

## 10 HYDROLOGY, WATER QUALITY, AND SOIL EROSION

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This chapter evaluates the potential hydrology, water quality, and soil erosion impacts associated with the proposed dairy expansion project, and includes a discussion of the mitigation measures necessary to reduce these impacts to a less-than-significant level, where possible. As established in the Initial Study (IS) for the proposed project (see Appendix A, *Notice of Preparation and Initial Study*), the construction and operation of the Oliveira Dairy Expansion project may result in degradation of groundwater resources, potential adverse effects to surface water quality, impacts to groundwater levels, water quality impacts due to flooding, soil erosion impacts, and impacts from the proposed septic system.

This water resources evaluation implements, and is consistent with, mitigation measures and study protocols adopted by Merced County in its certification of the 2030 Merced County General Plan EIR in addition to the EIR for Revisions to the Animal Confinement Ordinance (ACO) and its approval of the ACO.

### INTRODUCTION AND METHODOLOGY

Dairies pose a number of potential risks to water quality, primarily related to the amount of manure and wastewater that they generate. Manure and wastewater from animal confinement facilities can contribute pollutants such as nutrients (nitrogen), ammonia, phosphorus, organic matter, sediments, pathogens, hormones, antibiotics, and total dissolved solids (salts). These pollutants, if uncontrolled, can cause several types of water quality impacts, including contamination of drinking water, interference with irrigation systems, and impairment of surface water and groundwater quality.

To evaluate potential impacts to water quality, a hydrogeologic evaluation was conducted by NV5, engineering and hydrogeological consultants, for the Oliveira Dairy Expansion project to provide an assessment of existing surface water and groundwater conditions, and the potential future impacts associated with operation of the proposed dairy expansion (included in Appendix K of this EIR, bound separately). To determine background characteristics of the groundwater at the project site, NV5 reviewed California Department of Water Resources (DWR) well log information and water quality data from on-site supply well samples collected as required by the Central Valley Regional Water Quality Regional Water Quality Control Board (CVRWQCB) General Order for Existing Milk Cow Dairies (Order No. R5-2013-0122).

### 10.1 REGULATORY FRAMEWORK

#### 10.1.1 FEDERAL LAWS AND REGULATIONS

##### UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Federal, state, and local regulations have been implemented to protect the quality of surface water and groundwater resources. The primary federal laws for protection of water quality are the Clean Water Act (CWA) and the Safe Drinking Water Act (SDWA). Federal and state regulations based on this underlying legislation range from establishing maximum contaminant levels to setting anti-degradation policies.

The primary regulatory program for implementing water quality standards is the federal National Pollutant Discharge Elimination System (NPDES) Program. The United States Environmental Protection Agency (EPA) has delegated NPDES enforcement and administration to the State of California. Under the Federal Concentrated Animal Feeding Operations (CAFO) program, owners and operators (“dischargers”) of dairies are required to apply for and receive an NPDES permit if the dairy is a Large CAFO<sup>1</sup> **and** the operator discharges, or proposes to discharge, pollutants to the waters of the United States.

The CVRWQCB administers the federal NPDES program in the Central Valley. The CVRWQCB adopted the General Waste Discharge Requirements and General NPDES Permit for Existing Milk Cow Dairy Concentrated Animal Feeding Operations within the Central Valley Region, Revised Order No. R5-2011-0091, in December 2011. The CAFO Order was written to follow the format of the 2007 General Order for Existing Milk Cow Dairies and Individual Waste Discharge Requirements (discussed under California Laws and Regulations, NPDES Program and the General Order for Existing Milk Cow Dairies and Individual Waste Discharge Requirements below), as closely as possible, while incorporating requirements of the Federal CAFO rule. The CAFO Order serves as a NPDES permit for those existing milk cow dairies that are classified as CAFOs **and** discharge pollutants to water of the United States.

## **FEDERAL EMERGENCY MANAGEMENT AGENCY**

The Federal Emergency Management Agency (FEMA) is the federal agency that oversees floodplains and manages the National Flood Insurance Program (NFIP), adopted under the National Flood Insurance Act of 1968. FEMA’s regulations establish requirements for floodplain management. FEMA prepares Flood Insurance Rate Maps denoting the regulatory floodplain to assist communities such as Merced County with land use and floodplain management decisions in order to meet the requirements of the NFIP.

### **10.1.2 CALIFORNIA LAWS AND REGULATIONS**

California’s primary water law is the Porter-Cologne Water Quality Control Act (Porter Cologne). The regulations that implement Porter Cologne are contained in the California Code of Regulations (CCR). The water quality control programs, plans, and policies that affect the operations of animal confinement facilities include the NPDES program, regional water quality control plans, storm water protection plans, and the Total Maximum Daily Load (TMDL) program.

## **NPDES PROGRAM AND THE GENERAL ORDER FOR EXISTING MILK COW DAIRIES AND INDIVIDUAL WASTE DISCHARGE REQUIREMENTS**

In general, the Waste Discharge Requirements (WDR) Program regulates point discharges that are exempt pursuant to Title 27 of the California Code of Regulations<sup>2</sup> and not subject to the Federal Water Pollution Control Act. In California, the permitting authorities for WDRs are the Regional Water Quality Control Boards (RWQCB). The CVRWQCB has jurisdiction over the project site. In May 2007, the CVRWQCB adopted Waste Discharge Requirements General Order R5-2007-0035

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<sup>1</sup> A large CAFO is defined as having 700 or more mature dairy cattle. Medium and small CAFOs that propose to discharge must also apply for and receive a permit under the NPDES program.

<sup>2</sup> Subsection 20090 of Article 1, Subchapter 2, Chapter 7, Division 2, Title 27 of the California Code of Regulations.

for Existing Milk Cow Dairies (2007 General Order). In October 2013, the CVRWQCB adopted changes to the Order through the Reissued Waste Discharge Requirements General Order for Existing Milk Cow Dairies R5-2013-0122 (General Order), which rescinded and replaced the 2007 General Order. The General Order implements the State laws and regulations relevant to confined animal facilities. The General Order is not a NPDES Permit, and does not authorize discharges of pollutants to surface water that are subject to NPDES permit requirements of the Clean Water Act. The General Order serves as general WDRs for discharges of waste from existing milk cow dairies, and is intended to be compatible with the EPA's regulations for CAFOs discussed above. Under the General Order Waste Discharge Permit Program, Animal Feeding Operations are prohibited from discharging waste into surface water or into groundwater that is directly connected to surface water.

The General Order only applies to owners and operators of existing milk cow dairies (dischargers) in the Central Valley Region. For the purposes of the General Order, existing milk cow dairies are those that were operating as of October 17, 2005 for which a Report of Waste Discharge (ROWD) was filed with the CVRWQCB. Dairies that did not file a 2005 ROWD, new dairies, and existing dairies expanding the mature cow number established under the 2005 ROWD by greater than 15 percent are not covered under the General Order, and are required to obtain coverage under Individual WDRs. All dairies covered under the General Order are required to:

- Comply with all provisions of the General Order,
- Submit a Waste Management Plan (WMP) for the production area,
- Develop and implement a Nutrient Management Plan (NMP) for all land application areas,
- Monitor wastewater, soil, crops, manure, surface water discharges, and storm water discharges,
- Monitor surface water and groundwater,
- Keep records for the production and land application areas, and
- Submit annual monitoring reports.

The NMP and WMP describe the regulatory requirements for the facility, and together they serve as the primary tool to prevent groundwater contamination and poor operations. The General Order establishes a schedule for dischargers to develop and implement their WMP and NMP, and requires them to make facility modifications as necessary to protect surface water, improve storage capacity, and improve the facility's nitrogen balance before all infrastructure changes are completed. In addition, Best Management Practices (BMP) intended to minimize surface water discharges and subsurface discharges at dairies are required. The General Order also requires each dairy to have fully implemented a WMP and a NMP as of the date of this EIR. In compliance with the requirements of the CVRWQCB, the proponents of the Oliveira Dairy Expansion have completed the required components of the WMP and NMP of the General Order.

The Reissued Dairy General Order is intended to enhance 2007 General Order requirements on existing milk cow dairies. Improvements may include recycling flush water, grading, establishing setbacks, installing flow meters, exporting manure, leasing or purchasing land, etc. The dairy operator may be able to make some of these improvements relatively quickly while some improvements may require more time to implement. The General Order requires dairy operators to make any necessary interim facility modifications first in order to prevent discharges to surface

water, improve storage capacity, and improve the facility's nitrogen balance before completing any necessary infrastructure changes.

The 2007 General Order included a provision that required compliance with Monitoring and Reporting Program No. R5-2007-0035. With the Reissued Dairy General Order, the Monitoring and Reporting Program (MRP) has been updated (Monitoring and Reporting Program R5-2013-0122). Under the revised MRP, and based on an evaluation of the threat to water quality at each dairy, the CVRWQCB may require the installation of monitoring wells to comply with the General Order MRP. The 2013 Monitoring and Reporting Program requires:

- Periodic inspections of the production area and land application areas,
- Monitoring of manure, process wastewater, crops, and soil,
- Recording of operation and maintenance activities,
- Groundwater monitoring,
- Storm water monitoring,
- Monitoring of surface water and discharges to surface water,
- Annual reporting,
- Annual reporting of groundwater monitoring,
- Annual storm water reporting,
- Noncompliance reporting, and
- Discharge reporting.

The General Order and Individual WDRs also established the ability for individual dairies to participate in a Groundwater Representative Monitoring Program (RMP) as an alternative to an individual requirement for groundwater monitoring. Each dairy must notify the CVRWQCB about its decision to join a RMP. Dairies that do not notify the CVRWQCB or do not intend to join a RMP will be held to individual monitoring requirements set forth in the regulations. The Oliveira Dairy is a member of a Groundwater Monitoring Coalition.

The RMP establishes a regional monitoring network for the member dairies of the Central Valley Dairy Representative Monitoring Program (CVDRMP). The RMP has been developed in accordance with General Order requirements and with review by the CVRWQCB. The regional monitoring network is established by installing individual monitoring well networks at dairies with hydrogeologic and land use characteristics typical of the area. Groundwater monitoring results for these dairies are then extrapolated to other member dairies of the RMP, theoretically precluding the need to install monitoring well networks on an individual basis.

There are over 1,100 dairy members of the CVDRMP. Monitoring data are being collected at 42 representative dairies, using 443 monitoring wells. The findings for January 2012 through December 2017<sup>3</sup> confirm that first encountered groundwater has been affected by historic and current dairy farming practices, and indicates that crop fields are the primary source of nutrient emissions to groundwater. Based on current knowledge collected to date, the RMP findings indicate that most

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<sup>3</sup> Program updates accessed on November 6, 2018, available at:  
[http://www.waterboards.ca.gov/centralvalley/water\\_issues/confined\\_animal\\_facilities/groundwater\\_monitoring/index.shtml](http://www.waterboards.ca.gov/centralvalley/water_issues/confined_animal_facilities/groundwater_monitoring/index.shtml)

dairies will not be able to meet CVRWQCB standards for being protective of groundwater. The CVDRMP continues to work towards development of evidence-based industry recommendations to improve groundwater protection and to meet the April 1, 2019 schedule mandated by the 2013 General Order.

In accordance with Provision 29 of the General Order, all dairies must be in compliance with Title 27. As explained in the General Order Information Sheet, the Title 27 design standards for ponds have been determined to not be protective of groundwater quality, and there are technologies available that can provide greater groundwater protection. Because Section 13360 of the California Water Code requires that WDRs not specify the design, location, type of construction, or particular manner in which compliance may be had with the requirements, the General Order cannot specify any particular pond design. However, the General Order establishes performance standards for new wastewater ponds that are more stringent than Title 27 in order to provide increased groundwater protection.

The Oliveira Dairy is regulated under the Reissued Dairy General Order (R5-2013-0122). As established by the ROWD submitted for the existing dairy to the CVRWQCB in October 2005, the State-permitted herd size for the dairy is 943 milk and dry cows combined<sup>4</sup>, with regulatory review required for expansions of greater than 15 percent above this value. Since the proposed expansion would increase the mature cow number established under the WDR by greater than 15 percent, the proposed expansion would require a new individual WDR. Significant operational and reporting requirements will be required as part of the individual WDR process, including the following nutrient management practices:

- Discharge reporting,
- Groundwater monitoring,
- Wastewater sampling and application monitoring,
- Irrigation application monitoring,
- Facility and land application visual inspections,
- Crop nitrogen/phosphorus uptake monitoring, and
- Field specific nutrient budgeting.

Planning documents related to these requirements include a Nutrient Management Plan and Waste Management Plan (see Appendix L, *Dairy Facility Nutrient Management Plan Report and Waste Management Plan Report*).

### ***Nutrient Management Plan and Waste Management Plan***

The NMP/WMP planning process is used to implement BMPs for dairies. The NMP/WMP are planning documents used to describe facility operations, develop wastewater disposal options, and outline mitigation measures for each dairy. These documents are required to be revised as appropriate for the operation. Specific elements related to the number and type of animals dictate the size of a facility, fresh/flush water needs, and wastewater generation. Nitrogen and salt balance calculations based on the herd description, housing requirements (i.e., flush freestalls or dry lots),

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<sup>4</sup> The CVRWQCB regulates only mature cows (milk and dry) and does not establish any limits on calves, heifers, and other support stock.

acreage available for land application, and crop nutrient removal rates are made to determine the nitrogen and salt uptake for the proposed cropping pattern. On-site wastewater plans, storage elements, and storm water planning may be modified based on the calculations contained in the NMP/WMP.

As mandated by the ACO, a NMP/WMP in place of a Comprehensive Nutrient Management Plan (CNMP)<sup>5</sup> for the Oliveira Dairy Expansion facility has been prepared pursuant to the requirements of the CVRWQCB (see Appendix L). The NMP and WMP for the proposed dairy expansion, both dated September 2018, have been used for the evaluation in this DEIR. To establish a baseline, the NMP and WMP (both dated August 2016) were used to represent existing conditions.

## **CALIFORNIA STATEWIDE GROUNDWATER ELEVATION MONITORING PROGRAM AND SUSTAINABLE GROUNDWATER MANAGEMENT ACT**

Since 2009, the California Statewide Groundwater Elevation Monitoring Program (CASGEM) has tracked seasonal and long-term groundwater elevation trends in groundwater basins statewide. The CASGEM is a voluntary program run by DWR wherein local monitoring entities collect groundwater elevation data and provide it to DWR. In June 2014, the DWR announced its CASGEM Basin Prioritization results. The Basin Prioritization determined groundwater use, groundwater supply, groundwater overdraft, and other factors for each basin to assign priority for action. Medium and high priority basins are those identified with medium or high risk for overdraft or adverse groundwater impacts. These at-risk groundwater basins would be first to receive state funds for drought management and other groundwater funding programs. The Merced Groundwater Subbasin (the area of the Oliveira Dairy) has been designated as critically overdrafted; it is identified as a high priority groundwater basin. Basin boundary modifications were made in 2016, and the 2018 SGMA Basin Prioritization based on 2016 boundary modifications is currently underway and anticipated to be completed in May 2019.

The Sustainable Groundwater Management Act (SGMA) of 2014 (as amended) allows customized groundwater sustainability plans (GSP) to be designed by groundwater sustainability agencies (GSA) to manage groundwater resources while being sensitive to local economic and environmental needs. SGMA requires governments and water agencies of high and medium priority basins to halt overdraft and bring groundwater basins into balanced levels of pumping and recharge. Under SGMA, these basins should reach sustainability within 20 years of implementing their sustainability plans. For critically over-drafted basins, that will be 2040. For the remaining high and medium priority basins, 2042 is the deadline. The Merced Irrigation-Urban Groundwater Sustainability Agency (MIUGSA), in the area around the Oliveira Dairy, was formed on April 24, 2017. As a critically overdrafted basin, the Merced area must complete a GSP by January 31, 2020.

## **REGIONAL WATER QUALITY CONTROL PLAN**

Individual RWQCBs regulate animal confinement facilities, including dairies and other types of facilities, by developing and enforcing a Basin Plan that identifies beneficial uses of waters in the

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<sup>5</sup> Since adoption of the ACO, the CVRWQCB has required the preparation of a NMP and WMP, which serve in place of the CNMP as allowed by Merced County Code Chapter 18.48.055 K.

region, and establishes policies to protect those uses. Agriculture and dairies are designated as beneficial uses of water resources in the Basin Plan.

The RWQCB regulates dairies under the provisions of Title 27 of the California Code of Regulations<sup>6</sup> and the Porter Cologne Water Quality Control Act. The Basin Plan for the Sacramento-San Joaquin Valley (Basin Plan) developed by the CVRWQCB generally regulates agriculture practices.

## **TOTAL MAXIMUM DAILY LOAD PROGRAM – IMPAIRED WATERWAYS**

Under Section 303(d) of the CWA, states are required to identify and list water bodies that do not meet applicable water quality standards. Such water bodies receive a ranking for the establishment of Total Maximum Daily Load<sup>7</sup> for all listed water contaminants that do not meet water quality standards. States are required to establish a TMDL for these identified water bodies that will lead to achieving the applicable water quality standards, and to allocate the TMDL among all contributing sources. The assessment of sources may indicate that a water body is impaired because of nutrient or pathogen problems attributable to animal manure or wastewater, or because a watershed has more manure generated than there is land available for application. The TMDLs will be implemented through NPDES permits, nonpoint source control programs, and other local and state requirements.

As mentioned above, Bear Creek is located approximately one-mile north of the project site. Bear Creek is listed as impaired under §303(d). The affected segments stretch from Bear Valley to the San Joaquin River, crossing through Mariposa and Merced counties. This 84-mile segment is impaired for *Escherichia coli* (*E. coli*) and an unknown toxicity. The proposed TMDL completion date for Bear Creek is 2021.

The CVRWQCB adopted Amendments to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins and Tulare Lake Basin to Incorporate a Central Valley-wide salt and nitrate control program in May 2018. Discharges off site would be required to comply with discharge limits outlined in the Basin Plan. As described in the NMP and WMP, land application field discharges are closely monitored to address potential impacts.

## **IRRIGATED LANDS REGULATORY PROGRAM**

A range of pollutants such as pesticides, fertilizers, salts, pathogens, and sediment can be found in runoff from irrigated lands. The Irrigated Lands Regulatory Program (ILRP) of the CVRWQCB regulates discharges from irrigated agricultural lands throughout the Central Valley. Its purpose is to prevent agricultural discharges from impairing the surface waters that receive the discharges. To protect these waters, RWQCBs have issued conditional waivers of WDRs to growers that contain conditions requiring water quality monitoring of receiving waters, and corrective actions when impairments are found. The Long-term Irrigated Lands Regulatory Program General Orders adopted by the RWQCB protect both surface water and groundwater throughout the Central Valley.

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<sup>6</sup> Article 1, Subchapter 2, Chapter 7, Division 2, Title 27 of the California Code of Regulations.

<sup>7</sup> A Total Maximum Daily Load, or TMDL, is a calculation of the maximum amount of a pollutant that a waterbody can receive and still safely meet water quality standards.

In implementing the ILRP, the CVRWQCB has allowed growers to combine resources by forming water quality coalitions. The coalition groups work directly with their member growers to assist in complying with CVRWQCB requirements by conducting surface water monitoring, and by preparing regional plans to address water quality problems. Of the estimated 35,000 growers in the Central Valley, there are about 25,000 landowners/operators who are part of one of eight water quality coalition groups. If growers do not obtain regulatory coverage with payment of a membership fee for their waste discharges as a part of a Coalition Group, they must file a ROWD and filing fee with the CVRWQCB to obtain a grower-specific permit. The Conditional Waiver requires that coalition groups comply with General Order WDRs, implement Monitoring and Reporting Program plans, and submit periodic monitoring reports and monitoring data. When there have been two or more exceedances of the same pollutant at the same site within a three-year period, Management Plans must be prepared and implemented.

There is significant overlap between the ILRP and the Dairy Programs with regard to regulatory requirements, monitoring, and best management practices. The Oliveira Dairy is not anticipated or likely to be regulated under the ILRP program. If site conditions change (i.e., the Dairy Program regulations no longer apply) and a regulatory assessment warrants action under the ILRP, the Oliveira Dairy could potentially participate in the East San Joaquin Water Quality Coalition by paying a membership fee. This Coalition represents all member dischargers as the monitoring and reporting entity for the Coalition-specific Waste Discharge Requirements / Monitoring and Reporting Program.

## **CENTRAL VALLEY SALINITY ALTERNATIVES FOR LONG TERM SUSTAINABILITY**

Central Valley Salinity Alternatives for Long Term Sustainability is a coalition of agencies tasked with developing a Salt and Nitrate Management Plan for the Central Valley RWQCB. The efforts will be used to direct water quality management policies. Policies will be used for comprehensive regulatory and programmatic approaches for better management of salt and nitrates. The impact to individual dairy permits will not be known until regulations are finalized.

## **FLOODPLAIN MANAGEMENT**

The California Department of Water Resources Division of Floodplain Management constructs and operates regional scale flood protection systems in partnership with federal and local agencies, and provides technical, financial, and emergency response assistance related to flooding. The DWR has prepared non-regulatory Best Available Maps showing 100-, 200-, and 500-year floodplains using data compiled from various sources intended to support community-based planning and flood risk management. The 100-year areas are similar to those of FEMA maps, with some additional areas and localized differences.

### **10.1.3 MERCED COUNTY**

#### **MERCED COUNTY GENERAL PLAN**

The Water Element of the Merced County General Plan contains goals and policies pertaining to protection of water resources in Merced County. Those policies that are relevant to the project site are presented below:

**Policy W-2.4: Agricultural and Urban Practices to Minimize Water Contamination**

Encourage agriculture and urban practices to comply with the requirements of the Regional Water Quality Control Board for irrigated lands and confined animal facilities, which mandate agricultural practices that minimize erosion and the generation of contaminated runoff to ground or surface waters by providing assistance and incentives.

**Policy W-2.5: Septic Tank Regulation**

Enforce septic tank and onsite system regulations of the Regional Water Quality Control Board to protect the water quality of surface water bodies and groundwater quality.

**Policy W-2.6: Wellhead Protection Program**

Enforce the wellhead protection program to protect the quality of existing and future groundwater supplies by monitoring the construction, deepening, and destruction of all wells within the County.

**Policy W-3.13: Agricultural Water Reuse**

Promote and facilitate using reclaimed wastewater for agricultural irrigation, in accordance with Title 22 and guidelines published by the State Department of Public Health.

These policies were considered in the evaluation of the proposed project and the formulation of appropriate mitigation measures below. A more detailed discussion of the relevance of these goals and policies to the proposed project is located in Table 11-1 of Chapter 11, *Land Use Compatibility*.

**ANIMAL CONFINEMENT ORDINANCE**

The Merced County Animal Confinement Ordinance regulates the design, construction, and operation of animal confinement facilities within the county. Because the ACO is regulatory rather than permissive, all existing and proposed animal confinement facilities within the county are required to comply with the terms of the ACO, including the proposed Oliveira Dairy Expansion project. The Merced County ACO is included as a section of Title 18, *Zoning*, of the Merced County Code.

Merced County regulations under the ACO maintain water quality standards that are consistent with the CVRWQCB Basin Plan. The Merced County ACO addresses potential impacts to water quality primarily through preparation and implementation of a CNMP. If a site-specific CNMP is followed and if best management practices are used, nitrogen loading and salt loading to groundwater will be minimized. Since adoption of the ACO, the CVRWQCB has required the preparation of a NMP and WMP as described above, which would serve in place of the CNMP as allowed by County Code Chapter 18.48.055 K.

The Merced County ACO contains additional provisions to protect water quality. For example, Chapters 18.48.050 E and I of the ACO require that all wastewater or storm water that has come into contact with manure be maintained on the project site, or applied to other sites only upon written approval of the landowner. Chapter 18.48.050 J requires that off-site property owners accepting wastewater (liquid manure) complete written agreements to accept responsibility for proper land application. Chapter 18.48.050 G requires notification of Merced County Division of Environmental Health (DEH) for any off-site discharge of wastewater. Chapter 18.48.050 BB

requires application of manure at agronomic rates. For the permanent closure of an animal confinement facility, Chapter 18.48.050 R requires DEH to review and approve specific collection of soil samples from underneath existing ponds to be abandoned after liquid and solids have been removed. Chapter 18.48.060 contains guidelines for new or modified retention ponds and settling basins. Permits must be obtained from DEH prior to construction and an inspection must be performed prior to use of a newly constructed pond or basin. Portions of the ACO that specifically apply to protection of water quality include: Chapters 18.48.050 D, E, F, G, H, J, K, M, N, O, P, Q, R, T, V, Z, AA, BB, CC, DD, EE, II, JJ, KK, LL, MM, NN, QQ; 18.48.055 A, B, C, D, E, F, H, K; and 18.48.060 A, D, E, G, H, I, K, L, M, P, Q, S, and T (see Appendix C for the full text of the ACO).

To address potential impacts to water resources, the EIR prepared for the ACO contains mitigation measures to be implemented during environmental review of animal confinement facility projects such as the proposed project. Mitigation measures adopted as policy in the EIR for the ACO include:

- Measures to reduce groundwater contamination; and,
- Measures to reduce the risk of contamination of surface waters during flood events.

These mitigation measures as contained in the EIR for the ACO are incorporated as study protocols for this EIR and serve as the basis for mitigation measures identified in this document.

## **FLOOD ORDINANCE**

Merced County is responsible for implementing FEMA floodplain management regulations. Zoning Code Section 18.34.050, *Provisions for Flood Hazard Reduction* (Flood Ordinance) contains specific requirements limiting and discouraging development in various flood zones, as designated on Flood Insurance Rate Maps. The County's Flood Ordinance defines areas of special flood hazard as Zones A, AO, AE, or AH. For areas in a special flood hazard zone, no development may occur on the site until all of the relevant requirements of the Flood Ordinance have been satisfied. These requirements as set forth in Section 18.34.050 of the Zoning Code include construction standards for both occupied and non-occupied structures, utilities, mobile homes, and for non-residential structures. These standards include anchoring structures to prevent flotation, collapse or movement, raising structures above the base flood elevation or otherwise flood-proofing them, constructing adequate drainage paths around structures to guide floodwaters around and away from proposed structures, providing a determination of the base flood elevation as determined by a licensed engineer, and drafting all subdivision plans so that they identify the flood hazard area and elevation of the base flood, and provide the elevation of proposed structures and pads.

## **MERCED COUNTY WELL ORDINANCE**

The Merced County Code Chapter 9.28, *Wells* contains Water Well Standards (Chapter 9.28.060) that would minimize the potential for contaminated water to enter a well and contaminate groundwater. The standards include well setback distances from potential sources of contamination and pollution, and standards for construction as set forth in Appendix K of this EIR.

## MERCED COUNTY GROUNDWATER ORDINANCE

With the adoption of the Sustainable Groundwater Management Act of 2014, Merced County has adopted groundwater ordinance No. 1930, that prohibits the unsustainable extraction of groundwater or conveyance of groundwater outside of a subbasin. This ordinance is a transition document until documents required by the SGMA are published and implemented. Two prohibitions were set in place as part of the ordinance. The first prohibits the construction of new wells within unincorporated areas of the county showing excess extraction patterns from 1995 through 2013. The second prohibits the export of groundwater from Merced County to areas outside of the groundwater basin where it originated. Multiple exemptions are in place to allow water districts and water agencies to continue to operate.

## ONSITE WASTEWATER TREATMENT SYSTEMS

In June 2012, the SWRCB adopted a Water Quality Control Policy for Siting, Design, Operation, and Maintenance of Onsite Wastewater Treatment Systems (OWTS). The policy establishes a set of comprehensive regulations for all aspects of siting, construction, and operating OWTS. The Merced County Division of Environmental Health (DEH) enforces design standards for the operation and maintenance of on-site sewage disposal systems to minimize potential pollution of groundwater and surface water features (Merced County Code Chapter 9.54, *Regulation of Onsite Wastewater Treatment Systems*). DEH requires that every occupied structure in the county that cannot be connected to a public wastewater treatment system must construct an OWTS under permit from DEH, consisting of an OWTS with effluent discharging into an approved subsurface disposal field. All systems must meet the minimum design standards of DEH, including location, system dimensions and capacity, soil capability, minimum depth to groundwater, and minimum separation distances between septic systems and wells, streams, and other water bodies. In order to obtain a permit, an applicant must provide DEH with a site plan indicating the dimensions and placement of the disposal field. DEH expects that their existing design standards for operation and maintenance of OWTS will usually meet the requirements of the Water Quality Control Policy for Siting, Design, Operation, and Maintenance of Onsite Wastewater Treatment Systems.

## REGULATORY COMPLIANCE AUDIT

The Merced County Community and Economic Development Department requests regulatory compliance audits of expanding dairies from the Division of Environmental Health as part of the Conditional Use Permit (CUP) evaluation process prior to project approval. The DEH staff performed an inspection of the Oliveira Dairy on June 6, 2018 and issued a staff inspection report dated July 12, 2018. In the staff report, the DEH staff recommended revisions to figures within of the WMP and NMP to more accurately reflect proposed practices and processes at the Oliveira Dairy. Revisions to the WMP and NMP were completed in September 2018, and the DEH concluded that the dairy facility was in substantial compliance with the ACO on October 10, 2018.

## 10.2 ENVIRONMENTAL SETTING

Figures 1 through 4 in Appendix K of this DEIR shows the dairy facility and application area, project Assessor Parcel Numbers, and the hydrogeologic cross section line locations. For a depiction of the dairy facility with existing and proposed structures and the application area irrigation wells, see Figures 3-4, 3-4, 3-5, and 3-7 in Chapter 3, *Project Description*, of this EIR.

### **10.2.1 PROJECT SETTING AND PHYSIOGRAPHY (PHYSICAL GEOGRAPHY)**

The project site is located in an active agricultural district in the San Joaquin Valley and within the larger Central Valley of California. The topography of the site is nearly flat with surface elevations ranging from 135 to 170 feet above mean sea level (MSL) at the dairy facility. Land application area elevations range from 135 to 145 feet MSL. The Bailey Lateral 'A' of Merced Irrigation District (MID) borders the north of the site, on the south side of Oak Avenue. The MID Deane Canal flows directly through the project area along Gurr Road. MID's Thornton Lateral borders New Field on the north. South Slough, a tributary of Bear Creek, is located approximately 0.25 miles north of the project site.

There is one settling basin and two wastewater storage ponds (retention pond) on site for wastewater storage and treatment. Irrigation water for the project farming operations is primarily mixed with canal water supplied by MID supplemented by three dairy farm groundwater irrigation wells. Two groundwater wells are used for residential domestic purposes. Flood and furrow irrigation methods are used to distribute fresh irrigation water and wastewater (manure) mix to cropped fields. This existing irrigation system would continue to be used to mix and apply wastewater in the future. Land application fields receiving manure wastewater have been graded and developed with tailwater return systems to circulate irrigation water across the project site, maintain wastewater on individual application fields, or return tailwater to the wastewater storage ponds.

### **10.2.2 GEOLOGY**

#### **REGIONAL GEOLOGY**

The Central Valley is composed primarily of alluvial deposits from erosion of the Sierra Nevada located to the east and the Coastal Ranges located to the west. In addition to the alluvial deposits that comprise the majority of the geology within the Central Valley, lacustrine<sup>8</sup> and marsh deposits also exist. Lacustrine deposits are composed of fine-grained material (clay and silt interbedded with sands and conglomerates) and were formed during a time when lakes and marshes existed within the Valley. Geologic units located east of the San Joaquin River (the location of the Oliveira Dairy Expansion project) consist of the Modesto and Riverbank Formations, Laguna Formation, Merhten Formation, Valley Springs Formation, Ione Formation and alluvium. These Formations are characterized by silica-rich intermixed clay, silt, sand and gravel deposits derived from the granitic Sierra Nevada Mountains.

#### **SITE SPECIFIC SOILS AND GEOLOGY**

Predominant soils underlying the project site as classified by the Natural Resources Conservation Service (NRCS) consist primarily of the Landlow silty clay loam, the Lewis silty clay loam, and the Burchell silty clay loam soil types. The predominant soil types underlying the site and application fields are derived from granitic sourced alluvium. Near surface geology at the project site consists of Modesto Formation.

Logs have been collected for DWR wells within one mile of the site and application fields. A total of 140 wells logs from Merced County were available for review. The average depth for wells drilled in

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<sup>8</sup> Lacustrine means "of a lake" or "relating to a lake."

the area was approximately 200 feet below ground surface (bgs). Select well logs were used to create a southwest-northeast trending cross section through the project area (see Appendix K, Figure 3 for the cross section locations, and Figure 4 for the hydrogeologic cross sections). The cross section indicates that clay and sand beds generally dominate the near surface geology in proximity to the facility. Sand beds, generally greater than 30 feet thick, were identified below 100 feet bgs.

Continuous clay deposits from 20 feet to 60 feet in thickness are found from near surface to depths of over 100 feet bgs. Continuous clay deposits from 10 feet to greater than 150 feet in thickness are found from near surface to depths of over 100 feet bgs.

### **10.2.3 HYDROGEOLOGY**

#### **REGIONAL HYDROGEOLOGY**

Regional groundwater in Merced County is composed of four subbasins of the San Joaquin Hydrologic Region: the Turlock, the Merced, the Chowchilla, and the Delta-Mendota. The project site lies within the Merced Subbasin. Each of the subbasins is split into the following three different water bodies depending upon depth and geology: an unconfined aquifer, a semi-confined aquifer, and a confined aquifer. Differentiation between the unconfined, semi-confined, and confined aquifers is due to existence of Corcoran Clay within the Tulare Formation. Groundwater is unconfined or perched above the Corcoran Clay and semi-confined to confined below the Corcoran Clay.

#### **SITE SPECIFIC HYDROGEOLOGY**

The hydrogeologic cross-sections depict the interbedded nature of the subsurface sediments (see Figure 4 in Appendix K). Water supply wells in the area have an average well depth of 200 feet bgs, but range from less than 100 to 575 feet bgs. Due to the presence of continuous clay layers near surface, limited perched groundwater conditions may exist at near surface depths. Significant continuous sand units greater than 20 feet and up to 60 feet thick were identified below 100 feet bgs. Continuous clay deposits from 10 feet to greater than 150 feet in thickness are found from near surface to depths of over 100 feet bgs.

Area knowledge and DWR hydrographs indicate that groundwater may exist within 20 to 30 feet bgs. First encountered groundwater is anticipated to be found in unconfined aquifers within laterally extensive sand units, or as isolated perched units. DWR hydrographs for nearby wells show generally stable water level trends historically, except from 2014 to 2016 (see Figure 5 in Appendix K). The drought conditions of 2014 through 2016 resulted in generally lower groundwater levels, though the effect was heavily offset by proximity to the San Joaquin River. Groundwater elevations have varied from approximately 72 to 135 feet MSL for the area wells.

Groundwater flow in the Merced Subbasin within the project vicinity is generally to the southwest, towards the San Joaquin River. In general, groundwater depths are shallowest near the San Joaquin River, and increase away from the river as surface elevation increases. Regional groundwater contour maps for data collected in fall 2017 and spring 2018 indicate that depth to groundwater in the vicinity of the project area range from 20 to 40 feet bgs (see Figures 6 and 7 in Appendix K). Groundwater elevation in the project vicinity ranges from 20 to 110 feet MSL.

Project area groundwater beneficial use is for domestic and irrigation purposes. Field crops and several dairies are present in the project vicinity. Domestic water at the project site is supplied by

existing on-site wells. Similar to existing conditions, the proposed project would continue to use surface water from the Merced Irrigation District and supplemental groundwater for irrigation at the dairy.

#### **10.2.4 EXISTING WATER QUALITY**

Water quality data collected as required by the General Order for Existing Milk Cow Dairies was available from July 2015 through November 2017 on a variable basis for one on-site domestic well and two irrigation wells. One primary maximum contaminant level (MCL) exceedance was reported for nitrate (10 mg/L standard) and several secondary MCL exceedances were reported for total dissolved solids (500 mg/L standard) in the Heifers irrigation well (IW). For a complete table of all water quality parameters tested, see Table 1 in Appendix K, *Hydrogeologic Assessment for CEQA for the Oliveira Dairy Expansion*.

#### **10.2.5 FLOODING**

The Flood Insurance Rate Maps from FEMA show that the dairy site and application fields are located within Zone A. Areas within the FEMA designation Zone A are defined as areas that would be inundated by a 100-year flood, but for which no base flood elevations (BFE) have been established.

A flood protection report for the dairy was prepared by Sousa Engineering as part of the WMP (dated 2018). The study determined the base flood elevation to be between 136 and 137.5 feet MSL. Additional analysis determined that approximately 70 percent of the dairy facilities have been constructed to 136.7 feet MSL or higher. The remaining 30 percent of the facilities would be subject to inundation levels of 1-2 feet based on estimated 100-yr BFEs. These areas include feed storage areas, about 10 percent of the corral area, and wastewater storage basins.

#### **10.2.6 PATHOGENS, ANTIBIOTICS, PESTICIDES, AND HORMONES IN MANURE**

The potential for pathogens, antibiotics, pesticides, and hormone transport in manure was evaluated in the ACO EIR. The discussion below provides a summary and update of the analysis contained in the ACO EIR.

##### **PATHOGENS**

Animal agriculture, such as dairies, results in the production of copious amounts of manure. On a per weight basis, livestock animals produce from 13 to 25 times more manure than humans. This manure is ultimately used as fertilizer for crops, either through the application of dairy wastewater or the incorporation of solid manure onto cropland (either on site or by trucking dry manure off site). Animal wastes contain zoonotic pathogens, which are viruses, bacteria, and parasites of animal origin that cause disease in humans. Diseases that can be caused by zoonotic pathogens include Salmonellosis, Tuberculosis, Leptospirosis, infantile diarrheal disease, Q-Fever, Trichinosis, Cryptosporidiosis, and Giardiasis. Health effects generally include mild diarrhea, fever, headaches, vomiting, and muscle cramps. In more severe cases, however, these diseases may cause meningitis, hepatitis, reactive arthritis, mental retardation, miscarriages, and even death, particularly in the immunocompromised. (EPA 2005)

Human infection from zoonotic pathogens occurs through various routes, including contaminated air, contact with livestock animals or their waste, swimming in water impacted by animal feces, exposure to potential vectors (such as flies, mosquitoes, water fowl, and rodents), or consumption of food or water contaminated by animal wastes. Regulatory limits on the concentrations of pathogens in the environment protective of human health have not been established. Based on epidemiological evidence, the fecal indicator bacteria *E. coli* and enterococci provide the basis for local, state, and federal water quality regulations. (EPA 2005; LPE Learning Center 2015)

In general, agricultural soils tend to create relatively effective barriers by filtering pathogens/parasites from percolating water, thereby minimizing groundwater contamination. Important exceptions are sandy or rocky soils, which generally allow for greater infiltration of organisms through the soil profile than heavier soils. Movement of bacteria and viruses increases in saturated soils, and percolating water can provide a mechanism for downward movement. Additionally, plant roots tend to increase the movement of bacteria through soil (USDA 2000). Finally, improper installation of wells can allow for direct contamination of groundwater via the leaching of organisms along the well casing.

The survival of pathogens in manure varies by pathogen, environment, and temperature. It has been reported that *Cryptosporidium* oocysts<sup>9</sup> can survive up to two weeks in surface water. Other research reports have shown that *E. coli* can survive 84 days in manure. Generally speaking, microbial survival is lowest during times when the temperatures are high, sunlight is present, and the environment is dry. There may be higher proliferation of pathogens in manure slurry than dry manure (EPA 2005). Further, organisms are known to survive longer in the anaerobic state than in aeration. This is most likely because the generation of heat from bacterial breakdown of organic material in aerated material is sufficient to shorten bacterial life spans. (USDA 2000)

Several options are available for treatment of manure transferred from animal operations to minimize the presence of pathogens. These options include aerobic lagoons, anaerobic lagoons, controlled anaerobic digestion for methane, composting, and constructed wetlands. Pathogens can also be managed by cleaning pens regularly and keeping them dry (Augustin et al 2011). Therefore, good pathogen practice, such as cleaning clothing after working or visiting a dairy facility, tracking visitor activity, and cleaning, adequately drying, and disinfecting manure handling equipment can greatly reduce hazards related to pathogen outbreaks (Augustin et al 2011).

## **ANTIBIOTICS**

Antibiotics are used in animal feeding operations and may appear in animal wastes. The practice of feeding antibiotics to poultry, swine, and cattle evolved from the 1949 discovery that the application of very low levels of antibiotics usually improved animal growth and development. The primary mechanisms of the elimination of antibiotics in animals are in the discharge of urine and bile. Essentially all of an antibiotic administered is eventually excreted, whether unchanged or in metabolite form. Little information is available regarding the concentrations of antibiotics in animal wastes, or on their fate and transport in the environment (EPA 2013; EPA 2018).

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<sup>9</sup> *Cryptosporidium* is a protozoan parasite that causes a parasitic disease that affects the intestines. The parasite is transported in an oocyst, an environmentally hardy microbial cyst.

The industrialization of livestock production and the widespread use of non-therapeutic antibiotics has intensified the risk for the emergence of new, more virulent, or more resistant microorganisms. These have reduced the effectiveness of several classes of antibiotics for treating infections in both humans and livestock. A report issued by the U.S. Centers for Disease Control and Prevention states that “up to half of antibiotic use in humans and much of antibiotic use in animals is unnecessary and inappropriate and makes everyone less safe” (CDC 2013). However, microbial risk assessment is an evolving discipline. Methods have not been developed for estimating risks associated with more than one antibiotic and one bacterium at a time (Gilchrist et. al. 2007).

The Food and Drug Administration issued guidance in April 2012 that seeks to stop farmers and ranchers from feeding antibiotics to cattle, pigs, chickens and other animals simply to help the animals grow larger. Under a voluntary initiative, farmers and ranchers will need a prescription from a veterinarian before using antibiotics in farm animals. The guidance is also asking drug makers to change the labels that detail how a drug can be used so they would not allow farmers from using the medicine to promote growth (USFDA 2013).

Dairies administer significantly less antibiotics proportionally per animal than other animal confinement facilities since most antibiotics are prohibited for use with lactating cows (Watanabe, et. al. 2010). Antibiotics are often only used to treat sick animals and are not routinely administered, though some dairies may administer antibiotics to calves, heifers, and dry cows. Animals being treated with antibiotics are removed from the milking herd and isolated until treatment is completed. Waste milk from animals treated with antibiotics is commonly fed to calves. Additionally, waste from animals being treated with antibiotics is typically managed within the normal waste stream of a dairy. Therefore, environmental pathways that may allow antibiotics to be transported into groundwater include leakage from wastewater lagoons, leaching of manure applied to fields, and leaching from animal housing areas (Watanabe, et. al. 2010).

A study completed by University of California, Davis researchers investigated the use and occurrence of antibiotics in dairy confined animal feeding operations and their potential transport into first-encountered groundwater. The July 2010 study found that antibiotics were detected ubiquitously at the surface and in the waste stream of the dairy, but generally degraded in the top layers of soils. Even after decades of use, the study indicated that antibiotics are not generally transported in groundwater beyond the boundaries of the farms. Overall, the detection of several antibiotics in soil samples indicates that different antibiotic types move differently through the subsurface environment, and therefore all production areas of dairies could be considered a potential source of antibiotics in shallow groundwater. The study also suggested that proper dilution of lagoon water with irrigation water and controlling the loading rate of wastewater to cropped fields could promote degradation and sorption<sup>10</sup>, and thereby attenuate the movement of certain types of antibiotics in the environment. The results of the study suggests that intensive sampling campaigns are necessary to properly evaluate animal farms as sources of antibiotics, and further studies would be required to determine specific best management practices for improved antibiotic attenuation. (Watanabe, et. al. 2010)

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<sup>10</sup> Sorption is the process by which one substance becomes attached to another.

## **PESTICIDES AND HORMONES**

Pesticides and hormones are compounds that are used in animal feeding operations and can be expected to appear in animal wastes. Both of these types of pollutants have been linked with endocrine (hormonal) disruption in humans and animals. Pesticides are applied to livestock to suppress houseflies and other pests, and are often used in the production of livestock feed. Little information is available regarding the concentrations of these compounds in animal wastes, or their fate/transport behavior and bioavailability in waste-amended soils (EPA 2018).

Specific hormones are used to increase productivity in the beef and dairy industries. Several studies have shown that hormones are present in animal manures in situations where hormones are fed or applied to animals. Most studies to date have evaluated poultry manure, which has been shown to contain both estrogen and testosterone. Runoff from fields with land-applied manure has been reported to contain estrogens, estradiol, progesterone, and testosterone, as well as their synthetic counterparts.

Recombinant Bovine Growth Hormone (rBGH or also known as Bovine Somatotropin or BST) is a genetically engineered copy of a naturally occurring hormone produced by cows. This hormone is used by some milk producers. The purpose of rBGH is to enable cows to produce more milk than they naturally produce. The hormone is destroyed in the cow's gut. The hormone is approved by the Federal Food and Drug Administration. This hormone is not used at the Oliveira Dairy operations, nor would it be used with implementation of the dairy expansion project.

## **TRACE MINERALS**

Trace mineral supplements are generally provided in the daily feed for the dairy herd and are essential for common biological processes. As evaluated in the EIR for the Merced County Animal Confinement Ordinance (Merced County 2002), approximately 90 to 95 percent of dairies in Merced County use feed additives for selenium (and other trace metals) because feed in Merced County is lacking in selenium. Trace minerals can improve herd health and efficiency, as research has shown that minerals can improve fertility, decrease infections, prevent lameness, and increase milk production. In most cases, trace elements are only partially absorbed by the cow, and some of the elements are excreted in the manure or urine. Through the application of wastewater and dry manure to cropland, trace minerals can accumulate in the soil.

Water contamination and plant toxicity are common detriments associated with a high concentration of metals. Most environmental concerns are focused on the over-application of nitrogen and phosphorous. However, other elements, currently not regulated in dairy manure, are routinely overfed, or have low absorption efficiency and may be excreted in large quantities in animal manure (Brock et. al. 2006). Several studies have identified copper and zinc as a concern since they are frequent minerals used on the dairy herd and could accumulate in manure-amended fields. A reduced yield has been documented for various types of grasses and corn after application of copper to the soil (Flis et. al. 2006).

Possible strategies for minimizing excess minerals in the manure would be reducing the total amount of minerals in the ration or improving the efficiency of animal mineral use (using more bioavailable supplements). The National Research Council (NRC) requirements for dietary minerals have been found to be adequate for dairy cattle health, and any additional increase beyond NRC requirements

in the diet is unnecessary (Brock et. al. 2006). The results from several studies suggest that reduction in the concentration of dietary minerals is potentially the most efficient way of reducing overall excretions and whole-farm surpluses of these minerals. Further, minerals in the water may affect excretion of them from the cows, and at some dairies, controlling water contributions when formulating animal diets could reduce the amount of minerals in manure and overall land application (Castillo et. al. 2007).

## 10.3 ENVIRONMENTAL EFFECTS

### 10.3.1 SIGNIFICANCE CRITERIA

As set forth in Appendix G to the State CEQA Guidelines, Section X, *Hydrology and Water Quality*, and Section VII, *Geology and Soils*, the following criteria have been established to quantify the impact of an adverse effect for evaluation pursuant to CEQA. A project would normally result in a significant impact if the project would:

- Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality. (X.a)
- Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin. (X.b)
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:
  - result in substantial erosion or siltation on- or off-site; (X.c.i)
  - substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite; (X.c.ii)
  - 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; (X.c.iii)
  - or impede or redirect flood flows. (X.c.iv)
- Result in substantial soil erosion or loss of topsoil. (VII.b)
- In flood hazard zones, risk release of pollutants due to project inundation. (X.d)
- Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan. (X.e)
- Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of waste water. (VII.e)

Additional hydrology and water quality assessment criteria previously evaluated in the project IS/NOP include whether the project would:

- In tsunami or seiche zones, risk release of pollutants due to project inundation. (X.d)

This impact was found to be less than significant in the IS/NOP (see Appendix A), therefore, it will not be evaluated further in this chapter.

## 10.3.2 ENVIRONMENTAL IMPACTS

### PROPOSED PROJECT OPERATIONS AND NMP AND WMP SUMMARY

The project applicant has prepared a proposed NMP/WMP, both dated September 2018, as required by the CVRWQCB General Order for Existing Milk Cow Dairies. A professional engineer registered in the State of California and a Certified Crop Advisor completed the required elements of the NMP/WMP. The NMP and WMP for the existing dairy operations, both dated August 2016, were used to establish a baseline of existing conditions.

The existing facility consists of freestall barns and open corrals, shade structures, feed storage area, maternity barn, milking parlor, three wastewater storage ponds, commodity barn, manure storage area, and a hay barn. Animal wastes from feed alleys and other concrete-surfaced areas are flushed with recycled water and scraped to an on-site waste management system that consists of one settling basin and two wastewater storage ponds. Solid manure within pen areas is scraped approximately three times per year and removed from the site as material accumulates. Currently, approximately 3,800 tons of solid manure is exported or applied to off-site fields not owned by Oliveira Dairy. As shown in Table 3-3 of Chapter 3, *Project Description*, existing herd numbers at the Oliveira Dairy include 2,218 cows, which would increase to 4,400 cows with the proposed expansion.

Wastewater is mixed with irrigation water, supplied via MID canals or three dairy farm groundwater irrigation wells, and applied to cropland. Stormwater runoff from impervious surfaces is routed to the wastewater ponds. Stormwater from all roofed areas is routed to a nearby field, except for stormwater from the commodity barn roof, which is routed to a wastewater pond. Receiving fields are graded to guide excess applied wastewater to an existing tailwater return or retention system. Most collected tailwater is retained by berms, and for the Pump Field tailwater is returned to the storage pond.

The proposed expansion would include construction of supporting buildings and structures, including two new shade barns, approximately 30,000 square feet each; two additional freestall barns, approximately 52,500 square feet and 72,500 square feet; and a new milking parlor, approximately 30,000 square feet. The existing commodity barn would be relocated to the southern area of the site. The existing milking parlor and three residences, totaling 6,400 square feet, would be removed. With construction of the proposed facilities, approximately seven acres of existing cropped acreage would be converted to dairy facilities. Stormwater runoff from impervious areas would continue to be directed to the wastewater management system. Stormwater runoff from roofed areas would continue to be routed to the wastewater pond or an adjacent field.

The existing liquid waste management system consists of one settling pond, two wastewater storage ponds, and pipelines and irrigation facilities to apply the wastewater to cropland. Animal wastes from barns and other concrete-surfaced areas of the facility would continue to be flushed to the on-site waste management system, except for solid manure within corral areas, which would continue to be scraped. Liquid manure would continue to be directed to the settling pond and then treated in the wastewater storage ponds.

With the proposed dairy expansion, dry manure would continue to be stockpiled on site at the existing dry manure storage area. Dry manure would be used for bedding or sold and hauled off site weekly for use as fertilizer and soil amendments. As reported in the NMP, exported solid manure

applied to off-site agricultural fields not owned by the project applicant would increase from 3,800 tons (currently) to 7,500 tons with the proposed expansion. In addition, 6,000,000 gallons of wastewater slurry would be exported from the facility and applied to adjacent off-site agricultural fields not owned by the project applicant<sup>11</sup>. While the exact location of these off-site cropland parcels may vary throughout operations, the disposal of manure at off-site locations and the acreage necessary to properly dispose of manure liquids and solids are accounted for in the project NMP.

According to the General Order, nitrogen application rates shall not result in total nitrogen applied to the land application areas exceeding 1.4 times the nitrogen that will be removed from the field in the harvested portion of the crop, unless plant tissue sampling identifies a need to increase fertilizer application of a specific crop. The whole farm nitrogen balance is a ratio that reflects the total nitrogen generated by the operation minus losses and exports, divided by the nitrogen removed by crops. The

General Order requires that if the whole farm nitrogen balance is greater than 1.65, a review must be made of nitrogen inputs and outputs at the facility to identify how to reduce inputs to meet the standard.

$\text{field nutrient balance ratio (applied to removed)} = \frac{\text{nitrogen applied (from irrigation/fertilizer/manure)}}{\text{total N removed by crops}}$ $\text{whole farm nitrogen balance} = \frac{(\text{N stored} + \text{N imported} + \text{atmospheric N} - \text{N exported})}{\text{total N removed by crops}}$
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Under existing conditions as reported in the August 2016 NMP, total annual gross nitrogen generated by the facility is approximately 471,812.5 pounds/year. Nitrogen exports currently total 154,547.5 pounds/year. After ammonia losses, existing operations reflect a whole farm nitrogen balance ratio of 1.65. The applied to removal nitrogen ratio is 1.4, which equals but does not exceed the recommended maximum field by field nutrient balance of 1.4.

With implementation of the proposed expansion as reported by the September 2018 proposed conditions NMP, total annual gross nitrogen generated by the facility would increase to 1,001,769.5 pounds/year. A total of 518,326.2 pounds/year of nitrogen would be removed through nitrogen exports as solid manure (7,000 tons of solid manure would be exported per year from the dairy facility, approximately 90 percent of previously separated solids). After ammonia losses, the whole farm balance ratio would be 1.38. The applied to removal nitrogen ratio would decrease to 1.39. The net volume of nitrogen exported would increase by approximately 363,778.7 pounds/year over existing conditions and reduce the whole farm nitrogen value.

Based on a normal precipitation year, there are currently 57,223 gallons per day of wastewater (approximately 21 million gallons per year) generated by the existing dairy herd. The proposed expanded dairy would generate approximately 69,288 gallons/day of wastewater (approximately 25 million gallons/year). There would be a 4 million gallon per year increase in wastewater generated with the proposed dairy expansion. This increase in water use is related to an increase in milk cows per string, pipeline wash water and milkbarn/parlor wash water. Wastewater generated by plate

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<sup>11</sup> A pipeline to transport the wastewater has been previously installed by the project applicant. The ACO requires written agreements between the owner of the animal confinement facility and property owner received the wastewater.

coolers is anticipated to be reduced substantially between the existing conditions and proposed expansion, from 17,300 gallons/day to none, due to change in plate coolers type from existing well water cooled to mechanically/air cooled. Sprinkler pen wastewater is anticipated to reduce slightly between the existing conditions and proposed expansion. Recycled water use is anticipated to increase under the proposed conditions. Wastewater would be mixed with irrigation water and applied to crops.

The irrigation water demand of the existing farming operations is estimated by multiplying the croppable acres by the estimated average irrigation demand per acre, depending on crop type. The existing NMP estimates an irrigation demand of over 4 feet of water for cropped oat and corn silage. As reported in the existing conditions NMP, there are approximately 249 acres currently double-cropped with oats silage – soft dough and corn silage, for a total irrigation demand of approximately 1,141.0 acre-feet, or 3.7 billion gallons of water. Note that under proposed conditions, total land application area would be slightly adjusted from 249 acres to 242 acres. The cropping pattern would also be adjusted slightly on all fields to include the planting of sudangrass, silage in the middle of September and harvesting in early November. The proposed NMP estimates an irrigation demand of over 6 feet of water for cropped oat, corn, and sudangrass silage. As reported in the proposed conditions NMP, there are approximately 242 acres proposed to be triple-cropped with oats silage – soft dough, corn silage, and sudangrass silage, for a total irrigation demand of approximately 1,488.3 acre-feet, or 4.8 billion gallons of water.

For the proposed conditions, the estimated wastewater component of the total irrigation demand is estimated to be 5 percent of total water volume, not accounting for pond evaporation and evapotranspiration. The estimated wastewater component was determined by calculating the percentage of total irrigation demand, 4.8 billion gallons, provided by the wastewater generated per year, in this case 25 million gallons per year.

In summary, the proposed NMP/WMP establishes the following required facility improvements for the herd and potential areas of sensitivity under the proposed expansion<sup>12</sup>:

- Proposed nutrient application rates would meet required agronomic rates of 1.4 or less for best management farming practice mandated by the CVRWQCB. The applied to removal nitrogen ratio would be 1.39 under proposed conditions. With exported solid manure and evaporative losses under proposed conditions, the nitrogen whole farm balance ratio would be 1.38.
- The recommended amount of salt applied to cropland will be provided in the future versions of the approved NMP for the dairy.
- The 8,121,772 gallons of storage capacity for the existing treatment and wastewater pond would be sufficient to permit storage of wastewater generated by the facility for a 120-day cycle during normal precipitation periods and 1.5 times the normal precipitation periods. Under proposed conditions, no change in the pond sizes is planned. Pond freeboard capacity is used to address 100-year storm events. Pond construction information was not available for review. Based on permitting information identified in the IS/NOP, the dairy lagoons were likely constructed in the mid-1970s.

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<sup>12</sup> These standards and improvements do not address potential environmental effects from the proposed expansion. For an evaluation of these effects and required additional mitigation, see Impacts HYD-1 through HYD-8 in this chapter.

- A tailwater return system, composed of berms, piping, sumps, and pumps, is used to prevent the movement of water off site and allow the recycling of applied wastewater.
- Rainwater would not be separated and would be co-mingled with on-site wastewater. Stormwater runoff from impervious areas would continue to be directed to the wastewater management system, except for some roofed areas where stormwater is directed to adjacent fields.
- The site is located in the Federal Emergency Management Agency (FEMA 2008) Zone A. Zone A is an area determined to be subject to inundation by the 100-year flood event. A Base Flood Elevation was determined to be between 136 and 137.5 feet. Approximately 30 percent of the existing dairy production area would be subject to inundation levels of 1-2 feet based on estimated 100-year base flood elevations.
- With construction of the proposed facilities, approximately seven acres of cropped acreage would be converted to active dairy facilities. This leaves 81 acres of the fields receiving only solid manure and 161 acres of the fields receiving both wastewater and solid manure. All four fields would be cropped in oats silage-soft dough, corn silage, and sudangrass silage. Future crops could vary from those discussed above as long as nitrogen balance requirements are met. Additional off-site fields not owned by the dairy operator would receive solid manure and wastewater for use as a soil amendment or fertilizer.

The NMP demonstrates that the proposed dairy facility would, after off-site disposal of solid wastes, comply with the nitrogen loading groundwater protection requirements of the CVRWQCB and the Merced County ACO. The NMP shows the whole farm balance would be reduced to 1.38 with the proposed expansion, and that the whole farm balance ratio would remain below the regulatory limit of 1.65.

***Impact HYD-1: Degradation of water quality due to storm water runoff during project construction (Criteria X.c.i, VII.b)***

Construction of the proposed project could result in the erosion of on-site soils or the loss of topsoil, which could cause degradation of water quality in waterways draining the site by reducing the quality of storm water runoff during project construction. This would be a significant impact.

The proposed facilities would be constructed either within the existing facility footprint or within seven acres of existing cropland adjacent to existing facilities. A decrease of seven acres of cropland would occur with the construction. Storm water runoff during the construction period could result in the siltation and sedimentation of waterways draining the site, or in the transport of pollutants used during construction.

Construction activities disturbing one or more acres are required by the State Water Resources Control Board (SWRCB) to obtain a Construction General Permit (Order 2009-0009-DWQ). This Construction General Permit provides a risk-based approach to managing stormwater discharge. The Construction General Permit has three risk level categories based on sedimentation risk and receiving water risk. Each risk category has specific Best Management Practices (BMP) that must be implemented with specific monitoring, sampling, and reporting requirements. The Construction General Permit also sets specific numeric action levels (NAL) for pH and turbidity.

The Construction General Permit requires a Storm Water Pollution Prevention Plan (SWPPP) and a Rain Event Action Plan (REAP) to be developed by the discharger, who must implement these plans – and also comply with specific requirements of the Construction General Permit. The SWPPP must list any BMPs that the discharger will use to protect storm water runoff, and define the placement of identified BMPs. Additionally, the SWPPP must contain: a visual monitoring program; a chemical monitoring program for “non-visible” pollutants to be implemented if there is a failure of BMPs; and a sediment monitoring plan.

Although compliance with the RWQCB’s Construction General Permit and its requirement that a SWPPP be prepared and implemented would reduce potential effects from storm water runoff, to ensure implementation of storm water regulatory requirements and coordination with standard County building review processes to reduce the potential water quality impacts during construction, the following mitigation measure would be required.

**Significance of Impact:** Significant.

**Mitigation Measure HYD-1:**

The project applicant shall submit Permit Registration Documents (PRD) for the Construction General Permit Order 2009-0009-DWQ to the State Water Resources Control Board, and comply with, and implement, all requirements of the permit. A Legally Responsible Person (LRP) shall electronically submit PRDs prior to commencement of construction activities in the Storm Water Multi-Application Report Tracking System. PRDs consist of the Notice of Intent, Risk Assessment, Post-Construction Calculations, a Site Map, the Storm Water Pollution Prevention Plan (SWPPP), a signed certification statement by the LRP, and the first annual fee. Following submittal of a Notice of Intent package and development of a SWPPP in accordance with the Construction General Permit, the applicant will receive a Waste Discharge Identification Number from the SWRCB. All requirements of the site-specific SWPPP, including any revisions, shall be included in construction documents and must be available on site for the duration of the project. Proof of registration shall be submitted to the Merced County Building Department prior to the initiation of construction.

**Potential Environmental Effects of Measure:** All physical improvements or activities that could result in changes to the physical environment required by this measure would be located within the project site. The impacts of implementing such measures, if any, would be similar to those identified for the project in Chapters 5-11 of this EIR.

**Significance after Mitigation:** Project compliance with State Water Resources Control Board regulations to avoid siltation effects would reduce this impact to less than significant.

**Implementation/Monitoring:** Implementation of the mitigation measure would be the responsibility of the project applicant. The Merced County Building Department and the SWQCB shall monitor for compliance. Implementation of HYD-1 shall occur prior to and during construction.

***Impact HYD-2: Degradation of surface water quality from operation of the Oliveira Dairy Expansion (Criterion X.a)***

The project would not result in the degradation of surface water quality during project operations. Crop fields associated with the existing and proposed expansion of the dairy are developed with an existing tailwater return system. Wastewater is applied, and would continue to be applied, in accordance with ACO and CVRWQCB requirements. This would be a less-than-significant impact.

As noted on USGS topographic maps, South Slough, a tributary of Bear Creek, is located less than 0.25 miles north of the dairy site. The Bailey Lateral 'A' of MID borders the north of the site, on the south side of Oak Avenue. The Deane Canal of MID flows directly through the project area along Gurr Road. Thornton Lateral of MID borders New Field on the north.

There is an existing irrigation system that consists of a surface flood system and broadcast spreading/incorporation system coupled with tailwater retention and return. The tailwater return system, composed of berms, piping, sumps and a pump system to return excess irrigation water to the waste storage pond or to the top of the field for reapplication, is used to prevent the movement of water off site and allow the recycling of applied wastewater. The existing, extensive field ditch and berm system with tailwater return has been used to minimize irrigation water use and subsequently minimize the potential for runoff.

As required by the General Order WDRs, the dairy operator must document compliance with provisions to prevent backflow or direct discharge of wastewater to surface water resources. Locations of cross-connections with wastewater and surface water must be identified, along with how backflow can or does occur at each location, and any current backflow preventive measures. No surface water connections for irrigation are known to exist at the site at this time. Backflow prevention and documentation (dated February 2016) for the site has been completed in compliance with the General Order, and identified no locations where backflow can occur.

With regular inspection and water testing requirements, ongoing maintenance would occur for the wastewater application system and tailwater return system to ensure the systems are working properly. The continued use of good farming practices and application of wastewater at agronomic rates detailed in the NMP and as required by the ACO and the individual WDRs would minimize potential impacts to surface water. Due to the extensive tailwater return system, the BMPs for liquid and solid manure application, and backflow prevention compliant with General Order requirements, no surface water discharge from these manured areas is anticipated, and no adverse impacts to surface water would occur as a result of the proposed dairy expansion. This would be a less-than-significant impact.

**Significance of Impact:** Less than significant.

**Mitigation Measure HYD-2:** None required.

***Impact HYD-3: Groundwater contamination from operation of the Oliveira Dairy Expansion (Criterion X.a)***

Expanded operations at the Oliveira Dairy could result in degradation of groundwater resources. This would be a significant impact.

The proposed dairy expansion has the potential to impact the underlying groundwater quality with nutrients, salts, and other compounds. Based on the existing water quality data collection required by the General Order, elevated concentrations of nitrate as N and TDS have been observed (see Table 1 of Appendix K for water quality data). Area water quality reported by the DWR indicated elevated levels for Nitrate above the MCL, especially noted for the City of Merced. Due to the proposed expansion of project operations and the existing elevated nitrate and TDS levels found in groundwater under the project site and in the greater project area, additional or increased impacts would be possible. Sources of potential additional contamination from the expanded dairy are discussed below.

***Areas of Potential Groundwater Contamination from Waste Storage and Application on the Dairy***

The Oliveira Dairy Expansion project would concentrate animals and their wastes within the feeding areas, and to a lesser degree, within open corrals. Concrete lined feed lanes would flush wastes to the on-site wastewater management system for treatment and storage in ponds as referenced in the existing WMP.

**Existing Wastewater Storage and Treatment Ponds.** The treatment and storage ponds receive wastewater as described in the project NMP/WMP. Pond construction information was not available for review, though based on permitting history, the ponds were likely constructed in the mid-1970s. According to the project applicant, the ponds are earthen embankment structures constructed to the standards in place at that time. Following solids removal and additional settling in the storage pond, the wastewater with dissolved constituents would be stored in the treatment pond for later application in irrigation water to crops. All basin structures would continue to be subject to regular maintenance.

The existing dairy wastewater ponds have the potential to impact groundwater because they contain elevated concentrations of inorganic and organic constituents, and because hydraulic pressure and gravity force liquids downward through soils to groundwater. The flux of liquid through the base of the existing ponds has been estimated based on the soil permeability at the base of the ponds (estimated as  $10^{-6}$  centimeters per second or 1 foot per year). Based on the combined existing pond sizes of 195,000 square feet, the total leakage through the base of the ponds is estimated at 14 million gallons per year. Because there would be no change in pond capacity with the proposed dairy expansion, the pond leakage would remain the same as currently exists.

**Corrals and Freestalls.** The dairy expansion would continue to use open-air, concrete-lined feed lanes which are roofed (freestalls), where animals are fed and watered, and waste is collected. Outside of the feed lanes, cows are allowed to roam in uncovered areas where manure is collected three times per year, which minimizes the potential impact. Liquid discharge from corrals is minimal.

There is an existing heifer facility on Buhach Field, west of the main production area, which would be eliminated with the proposed dairy expansion. Animals currently housed at the heifer facility would be transferred to the main dairy production area to be housed in proposed new structures. For the permanent closure of an animal confinement facility, Chapter 18.48.050 R requires DEH to review and approve specific collection of soil samples from underneath existing corral areas to be abandoned after all liquid and solid manure has been removed.

**Crop Fields.** Dry and liquid manure are used to fertilize dairy cropland. A tailwater return system, composed of berms, piping, sumps, and a pump system, is used to prevent the movement of water off site and allow the recycling of applied wastewater. A reduction of seven acres in cropland would occur under the proposed expansion as new dairy facilities would be constructed both within the existing facility footprint and in a portion of an adjacent land application field. As indicated by monitoring data by the CVDRMP, crop fields are the primary source of nutrient emissions to groundwater on a dairy. The proposed dairy expansion would result in increased application of irrigation water to cropland due to increased cropping frequency, which may result in an increase potential for groundwater contamination from crop fields.

### *Potential Impacts from Wastewater Constituents*

The proposed operations must comply with the NMP and WMP as proposed by the CVRWQCB to be issued in the individual WDR as follows:

- With implementation of the proposed operations NMP/WMP, field application of manure using the proposed cropping pattern and land application area would maintain a field by field nutrient balance of 1.4 or less, and a whole farm nitrogen balance ratio of 1.65 or less. In order to maintain the nitrogen balance, a net 518,326 lbs/nitrogen would be exported off-site through solid manure. No nitrogen would be imported to the site from commercial fertilizer.
- With implementation of the proposed operations NMP/WMP, the total phosphorus generation would be 162,808 lbs/yr, and the phosphorus crop nutrient removal potential would be 19,521.2 lbs/yr. Approximately 136,777.9 lbs/yr of phosphorus would be exported off site. After losses, the calculated whole farm balance for phosphorus would be 1.33<sup>13</sup>.

Field application of phosphorus, potassium, and salts are calculated and managed under the General Order. Salt tolerance of crops and yield reductions can vary depending on various factors, such as irrigation management, the crop being grown, and the site conditions. While the General Order does not regulate a nutrient balance ratio for phosphorus, potassium, and salts, it does require that if monitoring indicates levels of these elements are causing adverse impacts, then application rates must be adjusted downward to prevent or correct the problem. The intent of regulatory requirements is to implement operational improvements and monitor groundwater quality to assess impacts. Long-term groundwater and soil monitoring would be used to determine the success of the program on a regular basis and determine the need for additional action.

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<sup>13</sup> Because the General Order does not have a phosphorus nutrient balance ratio limit like it does for nitrogen, this data is provided for informational purposes only.

Despite attempts to apply pond wastewater at agronomic rates, groundwater quality beneath crop fields may be impacted above the primary and secondary MCL levels already observed for nitrates and TDS (MCL is 10 mg/L for nitrate as N and 500 mg/L for TDS). As discussed above, the CVDRMP monitoring has found that shallow groundwater has been affected across the Central Valley due to historic or current dairy operations, especially beneath cropland. The NMP allows application of nitrogen at greater rates than the plant crops actually need, with a maximum of 1.4 times crop uptake. Additionally, imprecision and inefficiencies in wastewater application and variations in weather both can influence plant growth, and, thus, the uptake of nitrogen. For these reasons, over-application of nitrogen and other nutrients could occur. Also, applying manure with high organic nitrogen content may not meet a crop's nitrogen need during the most rapid growth stage, while exceeding the crop nitrogen uptake during the remainder of the crop's growing season, when the nitrogen may be subject to leaching (Bradford 2012). The existing on-site monitoring system, including installation and monitoring of groundwater monitoring wells if required, would be used to assess future changes in water quality and to determine if further degradation occurs.

Chapters 18.48.050 D, E, F, G, H, J, K, M, N, O, P, Q, R, T, V, Z, AA, BB, CC, DD, EE, JJ, KK, LL, MM, NN, QQ; 18.48.055 A, B, C.8.d, D, E, F; and 18.48.060 A, D, E, G, H, I, K, L, M, P, Q, S, and T of the ACO apply to this potential effect (see Appendix C). For a discussion of potential secondary impacts of off-site disposal of solid manure from the project, see Impact HYD-8 below.

The proposed project as planned would be required to use BMPs, engineering, and design consistent with local and state regulations. Because of the first encountered groundwater conditions have shown some impacts to water quality, the proposed dairy expansion may result in additional groundwater impacts despite operational improvements and BMPs required by the NMP and WMP. The proposed dairy expansion would be required to obtain coverage under Individual WDRs to be issued by the CVRWQCB, which would be more protective than the General Order. To minimize degradation of groundwater, the CVRWQCB should incorporate the following mitigation measures into the individual WDR permit requirements for the Oliveira Dairy Expansion. The following mitigation protocol mirrors CVRWQCB requirements to quantify and evaluate water quality and determine necessary measures to remediate water quality conditions. It includes monitoring of the effectiveness of implemented measures, and modification or addition of measures if water quality problems persist.

**Significance of Impact:** Significant.

### **Mitigation Measure HYD-3a:**

The following Best Management Practices shall be implemented by the Oliveira Dairy:

1. Positive drainage shall be included in project design and construction to ensure that excessive ponding does not occur. The design shall comply with Title 3, Division 2, Chapter 1, Article 22, Section 646.1 of the Food and Agriculture Code for construction and maintenance of dairy or facility surroundings, corrals, and ramps, as described below.
2. Dirt or unpaved corrals, or unpaved lanes, shall not be located closer than 25 feet from the milking barn or closer than 50 feet from the milk house. Corral drainage must be provided.
3. A paved (concrete or equivalent) ramp or corral shall be provided to allow the animals to enter and leave the milking barn. This paved area shall be curbed (minimum of 6 inches high and 6 inches wide) and sloped to a drain. Cow washing areas shall be paved (concrete or equivalent) and sloped to a drain. The perimeter of the area shall be constructed in a manner

that will retain the wash water to a paved drained area. Paved access shall be provided to permanent feed racks, mangers, and water troughs. Water troughs shall be provided with: (1) a drain to carry the water from the corrals; and (2) pavement (concrete or equivalent) which is at least 10 feet wide at the drinking area.

4. The cow standing platform at permanent feed racks shall be paved with concrete or equivalent for at least 10 feet back of the stanchion line.
5. As unpaved areas are cleaned, depressions tend to form, allowing ponding and increased infiltration. Regular maintenance shall include filling of depressions. Personnel shall be taught the correct use of manure collection machines (wheel loaders or elevating scrapers).

**Mitigation Measure HYD-3b:**

The applicant shall comply with requirements of the NMP/WMP, implement CVRWQCB requirements included in the individual WDR provided for the proposed expansion, and meet all Merced County ACO requirements not superseded by the conditions of the individual WDR.

**Mitigation Measure HYD-3c:**

As set forth in the NMP, proposed application rates of liquid and/or solid manure shall not exceed agronomic rates. Nutrient samples shall be collected prior to and during applications periods to confirm agronomic rates within all portions of cropped areas receiving manure, and to protect water supplies. Soil testing frequency for nitrogen, potassium, phosphorus, and salts are described in the NMP. Modifications to the NMP may be required as outlined in the individual WDR for the proposed expansion to be issued by the CVRWQCB.

**Mitigation Measure HYD-3d:**

The CVRWQCB may require an industry-wide or site-specific salinity report to be submitted to the CVRWQCB for review and approval prior to operation or final inspection. The County understands that the salinity report will identify sources of salt in waste generated at the dairy, and evaluate measures that can be taken to minimize salt in the dairy waste. Should a salinity report define measures necessary to reduce salt loading from dairy operations, the owner/operator of the Oliveira Dairy shall implement measures identified to minimize salt in the dairy waste to meet Basin Plan or other CVRWQCB requirements. As specified by the CVRWQCB, necessary measures may be incorporated into the WDR issued for the facility or become a required deliverable of the WDR.

**Mitigation Measure HYD-3e:**

Because the Oliveira Dairy is a member of a Groundwater Monitoring Coalition, no site-specific shallow groundwater monitoring system has been implemented for the Oliveira Dairy. As a condition of the individual WDR issued for the facility, the applicant shall maintain continued membership in the groundwater monitoring network or install a site-specific groundwater monitoring system. The resulting groundwater monitoring objectives for either the regional program or an individual site are intended to be used by the Regional Board to assess and mitigate groundwater impacts.

**Mitigation Measure HYD-3f:**

Groundwater monitoring of the on-site domestic and irrigation wells shall be continued by the dairy operator. If appropriate, surrounding properties with domestic water supply wells within 500 feet of the land application property could be considered for sampling for nitrate and E.C. at a minimum.

An updated well monitoring schedule shall be developed and submitted to the County DEH. The updated well monitoring schedule will be fully incorporated into the WDR issued for the facility.

**Mitigation Measure HYD-3g:**

After project implementation and subsequent groundwater monitoring, if the dairy shows increased concentration in groundwater of constituents of concern, then additional manure exportation, a reduction in herd size, or additional crop acres may be necessary to accommodate the proposed expansion. The project applicant shall clearly demonstrate that the herd size will not constitute a threat to groundwater quality, and the County may alter conditions of the Conditional Use Permit, if necessary. In addition, a new Report of Waste Discharge (ROWD) may be required by the CVRWQCB. If necessary, the CVRWQCB may revise the WDR issued to the facility.

**Mitigation Measure HYD-3h:**

The existing heifer facility on Buhach Field, west of the main production area, shall be closed in accordance with Chapter 18.48.050 R of the ACO. All liquid and dry manure shall be removed from the facility within one hundred twenty (120) days of closure (weather conditions permitting) and soil samples shall be taken to determine the levels of nitrogen in the soil. The specific constituents to be sampled, number of samples, and sample depths, shall be determined by the Division of Environmental Health.

**Mitigation Measure HYD-3i:**

The Department of Community and Economic Development and the Division of Environmental Health shall make a final inspection of the facility prior to the commencement of expanded operations to confirm the dairy meets local and state requirements.

**Potential Environmental Effects of Measure:** All physical improvements or activities that could result in changes to the physical environment required by this measure will be located within the project site. The impacts of implementing such measures, if any, would be similar to those identified for the project in Chapters 5-11 of this EIR.

**Significance after Mitigation:** While the above mitigation measures and any corrective actions deemed essential by the CVRWQCB will allow ongoing monitoring of any operational changes that may impact the nutrient balance on this facility, because the proposed operations would increase solid and liquid manure generated and handled at the facility, and exported for off-site application, and there are existing water quality exceedances on site, potential impacts to groundwater quality would be significant and unavoidable.

**Implementation/Monitoring:** Implementation of these measures would be the responsibility of the project applicant. The Merced County Division of Environmental Health, Department of Community and Economic Development, and the CVRWQCB shall monitor for compliance. Implementation of HYD-3a and HYD-3b shall occur prior to issuance of a building permit and throughout ongoing operations. Implementation of HYD-3c, HYD-3e, HYD-3f, and HYD-3g shall occur throughout ongoing operations. Implementation of HYD-3d shall occur prior to final inspection or initiation of new operations, and throughout ongoing operations. Implementation of HYD-3h shall occur prior to final inspection or initiation of new operations.

***Impact HYD-4: Decrease groundwater supplies (Criterion X.b)***

Implementation of the proposed project may result in the decrease of groundwater supplies since there could be an overall increase of groundwater use with the proposed dairy expansion. However, because the majority of the water would be used for irrigation and would contribute to groundwater recharge, this would be a less-than-significant impact.

Area knowledge and DWR hydrographs indicate that groundwater may exist within sand units above 20 to 30 feet bgs. First encountered groundwater is anticipated to be found in unconfined aquifers within laterally extensive sands units or as isolated perched units. DWR hydrographs for nearby wells depict multi-year groundwater elevation changes (see Figures 6 through 8 of Appendix K). Groundwater depth and elevations have shown generally stable water level trends from 1987 to 2017. Groundwater elevations have varied from approximately 20 to 110 feet MSL.

The Oliveira Dairy Expansion would continue to rely on surface water, groundwater, and wastewater recycling for irrigation. For the entire land application area of the operation, in normal years approximately 20 percent of the irrigation water comes from groundwater. In drought years, as much as 30 percent of the irrigation water might come from groundwater. No new irrigation wells are proposed as part of the dairy expansion project. With implementation of the proposed dairy expansion, the overall acreage for the land application area would decrease by seven acres, and water application to the land application area would increase under proposed conditions. As detailed above, the estimated crop water demand would increase to 4.8 billion gallons under proposed conditions from 3.7 billion gallons under existing conditions.

Currently, the wastewater generated from daily water use from the milkhouse equipment and floor wash at the Oliveira Dairy is 6 million gallons annually. With the proposed expansion, wastewater generated would decrease to 3 million gallons annually due to efficiency of the wash wastewater and milk barn/parlor floor wash volume. The decrease in water use would be directly related to the efficiency of the new milk parlor. This water is sourced from the domestic groundwater well at the milk barn. While there would be a decrease in wastewater generated and overall groundwater use at the milk barn, the change in volume of wastewater would be relatively minor compared to overall dairy water use and continued irrigation of existing cropland.

Groundwater overdraft conditions have been documented as downward but stable during the drought within Merced County and specifically the Merced Groundwater Basin. However, water levels in the vicinity of the site have remained fairly stable over time. Additionally, with the passage of the SGMA legislation, the MIUGSA Groundwater Sustainability Agency (GSA) has notified the Merced Subbasin to prepare the Groundwater Sustainability Plan (GSP) for the area. With implementation of the GSP, as part of the SGMA program, multiple wells will be used in the region to determine groundwater level trends and to monitor for undesirable effects, such as groundwater depletion or subsidence. The Oliveira Dairy, depending on groundwater use, may be required to report groundwater extraction to the GSA as part of the monitoring program. The Oliveira Dairy will be expected to follow the guidelines within the GSP, as applicable, to monitor groundwater depletion.

While the proposed dairy expansion would result in an increase in overall water use, the majority of the water would be used for irrigation, which could result in groundwater recharge via irrigation percolation. Further, the proposed dairy expansion would be subject to the requirements of the GSP for the region, if and when adopted, which would further minimize impacts to groundwater

supplies. Therefore, impacts from a decrease in groundwater supplies from this operation would be considered less than significant.

**Significance of Impact:** Less than significant.

**Mitigation Measure HYD-4:** None required.

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***Impact HYD-5: Modification of surface water drainage patterns and an increase in runoff  
(Criteria X.c.ii, X.c.iii, and X.c.iv)***

Implementation of the proposed dairy expansion project would not modify surface water drainage patterns, and would not cause localized off-site migration of runoff, erosion, and/or flooding since the expansion could require minimal grading over a previously disturbed area. Because all storm water generated by the project would be collected and maintained within the project proponent's larger property, this would be a less than significant impact.

Construction activities are proposed for the expansion project and would result in the conversion of seven acres of cropland to dairy facility footprint. The facility includes an existing irrigation and tailwater return system for the land application areas that minimizes the potential for runoff. Stormwater generated at the project site is collected and routed to the existing on-site ponds, which would continue with project implementation, except for several roofed sections, which would be diverted to adjacent dairy-owned crop fields. Because stormwater generated by the project would be collected and maintained within the project proponent's larger property, no additional drainage would reach regional waterways as a result of the project. Run-on and runoff water would be prevented from entering or leaving the facility.

Chapters 18.48.050 E and I of the ACO require that all wastewater or stormwater that has come into contact with manure be maintained on the project site, or applied to other sites only upon written approval of the landowner. Chapter 18.48.050 G requires notification of Merced County Division of Environmental Health for any off-site discharge of wastewater. Chapter 18.48.050 BB requires application of manure at agronomic rates. Additionally, Chapter 18.48.050 O requires a separation of at least 100 feet between waste application areas and any surface water feature. However, application of manure (liquid or dry) may be closer than 100 feet to a surface water body or irrigation well if adequate protection to the surface water body or irrigation well is provided. While the Oliveira Dairy fields are within 100 feet of MID canals, the fields and canals are separated by roadways with a pipe drain to the waterway that can be closed to avoid off-site discharge, and/or berms and levees. Chapter 18.48.060 M requires a separation of at least 50 feet between waste management ponds and settling basins and any public irrigation facilities, with a maintained drainage area between the two facilities. As noted in the DEH inspection, the Oliveira Dairy is in substantial compliance with ACO requirements.

Under State regulations and according to the WMP, the Oliveira Dairy has been designed to retain all facility wastewater generated, together with all precipitation on, and drainage through, manured areas during a 100-year, 24-hour storm event, including a 120-day storage period. All precipitation and surface drainage outside of manured areas would be diverted away from manured areas unless it would be fully retained (CCR Title 27, Division 2, Subdivision 1 22562(a)). On-going maintenance

inspections of the storage ponds as outlined in the WMP Operation and Maintenance Plan would ensure compliance with stormwater retention requirements.

The runoff from increased impervious surfaces outside of manured areas may be substantial during intense storm events. However, the annual rainfall for the project area is relatively low, and under normal circumstances, little runoff would be expected. Conformance with the County ACO requirements and individual WDR process would reduce surface drainage impacts associated with runoff from dairy facilities to a less than significant level. Additional regulatory requirements for the proposed dairy expansion may be included in the individual WDR issued by the CVRWQCB for the facility. Because all stormwater generated by the project would be collected and maintained within the project proponent's larger property, no adverse effects due to runoff would occur and no mitigation would be necessary.

**Significance of Impact:** Less than significant.

**Mitigation Measure HYD-5:** None required.

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***Impact HYD-6: Risk release of pollutants due to project inundation in flood zones (Criteria X.a and X.d)***

The project site could be subject to a flood event, during which dairy facilities could be damaged, or floodwaters could inundate dairy facilities and fields where wet or dry manure had been applied, causing impacts to surface water quality. This would be a significant impact.

Dairies located within flood hazard zones could be damaged by floodwaters, or could be required to shut down for extended periods. Flood waters could mingle with wet or dry manure storage areas at the facilities, cause releases of process water from ponds, and/or come into contact with freshly applied manure on fields, impacting surface water quality. The project site is located in a potential 100-year flood hazard zone identified by FEMA as Zone A. Within Merced County, no base flood elevations have been determined in areas designated as Zone A.

The Merced County floodplain management ordinance (Zoning Code Section 18.34) meets the minimum federal standard for participation in the National Flood Insurance Program. This ordinance requires that the base flood elevation on a project site be established, that structures be flood proofed, and that a development permit demonstrating compliance with the provisions of the floodplain management ordinance be obtained prior to the initiation of construction. In addition, Section 7.13.050 Q of the Animal Confinement Ordinance requires that wastewater retention ponds/settling basins be protected against the 100-year flood hazards. The General Order also requires in the WMP an evaluation of the dairy's design, construction, operation, and maintenance for flood protection. Compliance with Merced County and General Order regulations regarding floodplain management would provide protection of active dairy facilities from flood inundation.

For non-residential structures, an elevation certificate or a flood proofing certificate is required in accordance with Section 18.34.050 of the Merced County Code. A Flood Protection Report was completed for the Oliveira Dairy (Sousa Engineering 2018). The Flood Protection Analysis shows the existing and proposed dairy footprint within the Zone A designation, and established a base flood elevation of between 136 and 137.5 feet MSL. According to the report, approximately 70

percent of the dairy facilities have been constructed to 136.7 feet MSL or higher, and are therefore protected from flood hazards. The remaining 30 percent of the dairy facilities would be subject to inundation levels of 1-2 feet based on estimated 100-yr BFEs. These areas include feed storage areas, about 10 percent of the corral area, and wastewater storage basins.

In accordance with Merced County flood requirements, all future buildings on the Oliveira Dairy with three or more walls would need to have the finished floor at or above the base flood elevation, or buildings can be flood proofed up to BFE and provided with adequate venting (one square inch of vent per square foot of building). Any remodeled or improved buildings where the value of the improvement is more than 50 percent of the pre-construction value of said building would also be required to meet the BFE requirement. Construction activities are proposed for the expansion project at this time, including within the Zone A floodplain. The Flood Protection Analysis (Sousa Engineering) prepared for the Oliveira Dairy provided recommended improvements to existing and proposed facilities to provide adequate flood protection, including the construction of access roads along the west, south, and southeast boundaries of the project site, and new structures with finished floor elevations higher than the base flood elevation. With the incorporation of these improvements, the study confirmed that the Oliveira Dairy facility would have adequate protection from the 100-year flood event. Additional assessment and certification of the flood protection plan may be required in accordance with Merced County Code Section 18.34.050.

Manure and process water applied to fields may contain substantial quantities of nutrients (e.g., nitrogen and phosphorus) and microorganisms, including pathogens (disease causing organisms). If these substances enter the surface or groundwater environments in sufficient concentrations, they could cause water quality degradation. Potential impacts to surface water quality associated with the flooding of manure-fertilized agricultural fields would be minimized by the measures identified below and existing conditions as follows:

- The ACO, individual WDRs, and NMP/WMP will require operational practices that will keep flood waters from coming into contact with recently applied manure or process water (Merced County Code 18.48.050 E, F, and G);
- Domestic wells are required to have sanitary seals to prevent surface water contamination into the well casing (Merced County Code Chapter 9.28.060 C5 Water Well Standards);
- A significant amount of adsorption of nutrients to soil particles and inactivation of pathogenic organisms are expected to occur in the fields prior to contact with any flood waters;
- Neither the flood water nor the receiving waters will be used as a drinking water source without prior treatment, and therefore any pollutants contained in the flood water will not be expected to be ingested by the public;
- During widespread regional flooding, all surface waters are expected to be degraded; precautions are already in place to minimize the likelihood of inadvertent ingestion of pollutants by the public (i.e., public advisories to boil water before use, maintenance and disinfection of wells after flood waters recede).

As discussed above, the majority of the dairy facilities currently meet the requirements of the General Order and Merced County regulations for flood protection. However, because a portion of the dairy facilities could be subject to flood inundation in the event of a 100-year storm, the following measures would be required to bring the facility into compliance with the General Order. For potential effects groundwater impacts due to pathogens at off-site locations, see Impact HYD-8.

**Significance of Impact:** Significant.

**Mitigation Measure HYD-6:**

- As recommended by the Flood Protection Analysis report (Sousa 2018), the following measures shall be implemented to bring the proposed facilities into compliance with General Order requirements for flood protection: The project shall include construction of an access road along the west, south, and southeast boundary of the project site and new structures with finished floor elevations higher than the base flood elevation.
- Following construction of the proposed facilities and prior to commencement of dairy expansion operations, the project applicant shall obtain a flood proofing certificate in accordance with Section 18.34.050 of the Merced County Code from the Merced County Public Works Building Department. If any portion of the dairy facility is found not to comply with flood proofing requirements, the project applicant shall complete flood proofing as necessary to obtain the flood-proofing certificate from the County.

**Potential Environmental Effects of Measure:** All physical improvements or activities that could result in changes to the physical environment required by this measure would be located within the project site. The impacts of implementing such measures, if any, would be similar to those identified for the project in Chapters 5-11 of this EIR.

**Significance after Mitigation:** This impact would be reduced to less-than-significant levels by ensuring that existing and proposed facilities would protect the areas of the proposed dairy facilities subject to inundation. Issuance of a flood proofing certificate would demonstrate that needed measures have been installed, or that such measures would be installed during construction of the proposed expansion.

**Implementation/Monitoring:** Implementation of the mitigation measure would be the responsibility of the project applicant and Merced County Public Works Building Department. The Merced County Public Works Building Department shall monitor for compliance. Implementation of HYD-6 shall occur prior to issuance of a building permit, during construction, and prior to final inspection or initiation of new operations.

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***Impact HYD-7: Water supply pathways for pollutant migration (Criterion X.a)***

Existing water supply wells on site and adjacent to the proposed dairy may represent preferred pathways for pollutant migration to groundwater. Following the DEH inspection (June 2018), the project applicant has documented compliance with setback requirements or adequate well protection for on-site wells. This would be a less-than-significant impact.

Existing irrigation and domestic water wells (either active or abandoned) in proximity of the site that do not meet current wells standards of construction may act as conduits for pollutant migration to the subsurface. If any of the wells were not constructed with effective sanitary seals upon construction, or have been damaged since installation, surface water may seep into the wells and the underlying aquifer, causing water quality degradation.

There are a total of five wells serving the Oliveira Dairy, including two domestic wells on site and three irrigation wells (for approximate location of the wells, see Section 3.1.2, Existing Conditions of Chapter 3, *Project Description*). The Merced County ACO, together with the Merced County Well Ordinance, recognizes the importance of protecting water quality from the release of animal pathogens. One ACO requirement addresses the specific issue of potential pollutant migration into wells. Chapter 18.48.050 establishes a minimum setback of 100 feet between any manured areas and water wells. However, application of manure (liquid or dry) may be closer than 100 feet to a surface water body or irrigation well if adequate protection to the surface water body or irrigation well is provided. The Merced County Code, Chapter 9.28 Wells, requires a minimum setback of 100 feet between a non-public water well and areas of intense animal confinement (9.28.060 (C)(1)). Two domestic wells (West well and East well) are located near the existing and proposed milk parlors. The East well is currently less than 100 feet from areas of intense animal confinement, primarily to the north and east. The proposed changes appear to decrease the amount of intense animal confinement within the 100-foot setback to the north, due to placement of the new milk parlor. The proposed expansion would not place any additional (new) unpaved areas of intense animal confinement within the 100-foot well setback. Following the Division of Environmental Health (DEH) inspection and review, the project applicant has documented compliance with setback requirements or adequate well protection for on-site wells.

The ACO requires that all wastewater be maintained on-site and discharged into the manure management system, and that it not create a nuisance or pollution condition (Chapter 18.48.050 E, K, LL). In the event of groundwater pollution, the project applicant must submit a plan to abate the groundwater impacts to the Merced County Division of Environmental Health (Chapter 18.48.050 T). In addition, the CVRWQCB requires that all process water that comes into contact with wastewater be collected and stored in the ponds with low permeability liners, reducing the potential release of pathogens to water supplies.

Since existing wells at the project site meet current Merced County standards for well protection as set forth above, there would be no potential conduits for groundwater contamination. This would be a less-than-significant impact.

**Significance of Impact:** Less-than-significant impact.

**Mitigation Measure HYD-7:** None required.

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***Impact HYD-8: Impacts to water quality at off-site locations as a result of project operations (Criterion X.a)***

Implementation of the proposed Oliveira Dairy Expansion project could result in increased export of dry manure and wastewater slurry, associated pathogens, and residual contaminants to off-site locations, potentially causing impacts to water quality at off-site locations. This would be a significant impact.

The proposed dairy expansion would increase the dairy herd size from 2,218 animals to 4,400 animals; the addition of 2,182 animals would result in an increased volume of manure and associated pathogens produced at the project site. The manure could also contain residual amounts of contaminants such as hormones, antibiotics, or pesticides. Therefore, manure process water applied

to fields may contain these pathogens and contaminants. For the potential impacts from pathogen transport and contamination of groundwater and water supply wells at the project site, see Impacts HYD-3 and HYD-7. For the potential of flooding resulting in mobilization of manure pathogens at the project site, see Impact HYD-6.

While implementation of the ACO and the Merced County Well Ordinance would minimize potential impacts from pathogen contamination on site, the proposed dairy expansion includes the export of manure generated from the facility. As reported in the NMP, exported solid manure applied to off-site agricultural fields not owned by the project applicant would increase from 3,800 tons (currently) to 7,500 tons with the proposed expansion. In addition, 6,000,000 gallons of wastewater slurry would be exported from the facility and applied to adjacent off-site agricultural fields not owned by the project applicant. Exported manure would be sold as fertilizer to an off-site agricultural operation that may not be regulated to the same extent as dairy operations in Merced County and the San Joaquin Valley. The Long-term Irrigated Lands Regulatory Program General Orders adopted by the RWQCB (see Regulatory Setting of this chapter) provide general waste discharge requirements to protect ground and/or surface waters for owners and operators of irrigated lands throughout the Central Valley who join an approved third-party group or coalition. The Individual Discharger General Order (Order R5-2013-0100) regulates waste discharges from irrigated lands for individuals that are not enrolled under WDRs administered by a third-party. (CVRWQCB 2018)

As defined by the adopted IRLP General Orders, surface water and groundwater monitoring conducted by water quality coalitions and individuals may reduce but not avoid this potential impact. Potential impacts to water quality at off-site fields receiving exported manure would be reduced since a significant amount of adsorption<sup>14</sup> of nutrients to soil particles and inactivation of pathogenic organisms would be expected to occur in the fields; however, since application of manure may result in groundwater impacts, to ensure implementation of BMPs required by the Irrigated Lands Regulatory Program, the following mitigation would be required.

**Significance of Impact:** Significant.

**Mitigation Measure HYD-8:**

Over the course of dairy operations, the project sponsor shall obtain written agreement from the recipients of manure exported off site that will include the following requirements:

- All manure shall be applied to cropland at rates and times that are reasonable for the crop, soil, climate, special local situations, and management system. Manure applications shall be timed and managed to minimize nitrogen movement below the root zone and to minimize percolation of waste constituents to groundwater.
- All stormwater that is or has been in contact with manure shall be maintained on site. No storm drainage that has been in contact with manure shall be allowed to flow or seep onto adjacent properties or public roads, or into any waterway.

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<sup>14</sup> Not to be confused with absorption, adsorption is the adhesion of atoms, ions, or molecules from a gas, liquid, or dissolved solid to a surface. Absorption is the process in which a fluid permeates or is dissolved by a liquid or solid.

- Where the commingling of water containing manure can take place with irrigation wells and irrigation and/or drainage district facilities, these facilities must be protected from pollution by a backflow device or method that is approved by the Division of Environmental Health and/or the appropriate irrigation/drainage district. It is the obligation of the property owner to install and maintain or cause to be installed and maintained the backflow device or method.
- Manure shall not be applied within 100 feet of any domestic well, irrigation well, or surface water body. Surface water bodies include creeks, streams, lakes and reservoirs, but do not include canals constructed above grade. Adequate protection of surface water bodies or irrigation wells shall prevent discharge or infiltration of manure constituents to the water body or well.

The project sponsor shall provide the most recent analysis of the dry manure and/or wastewater slurry, in writing, to the manure recipient. The signed agreement between the project sponsor and the recipient of manure exported off site shall be submitted to the Merced County Division of Environmental Health for review.

**Potential Environmental Effects of Measure:** All physical improvements or activities that could result in changes to the physical environment required by this measure would be located outside the project site. The construction of surface water protection, such as berms, or installation of well backflow protection at off site locations would result in less-than-significant environmental effects.

**Significance after Mitigation:** Significant and unavoidable. Even though implementation of the foregoing measures could reduce the magnitude of this potential effect by requiring management measures for manure applied to cropland off site, there is no feasible mechanism for the County to track its implementation and ensure compliance. This impact would be significant and unavoidable.

**Implementation/Monitoring:** Implementation of these measures would be the responsibility of the project applicant. The Merced County Community and Economic Development Department and Division of Environmental Health shall monitor for compliance. Mitigation Measure HYD-8 shall be implemented throughout ongoing operations.

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***Impact HYD-9: Impacts to water quality due to septic systems located in limited on-site soils (Criterion VII.e)***

Implementation of the proposed Oliveira Dairy Expansion project would include the installation of a septic system where soils may be incapable of adequately supporting its use. Because on-site soils are very limited with respect to wastewater treatment and disposal, impacts to water quality could occur. This would be a significant impact.

Installation and operation of onsite wastewater treatment systems (OWTS)<sup>15</sup> or similar individual wastewater disposal systems in unfit soils can lead to the degradation of groundwater quality, and ultimately impact all groundwater supplies. A comprehensive body of OWTS design and operational requirements have been adopted by the California SWRCB, and a similar set of comprehensive requirements are enforced by the County. These, together with the goals and policies set forth in the 2030 General Plan, would avoid or reduce the effect of pollution of groundwater.

The proposed dairy expansion would include the removal of three residences (and two septic systems), and the removal of the existing milk parlor (and one septic system). A new septic system would be installed to serve the new milk parlor. The project site soil types (Burchell, Landlow, and Lewis silty clay loam) have a “very limited” suitability rating as septic tank absorption fields. The installation, modification, or abandonment of any on-site septic system would require compliance with Merced County performance standards and approval by the DEH (Chapter 9.54, *Regulation of Onsite Wastewater Treatment Systems* and Chapter 18.41, *Performance Standards*). These standards would require proper abandonment of the existing septic systems to be removed, and that the proposed septic system be properly sized and designed with respect to on-site soil capabilities, which would ensure the safe treatment and disposal of wastewater and the maintenance of groundwater quality.

Because on-site soils are very limited with respect to wastewater treatment and disposal, the following mitigation measures would be necessary.

**Significance of Impact:** Significant.

**Mitigation Measure HYD-9a:**

A permit shall be applied for and obtained from the DEH prior to abandonment of three existing septic systems to be removed. Abandoned OWTS shall be properly disconnected from the building or sewer source, and pumped by a licensed septic tank pumper. Components removed must be disposed of at an approved location, or destroyed in-place and backfilled with compacted earth, sand, or other approved materials. Septic tanks destroyed in-place shall be rendered incapable of fluid storage.

**Mitigation Measure HYD-9b:**

A permit shall be applied for and obtained from the DEH prior to construction of the proposed OWTS. A soils study performed in accordance with the Merced County On-Site Septic System Standards or subsequent ordinance may be required by DEH to determine the feasibility of using on-site septic systems and type of system appropriate for the site. The study shall address all soil conditions potentially affecting septic system function, including but not limited to highest anticipated groundwater, soil permeability, loading rate, impervious layers, and perched water tables.

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<sup>15</sup> As defined by the SWRCB, “Onsite wastewater treatment system(s)” (OWTS) means individual disposal systems, community collection and disposal systems, and alternative collection and disposal systems that use subsurface disposal. The short form of the term may be singular or plural. Septic tanks and leach fields, typically used in rural areas of Merced County are a type of OWTS. OWTS do not include “graywater” systems pursuant to Health and Safety Code Section 17922.12. To provide consistency to the following discussion, the term OWTS will be used even though the state CEQA Guidelines Appendix G uses the term “septic tanks” in the significance criterion set forth in this Environmental Impact Report.

The system shall be designed by a qualified professional. The DEH may exempt these requirements (except for plot plan submittal) on parcels where documented OWTS performance is adequate.

**Mitigation Measure HYD-9c:**

The following conditions of approval as required by DEH shall be documented in the permit application and implemented throughout project operations.

- The leach field replacement areas (300% of required leach field for non-residential systems) shall remain unpaved, contain no structure, and not be under a permanent drive or parking area.
- A permanent barrier shall surround the septic system. The barrier shall protect each septic tank (unless the tank is traffic rated and has traffic rated risers and lids) and leach line area from vehicle traffic, parking, and any other soil-compacting activity.

**Potential Environmental Effects of Measure:** All physical improvements or activities that could result in changes to the physical environment required by this measure would be located within the project site. The impacts of implementing such measures, if any, would be similar to those identified for the project in Chapters 5-11 of this EIR.

**Significance after Mitigation:** Implementation of these measures would ensure that the proposed OWTS would operate to avoid adverse effects to water quality. Potential water quality impacts would be reduced below a level of significance, and no additional mitigation would be necessary.

**Implementation/Monitoring:** Implementation of the mitigation measure would be the responsibility of the project applicant. The Merced Division of Environmental Health shall monitor for compliance. Implementation of HYD-9a shall occur prior to and during construction. Implementation of HYD-9b shall occur prior to and during construction, and during ongoing operations.

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***Impact HYD-10: Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan (Criterion X.e)***

Implementation of the Oliveira Dairy Expansion project would not conflict with or obstruct implementation of the General Order for Existing Milk Cow Dairies WDRs or the Merced Subbasin Groundwater Sustainability Plan. Therefore, this impact would be less than significant.

As stated above in the regulatory setting, the CVRWQCB Existing Milk Cow Dairies General Order implements the State laws and regulations relevant to confined animal facilities. Under the General Order, animal confinement facility operations are prohibited from discharging waste into surface water, or into groundwater that is directly connected to surface water. In compliance with the requirements of the CVRWQCB, the proponents of the Oliveira Dairy have completed the required components of the General Order for the existing dairy, and would be required to obtain coverage under Individual WDRs for the proposed dairy expansion.

The Oliveira Dairy is located in the Merced Groundwater Subbasin, which has been designated as critically overdrafted and as a high priority groundwater basin. As a critically overdrafted basin, the Merced area must complete a GSP by January 31, 2020. The GSP will seek to halt overdraft and bring groundwater basins into balanced levels of pumping and recharge within 20 years of implementing their sustainability plans. As discussed in Impact HYD-4, while the proposed dairy expansion would result in an overall increase of groundwater use, the majority of the water would be used for irrigation and would contribute to groundwater recharge, and a less-than-significant impact to groundwater supplies would occur. While the GSP for the region has not yet been completed, if and when adopted, the proposed dairy expansion would be subject to the requirements of the GSP, which would minimize impacts to groundwater supplies.

Because the proposed dairy expansion would be subject to the requirements of the General Order for Existing Milk Cow Dairies WDRs and the anticipated Merced Subbasin Groundwater Sustainability Plan, the proposed project would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.

**Significance of Impact:** Less than significant.

**Mitigation Measure HYD-10:** None required.