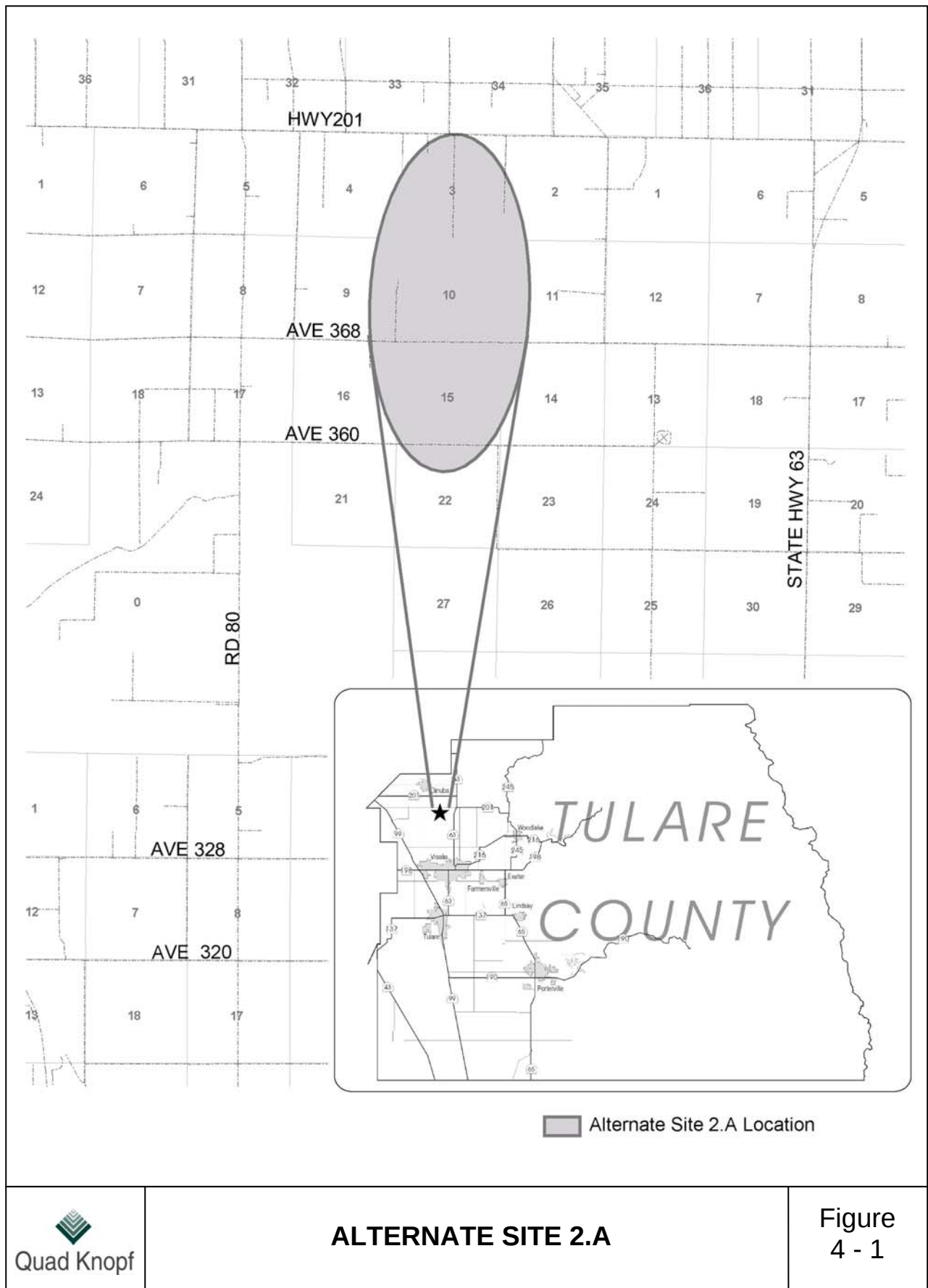
In brief analysis of the impacts of a 6,646 animal unit dairy on a 1,242 acre site at this alternative location, comparing with the impacts for the project:

- **Aesthetics:** Potentially significant impact (light and glare), mitigable to less than significant.

There are no physical features in the area whose aesthetic value would be diminished by dairy construction. The site is occupied by an older farm residence and minor, old, agricultural buildings and fences. Adjacent properties are vacant. The glare impacts of nighttime lighting can be diminished to less than significant by directing security lighting at dairy structures downward and inward.

- **Agriculture Resources:** No significant impact.

The project site will remain in agricultural production. Currently unused portions of the site will be converted to intensive agriculture.



- Air Quality: Significant project-level impacts, prior to mitigation, similar to those of the project

With a project herd of the same size, incremental project air quality impacts will be the same as those of the project.

- Biological Resources: Potentially significant impact on a protected species (burrowing owl); mitigable to less than significant with buffer zones along irrigation ditches, light and glare mitigation.

A biological survey of the site disclosed no wetlands or areas of native vegetation in the site vicinity. No endangered or threatened species, or species of special concern, were found on the site with the exception of burrowing owls on site ditchbanks. Avoidance of disturbance of owl burrows during nesting season will mitigate any significant biological impacts.

- Cultural Resources: Potentially significant impacts (disturbance of cultural or historical resource skeletal remains) mitigable to less than significant.

There is always, in the San Joaquin Valley, the potential for disturbance of cultural or historical artifacts or skeletal remains. There are, however, no known historical sites on the alternative project site, and no streams traversing the property on which cultural habitation sites might be anticipated. Standard mitigation measures involving construction cessation and notification procedures would mitigate any potential impacts to less than significant.

- Geology, Soils, and Mineral Resources: No significant impact.

The site is not located in an area of the Valley in which any mineral resources have been found. There will be no soils impacts; all of the site will remain in agricultural usage, and the flat slopes in the area mitigate against soil erosion.

- Hazards and Hazardous Materials: Potentially significant impacts (operational hazards) mitigable to less than significant.

As with the project, hazardous materials would be used by a dairy operation at this site. Documentation of, and compliance with, SB 198 employee safety programs, a Storm Water Pollution Prevention Plan and the permitting requirements of the California Department of Pesticide Regulations will reduce the potential impact to less than significant.

- Hydrology and Water Quality: Possibly significant impacts mitigable to less than significant (with elevated ponds and supplemental pond sealing measures required by the Regional Water Quality Control Board, similar to the pond elevation and pond sealing required by that Board at a recently-permitted adjacent dairy).

The project's location in an area of high groundwater creates the need for specialized mitigation measures.

- Land Uses and Planning: No significant impacts; the site is in compliance with all land use and planning regulations. It is remote from clusters of residences, and from orchards. It is over one-half mile from the nearest dairy. It is properly zoned (AE 40).
- Noise: No significant impacts.

There are no nearby sensitive receptors or residential areas.

- Population and Housing: No significant impacts.

The alternative's employment generation potential is the same as that of the project. It is within easy commute distance from communities with existing high unemployment levels and thus unlikely to generate population growth or housing demand.

- Public Services and Utilities: No significant impacts.

Like the project, the alternative creates no demand for public utility services, and can be served by existing County law enforcement and fire suppression services.

- Recreation: No significant impacts.

The alternative creates no demand for additional recreation facilities. Employees will live and recreate in existing communities served by such facilities provided by the communities or the County of Tulare.

- Transportation/Traffic: No significant impacts.

The alternative's direct access to Avenue 360, a component of the County's Select System, and from that Avenue to Road 80, partially mitigates the potential for traffic-related or road deterioration impacts, but it appears that pavement cross-section on Avenue 360 may not be constructed to an engineered standard and that further mitigation for the alternative's project-related road degradation would be required.

As with the project, there would be significant cumulative impacts with respect to air quality, possible cumulative water quality impacts and cumulative loss of avian predator foraging habitat, but it appears that the pavement cross-section on Avenue 360 may not be constructed to engineered standards and that mitigation for alternative project-related road degradation would be required.

(ALTERNATIVE SITE NO. 2.B)

This site is located south of the intersection of Tulare County Road 152 and County Avenue 160. (See Figure 4-2). It has direct access to Road 152, a County select system

collector. It is assumed to be 679 acres in size; and is located over one-half mile from the nearest confined-animal facility (a calf ranch). Properties adjacent to the site are in intensive row and field crop agriculture. There are no orchards, vineyards or concentrations of rural residencies within County “windshed” boundaries nor is the site located within a County-defined Community Windshed. Groundwater beneath the site is at 40 to 130 feet depth below ground surface and is of good quality. Surface soils are fine sandy loam. The site is located within a Zone C flood boundary, “area of minimal flooding”.

In brief analysis of the impacts of a 2,637 animal unit dairy on a 1,242 acre site at this location, reviewing possible impacts against the “setting” data described above and to similar analyses for the project itself:

- Aesthetics: Potentially significant impact (light and glare), mitigable to less than significant.

There are no physical features in the area whose aesthetic value would be diminished by dairy construction. Adjacent properties are essentially vacant. The glare impacts of nighttime lighting can be diminished to less than significant by directing security lighting at dairy structures downward and inward.

- Agriculture Resources: No significant impact.

The project site will remain in agricultural production.

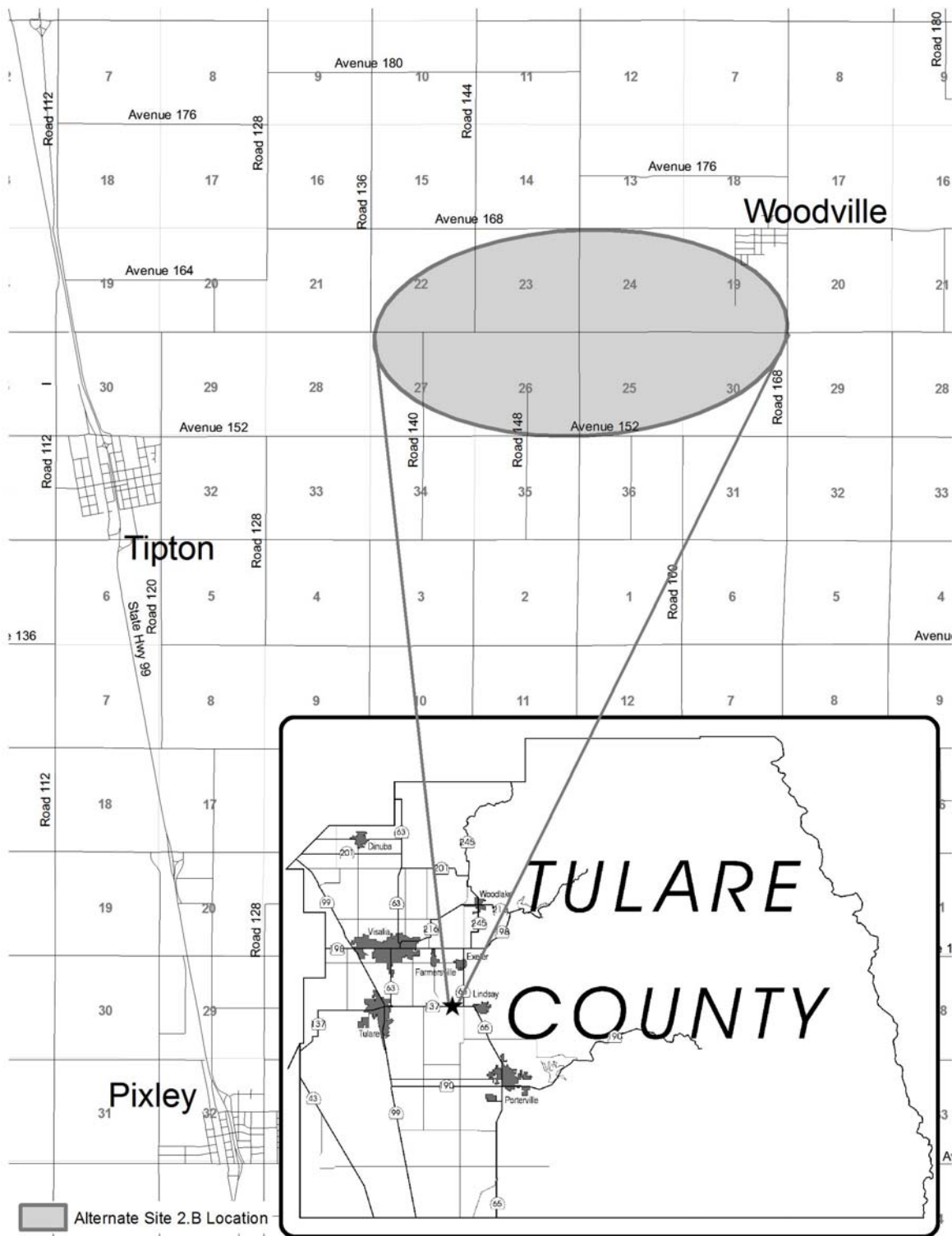
- Air Quality: Significant project-level impacts, prior to mitigation, similar to those of the project.

With a project herd of the same size, incremental project air quality impacts will be the same as those of the project.

- Biological Resources: Potentially significant impact, mitigable to less than significant (see Aesthetics).

There is no evidence of wetlands or areas of native vegetation in the site vicinity, or of endangered or threatened species, or species of special concern, on the site except that the area may be used for foraging by avian predators.

Cultural Resources: Potentially significant impacts mitigable to less than significant.



ALTERNATE SITE 2.B

Figure
4 - 2

There is always, in the San Joaquin Valley, the potential for disturbance of cultural or historical artifacts or skeletal remains. There are, however, no known historical sites on the alternative project site, and no streams traversing the property on which cultural habitation sites might be anticipated. Standard mitigation measures involving construction cessation and notification procedures would mitigate any potential impacts to less than significant.

- Geology, Soils and Mineral Resources: No significant impact.

The site is not located in an area of the Valley in which any mineral resources have been found. There will be no soils impacts; all of the site will remain in agricultural usage, and the flat slopes in the area mitigate against soil erosion.

- Hazards and Hazardous Materials: Potentially significant impacts mitigable to less than significant.

As with the project, hazardous materials would be used by a dairy operation at this site. Documentation of, and compliance with, SB 198 employee safety programs, a Storm Water Pollution Prevention Plan and the permitting requirements of the California Department of Pesticide Regulations will reduce the potential impact to less than significant.

- Hydrology and Water Quality: Possibly significant impacts mitigable to less than significant.

Groundwater at the site is at approximately 40 feet to 130 feet depth below ground surface. The site is located in FEMA Zone C, an “area of minimal flooding”.

- Land Use and Planning: No significant impacts.

The site is in compliance with all land use and planning regulations. It is remote from clusters of residences, and from orchards. It is over one-half mile to the nearest confined annual facility. It is properly zoned (AE 40).

- Noise: No significant impacts.

There are no nearby sensitive receptors or residential areas.

- Population and Housing: No significant impacts.

The alternative’s employment generation potential is the same as that of the project. It is within easy commute distance from communities with existing high unemployment levels and thus unlikely to generate population growth or housing demand.

- Public Services and Utilities: No significant impacts.

Like the project, the alternative creates no demand for public utility services, and can be served by existing County law enforcement and fire suppression services.

- Recreation: No significant impacts.

The alternative creates no demand for additional recreation facilities. Employees will live and recreate in existing communities served by such facilities provided by the communities or the County of Tulare.

- Transportation/Traffic: No significant impacts.

The alternative has direct access to County Road 152, and will be required to construct access thereto under the restrictions of an encroachment permit from the County. The site location, road condition and minimal traffic flows on Road 152 mitigate the potential for traffic-related or road deterioration impacts.

As with the project, there would be significant cumulative impacts with respect to air quality, possible cumulative water quality impacts and loss of cumulative avian predator foraging habitat.

4.3 Reduced Herd Sizes (Alternative No. 3)

The air section of the EIR (Section 3.3) evaluates air quality emissions before mitigation from Phase II of the proposed dairy project. Phase I emissions have been grandfathered into permits and will not be evaluated. Therefore, the air quality analysis evaluates a project herd size of 3,916 animal units. This analysis evaluates alternatives incorporating reduced herd sizes of approximately 2,392 and 1,566 animal units, 60 percent and 40 percent of project levels and representative of other dairy applications.

With these reduced herd sizes, the amount of acreage needed for feed production and for liquid and solid manure utilization will be significantly decreased; at the reduced animal unit levels all liquid and dry manure can be reused onsite, eliminating the possibility of offsite manure usage-related water quality impacts.

The possibility for onsite cumulative water quality impacts will be proportionately reduced. Lagoon sizing is significantly affected by dairy facilities drainage requirements and by liquid manure loadings. Such lagoon dimensions are determinants of any possible seepage to groundwater, as is corral sizing for support stock. Irrigation cropping impacts reduction will be proportional. None of these water quality-related impacts have been quantified; the calculations and discussions in Section 3.8 have determined that such possible project impacts were mitigated as to be de minimus and less than significant.

CEQA requires that the alternatives evaluate impacts prior to mitigation. In order to allow ready comparison of the differential air quality impacts between the project and the two reduced herd size alternatives, project and alternative herd size emissions were calculated prior to mitigation reductions (see Tables 4.3-1, 4.3-2, and 4.3-3).

Table 4.3-1
Unmitigated Operational Emissions of Pollutants (Tons/Year) (Project, 3,916-Animal Units)*

Source	ROG	NOx	PM10	PM2.5	NH ₃	CH ₄
Existing Sources:						
Farm Equipment	0.80	5.68	0.38	0.35	---	---
Land Preparation	---	---	2.97	0.66	---	---
Crop Harvesting	---	---	1.73	0.38	---	---
Windblown Dust	---	---	15.55	3.45	---	---
Unpaved Road Dust	---	---	5.61	1.19	---	---
Truck Exhaust	0.05	0.51	0.20	0.04	---	---
Total Emissions	0.85	6.19	26.44	6.07		
Proposed Project:						
Farm Equipment	1.14	7.69	0.44	0.41	---	---
Land Preparation	---	---	4.13	0.92	---	---
Crop Harvesting	---	---	1.69	0.37	---	---
Windblown Dust	---	---	15.98	3.54	---	---
Unpaved Road Dust	---	---	6.63	1.41	---	---
Truck Exhaust	0.07	0.66	0.27	0.06	---	---
Employee Travel	0.06	0.07	0.51	0.09	---	---
Cattle Housing	---	---	12.75	1.46	---	---
Manure Decomposition/ Digestion	25.59 ¹	(39.17) ²	---	---	93.39	460.82
Total Emissions	26.85	8.42	42.40	8.24	93.39	460.82
Net Change	26.00	2.23	15.97	2.17	93.39	460.82
SJVAPCD Threshold	10.0	10.0	15.0	---	---	---

*See Appendix I for calculations.

ROG = Reactive Organic Gases

NOx = Nitrogen Oxides

PM10 = Particulate Matter, 10 Microns

PM2.5 = Particulate Matter, 2.5 Microns

NH₃ = Ammonia

CH₄ = Methane

Source: John Castleberry, Air Quality Specialist

1. ROG tonnage based on SJVAPCD emission factor of:
 - Milk Cow: 21.0 lb/head/yr
 - Dry Cow: 11.9 lb/head/yr
 - Heifer (15-24 months): 8.3 lb/head/yr
 - Heifer (7-14 months): 7.2 lb/head/yr
 - Heifer (4-6 months): 6.6 lb/head/yr
 - Calf (under 3 months): 6.2 lb/head/yr
2. Parenthetical ROG tonnage based on CARB emission factor of 12.8 lb/head/yr

Note: The proposed project emissions do not account for the implementation of BACT control measures required by the SJVAPCD. The emissions do not include the contribution from the Phase I animal population.

Table 4.3-2
Unmitigated Operational Emissions of Pollutants for 2,392-Animal Unit Alternative
(Tons/Year)*

Source	ROG	NOx	PM10	PM2.5	NH ₃	CH ₄
Existing Sources:						
Farm Equipment	0.80	5.68	0.38	0.35	---	---
Land Preparation	---	---	2.97	0.66	---	---
Crop Harvesting	---	---	1.73	0.38	---	---
Windblown Dust	---	---	15.55	3.45	---	---
Unpaved Road Dust	---	---	5.61	1.19	---	---
Truck Exhaust	0.05	0.51	0.20	0.04	---	---
Total	0.85	6.19	26.44	6.07		
Proposed Project:						
Farm Equipment	1.14	7.69	0.44	0.41	---	---
Land Preparation	---	---	4.13	0.92	---	---
Crop Harvesting	---	---	1.69	0.37	---	---
Windblown Dust	---	---	15.98	3.54	---	---
Unpaved Road Dust	---	---	6.63	1.41	---	---
Truck Exhaust	0.07	0.66	0.27	0.06	---	---
Employee Travel	0.06	0.07	0.51	0.09	---	---
Cattle Housing	---	---	7.65	0.87	---	---
Manure Decomposition/ Digestion	15.35 ¹	(23.5) ²	---	---	56.03	276.49
Total Emissions	16.62	8.42	37.31	7.66	56.03	276.49
Net Change	15.76	2.23	10.87	1.59	56.03	276.49
SJVAPCD Threshold	10.0	10.0	15.0	---	---	---

*See Appendix I for Calculations.

ROG = Reactive Organic Gases

NOx = Nitrogen Oxides

PM10 = Particulate Matter, 10 Microns

PM2.5 = Particulate Matter, 2.5 Microns

NH₃ = Ammonia

CH₄ = Methane

Source: John Castleberry, Air Quality Specialist

1. ROG tonnage based on SJVAPCD emission factor of:
 - Milk Cow: 21.0 lb/head/yr
 - Dry Cow: 11.9 lb/head/yr
 - Heifer (15-24 months): 8.3 lb/head/yr
 - Heifer (7-14 months): 7.2 lb/head/yr
 - Heifer (4-6 months): 6.6 lb/head/yr
 - Calf (under 3 months): 6.2 lb/head/yr
2. Parenthetical ROG tonnage based on CARB emission factor of 12.8 lb/head/yr

Note: Emissions from cattle housing and manure decomposition/digestion are scaled from the Proposed Project emissions by the relative animal population. All other emissions are assumed to be equivalent to the Proposed Project.

Table 4.3-3
Unmitigated Operational Emissions of Pollutants for 1,566-Animal Unit Alternative
(Tons/Year)*

Source	ROG	NO _x	PM ₁₀	PM _{2.5}	NH ₃	CH ₄
Existing Sources:						
Farm Equipment	0.80		5.68	0.38	---	---
Land Preparation	---		---	2.97	---	---
Crop Harvesting	---		---	1.73	---	---
Windblown Dust	---		---	15.55	---	---
Unpaved Road Dust	---		---	5.61	---	---
Truck Exhaust	0.05		0.51	0.20	---	---
Total	0.85		6.19	26.44		
Proposed Project:						
Farm Equipment	1.14	7.69	0.44	0.41	---	---
Land Preparation	---	---	4.13	0.92	---	---
Crop Harvesting	---	---	1.69	0.37	---	---
Windblown Dust	---	---	15.98	3.54	---	---
Unpaved Road Dust	---	---	6.63	1.41	---	---
Truck Exhaust	0.07	0.66	0.27	0.06	---	---
Employee Travel	0.06	0.07	0.51	0.09	---	---
Cattle Housing	---	---	5.10	0.58	---	---
Manure Decomposition/ Digestion	10.24 ¹	(15.7) ²	---	---	37.35	184.33
Total Emissions	11.50	8.42	34.76	7.37	37.35	184.33
Net Change	10.65	2.23	8.32	1.3	37.35	184.33
SJVAPCD Threshold	10.0	10.0	15.0	---	---	---

*See Appendix I for Calculations.

ROG = Reactive Organic Gases NO_x = Nitrogen Oxides

PM_{2.5} = Particulate Matter, 2.5 Microns

Source: John Castleberry, Air Quality Specialist

PM₁₀ = Particulate Matter, 10 Microns

NH₃ = Ammonia

CH₄ = Methane

1. ROG tonnage based on SJVAPCD emission factor of:
 - Milk Cow: 21.0 lb/head/yr
 - Dry Cow: 11.9 lb/head/yr
 - Heifer (15-24 months): 8.3 lb/head/yr
 - Heifer (7-14 months): 7.2 lb/head/yr
 - Heifer (4-6 months): 6.6 lb/head/yr
 - Calf (under 3 months): 6.2 lb/head/yr
2. Parenthetical ROG tonnage based on CARB emission factor of 12.8 lb/head/yr

Note: Emissions from cattle housing and manure decomposition/digestion are scaled from the Proposed Project emissions by the relative animal population. All other emissions are assumed to be equivalent to the Proposed Project.

The reduced herd size air emissions assume that all of the existing farmland will remain in cultivation even if not totally required for liquid manure or solid manure utilization. Similarly, they attempt no correction for lesser truck exhaust or employee travel emissions; such emissions are not substantial in evaluating criteria pollutants against thresholds and have no substantial or no impact on PM_{2.5}, ammonia and methane emissions.

Project ROG emissions remain above SJVAPCD thresholds at the assumed reduced herd sizes; incremental project NO_x and PM₁₀ levels are below SJVAPCD thresholds for the project and the reduced herd size alternatives; project emissions of methane and ammonia are proportionately reduced by the reduced herd size alternatives. The 2,392 animal unit and 1,566 animal unit herd sizes were found to be economically infeasible; a reduction in

herd size to about 1,527 animal units, even more economically infeasible, would be required to bring ROG emissions below the SJVAPCD threshold.

There is a proportional reduction in avian predator foraging habitat ‘loss’ engendered by dairy facilities development at reduced herd sizes.

4.4 Feasibility Analysis of Alternatives

The alternate, larger, site alternatives have the limited environmental advantage of precluding the possibility of non-agronomic utilization of solid manure. There is a commensurate cost associated with the purchase of replacement and additional land, which makes these alternatives patently infeasible. The applicant has an investment of over \$3,000,000 in land, and \$200,000 in entitlement documentation for the existing site. Without a dairy permit there is no assurance that these investments could be recovered at an alternate site. The costs of purchase of an alternate, larger size site together with new entitlement documentation costs, make these alternatives infeasible. In addition, assuming suitable alternative sites are available, then the applicant, in order to make the acquisition of any of these sites economically feasible, would have to recover his original multi-million dollar investment in the subject property, which is highly speculative at this time given market conditions, and which contributes further to the economic infeasibility of selecting alternative sites.

Neither of the reduced herd size alternatives fully achieves the basic objective of the project. The significant costs of permitting, and the limited profit margins in the dairy industry combine to confirm a determination that the reduced herd size alternatives are not economically feasible.

The economic infeasibility of the reduced herd size alternatives is summarized and reiterated here:

- The value of the project’s land investment, dairy design costs and consulting services to meet District and Regional Board requirements and SJVAPCD/environmental processing have been significant (over \$3,000,000).
- The dairy facilities site areas will support the project-design dairy herd; the project’s cropped area is designed to support the project-design dairy herd and support stock.
- Lesser dairy herd sizes than those proposed for the project will not permit a financeable return on investment; the added costs make the project impractical.

The reader is referred to the economic analyses in Appendix Q for substantiating data regarding the economic infeasibility of the alternatives.

4.5 Environmentally Superior Alternative

CEQA requires that in addition to the analysis of individual alternatives, the alternatives must be ranked according to which alternatives have the lesser environmental effects. The ranking is shown in Table 4.1-1. The no-project alternative is environmentally

superior, followed by the lesser herd size and alternate-site alternatives. The reduced herd size alternatives reduce air quality impacts, and are thus environmentally superior alternatives. However, neither of these two alternatives fully achieves the basic objectives of the project. The alternate, larger, site alternatives have the limited environmental advantage of precluding the potential for non-agronomic utilization of solid manure.

The no-project alternative although environmentally superior is not feasible because it will not meet the project objectives; the dairy facility would not be built. The reduced herd size alternatives reduce air quality impacts, and are thus environmentally superior alternatives.

CHAPTER FIVE

CUMULATIVE IMPACTS

CHAPTER FIVE - CUMULATIVE IMPACTS

Summary

The *California Environmental Quality Act Guidelines* require that all environmental impact reports contain an analysis of cumulative impacts for the project. An EIR must discuss the “cumulative impacts” of a project when its incremental effect will be cumulatively considerable. Section 15355 defines cumulative impacts as “two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts.” A cumulative impact “consists of an impact which is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts” [Section 15130(a)(1)]. The discussions of cumulative impacts “shall reflect the severity of the impacts and their likelihood of occurrence, but the discussion need not provide as great detail as is provided for the effects attributable to the project alone” [Section 15350(b)].

The Guidelines provide further direction regarding cumulative impacts analysis. They state that “Lead agencies should define the geographic scope of the area affected by the cumulative effect and provide a reasonable explanation for the geographic limitation used” [Section 15130(b)(1)(B)(3)]. The cumulative impact analysis “shall examine reasonable, feasible options for mitigating or avoiding the project’s contribution to any significant cumulative effects” [Section 15130(b)(3)]. With some projects, the only feasible mitigation for cumulative impacts may involve the adoption of ordinances or regulations rather than the imposition of conditions on a project-by-project basis” [Section 15130(c)].

Section 15130(a)(3) states also that an EIR may determine that a project’s contribution to a significant cumulative impact will be rendered less than cumulatively considerable, and thus not significant, if a project is required to implement or fund its fair share of mitigation measure(s) designed to alleviate the cumulative impact.

As indicated above, a cumulative impact involves two or more individual effects. Per State CEQA Guidelines Section 15130, the discussion of cumulative impacts shall be guided by the standards of practicality and reasonableness. Per CEQA Guidelines Section 15130(b), the following elements are necessary in an adequate discussion of significant cumulative impacts:

(1) Either:

- a. A list of relevant, past, present, and probable future project producing related or cumulative impacts, including, if necessary, those projects outside the control of the Agency, or
- b. A summary of projections contained in an adopted General Plan or related planning document, or in a prior environmental document which has been adopted or certified, which described or evaluated regional or area wide conditions contributing to the cumulative impact. Any such planning document shall be referenced and made available to the public at a location specified by the lead agency; and

- (2) When utilizing a list, as suggested in paragraph (1) of subdivision (b), factors to consider when determining whether to include a related project should include the nature of each environmental resource being examined, the location of the project and its type. Location may be important, for example, when water quality impacts are at issue since projects outside the watershed would probably not contribute to a cumulative effect. Project type may be important, for example, when the impact is specialized, such as a particular air pollutant or mode of traffic.
- (3) Lead agencies should define the geographic scope of the area affected by the cumulative effect and provide a reasonable explanation for the geographic limitation used.
- (4) A summary of the expected environmental effects to be produced by those projects with specific reference to additional information stating where that information is available; and
- (5) A reasonable analysis of the cumulative impacts of the relevant projects. An EIR shall examine reasonable, feasible options for mitigating or avoiding the project's contribution to any significant cumulative effects.

The following environmental effects have been determined not to require extensive Cumulative Impacts discussion due to the project's location and lack of proximity to sensitive receptors, to a lack of other projects within the vicinity, or the absence of project-level impact:

Aesthetics. There are no sensitive receptors within 1 mile of the project site. Implementation of mitigation measures discussed in section 3.1 will reduce light and glare to less than significant. Therefore, there is no cumulative impact.

Agricultural Resource. The proposed dairy facility is an agricultural use and does not conflict with zoning or with provisions of the Williamson Act. There is no project-level impact identified; therefore, there is no cumulative impact.

Cultural Resources. There are no other projects or historically proposed or historically completed within the vicinity of the dairy site. Implementation of mitigation measures as discussed in Section 3.5 will reduce impacts to cultural resources to less than significant. Therefore, there is no cumulative impact.

Geology, Soils, and Mineral Resources. There were no impacts identified in Section 3.6. of the EIR; therefore, there is no cumulative impact.

Hazards/Hazardous Materials. Impact #3.7.7 discusses cumulative fly generation. Based on evidence that there were no fly problems in the area of the dairy, and based on the dairy location and design consistency with the University of California Cooperation Extension Guidelines and the lack of sensitive receptors or residences within one mile of the dairy facility site, the mitigation measures imposed, cumulative fly impacts will be less than significant.

Land Use and Planning. The project site is not near any established communities. The project is in compliance with applicable Fresno County land use General Plan designations and zoning regulations. There is no cumulative impact.

Mineral Resources. The petroleum resource underlying the site is being utilized by existing onsite and site-adjacent oil wells. Project development and operation will have no impact on these facilities or on existing oil leases. No other mineral resources have been identified on or underlying the site. There is no cumulative impact.

Noise. There are no residences or other sensitive receptors within a mile of the dairy facilities site; there will, therefore, be no noise level standards violations resulting from the project's dairy operations. The project site is currently row-crop farmed; there will be no change in the noise levels occasioned by continued row-crop farming. The project will not expose sensitive receptors to excessive ground borne vibration by either dairy construction and operation or by continued row-crop farming. The construction and operation of the dairy, and the continuation of row-crop farming on the project site, will not result in any substantial permanent increase in ambient noise levels. The lack of any residences or other sensitive receptors within one mile of the dairy facilities site, and normal distance-related attenuation of noise levels, mitigate noise levels to less than significant. There is no cumulative impact.

Population and Housing. The dairy will employ 18 people who will be recruited from the existing local work force; thus there will be no direct population growth inducement. No road or other infrastructure extensions will be required by the project. In addition, the project will not displace any existing housing or persons. There is no cumulative impact.

Public Services. There will not be any impact on schools, parks, or other population-growth related public facilities and services. Fire protection and police protection requirements of the project will be de minimus and similar to those of other dairy facilities in the area; no additional personnel or equipment for these public safety services is therefore warranted. There is no cumulative impact.

Recreation. There will be no impact on recreational facilities. The project workforce will be recruited from the existing local population. The project does not include recreational facilities or require the construction or expansion of existing facilities. There is no cumulative impact.

Transportation/Traffic. The net increase in automobile/pickup traffic is 32 trips per day. The net increase in truck traffic is 17 trips per day. Existing traffic volumes on the County roads serving the project are approximately 300 vehicles per day. The nearest major intersection to the project is at Elkhorn Avenue and SR 145, which is approximately 2.5 miles from the dairy facilities site. The project-induced increase in traffic is not substantial with respect to increase in vehicle trips, volume-to-capacity ratio, or congestion at intersections. In addition, there are no other projects recently completed or proposed served by project-access roads to contribute to a cumulative impact. Therefore, there is no cumulative impact.

Utilities. The project facilities design must comply with all applicable water quality law and regulations enforced by the California Regional Water Quality Control Board, Central Valley

Region. In addition, all storm drainage runoff will be contained onsite. The construction of the required facilities for such containment must be in accord with Regional Water Quality Control Board requirements. Such compliance will assure that construction does not cause significant environmental effects. Water usage calculations for numerous dairy projects located, as is the proposed project, on land currently in intensive agricultural production, have demonstrated that the net usage of water for the dairies is less than if the dairy project site were reclaimed to agricultural crop production. There is, therefore, no water supply impact. The project will not utilize a wastewater treatment provider's facilities. The project will, based upon analyses of typical dairy projects of similar size, produce approximately 2 cubic yards per year of refuse to be disposed of at a landfill. The landfills serving the project area are the Coalinga Disposal Site, located near the City of Coalinga and American Avenue Disposal Site located approximately 5 miles northeast of the City of San Joaquin. The County of Fresno Department of Public Works states that the lifespan limits of these landfills are 2043 and 2029, respectively. The project's impact thereon is therefore less than significant. Regional Water Quality Control Board regulations pertinent to the project limit the onsite usage of liquid and solid manure. Such usage is constrained by the amount of salts or nitrogen which can be utilized by the crops on the site. It has been determined by a nutrient management plan prepared for the project (see Appendix O) that 2,829 tons of solid manure will be hauled off site per year. The project thus creates no solid waste impact. Cumulative impacts associated with utilities and service systems are demonstrably less than significant.

Those impacts that have not been eliminated are discussed below:

Impact #5.1: Air Quality Degradation

The types of development and geographic area analyzed for air quality cumulative impacts include dairy facilities in the San Joaquin Valley Air Basin, including existing and probable facilities. The Basin has geographic boundaries which encompass approximately 25,000 square miles of land, including portions of 8 counties. The air quality within the basin is affected by a wide range of human activities, including stationary sources of air emissions (e.g. industrial facilities and power plants), mobile sources (e.g., cars, trucks, and mobile equipment) and biogenic or natural sources (e.g., methane emissions from decomposition of organic materials, including sewage). The air basin is also affected by emissions generated by a wide range of agricultural activities, such as dairy operations and crop production. The basin has been designated as severe non-attainment status for PM₁₀ and ozone.

Agricultural activities have, for the most part, not been subject to land use permits or air quality permits. Consequently, comprehensive information is not available from either air quality control districts or counties on air emissions generated by agricultural activities. Although the CARB and SJVAPCD have developed emissions inventories for select air pollutants from some agricultural activities (e.g., land preparation, harvesting, and beef cattle feedlots), air emissions, inventories and site-specific monitoring data regarding relevant parameters (e.g., ROG, hydrogen sulfide, PM₁₀, and methane) for animal confinement facilities (including dairies) within the San Joaquin Valley air basin are not available. General inventories of estimated emissions from agricultural activities are under development but are not related to site-specific conditions (i.e., the number of animals, volume of manure generated, area of animal confinement, or process

water management). In contacting local lead agencies within the air basin during preparation of this EIR, it became evident that complete records of conditions at and operations of all animal confinement facilities are not available.

The lack of available quantitative data makes exact representative analysis of all cumulative sources of air emissions infeasible (Mitchell, pers. comms., 2001). The primary thresholds of significance for cumulative air quality impacts are defined by Ambient Air Quality Standards which provide a basis for measurement or the attainment status of the air basin. These ambient standards do not define which sector or sources contribute to air pollution (or how much), but nevertheless act to trigger the significance classification of cumulative impacts. All sources (point or non-point, permitted and unpermitted) of air emissions for which the air basin is not in attainment (e.g., PM₁₀ and ozone precursors) contribute to the nonattainment condition.

Lacking other specific data, a projection of cumulative impacts from dairy development in the San Joaquin Valley was made based on existing dairy cow inventories, on lists of dairy cow use permits issued or pending but not constructed, and on projections by Tulare County and Kings County of maximum potential increases in dairy inventory. (Similar projections have not been made in the other 6 counties.) Table 5-1 describes current and projected milk cow/dairy population in the 8-county area. Based on the preceding discussion of the lack of precise data on the number of cows on each individual dairy within the air basin, this EIR does not evaluate the impacts of each such dairy.

(In addition to the data regarding existing dairies and milk cow numbers presented in Table 5-1, Appendix R contains a listing of all dairies currently permitted by the 8 counties in the San Joaquin Valley Air Basin.)

In Table 5-1, the existing dairies and milk cow numbers in Column A were obtained from the California Department of Food and Agriculture. The table analyzes milk cows, as dry cows and young stock number could not be confirmed. None of the Agricultural Commissioner's offices, or individuals at the University of California Cooperative Extension offices, could provide actual support stock numbers. Columns B and C in Table 5-1 are based on information provided by each of the county planning departments with one exception. In Fresno County, the information on new or expanded dairies in the permit process (Column C) was not available from the county planning department.

Average animal-unit to milk cow ratios for dairy projects currently being environmentally reviewed in the Central Valley is approximately 1.35 animal units per milk cow. It is conservatively assumed that the milk cows in Table 5-1 are Holsteins rather than Jersey or Guernsey cows. Projected animal emissions are then calculated by multiplying the figures in Column E of Table 5-1 by 1.35 times the emission factors listed in Appendix O.

In Table 5-2 a ratio of 1.35 animal units per cow will be utilized to estimate resulting annual new emissions contributions by the San Joaquin Valley dairy industry using the Total Projected Milk Cows figure from Column E in Table 5-1.

Table 5-1
San Joaquin Valley Dairy Industry Projections
January 2005

County	A Existing Milk Cows ⁽¹⁾			B Permitted, Un-built, New or Expanded Dairies ⁽²⁾	C New or Expanded Dairies In Permit Process ⁽²⁾	D Total Existing and Permit- related ⁽³⁾	E Total Projected ⁽⁴⁾
	Milk Cows	No. Dairies	Avg Per Dairy	Milk Cows	Milk Cows	Milk Cows	Milk Cows
Fresno	95,577	117	817	N/A	N/A	95,577	95,577
Kern	121,147	51	2,375	25,173	81,235	227,555	227,555
Kings	162,656	165	986	18,345	0	181,001	381,980
Madera	63,934	57	1,020	0	11,650	75,584	75,584
Merced	237,854	317	750	7,665	11,400	256,919	256,919
San Joaquin	103,619	148	700	1,000	0	104,619	104,619
Stanislaus	178,420	311	574	0	2,000	180,420	180,420
Tulare	<u>442,853</u>	<u>334</u>	<u>1,326</u>	<u>14,902</u>	<u>137,063</u>	<u>594,818</u>	<u>750,000</u>
Total	1,406,060	1,500	937	67,085	243,348	1,716,493	2,072,654

1) California Department of Agriculture, California Counties: *Cows, Dairies and Cows Per Dairy*, 2005.

2) County planning offices (milk cow numbers as of January 2005 with exception of Merced Co., 2003).

3) Total figures based on data from columns A, B, and C only.

4) Kings County number from *Dairy Element of the Kings County General Plan, December, 2002*, and Tulare County from *Tulare County Animal Confinement Facilities Plan, 2000*, plus columns A, B, and C totals for the other 6 counties. (Figures updated for January 2005.)

Table 5-2
Cumulative Animal Emissions

▪ ROG	27,001	tons ¹	(18,018) tons ²
▪ NOx	(450)	tons	
▪ PM ₁₀	3,263	tons	
▪ Methane	524,706	tons	
▪ Ammonia	139,260	tons	
▪ PM _{2.5}	375	tons	

¹ VOC tonnage based on SJVAPCD emission factor of 19.3 lb/head/yr.

² Parenthetical VOC tonnage based on CARB emission factor of 12.8 lb/head/yr.

It should be noted that the above figures represent gross estimates which assume that all dairies have similar feed programs and design features and generate employee and truck trips of similar frequency and length. It should be further noted that a recent (May 6, 2005) California Air Resources Board report has estimated that dairy cow annual ROG emissions are now estimated to be 8,578 tons compared to that agency's previously estimated 13,961 tons.

Although the number and length of the incremental truck trips, and resulting emissions, from the dairies housing the "buildout" number of milk cows in the Valley is difficult to estimate and speculative, it was attempted to estimate such emissions.

- VOC 143,627 tons
- PM₁₀ 130,122 tons
- NOx 179,689 tons

For further comparative purposes, CARB estimates of emissions, and their sources, are included in the Criteria Pollutants Forecast and Estimated Annual Average Emissions in Appendix S.

Major contributing sources of PM₁₀ emissions in the air basin (in descending order of contribution) are entrained roadway dust, farming operations, waste burning, and industrial processes. The main sources of NOx and ROG emissions are vehicle and other mobile sources, solvent use, farming, petroleum storage and transfer, and waste burning. Although dust (PM₁₀), NOx and reactive organic gas emissions from the project site contribute to criteria pollutant emissions generated throughout the San Joaquin Valley air basin, the area of the basin is nearly 25,000 square miles and it covers all or portions of 8 counties.

The California Air Resources Board has estimated the total daily contaminant emissions for the San Joaquin Valley for 2005. The data is included in Appendix S and is summarized here in Table 5-3:

Table 5-3
2005 Estimated Annual Average Emissions,
San Joaquin Valley Air Basin

(All emissions are represented in Tons per Day and reflect the most current data provided to CARB)

STATIONARY SOURCES	TOG	ROG	CO	NOx	SOx	PM	PM₁₀	PM_{2.5}
Fuel Combustion	37.7	15.5	49.5	105.7	12.9	6.9	6.5	6.4
Waste Disposal	242.2	2.2	0.1	0.0	0.0	0.1	0.1	0.0
Cleaning and Surface Coatings	23.0	19.1	---	0.0	---	0.1	0.1	0.1
Petroleum Production and Marketing	68.3	39.4	0.4	0.6	0.4	0.0	0.0	0.0
Industrial Processes	18.8	15.2	4.1	21.7	7.2	26.7	16.4	9.6
*Total Stationary Sources	390.0	91.4	54.0	128.0	20.4	33.8	23.0	16.2
AREA-WIDE SOURCES	TOG	ROG	CO	NOx	SOx	PM	PM₁₀	PM_{2.5}
Solvent Evaporation	66.2	61.4	---	---	---	---	---	---
Miscellaneous Processes	927.2	128.7	826.9	24.0	4.3	571.5	323.0	138.0
*Total Area-Wide Sources	993.4	190.1	826.9	24.0	4.3	571.5	323.0	138.0
MOBILE SOURCES	TOG	ROG	CO	NOx	SOx	PM	PM₁₀	PM_{2.5}
On-Road Motor Vehicles	91.8	83.9	874.4	195.7	1.7	6.3	6.2	4.5
Other Mobile Sources	52.9	47.4	349.2	133.7	3.9	9.1	8.9	8.0
*Total Mobile Sources	144.7	131.4	1223.6	329.4	5.6	15.4	15.2	12.5
Grand Total For San Joaquin Valley	1528.1	412.9	2104.6	481.4	30.3	620.8	361.1	166.7

The project was found to have no significant impact with respect to particulate matter (PM₁₀), fine particulate matter (PM_{2.5}) reactive organic gases (ROG), nitrogen oxide (NO_x), ammonia (NH₃), hydrogen sulfide (H₂S), (odors), and methane (CH₄) after the imposition of mitigation measures including offsets.

Conclusion: It is the position of the SJVAPCD that when adopted significance thresholds are not individually exceeded the project impact is not cumulatively significant. Project-level air quality impacts have either been mitigated to less than adopted thresholds, or offsets to threshold levels have been required or there are no established thresholds. There are, therefore, no identifiable cumulative air quality impacts.

Mitigation Measures: None are required.

Impact #5.2 – Water Quality Degradation

Water quality impacts associated with dairies that could be cumulatively significant involve potential increases in groundwater salinity associated with increased salt loads or, even less likely, area-wide increases in groundwater nitrates or bacterial contamination. Important factors in evaluating such increases are:

1. Background conditions in the project-located water basin.
2. Natural geochemical factors, such as mineral dissolution and salt precipitation in the soil-aquifer system.

3. Groundwater flows between potential service areas.
4. Dairy management practices.

Irrigation generally results in increased salinity in the underlying groundwater due to concentration of salts in applied irrigation water by evapotranspiration. However, this is counter-balanced by canal seepage. Also, application of gypsum to improve water infiltration on irrigated lands contributes large amounts of salt to the groundwater in some areas. In general, increasing salinity of groundwater in the Kings Basin has been projected by various investigators over the past several decades. Although theoretical calculations, based on numerous assumptions, often indicate significant increases in groundwater salinity beneath irrigated lands over periods of decades, actual groundwater monitoring records frequently show much less of a change in groundwater salinity with time than was projected.

Natural mineral dissolution can contribute salt to the groundwater, although this factor is believed to generally be minimal in most of the east part of the San Joaquin Valley. Salt precipitation in the topsoil, particularly of calcium and magnesium bicarbonate, can be an important factor in limiting salinity increases in groundwater beneath irrigated areas.

Septic tanks are present at farmsteads in the area. In general, these are of such a low density as to have no significant impact on groundwater, compared to other influences such as irrigation practices. However, because of the distance from the proposed dairy facility, there will be no cumulative impact with the proposed project. In addition, septic tank effluent could only impact the quality of the shallow groundwater, and not the sources of water supply in the area. The quality of such sources is most likely influenced primarily by deep percolation of irrigation return flow.

Growth in the number of dairies in the San Joaquin Valley will, through the use of manure water for irrigation and through usage of manure for fertilizer, likely cause an increase in salts application in the Valley above that which would occur with existing irrigation water supplies and the usage of commercial fertilizers. Such application is within limits imposed by the Regional Water Quality Control Board and in accord with approved Comprehensive Nutrient Management Plans.

Cumulative impacts on groundwater basin water quality could conceivably occur with respect to nitrogen contamination due to manure application rates in excess of agronomic usage demands. However, the nitrogen loading impact of an individual dairy is not necessarily cumulative because of two factors:

1. Direction and rate of groundwater flow.
2. Recharge and interception of water by pumpage.

Typical rates of groundwater flow in the Basin are probably several hundred feet per year. As groundwater moves downgradient, there is normally dilution due to recharge

(i.e., canal seepage and irrigation). Also, pumpage of irrigation and dairy wells may intercept part of a groundwater flow. Because of these factors, only dairies in close proximity to one another and of designs not conforming to current Regional Water Quality Control Board and County regulations may have a cumulative nitrogen impact on groundwater quality. For this project, there is no significant contribution to such a cumulative impact because of the mitigation measures which have been incorporated.

Groundwater protection requirements imposed by the Regional Board and their predecessor regulations regarding dairy facility design, minimize the likelihood of cumulative water quality impacts from the construction and operation of permitted dairy facilities in the Basin. Any possible water quality bacterial contamination or nitrate degradation from an individual dairy facility would occur principally beneath the facility and with a non-uniform vertical and lateral distribution pattern. It is not possible to predict whether such contamination, if it exists, might in some instances conceivably intersect with or infringe upon a similar pattern from another permitted dairy, thus creating a cumulative water quality impact. In a small, closed, water basin with closely spaced dairies without effective mitigation measures (such as the Chino Basin, which in 1990 housed 167,000 milk cows in 23 square miles, a density of 7,260 milk cows per square mile), such a cumulative impact could occur. In basins the size of the San Joaquin Valley encompassing 25,000 square miles and projected to ultimately house in excess of 2,000,000 milk cows, a density of 80 milk cows per square mile, and with modern dairy facilities and operations, spaced and designed in accord with ACFP and predecessor policies, such a cumulative impact is theoretically possible but must be deemed highly unlikely.

It is impossible to quantitatively estimate the impact of the projected dairies in the 8-county areas, or in any hydrologic basin or sub-basin thereof such as the Kings Subbasin, in terms of the effects of total loadings or incremental loadings of salt or nitrates. There is not a current study and description of the basin which provides the background data necessary for this analysis. Inquiries were made of the State Water Resources Control Board (Landau pers. comms., 2001), Central Valley Regional Water Quality Control Board (Wass pers. comms., 2001), State Department of Water Resources (Hodges pers. comms., 2001), and U.S. Army Corps of Engineers (Jewell, pers. comms., 2001). The independent accumulation and analysis of the data required, even for sub-basins such as the Kings, is a most costly and time-consuming task not appropriate for this project's environmental analysis.

The well testing and test data collation which the Regional Board has undertaken has significant long-term value in recording nitrogen trends in Valley groundwater. Analysis thereof to conclude that dairies have been or will be the major source of nitrate degradation of the Valley groundwater would be aided by comparative well test data from other, non-dairy, agricultural cropping areas, by collated information regarding the depths from which tested groundwater is being pumped, and by information regarding the length of time the well-related dairy or dairies have been in operation and whether or not the dairy facilities have been constructed in accord with Title 27 or better standards. While there is little doubt that Valley groundwater is reflecting the long-term effect of

agricultural impacts, the extent to which such impacts are dairy facility related is not certain. Even less certain is whether or not dairy facilities constructed and operated in full accord with current Regional Board requirements will significantly contribute to cumulative groundwater degradation with nitrate, salts, or other contaminants.

Conclusion: In summary, there is no compelling evidence of cumulative groundwater degradation due to dairy development in the Basin, despite the incorporation of required monitoring wells and anti-groundwater degradation features in all new dairies. It is concluded, therefore, that there is no significant project-related groundwater impact. Mitigation measures for any such possible groundwater contamination are the continuing responsibility of the regulatory agencies after the adoption and implementation of project-level mitigation measures.

Mitigation Measures: None are required.

Impact #5.3: Loss of Habitat for Special-Status Animals

Assuming the loss of such habitat due to the construction and operation of this dairy, 110 acres for 3,200 milk cows 6,646 animal units, assuming 1,400 pound Holstein cows (0.034 acres per milk cow) and that projected Valley dairies would involve approximately 700,000 additional milk cows, such projected dairy construction and operation could remove 24,000 acres of habitat for special-status animals.

Conclusion: The San Joaquin Valley area includes 4,793,000 acres of irrigated land utilized as such foraging habitat. The cumulative loss described is therefore, with a statistical $\frac{1}{2}$ of 1% loss, less than significant, because of the requirement that this project, and the other dairies constructed in the Valley, retain avian row-crop foraging areas in production.

Mitigation Measures: None are required.

CHAPTER SIX

OTHER MANDATORY CEQA SECTIONS

CHAPTER SIX - OTHER MANDATORY CEQA SECTIONS

6.1 Growth Inducement

Section 15126.2(d) of the *CEQA Guidelines* requires that EIRs provide a discussion of the “growth inducing impacts of the proposed project.” Growth inducing impacts could be caused by projects that foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Growth inducing impacts can also be caused by removing obstacles to population growth, such as an expansion of a wastewater treatment plant. Growth inducement impacts can result from population increases that require the construction of new community services facilities.

The development of the proposed project is not growth inducing, it is the product of growth inducement. According to Larry Serpa of Land O’ Lakes, new dairy permits such as this one are absolutely necessary to provide milk for cheese plants in the area. (Larry Serpa, Land O’ Lakes, oral testimony at Tulare County Planning Commission Hearing on Hilarides Dairy Project, November 7, 2001.)

The development of the proposed project is also not likely to result in or contribute to population growth inducement, in that it is being located in an area with high unemployment, with a current unemployment rate exceeding 8 percent. The approximately 18 jobs this project will provide will serve to alleviate the high unemployment problem, rather than contribute to population growth inducement. Accordingly, employment growth in the agricultural sector would be considered beneficial. No significant direct or indirect population or housing growth can be attributed to this project.

The proposed project consists of the expansion and operation of the dairy and associated growing of crops for feed. Thus, the site would continue in agriculture uses, as permitted by the zoning for the site. The project does not propose any infrastructure projects to serve areas outside of the project site. Therefore, there are no direct growth-inducing activities associated with this project. However, dairy development could induce growth in other related industries, (e.g., creameries, cheese production, trucking). Thus, the project may result in indirect growth inducement in Fresno County. Such indirect growth would be responsive to market demand for dairy products.

It should be noted that the project’s effect on Fresno County’s and the San Joaquin Valley’s economic growth will be beneficial. The project will employ approximately 18 persons in year-round jobs; the County’s unemployment rate ranges from approximately 7.1 percent during each year. After a \$3,200,000 initial investment, with concomitant construction employment, it will result in a continuing revenue stream of approximately \$541,026 per year (see Appendix L). That revenue stream and its employment base, together with the associated milk processing, will result in a total income to Fresno County of approximately (2.4 x \$541,026), \$1,298,462 per year (see Appendix C).

6.2 Significant Environmental Effects That Cannot Be Avoided

“Significant effect on the environment” means a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including land, air, water, mineral, flora, fauna, ambient noise, and objects of historic or aesthetic significance. An economic or social change by itself shall not be considered a significant effect on the environment. A social or economic change related to a physical change may be considered in determining whether the physical change is significant.

Section 15126.2(b) of the State CEQA Guidelines requires that the EIR describe any significant impacts, including those which can be mitigated but not reduced to a level of insignificance. Where there are impacts that cannot be alleviated without imposing an alternative design, their implications and the reasons why the project is being proposed, notwithstanding their effect, should be described. The following effects were found to be significant project impacts for which mitigation measures are either not available or would not reduce the impacts to a less than significant level:

- Possible cumulative water quality impacts.

Although such cumulative impacts have been deemed unlikely because of project design, project compliance with RWQCB approval conditions, including Title 27, and recommended mitigation measures, there is a possibility that they may be significant and non-mitigable.

- Cumulative loss of avian predator habitat, a biological impact.

As dairies are constructed in areas currently utilized for intensive agriculture providing such habitat, an immitigable cumulative loss will occur.

The project is proposed, notwithstanding these significant impacts, in order to achieve the project objectives. Feasible alternative designs or locations which achieve these objectives would result in no diminishment of impacts.

CHAPTER SEVEN

MITIGATION REPORTING/MONITORING PROGRAM

CHAPTER SEVEN - MITIGATION REPORTING/MONITORING PROGRAM

Introduction

State and local agencies are required by *Section 21081.6* of the *California Public Resources Code* to establish a monitoring and reporting program for all projects which are approved and which require CEQA processing.

Local agencies are given broad latitude in developing programs to meet the requirements of *Public Resources Code Section 21081.6*. The mitigation monitoring program outlined in this document is based upon guidance issued by the Governor's Office of Planning and Research.

The mitigation monitoring and reporting program for the proposed project corresponds to mitigation measures outlined in the project EIR. The Program summarizes the environmental issues identified in the EIR, the mitigation measures required to reduce each potentially significant impact to less than significant, the person or agency responsible for implementing the measures, and the agency or agencies responsible for monitoring and reporting on the implementation of the mitigation measures.

7.1 The Program

Construction and operation of the dairy will require an Authority to Construct permit from the SJVAPCD; and an acceptance by the California Regional Water Quality Control Board of a Report of Waste Discharge or other approval.

The mitigation measures contained herein shall be included as conditions of approval for each of these permits, to the extent permitted by law. The SJVAPCD shall ensure that all construction plans and project operations conform to the conditions of the mitigated project. Table 7-1 shall be attached to all permits as a condition of approval.

Table 7-1
Mitigation Monitoring Program

Impact	Mitigation Measures	Implementation	Monitoring & Reporting	Time Span
Impact #3.1.1: Light and Glare	Mitigation Measure #3.1.1: All lighting shall be principally under roofs and designed to be directed downward and inward to illuminate specific areas.	The implementation of this measure will reduce the project's light and glare impact to less than significant.	Monitoring will be the responsibility of the SJVAPCD.	Completed at time of final building inspection.
Impact #3.3.2: Construction Emissions (Carbon Monoxide (CO), Reactive Organic Gases (ROG), Nitrogen Oxide (NOx), Sulfur Dioxide (SO₂), Particulate Matter (PM₁₀), Fine Particulate Matter (PM_{2.5}))	Mitigation Measure #3.3.2: As a condition of the Authority to Construct by the SJVAPCD, and to be monitored by such Agency, the owner/operator and construction crew shall ensure that the following control measures are implemented prior to and during construction activities to reduce exhaust emissions from construction related equipment: 1. Attend a preconstruction meeting at the District. 2. The idling time of all construction equipment used at the site shall not exceed ten minutes. 3. The hours of operation of heavy-duty equipment shall be minimized. 4. All equipment shall be properly tuned and maintained in accord with manufacturer's specification. 5. When feasible, alternative fueled or electrical construction equipment shall be used at the project site. 6. The minimum practical engine size for construction equipment shall be used. 7. When feasible, electric carts or other smaller equipment shall be used at the	The mitigation measures shall be implemented by the construction contractor, and shall be a condition of the Authority to Construct.	Monitoring shall be the responsibility of the SJVAPCD.	Beginning with construction permit and terminating with issuance of Notice of Completion.

Impact	Mitigation Measures	Implementation	Monitoring & Reporting	Time Span
	project site.			
	8. Gasoline-powered equipment shall be equipped with catalytic converters.			
	9. The facilities construction contractor shall comply with Rule 4641 of the SJVAPCD.			
Impact #3.3.3.A: Operational Emissions of Criteria Pollutants, Particulate Matter (PM10) and Fine Particulate Matter (PM2.5)	Mitigation Measures #3.3.3.A, PM10/PM2.5: The applicant shall perform the following BACT control measures: 1. Maintain a manure pack less than two inches deep. 2. Refrain from spreading dry manure on nutrient application areas when wind speeds exceed 10 miles per hour. 3. Remove mud or dirt which originates from project operations, on project-adjacent roads within 24 hours of deposition. 4. Protect dry feed storage on three sides to prevent material loss and transport due to wind action. 5. Plant trees downwind around the dairy facilities site. 6. Provide shade areas in corrals. In addition, the applicant shall purchase emission offsets to mitigate for the remaining 2.52 tons of PM10.	The mitigation measure(s) shall be implemented by the dairy facility/farm operator and shall be a condition of the Authority to Construct.	Monitoring shall be the responsibility of the SJVAPCD.	Continued monitoring during dairy operation
Impact #3.3.3.B: Operational Emissions of Criteria Pollutants, Reactive Organic Gas (ROG)	Mitigation Measures #3.3.3.B, ROG: The project applicant shall, in construction and operation of the project, comply with the following BACT control measures as agreed with the San Joaquin Valley Air Pollution Control District:	The implementation by the applicant of the listed three measures is required as conditions of approval of the Authority to Construct by the	Monitoring shall be by the SJVAPCD.	Continued Monitoring during dairy operation

Impact	Mitigation Measures	Implementation	Monitoring & Reporting	Time Span
	1. Use of phototrophic (red) lagoon and associated nutrient management practices. 2. Flush or spray down milking area with each batch milked, and flush holding pen and wash pens at least 4 times daily. 3. Flush feedlanes, walkways, etc. at least 4 times daily. In addition, the applicant shall purchase emission offsets to mitigate for the remaining 3.86 tons of ROG in exceedance of the SJVAPCD threshold of 10 tons per year.	SJVAPCD, plus the purchase of the 3.86 tons of offsets.		
Impact #3.3.4: Operational Emissions of Criteria Pollutants, Nitrogen Oxide (NOx)	Mitigation Measures #3.3.4, NOx: Although project impacts are less than significant the following mitigation measures are recommended to further reduce NOx emissions. 1. Idling time of on-site project farming and dairy operations equipment shall be minimized. 2. All on-site equipment shall be properly tuned and maintained in accord with manufacturer's specifications. 3. Whenever feasible, alternative fueled or electrical on-site equipment shall be utilized. 4. Minimum practicable on-site engine sizes shall be used. 5. On-site gasoline powered equipment shall be equipped with catalytic converters. 6. Employees will be encouraged to carpool-	The listed implementation measures will be a condition of the Authority to Construct for the project. The owner/operator of the project will be responsible for their implementation.	Monitoring thereof will be the continuing responsibility of the SJVAPCD.	Continued monitoring during dairy operation

Impact	Mitigation Measures	Implementation	Monitoring & Reporting	Time Span
	travel to and from the project site. The above measures are excerpted and extrapolated from the SJVAPCD's Guide for Assessing and Mitigating Air Quality Impacts, January 10, 2002. No other feasible mitigation measures exist.			
Impact #3.3.5: Methane (CH₄) Generation:	Mitigation Measures #3.3.5, Methane: The project applicant shall, in construction and operation of the project, comply with the following BACT control measures as agreed with the San Joaquin Valley Air Pollution Control District: 1. Use of phototrophic (red) lagoon and associated nutrient management practices. 2. Flush or spray down milking area with each batch milked, and flush holding pen and wash pens at least 4 times daily. 3. Flush feedlanes, walkways, etc. at least 4 times daily.	The implementation by the applicant of the listed mitigation measures, as agreed with the SJVAPCD shall be implemented as a condition of approval of the Authority to Construct for the project by the SJVAPCD.	Monitoring will be by the SJVAPCD.	Continued monitoring during dairy operation
Impact #3.3.6: Ammonia (NH₃)	Mitigation Measure #3.3.6, Ammonia: Nevertheless, the project applicant shall, in construction and operation of the project, comply with the following BACT control measures as agreed with the San Joaquin Valley Air Pollution Control District: 1. Use of phototrophic (red) lagoon and associated nutrient management practices. 2. Flush or spray down milking area with each batch milked, and flush holding pen and	The requirement by the SJVAPCD of implementation of the listed mitigation measures shall be incorporated in the Authority to Construct for the project by the SJVAPCD, requiring implementation by the applicant.	Monitoring shall be by the SJVAPCD.	Continued monitoring during dairy operation

Impact	Mitigation Measures	Implementation	Monitoring & Reporting	Time Span
	wash pens at least 4 times daily.			
	3. Flush feedlanes, walkways, etc. at least 4 times daily.			
Impact #3.3.7: Hydrogen Sulfide (H₂S)	Mitigation Measure #3.3.7: Hydrogen Sulfide: The project applicant shall, in construction and operation of the project, comply with the following BACT control measures as agreed with the San Joaquin Valley Air Pollution Control District: 1. Use of phototrophic (red) lagoon and associated nutrient management practices. 2. Flush or spray down milking area with each batch milked, and flush holding pen and wash pens at least 4 times daily. 3. Flush feedlanes, walkways, etc. at least 4 times daily.	The requirement by the SJVAPCD of implementation of one or more of the listed mitigation measures shall be incorporated in the Authority to Construct for the project by the SJVAPCD.	Monitoring shall be by the SJVAPCD.	Continued monitoring during dairy operation.
Impact #3.3.10: Ambient Air Quality Analysis (AAQA) and Risk Management Review (RMR)	Mitigation #3.3.10: As mentioned in Mitigation Measure #3.3.3.A, the applicant will purchase PM10 offsets (2.52 tons) to reduce PM10 emissions to zero.	The mitigation measure(s) shall be implemented by the dairy facility/farm operator and shall be a condition of the Authority to Construct.	Monitoring shall be the responsibility of the SJVAPCD.	
Impact #3.4.1: Substantial Adverse Effect on Candidate, Special-Status or Sensitive Species	Mitigation Measure #3.4.1.1: The following mitigation measures shall be followed: 1. Construction of a barrier fence along the southern and western edges of the construction site which would exclude kangaroo rats from entering the construction area. The fence would be constructed of a 3 foot-high metal flashing supported by t-	The requirements shall be included in the conditions of approval for an Authority to Construct from the SJVAPCD and shall be implemented by the applicant, and construction contractors.	Monitoring shall be performed by the SJVAPCD during project construction.	Prior to Construction

Impact	Mitigation Measures	Implementation	Monitoring & Reporting	Time Span
	posts. The lower edge of the fencing would be buried approximately 6 inches below the ground surface; and, 2. Construction related traffic outside of the fenced area would be limited to daylight hours. Continued agricultural operations would also have the potential to impact kangaroo rats and other sensitive species. Mitigation measures that would need to be implemented to avoid take of kangaroo rats and reduce impacts to sensitive species to less than significant include: 1. Agricultural operations must not encroach into the existing oil well pad sites; 2. Construction of irrigation facilities such as canals, ditches, and retention basins will not proceed until the specific construction sites are inspected by a biologist and determined to be free of kangaroo rats. The construction of barrier fencing at such construction sites may be required; 3. The application of rodenticides within 0.25 miles of the site occupied by kangaroo rats will only be applied using raised "T"-type bait stations which are approved for use in areas occupied by endangered kangaroo rats (Appendix D of the Biological Report); and, 4. Retain all existing stands of trees, individual trees, and snags.			
	Mitigation Measure #3.4.1.2: To avoid	The requirements shall	Monitoring shall be	Prior to Construction

Impact	Mitigation Measures	Implementation	Monitoring & Reporting	Time Span
	impacts to the San Joaquin kit fox, Standardized Recommendations for the protection of San Joaquin kit fox (Appendix C of the Biological Report) shall be followed. These include: 1. Project-related vehicles should observe a 20-mph speed limit in all project areas, except on county roads and State and Federal highways; this is particularly important at night when kit foxes are most active. To the extent possible, nighttime construction should be avoided. Off-road traffic outside of designated project areas should be prohibited. 2. To prevent inadvertent entrapment of kit foxes or other animals during the construction phase of the project, all excavated, steep-walled holes or trenches more than 2 feet deep should be covered at the close of each working day by plywood or similar materials, or provided with one or more escape ramps constructed of earth fill or wooden planks. Before such holes or trenches are filled, they should be thoroughly inspected for trapped animals. If at any time a trapped or injured kit fox is discovered, the procedures under numbers 8 and 9 of this section must be followed. 3. Kit foxes are attracted to den-like structures such as pipes and may enter stored pipe, becoming trapped or injured. All construction pipes, culverts, or similar structures with a diameter of 4-inches or greater that are stored at a construction site for one or more overnight periods should be thoroughly inspected for kit foxes before the pipe is subsequently buried, capped, or otherwise used or moved in anyway. If a	be included in the conditions of approval for an Authority to Construct from the SJVAPCD and shall be implemented by the applicant, and construction contractors.	performed by the SJVAPCD during project construction.	

Impact	Mitigation Measures	Implementation	Monitoring & Reporting	Time Span
	kit fox is discovered inside a pipe, that section of pipe should not be moved until the USFWS has been consulted. If necessary, and under the direct supervision of the biologist, the pipe may be moved once to remove it from the path of construction activity, until the fox has escaped. 4. All food-related trash items such as wrappers, cans, bottles, and food scraps should be disposed of in closed containers and removed at least once a week from a construction or project site. 5. No firearms shall be allowed on the project site. 6. To prevent harassment, mortality of kit foxes or destruction of dens by dogs or cats, no pets should be permitted on project sites. 7. A representative shall be appointed by the project proponent who will be the contact source for any employee or contractor who might inadvertently kill or injure a kit fox or who finds a dead, injured or entrapped individual. The representative's name and telephone number shall be provided to the USFWS. 8. In the case of trapped animals, escape ramps or structures should be installed immediately to allow the animal(s) to escape, or the USFWS should be contacted for advice. 9. Any contractor, employee(s), or military or agency personnel who inadvertently kills or injures a San Joaquin kit fox shall immediately report the incident to their			

Impact	Mitigation Measures	Implementation	Monitoring & Reporting	Time Span
	representative. This representative shall contact the CDFG immediately in the case of a dead, injured or entrapped kit fox. The CDFG contact for immediate assistance is State Dispatch at (916) 445-0045. They will contact the local warden or biologist. 10. The Sacramento Fish and Wildlife Office and CDFG will be notified in writing within three working days of the accidental death or injury to a San Joaquin kit fox during project related activities. Notification must include the date, time, and location of the incident or of the finding of a dead or injured animal and any other pertinent information. The USFWS contact is the Chief of the Division of Endangered Species, 2800 Cottage Way, Suite W2605, Sacramento, CA 95825-1846, and (916) 414-6620. The CDFG contact is Mr. Ron Schlorff at 1416 9th Street, Sacramento, CA 95814, (916) 654-4262.			
Impact #3.4.6: Degradation of Water Quality in Seasonal Creeks, Reservoirs and Downstream Waters	Mitigation Measure #3.4.6: Site plan design should ensure that the grading of the project prohibits offsite drainage. Once accomplished, the proposed project is expected to have no effect on water quality in the Stinson Canal or any seasonal creeks, reservoirs, or other downstream waters.	The requirements shall be included in the conditions of approval for an Authority to Construct from the SJVAPCD and shall be implemented by the applicant, and construction contractors.	Monitoring shall be performed by the SJVAPCD during project construction.	During Construction
Impact #3.4.7: Disturbance to Active Raptor Nests from Construction Activities	Mitigation Measure #3.4.7: The implementation of the following measures will ensure that raptors (hawks and owls) are not disturbed during the breeding season.	The requirements shall be included in the conditions of approval for an Authority to	Monitoring shall be performed by the SJVAPCD during project	Prior to Construction

Impact	Mitigation Measures	Implementation	Monitoring & Reporting	Time Span
	1. A qualified biologist/ornithologist will conduct a pre-construction survey for nesting raptors on site within 30 days of the onset of ground disturbance, if ground disturbance is to occur during the breeding season (February 1 to September 15). These surveys will be based on the accepted protocols (e.g., as for the burrowing owl) for the target species. If a nesting raptor were detected, an appropriate construction buffer would be needed (up to 250 feet or more). The actual size of the buffer would depend on the type of construction activity that would occur in the vicinity of the nest. 2. If burrowing owls are detected on site during the non-breeding season, they can be passively relocated by placing one-way doors in the burrows and leaving them in place for a minimum of three days. Once it has been determined that owls have vacated the site, the burrows can be collapsed and ground disturbance can proceed.	Construct from the SJVAPCD and shall be implemented by the applicant, and construction contractors.	construction.	
Impact #3.5.1: Disturbance of Cultural or Historic Resources, Skeletal Remains	Mitigation Measure #3.5.1: If, in the course of project construction any archaeological or historical resources are uncovered, discovered, or otherwise detected or observed, activities within 50 feet of the find area shall cease. A qualified archaeologist shall be contacted and advised the SJVAPCD of the site's significance. If the findings are deemed significant by the SJVAPCD, appropriate mitigation measures shall be required prior to any resumption of work in the affected area of the project. If, in the course of project construction or	This requirement shall be included in the conditions of approval and shall be implemented by the applicant, construction contractors, the SJVAPCD, and NAHC or local Native American organizations.	Monitoring shall be performed by the SJVAPCD during project construction.	During construction period

Impact	Mitigation Measures	Implementation	Monitoring & Reporting	Time Span
	operation, any skeletal remains are uncovered, discovered, or otherwise detected or observed, activities in the affected area shall cease. A qualified archaeologist, the SJVAPCD and local Native American organizations shall be consulted, and appropriate measures shall be required that may include avoidance of the burial site or reburial of the remains.			
Impact #3.7.1: Operational Hazards	Mitigation Measure #3.7.1: Prior to issuance of the Authority to Operate for the dairy, the owner/operator shall submit documentation to the SJVAPCD that appropriate permits and notifications regarding the storage, transport, use and disposal of hazardous materials have been completed and acquired. The documentation shall include, at minimum, evidence of compliance with: 1. An employee safety program in accord with California Labor Code Section 6401.7. 2. The RWQCB requirements, including a Storm Water Pollution Prevention Plan incorporating provisions for the safe storage, use, and disposal of hazardous wastes. 3. The permitting requirements of the California Department of Pesticide Regulation.	This requirement shall be a condition of the SJVAPCD Authority to Construct permit and implemented by the applicant.	Monitoring shall be the responsibility of the SJVAPCD, and the Regional Water Quality Control Board.	Prior to construction
Impact #3.7.6: Vector Generation	Mitigation Measure #3.7.6: 1. As a condition of project approval, the project operator shall agree to follow Consolidated Mosquito Abatement District	Implementation will be the responsibility of the applicant and operator.	Monitoring will be the responsibility of the Consolidated Mosquito Abatement District with regard to mosquito	Continued monitoring during operation

Impact	Mitigation Measures	Implementation	Monitoring & Reporting	Time Span
	requirements concerning mosquito control at the dairy facility. The following are requirements established by the District: (a) Wastewater holding ponds shall not exceed 150 feet in width. (b) All dairy wastewater holding and solid separator ponds shall be surrounded by lanes at least fourteen feet in width and nothing (e.g., calf pens, utility lines, hay stacks, silage, tires, ag equipment, etc.) shall be placed in the area of the holding ponds which would prevent passage or use of vector control equipment. (c) Any fencing placed around the wastewater and solids ponds shall be placed on the outside of the fourteen foot lanes and gates provided for access. (d) All interior banks of holding and separation ponds shall be graded 1:1 or steeper for the first ten feet, soil type permitting, but not greater than 1:2 (horizontal vertical). (e) All wastewater designs shall include a solids separation system. If separator ponds are the exclusive means of solids removal, two or more separator ponds are required. These ponds shall not be more than sixty feet in width. (f) No drainage lines shall bypass the separator ponds, except those which		control. Monitoring shall be the responsibility of the SJVAPCD with respect to facilities design and construction, and the Fresno County Department of Health Services with respect to operational practices resulting in fly complaints.	

Impact	Mitigation Measures	Implementation	Monitoring & Reporting	Time Span
	provide for normal corral runoff. All such drain inlets must be sufficiently graded to prevent solids accumulation in the holding ponds.			
	(g) Floatage of any solid substance which could provide harborage for immature mosquito stages shall be kept out of all wastewater holding ponds.			
	(h) The owner shall be responsible for keeping vegetation growth from all areas of the wastewater and solids separation ponds. This includes access lanes, interior pond embankments, and any weed growth that might become established on the pond surface.			
	(i) Dairy wastewater discharged for irrigation purposes shall be managed so it does not stand for more than three days.			
	(j) Any variance desired from these requirements must be submitted to the District for prior review and approval.			
	2. As a condition of project approval, the project operator shall implement the following fly abatement program:			
	(a) Project dairy facilities design and construction will include concrete-base freestalls and walk lanes, and water drainage to separator facilities.			
	(b) Utilization of manure water shall be in			

Impact	Mitigation Measures	Implementation	Monitoring & Reporting	Time Span
	thin layers, blending such manure water with irrigation groundwater in compliance with the nutrient management plan appended hereto.			
	(c) Manure in corrals shall be scraped as required for effective fly control.			
	(d) Feed lanes shall be cleared daily.			
	(e) Owner/operator must comply with RWQCB requirements, or permits. Monitoring well design, locations and sampling program shall be approved by the Regional Water Quality Control Board.			
	(f) All manured areas shall be sloped to prevent ponding and to convey all precipitation and moisture to drainage systems, including the lagoons. The applicant shall, at a minimum of once per year, backfill any slope loss with compacted, non-manured material, to maintain pre-existing slopes.			
	(g) All water systems shall be checked weekly to look for breaks, leaks, and overflows, including the water pressure systems, water troughs and mister lines.			
	(h) The owner/applicant shall submit to the Fresno County Health Services Division and to the CMAD before construction of dairy operations, and shall continuously and fully implement during dairy operations, an Integrated			

Impact	Mitigation Measures	Implementation	Monitoring & Reporting	Time Span
	Pest Management Plan for fly control which contains the following specific requirements: (1) Manure and feed storage maintenance, and prompt dead animal disposal, to minimize fly breeding. (2) Utilization of parasitoids, and judicious use of pesticides, for fly suppression as needed based on monitoring results. (3) Maintenance of records onsite, for regulatory agency inspection, regarding monitoring results, maintenance and disposal activities and parasitoid and pesticide suppression.			
Impact #3.8.6: Violation of Water Quality Standards or Waste Discharge Requirements	Mitigation Measure #3.8.6: Project lagoons and separator ponds shall be elevated or shall be lined to effectively preclude leakage to groundwater.	Implementation shall be the responsibility of the applicant.	Monitoring shall be the responsibility of the SJVAPCD and Regional Water Quality Control Board.	Prior to construction and continued monitoring during operation of dairy
Impact #3.8.8.1: Groundwater Degradation from Dairy Facilities	Mitigation Measures #3.8.8.1: 1. Owner/operator shall construct pond and lagoon lining in accord with Regional Water Quality Control Board groundwater separation standards (including NRCS Standards, Appendix R hereto and Title 27), and/or shall line ponds and lagoons with	This requirement shall be a condition of the SJVAPCD Authority to Construct;	Monitoring shall be the responsibility of the Regional Water Quality Control Board.	Prior to construction and continued monitoring during operation of dairy

Impact	Mitigation Measures	Implementation	Monitoring & Reporting	Time Span
	manure water prior to operation to reduce percolation. 2. A monitoring well sampling and testing program shall be established if required by the Regional Water Quality Control Board. Samples shall be tested to determine the presence of measurable contaminant leakage, including pathogens, and significant continuing increase in nitrate nitrogen, from separation ponds and lagoons. Testing shall include tests for soil moisture content and electrical conductivity and nitrogen compounds. Evidence of contaminant increase, based on such testing, shall be the basis for required additional lining, or relining, of ponds and lagoons. 3. The domestic well supplying dairy facilities shall be regularly sampled by the Fresno County Health Department for pathogen detection. Evidence of leakage shall be the basis for required additional lining, or relining of ponds and lagoons. 4. Owner/operator must comply with all applicable RWQCB Waste Discharge Requirements, or permits, as required by Title 27 or other applicable water quality control laws. Monitoring well design, locations and sampling program shall be approved by the Regional Water Quality Control Board. 5. All manured areas shall be sloped to prevent ponding and to convey all precipitation and moisture to drainage			

Impact	Mitigation Measures	Implementation	Monitoring & Reporting	Time Span
	systems, including the lagoons. The applicant shall, at a minimum of once per year, backfill any slope loss with compacted, non-manured material, to maintain pre-existing slopes. 6. Salt in animal rations should be limited to the amount required to maintain animal health and optimum production.			
Impact #3.8.8.3: Groundwater Contamination at Manure Re-Use Sites	Mitigation Measure #3.8.8.3: 1. The dairy facilities operator will provide to each manure hauler from the project site an invoice stipulating that manure re-use shall be undertaken only in full compliance with all applicable State and Federal laws and regulations. 2. Records of tonnage of manure sold will be kept by the dairy facilities operator on site for review upon request by the SJVAPCD or the Regional Water Quality Control Board.	The dairy facilities operator will be responsible for implementation.	The SJVAPCD and the Regional Water Quality Control Board will be responsible for ongoing monitoring.	Continued monitoring during dairy operation

Personal Communications

PERSONAL COMMUNICATIONS

Borges, Ray, Planning Department, County of San Joaquin, October 21, 2002 – telephone.

Brady, Roberto, Resource Management Agency, County of Tulare, October 15, 2002 – telephone.

Cardoza, Kris, Planning Department, County of Kern, October 22, 2002 – email.

Cope, Butch, Planning Department, County of Merced, November 12, 2002 – telephone.

Fox, Phil, Environmental Health Department, County of Fresno, February 14, 2002 – telephone.

Freitas, Ron, Planning Department, County of Stanislaus, February 14, 2002 – telephone.

Fulbright, Jennifer, Ag/Standards Department, County of Fresno, February 13, 2002 – telephone.

Gaffney, Patrick, California Air Resources Board, May 14, 2001 – telephone.

Gaffney, Patrick, California Air Resources Board, May 21, 2001 – telephone.

Garcia, Larry, Tulare County Fire Department, March 7, 2001 - telephone.

Gilbert, Stanley, Associate Water Resources Control Engineer, Central Valley Regional Water Quality Control Board, May 11, 2001 – telephone.

Haukenberry, James, Division of Clean Water, California Department of Water Resources, May 11, 2001 – telephone.

Jewell, Michael, Chief, Central California and Nevada Section, Army Corps of Engineers, May 11, 2001 – telephone.

Landau, Ken, Principal A.E.O., State Water Resources Control Board, May 11, 2001 – telephone.

Matta, Chris, Planning Department, County of Madera, February 14, 2002 – telephone.

Merriam, Jonathan, University of California Extension Service, Merced County, February 14, 2001 – telephone.

Mitchell, James, SJVAPCD, June 6, 2001 - telephone.

Navarro, Tom, Planning Department, County of Madera, October 29, 2002 – email.

O'Bannon, Joe, San Joaquin Valley Unified Air Pollution Control District, March 5, 2001 – telephone.

O'Brien, Greg, CCAQS Data Manager, California Air Resources Board, May 22, 2001 – telephone.

Oda, Dwight, Air Resources Engineer, California Air Resources Board, May 22, 2001 – telephone.

Perkins, Richard, Zoning Division, County of Fresno, February 13, 2001 – telephone.

Rodgers, Clay, California Regional Water Quality Control Board, Fresno, November 17, 2002.

Rowe, Barney, Environmental Resources, County of Stanislaus, November 6, 2002 – email.

Sharp, Roy, Owner/Operator Royal Farms, March 2003 – telephone.

Shipp, Evan, Supervising Air Quality Planner and Meteorologist, San Joaquin Valley Unified Air Pollution Control District, May 22, 2001 – telephone.

Sholes, David, Central Valley Regional Water Quality Control Board, March 15, 2005

Shultz, Tom, University of California Extension Service, Tulare County, March 20, 2001 – telephone.

Wass, Lonnie, Supervising Water Resources Control Engineer, Central Valley Regional Water Quality Control Board, May 11, 2001 – telephone.

Woods, Mary R., Ph.D., Air Quality Specialist, Particulate Matter Strategies, South Coast Air Quality Management District, February 10, 2004 – email.

Zumwalt, Bill, Planning Department, County of Kings, February 15, 2001 – telephone.

Zumwalt, Bill, Planning Department, County of Kings, October 22, 2002 – email.

**Persons Preparing this EIR
and Qualifications**

PERSONS PREPARING THIS EIR

San Joaquin Valley Air Pollution Control District:

Elena Nuño
Project Planner

Consultants:

QUAD KNOFF, INC.

Harry A. Tow, PE, AICP
Principal in Charge

Roger Richards
Senior Analyst

Jackie Neuffer
Environmental Planner

Curtis Uptain
Senior Biologist

ERWIN ENGINEERING

Michael R. Erwin, PE
Senior Environmental
Engineer

CASTLEBERRY ENVIRONMENTAL CONSULTING:

John Castleberry
Air Quality Specialist

LIVINGSTON DAIRY CONSULTING:

Bruce Livingston

VAN DYK AND ASSOCIATES:

Andy Dykstra, CPA

AREAS OF EXPERTISE ◆ Environmental Compliance ◆ Environmental Documentation ◆ Master Planning ◆ Municipal Engineering ◆ Economics & Financial Analysis EDUCATION ◆ M.S., Civil Engineering, University of Southern California ◆ B.S., Civil Engineering, University of Southern California REGISTRATIONS / CERTIFICATIONS ◆ Civil Engineer, CA #8891 ◆ Environmental Assessor, CA #00501 ◆ Certified Sanitary Engineer and Diplomat, American Academy of Environmental Engineers ◆ Certified Planner, American Institute of Certified Planners (AICP) PROFESSIONAL ORGANIZATIONS ◆ American Public Works Association (APWA) ◆ American Planning Association (APA) ◆ Tri-TAC	Harry A. Tow, PE, REA, AICP <i>Engineer/ Planner</i> Mr. Tow has more than 50 years experience in the fields of engineering and planning. He formerly served as Public Works Director/City Engineer and City Manager for the cities of Visalia, Santa Barbara as well as on-call contract City Engineer for Lemoore and Farmersville. Mr. Tow is a certified Environmental Assessor, Sanitary Engineer, and Planner and has served as Engineer/ Planner with Quad Knopf for more than 30 years. Mr. Tow has participated in and directed such complex and diverse projects as general and specific plans and development proposals for various cities, counties and private sector clients; economic development plans for downtown improvement districts; environmental assessments; market feasibility studies for both commercial and residential development proposals; public agency organizational and management studies; design of public improvements for industrial, commercial, and residential developments; and capital facilities master plans for public facilities. Because of Mr. Tow's unique background, he has been instrumental in establishing the firm's reputation as an effective, implementation-oriented resource for its clients. PROJECT EXPERIENCE Infrastructure Management — California. <i>Project Engineer/Manager.</i> Mr. Tow provides a comprehensive overview of the technical, environmental and economic effects of major public facility and infrastructure development plans, and the most effective and practicable measures to mitigate potential adverse impacts. Projects representative of Mr. Tow's ability include the City of Bakersfield's 25-square mile Rio Bravo annexation, the Los Angeles Department of Water and Power's San Joaquin Valley Nuclear Project, West Bakersfield Sewerage Project, and the South Lake Tahoe airport expansion project. Contract Engineering Services—Lemoore, CA. <i>City Engineer.</i> For more than 6 years, Mr. Tow provided: municipal/ traffic/ wastewater engineering, water production, highway design, environmental management, project management, construction engineering, assessment district engineering, grant program assistance, transportation planning, flood control and storm drainage design, land development regulation, surveying, ordinance development and administration. City Engineer, Farmersville- Mr. Tow served as City
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	Engineer on the Northside Sewer Trunkline project which included a 15" trunkline, pump station and force main. Mr. Tow also prepared applications and successfully managed four funded Public Facilities projects including an industrial project, water wells, water and sewer lines and street improvements totaling over \$2,000,000. The City's sanitary sewer relief project included design of a sewage pump station and approximately 4,800 linear feet of 8-inch to 24-inch sanitary sewer line along the west side of town to relieve overloading of the existing collection system. Facilities Master Plan EIR, California State University—Bakersfield, CA. Project Manager. This project involved the preparation of an EIR for the Kern Community College District. The project was necessary to determine the potential environmental effects associated with the proposed construction and operation of the Bakersfield College-Delano Center. Schakel Dairy EIR—Tulare County, CA. Principal Planner/ Engineer. Prepared an EIR for the proposed construction of a 5,032 Holstein milk cow plus support stock dairy. The EIR was certified by Tulare County in December 2003. Mineral King Dairy EIR—Tulare County, CA. Principal Planner/ Engineer. Prepared and EIR for the Tulare County Resource Management Agency's Mineral King Dairy project. The dairy will houses 3,320 Holstein milk cows on 1,648 acres of land. Hilarides Dairy EIR—Tulare County, CA. Principal Planner/ Engineer. The EIR was prepared for a 9,100 milk cow plus support stock dairy. The project included a farmstead cheese production facility and the covering of abandoned olive salt brine disposal ponds. De Boer Dairy EIR—Tulare County, CA. Principal Planner/ Engineer. The De Boer Dairy project involved construction of a 3,600 Holstein milk cow and support stock dairy on 839 acres. Tulare Campus EIR—Tulare, CA. Principal Planner/ Engineer. Managed the preparation of an EIR for the proposed construction of a new college farm and satellite instructional facility on a 90-acre site for the College of the Sequoias. Significant issues of concern included the loss of agricultural land and air quality. Waste Water Treatment Plant (WWTP) Environmental Documentation—Reedley, Sanger, Porterville, Tulare, Corcoran, CA. Project Manager. Prepared environmental documents for the cities of Reedley, Sanger, Porterville, Tulare, and Corcoran WWTP facilities projects.
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	Environmental Analysis of Municipal Facilities—Hanford, Delano, Wasco, Tulare, Stockton, CA. <i>Project Manager.</i> Performed environmental analyses for the cities of Hanford, Delano, Wasco, Tulare and Stockton as well as for the South Lake Tahoe and Lost Hills Public Utilities Districts. Physical Education/ Disabled Program Building Initial Study—Tulare County, CA. <i>Project Manager.</i> This project involved an initial study for the College of the Sequoias to determine if the effects of the proposed construction and operation of a new physical education/ disable program building and remodel of an existing gymnasium building were adequately addressed in an earlier Supplemental EIR. It was determined that the environmental impacts related to the current project were considered in the Supplemental EIR and no further action was necessary.
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AREAS OF EXPERTISE

- ◆ CEQA Documentation
- ◆ Environmental Analysis
- ◆ Project Management

EDUCATION

- ◆ AA, Business, College of the Sequoias

Roger Richards

Senior Analyst

Mr. Richards has been with Quad Knopf for more than 30 years. Since then he has accumulated an extensive background and experience as an administrative analyst and project coordinator within the firm's Planning and Environmental Studies Division. He is familiar with federally-funded projects, and EIRs ranging from single-family residential developments to major land use plan revisions and development proposals. He has provided environmental studies on virtually all projects for school districts and cities that involve school expansions, and new school sites. Mr. Richard's participation within the firm also extends to policy planning endeavors, projects addressing social services delivery systems, county and municipal government services consolidations and capital project feasibility.

PROJECT EXPERIENCE

Hartnell College Educational and Facilities Master Plan EIR — Salinas, CA. Project Manager. This project involved the preparation of an EIR to determine the impacts of the new Educational and Facilities Master Plan. The Project consists of new construction, demolition, and renovation of structures on the Hartnell College West Campus. At full build-out, the West Campus will be able to accommodate approximately 12,000 students.

College of the Sequoias College Farm and Satellite Campus EIR — Tulare, CA. Project Planner. This project involved the preparation of and environmental impact report for the construction and operation of a new college farm and educational center or satellite instructional facility. The project will be developed on a single, amalgamated, site to serve District students from the Tulare and southwest Tulare County / southeast Kings County area of the College of the Sequoias Community College District.

College of the Sequoias Master Plan EIR, Five-Year Construction Plan Supplemental EIR, Negative Declaration for Capital Projects — Visalia, CA. Project Planner. This project involved preparing an EIR for an updated Campus Master Plan. An Initial Study and mitigated negative declaration were prepared for several campus improvement projects as well as a supplemental EIR for the College's five year construction plan.

Kern Community College District Resource and Facilities Master Plan Environmental Impact Report – Bakersfield,

	Porterville, Ridgecrest, CA. <i>Project Manager.</i> This master plan EIR addressed planned growth within the existing campuses in Bakersfield, Porterville, and Ridgecrest. The projects included new construction upgrades/refurbishing, reconstruction and remodeling of existing buildings. All new construction activities to be within the boundaries of the existing campus sites. Comprehensive High School No. 1 (2004 Bond) – Kern County, CA. <i>Project Manager.</i> A mitigated negative declaration was prepared for Kern High School District on a proposed new high school in southeast Bakersfield. The report focused on the loss of agricultural land, on increased traffic and the availability of public services. The site contained two petroleum pipelines that would need to be removed before construction of the school facilities. Comprehensive High School No. 2 (2004 Bond) – Kern County, CA. <i>Project Planner.</i> On initial study and tiered mitigated negative declaration addressed the issues associated with a planned new high school to be located in southeast Bakersfield. Loss of agricultural land and increased traffic demands were cumulative impacts of concern in this rapidly growing urban area of the city. Golden Valley High School Mitigated Negative Declaration — Kern County, CA. <i>Project Manager.</i> The project involved the preparation of a mitigated negative declaration for Kern High School District on the proposed construction of a new high school. Issues of significance included aesthetics, air quality, biological resources, cultural resources, hydrology/water quality, noise, housing, public facilities and traffic/transportation. Frontier High School Mitigated Negative Declaration — Kern County, CA. <i>Project Manager.</i> This project involved the preparation of a mitigated negative declaration for Kern High School District on a proposed comprehensive high school on a campus site in northwest Bakersfield. Issues of significance included aesthetics, air quality, biological resources, hazards/hazardous materials, hydrology/water quality, noise, transportation/ traffic. Comprehensive High School Campus Environmental Assessments — Kern County, CA. <i>Project Manager.</i> Assisted in the preparation of EIRs/Mitigated Negative Declarations on five new high schools for Kern High School District. These projects entailed land acquisition and required analysis of soils, hazards, wildlife, and traffic effects. Schools include: Centennial High School, Stockdale High School, Ridgeview High School, and Liberty High School. Kern High School District Athletic Stadiums EIR — Kern County, CA. <i>Project Manager.</i> Assisted in the preparation
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	of a Draft EIR for the construction and operation of multiple athletic stadiums located on four high school campuses for Kern High School District. Potentially significant impacts included transportation/circulation, noise, air quality, and light and glare. Delano Joint Union High School District Delano Comprehensive Campus No. 1 Environmental Impact Report – Delano, CA. <i>Project Manager.</i> The new high school was proposed for the west side of Delano, approximately one quarter mile west of the District’s existing high school. The initial environmental issues were the loss of agricultural land, extension of sewer lines, the capacity of wastewater plant and the project-related traffic increases. However, the main issue was the location of a second high school on the west side of State Freeway 99. Visalia Unified School District Northwest School Complex Environmental Impact Report – Visalia, CA. <i>Project Manager.</i> The project was the purchase of a 160 acre site and the construction and operation of a new high school, middle school, elementary school, sports stadium, performing arts center and a library/learning center. Issues addressed in the EIR were loss of agricultural land, expansion of the Visalia Urban Area Boundary and the mitigation measures to reduce traffic-related impacts. Visalia Unified School District, Dans Lane Elementary School — Visalia, CA. <i>Project Manager.</i> This project involved the preparation of a mitigated negative declaration for Visalia Unified School District on a proposed 10-acre elementary school site located in southwest Visalia. The school is designed to provide an elementary educational program that will include 23 classrooms, two kindergarten rooms, library, multipurpose kitchen area, speech room, administration center, teacher workroom, restrooms, and a janitor/storage area. Visalia Unified School District, Visalia Community Stadium EIR — Visalia, CA. <i>Project Manager.</i> This project involved the preparation of an EIR for Visalia Unified School District for the new Visalia Community Stadium that would be constructed on an existing practice field at Golden West High School. Significant environmental impacts included aesthetics, noise, air quality and traffic/parking. De Boer Dairy EIR — Tulare County, CA. <i>Project Planner.</i> This project involved the preparation of an EIR for the construction of a 3,600 Holstein milk cow and support stock dairy on 839 acres Twin River Ranch Dairy EIR — Tulare County, CA.
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	<i>Project Planner.</i> This project involved the preparation of an EIR for the construction of a 1,700 Holstein milk cow dairy on 456 acres of land. Schakel Dairy EIR — Tulare County, CA. <i>Project Planner.</i> This project involved the preparation of an EIR for the proposed construction of a 5,032 Holstein milk cow plus support stock dairy. The EIR was certified by Tulare County in December 2003. Mineral King Dairy EIR — Tulare County, CA. <i>Project Planner.</i> This project involved the preparation of an EIR for the Tulare County Resource Management Agency for a proposed dairy that will house 3,320 Holstein milk cows on 1,648 acres of land. LSF Madera LLC Dairy EIRs — Madera County, CA. <i>Project Manager.</i> This project involves four dairy EIRs being prepared simultaneously. Responsibilities extend to two of the four EIRs. All 4 dairies are proposed on the same 3,443 acre sited located in Madera County. The number of cow units on each dairy will range from 4,000 to 8,000. Wastewater Treatment Plant EIR — Fresno, CA. <i>Project Manager.</i> This project was for the proposed construction and implementation of process modifications needed to improve the biological treatment capabilities of the Fresno-Clovis Regional Wastewater Reclamation Facility. The objective of the project is to improve the operational reliability and biological treatment at the wastewater facility. Wastewater Treatment Plant Environmental Document — Porterville, CA. <i>Environmental Analyst.</i> This project involved providing environmental documentation and analyzing effects associated with the expansion of the Porterville Wastewater Treatment Plant. The project will upgrade the existing facility, capable of serving an urban area with 32,600 persons, to an expanded facility capable of serving the commercial, industrial and domestic wastewater flow of a growing community. Wastewater Treatment Plant Expansion — Tulare, CA. <i>Environmental Analyst.</i> This project involved providing environmental documentation regarding the impacts of additional treatment and disposal capacity for planned industrial growth. The project retained sufficient treatment and disposal capacity for existing and planned residential and commercial development.
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AREAS OF EXPERTISE

- ◆ Environmental Planning
- ◆ Biological services and documentation

EDUCATION

- ◆ Masters of Science in Environmental Resource Management, Florida Institute of Technology
- ◆ Bachelor of Science in Biology with emphasis on Ecology, The Pennsylvania State University

PROFESSIONAL ORGANIZATIONS

- ◆ Association of Environmental Professionals, Inland Empire Chapter

CONTINUING EDUCATION

- ◆ Association of Environmental Professionals CEQA Workshop Series Fall 2005-CEQA Basics, Visalia, CA, 2005.

Jacquelyn Neuffer

Associate Environmental Planner, Biologist

Ms. Neuffer's professional experience has involved the preparation of multiple environmental documents for educational facilities, dairies, and residential/commercial properties that include: environmental impact reports (EIR), negative declarations, initial studies and categorical exemptions and exclusions per CEQA/NEPA standards. She has conducted surveys that evaluated potential environmental impacts of proposed projects, prepared biological assessments per U.S. Fish and Wildlife standards and regulations, conducted record searches to determine presence/absence of special-status species, prepared water supply assessments per Senate Bill 610 and assisted with general plan updates for cities throughout California. Prior professional employment history includes the Marin Municipal Water District, U.S. Department of Fish and Wildlife, and the biology department of Pennsylvania State University.

PROFESSIONAL EXPERIENCE

2004 – 2005 Watershed Aide, Marin Municipal Water District
2002 Fisheries Internship, U.S. Department of Fish and Wildlife
2000 – 2002 Research Assistant, Penn State Department of Biology

PROJECT EXPERIENCE

Mendosa Dairy EIR—Tulare County, CA. *Associate Planner.* Currently preparing an EIR for the proposed construction and operation of a new 2,637 animal unit (3,200 milk cow) dairy on 479 non-contiguous acres.

Van Der Kooi Dairy EIR—Fresno County, CA. *Associate Planner.* Preparation of an EIR for a dairy located in Fresno County. This will be the first dairy EIR in Fresno County with the San Joaquin Air Pollution Control District as the lead agency.

Madera County Tri-Dairy EIR—Madera County, CA. *Associate Planner.* Involved the preparation of an EIR for three dairies located throughout Madera County. The three proposed dairies will accommodate a total of 11,060 milk cows on a total of 1,281 acres.

Elkhorn Dairy EIR—Tulare County, CA. *Associate*

	<i>Planner.</i> Currently preparing an EIR for the proposed expansion of an existing dairy that will occupy a total of 2,322 acres, and an addition of approximately 1,690 acres to the existing dairy. The expanded dairy facilities include the addition of barns, corrals, ponds, feed storage and will be situated on 181 acres. Pacific Ethanol—Tulare County, CA. <i>Associate Planner.</i> Is currently preparing the EIR for a proposed ethanol plant. Primary environmental concerns include, air quality, water quality, land use compatibility, biological resources. Serafina Estates—Winton, CA. <i>Associate Planner.</i> Is currently preparing a mitigated negative declaration for a subdivision located within the Community of Winton. The subdivision will include the development of 47 residences located on 18 acres. Dinuba Reclamation, Conservation and Recreation (RCR) Project—Dinuba, CA. <i>Biologist.</i> Assisted with the design and implementation. The project involved the design of wastewater treatment through manmade wetlands and lakes; use of native vegetation throughout a golf course and residential development; the design of sustainable park features such as percolating asphalt pedestrian trails and asthma and allergy-free gardening; and the implementation of an educational program for the public. Annexation and Pre-Zoning—Porterville, CA. <i>Assistant Planner.</i> This project included preparing a mitigated negative declaration, developing staff reports, resolutions, ordinances and LAFCo applications for the Annexation of 12 unincorporated “islands,” located throughout the City. Issues of concern include: land use, circulation, provision of public services and the potential for infill development. U.S. Department of Fish and Wildlife. <i>Fisheries Intern.</i> Was responsible for various biological activities including: estimated daily escapement of Chinook, Chum, Coho, Sockeye and Pink Salmon populations, tagged and estimated age/sex/fork lengths and creek composition of adult salmon with weir and digital recording devices, monitored climatical information utilizing staff gauges, thermometers and discharge measurements and observed egg counts in deceased Chum and Chinook female salmon for adverse affects occurred due to weir on spawning for tagged females. Watershed Aide for Marin County Municipal Water District—Marin, CA. <i>Fisheries Intern.</i> Was responsible for a variety of environmental-related activities including: performing weekly surveys on estimated populations of spawning adult salmonids, evaluation and documentation of erosion processes, soil stabilization efforts and observations of salmonid habitat, utilizing video analysis to examine effects
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	flows released from local dam and migration of spawning adult salmon, monitored Coho smolts from emerging traps in addition to analyzing data and preparation of corresponding reports. Penn State Department of Biology—State College, PA. <i>Research Assistant.</i> Assisted with various activities that included: participating in field observations, fiddler crab behavior observations in a laboratory environment, analyzing digital film and the set-up and maintenance of a tidal aquarium.
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AREAS OF EXPERTISE ◆ Endangered Species Surveys and Research ◆ Environmental / Biological Documentation ◆ State and Federal ESA Consultations ◆ Restoration of Arid Lands EDUCATION ◆ MA, Zoology, California State University, Fresno, 1983 ◆ BA, Biological Sciences, California State University, Fresno, 1978 REGISTRATIONS/CERTIFICATIONS ◆ Certified Associate Wildlife Biologist, Wildlife Society, 1983 ◆ Certified in Habitat Evaluation Procedures, USFWS, 1986 ◆ Certified instructor – Human Impact Evaluation Procedures for the Mohave Ground Squirrel, California Department of Fish and Game, 1992 ◆ NEPA certification, UC Davis, 1998 ◆ CEQA certification, UC Davis, 1999 ◆ Certified in fairy shrimp identification, USFWS, 2001 PROFESSIONAL ORGANIZATIONS ◆ Member of The Wildlife Society, Western Section and San Joaquin Valley Chapter ◆ Life member of American Society of Mammalogists, Bethesda, MD. ◆ Member of Society for Ecological Restoration AWARDS / RECOGNITION ◆ Certificate of Recognition from the United States Fish and Wildlife Service	Curtis Uptain <i>Senior Associate Wildlife Biologist</i> Mr. Uptain specializes in conducting biological resource inventories and studies in the southwestern United States. He has more than 20 years experience working with federally- and state-listed endangered species and over 5 years of experience with restoration of arid lands. Mr. Uptain has been involved in a wide variety of projects that include housing developments, pipeline and transmission line corridors, cogeneration plants, solar and geothermal installations, mining and waste treatment facilities, and restoration and management of retired farmlands. Mr. Uptain has been responsible for documenting the results of research and surveys in numerous technical reports such as environmental assessments, environmental impact reports, environmental impact statements, biological opinions, mitigation and monitoring plans, habitat management plans, and habitat conservation plans. PROJECT EXPERIENCE Endangered Species Recovery Program, Land Retirement Demonstration Project — Fresno and Tulare counties, CA. <i>Lead Biologist.</i> Coordinated a five-year research project on wildlife use of retired and restored farmlands and the development of restoration technologies. Wildlife was monitored on 20, 10 acre plots that were subjected to various restoration prescriptions. Wildlife monitoring included invertebrates (annual pitfall and sweep surveys), amphibians and reptiles (transect surveys, pitfall trapping, coverboard surveys), birds (quarterly point counts and transect surveys), and small mammals (quarterly trapping). Additional responsibilities included coordinating installation and management of a 4-acre native plant nursery which was used to amplify local stock of native plant seed, conducting research on native plant propagation and harvest techniques. Installed and managed the operation of a 1,600 sq. ft. facility that was devoted to seed cleaning, processing, and storage. Coordinated data entry, statistical analysis, preparation of annual reports and a final five-year report for multiple research studies that were conducted to develop restoration techniques that could be applied to large scale restoration projects and presented findings at numerous professional conferences. Endangered Species Biological Studies — Kern/Tulare County, CA. <i>Project Coordinator.</i> Conducted multiple studies that included long-term demographic studies of the
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for the conservation of endangered species, 1998.

CONTINUING EDUCATION

- ◆ Tiger salamander larval survey techniques, Santa Rosa, CA. April 2006
- ◆ CEQA workshop, UC Davis Extension, Sacramento, CA. May 2006

blunt-nosed leopard lizard, giant kangaroo rat, and the Tipton kangaroo rat located on the Pixley National Wildlife Refuge and Elkhorn Plains. These studies were part of the Endangered Species Recovery Program. The project also involved the coordination of trapping studies of the Tipton Kangaroo rat on the Kern National Wildlife Refuge and a 6-year monitoring study of the Doyen's dune weevil.

Buena Vista Lake Shrew Trapping Studies — San Joaquin Valley, CA. *Project Coordinator.* Coordinated trapping studies throughout the southern San Joaquin Valley to collect tissue samples of the endangered Buena Vista Lake shrew for a genetics analysis of the species for the Endangered Species Recovery Program and the Smithsonian Institute.

Blunt-Nosed Leopard Lizard Studies — Tulare County, CA. *Project Coordinator.* Conducted research and studies to determine the absolute and relative density of the blunt-nosed leopard lizard on six sites at the Pixley National Wildlife Refuge for the United States Fish and Wildlife Service.

Mojave Pipeline Surveys for the Biological Opinion and EIR — Kern County, CA. *Project Manager.* Conducted biological surveys for threatened and endangered species on approximately 400 miles of the Mojave Pipeline that were needed for the biological opinion report and EIR. Threatened and endangered species that were surveyed included the Mohave ground squirrel, desert tortoise, blunt-nosed leopard lizard, San Joaquin kit fox, San Joaquin antelope ground squirrel, giant kangaroo rat, Tehachapi slender salamander, and the Tipton kangaroo rat. Also assisted with preparation of the project's reports and prepared the RFP for protection of biological resources during construction.

Habitat Management, Demographic Study — Tulare County, CA. *Project Coordinator.* The study involved the effects of fire and grazing and the demographic study for Tipton kangaroo rats at Lemoore Naval Air Station. He prepared the final report and made recommendations for appropriate land management to the Endangered Species Recovery Program and the Department of the Navy.

La Paloma Generating Plant — Kern County, CA. *Lead Biologist.* Conducted initial and focused surveys for sensitive plant and wildlife species for the La Paloma Cogeneration Plant and associated transmission lines and pipelines. Prepared the biological assessment and assisted with preparation of the EIS; application for certification to the California Energy Commission; California Department of Fish and Game 2081 Agreement; and the biological resources mitigation and implementation of the monitoring plan. Was the coordinating biologist for the construction monitoring and employee training programs.

	Vernal Pool Surveys — Fresno County, CA. <i>Project Coordinator.</i> These surveys were conducted on the 2,730 acre Blasingame Property, south of Friant. The surveys consisted of locating, mapping, and characterizing vernal pools, sampling pools for the presence of vernal pool branchiopods, California tiger salamanders, and spadefoot toads. The surveys were conducted for the United States Bureau of Reclamation and The Foothill Conservancy. Vernal Pool Surveys — Fresno/ Madera/ Tulare Counties, CA. <i>Project Coordinator.</i> Conducted vernal pool surveys for the United States Bureau of Reclamation on the Friant-Kern Canal. Surveys consisted of locating and mapping vernal pools and sampling pools for the presence of vernal pool branchiopods, California tiger salamanders, spadefoot toads, and other sensitive species. Buena Vista Lake Shrew Trapping Surveys — Tulare County, CA — <i>Project Coordinator.</i> Coordinated a trapping survey for Buena Vista Lake shrews at Goose Lake to determine impacts associated with wetlands enhancement on the site for the Endangered Species Recovery Program and Ducks Unlimited. United States Bureau of Reclamation Annual Census' — San Benito County, CA. <i>Project Coordinator.</i> Conducted annual censuses over a span of 5 years for the California red-legged frog and monitored construction activities at the San Justo Reservoir.
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John Castleberry

Principal; Senior Air Quality Specialist

Mr. Castleberry has expertise in conducting air quality impact analyses for industrial, residential, military, marine port, airport, dairy, and highway projects. He has prepared analyses under NEPA, CEQA, and the federal conformity requirements of the Clean Air Act. He is experienced in emissions estimation and air dispersion modeling for both mobile and stationary sources. He has prepared permit applications for both NSR and PSD. He has experience in assessing odor impacts from wastewater treatment plants and dairies.

Mr. Castleberry has extensive experience in assessing human health risk of air toxic emissions from industrial and military facilities. He has conducted risk assessments in accordance with both California and federal guidelines. He has worked with all of the large air districts and many of the smaller air districts throughout California, as well as the air quality agencies of many of the western states. He is trained to use the latest California Risk Assessment guidance and associated HARP software.

Distinguishing Qualifications

- 17 years of professional air quality experience
- Performed National Environmental Policy Act/California Environmental Quality Act (NEPA/CEQA) air quality impact analyses for numerous industrial, residential, military, marine port, airport, dairy, and highway projects
- Extensive experience performing human health risk assessments of toxic air emissions from industrial facilities; trained on HARP software
- Dispersion modeling and new source review/prevention of significant deterioration (NSR/PSD) permitting experience
- Conducted odor impact assessments for wastewater treatment facilities and dairies
- Experienced in performing criteria pollutant and toxic air contaminant emission inventories for industrial facilities and military installations
- Extensive experience performing project-level air quality conformity analyses for transportation projects

Certifications

Qualified Environmental Professional (QEP), Institute of Professional Environmental Practice, 2002

Certified Permitting Professional (CPP), South Coast Air Quality Management District, 2002

Erwin, Michael R., PE
Civil Engineer and Managing Principal in Charge
Erwin Engineering

In 1992 Mr. Erwin organized Erwin Engineering. As Principal Geotechnical Engineer, he has performed field and office studies for a variety of geotechnical projects. He has been lead consultant for various dairy and other animal management facilities, and various fruit and nut product processing facilities, where emphasis was placed on water and waste issues related to assessment of past and current regulatory compliance assessing permit compliance issues, Geological-Hydrological Investigations, Nutrient Management Plans and soil, groundwater and wastewater sampling and analysis where deemed appropriate. As Environmental Engineer, Mr. Erwin has conducted site characterization investigations for soils and ground water contamination by volatile and non-volatile organic hydrocarbons, land transfer assessments, and remedial action technical evaluations, subsurface explorations to characterize the extent of contamination, the assessment of contamination impacts on ground water resources, and proposed remedial and mitigation alternatives. Also in this capacity, Mr. Erwin conducted studies utilizing the design and installation of ground water monitoring wells included the delineation of the contaminant plume, the mobility of contaminants, and the modeling of transport, fate and risk factors.

PROFESSIONAL EMPLOYMENT

1992 – Present	Erwin Engineering, Madera, California
1988 – 1992	Dames & Moore, Inc., Fresno, California
1986 – 1988	Krazan & Associates, Inc., Fresno, California
1982 – 1986	J. H. Kleinfelder & Associates, Stockton, California
1969 – 1982	The Twining Laboratories inc. & The Foundation Engineers, Inc., Fresno, California

QUALIFICATIONS AND AFFILIATIONS

Ph.D., course work, Geotechnical Engineering, University of California, Berkeley, 1982 to 1986
M.S. Geotechnical Engineering, San Jose State University, 1969
B.S. Civil Engineering, California State, University, Fresno, 1965
American Society of Civil Engineers
California Council of Civil Engineers & Land Surveyors, San Joaquin Chapter (Past President),
Association of Soil and Foundation Engineers
Registered Civil Engineer, State of California, CE18625
Registered Geotechnical Engineer, State of California, GE297
Lecturer, California State University, Fresno, presented courses on Geotechnical Engineering.

BRUCE LIVINGSTON

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(559) 687-1440 (559) 584-2001 livcon@sbcglobal.net

Since 1996, as owner of Livingston Dairy Consulting, Inc., Mr. Livingston assists dairy owners with Environmental Compliance Review, Comprehensive Nutrient Management Plans, Reports of Discharge, and N.P.D.E.S. Permits. He also produces refinance packages for his clients, as well as advises them on business strategies to enhance cash flow and optimum dairy/farm management.

PROFESSIONAL EMPLOYMENT

1996 - Present	Livingston Dairy Consulting, Inc.
1992 - 1995	Dairymen's Feed & Supply Co-Op
1986 - 1992	J.D. Heiskell & Company, Inc.
1975 - 1986	Wells Fargo Bank & First Interstate Bank

QUALIFICATIONS AND AFFILIATIONS

- Dairy Industry Alliance - Board Member
- Tulare County Agricultural Advisory Sub-Committee Member
- Kings County Farm Bureau Committee on Kings County Dairy Element
- American Society of Agricultural Engineers
- Kiwanis Club of Greater Tulare
- Environmental Stewardship Short Course for California Dairy Operators
- Environmental Stewardship Certification Training for Partners
- UCCE Course in Lagoon Water Nutrient for Crop Production

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