

INFORMATION SHEET

Waste Discharge Requirements General Order No. ____ Existing Milk Cow Dairies

INTRODUCTION

This Information Sheet provides background information relative to this General Order and discusses the various elements of the General Order.

This General Order implements the State laws and regulations relevant to confined animal facilities. This General Order will serve as general Waste Discharge Requirements (WDRs) for discharges of waste from existing milk cow dairies and is intended to be compatible with the United States Environmental Protection Agency's regulations for concentrated animal feeding operations (CAFOs). This General Order is not a National Pollutant Discharge Elimination System (NPDES) Permit. This Information Sheet is a part of the General Order.

All dairies covered under this General Order will be required to:

- Comply with all provisions of the General Order
- Submit a Waste Management Plan 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
- Submit annual monitoring reports

CENTRAL VALLEY WATER BOARD AUTHORITY TO ISSUE WASTE DISCHARGE REQUIREMENT ORDERS

The Central Valley Water Board authority to regulate waste discharges that could affect the quality of the waters of the state, which includes both surface water and groundwater, and the prevention of nuisances, is found in the Porter-Cologne Water Quality Control Act (California Water Code Division 7). Regulation is accomplished through issuance of WDRs or the waiver of such requirements. All confined animal facilities are subject to this regulatory authority.

Confined animal facilities are defined in Title 27 California Code of Regulations (CCR) Section 20164 as "... any place where cattle, calves, sheep, swine, horses, mules, goats, fowl, or other domestic animals are corralled, penned, tethered, or otherwise enclosed or held and where feeding is by means other than grazing." Designation as a confined animal facility under these state regulations is not based on facility size.

California Water Code Section 13263(i) authorizes the issuance of general orders to regulate discharges of waste that meet specified criteria. The criteria in the California Water Code includes the following:

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- The discharges are produced by the same or similar types of operations
- The discharges involve the same or similar types of wastes
- The discharges require the same or similar treatment standards
- The discharges are more appropriately regulated under general WDRs rather than individual WDRs

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A general order for existing dairy facilities is appropriate because they: (a) involve the same or substantially similar types of operations, where animals are confined and wastes are managed by onsite storage, land application, or removal offsite; (b) discharge the same type of waste, primarily animal waste; (c) are subject to State regulations that impose the same or similar treatment standards; (d) have the same potential to impact surface water and groundwater; and (e) given the large number of facilities and their similarities, existing dairies are more appropriately regulated under general WDRs rather than individual WDRs.

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DAIRY FACILITIES IN THE CENTRAL VALLEY REGION AFFECTED BY THIS GENERAL ORDER

There are approximately 1,600 milk cow dairy operations within the Central Valley Region (Region) that may be affected by this General Order. Consistent with California Water Code Section 13260, any person who owns and/or operates any confined animal facility in the Central Valley must file a Report of Waste Discharge (ROWD) with the appropriate Regional Water Quality Control Board (Regional Board). The requirement to submit a ROWD was waived for most dairies pursuant to Central Valley Water Board Resolution No. 82-036. Pursuant to California Water Code Section 13269 (as amended by Senate Bill (SB) 390), that waiver expired on 1 January 2003 unless the Central Valley Water Board renewed it.

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To replace the expiring waiver for confined animal facilities, the Central Valley Water Board adopted Resolution R5-2002-0205 on 6 December 2002. This Resolution required all dairies to file a ROWD and each facility would be regulated in one of three ways: 1) an individual or general waste discharge requirement (under State law), 2) a conditional waiver of waste discharge requirements (Waiver) (under State law), or 3) an individual or general National Pollutant Discharge Elimination System (NPDES) permit (under Federal law). The rules for obtaining a Waiver were included as part of Resolution R5-2002-0205.

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The Central Valley Water Board rescinded Resolution R5-2002-0205 on 13 March 2003 because neither general waste discharge requirements nor a general NPDES permit were available as options for facility operators to consider before the Resolution R5-2002-0205 deadlines to apply for a Waiver.

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The waiver rescission however left all dairy operators without a clear understanding of their responsibility to comply with Water Code section 13260, which describes the need to file a ROWD for coverage under a Waste Discharge Requirement. To clarify the issue, on 27 May 2003, Central Valley Water Board staff wrote to all dairies that were in operation as of the date of that letter and staff stated in the letter "*owners and/or operators of existing dairies are not*

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expected to submit any information to the Regional Board until requested to do so.” On 8 August 2005, Central Valley Water Board staff notified (by certified mail) all dairies that received the original 27 May 2003 letter that they needed to file a ROWD for their existing dairy facility by 17 October 2005.

This General Order only applies to owners and operators of existing milk cow dairies (Dischargers) in the Central Valley Region. For the purposes of this General Order, existing milk cow dairies are those that were operating as of 17 October 2005 and were requested by the Central Valley Water Board on 8 August 2005 to file a ROWD.

Existing dairy operations include herd sizes that may vary in order to ensure a constant milk production volume. Maintaining constant milk production requires a dairy operator to manage the herd, continually producing calves, raising support stock to replace cows that die or fail to produce, and selling some of the mature cows and support stock. Professionals at the University of California Davis estimate the normal variation in California dairy herd sizes ranges from about 10 to 15 percent.

For the purposes of this Order, existing herd size is defined as the number of mature dairy cows reported in the Report of Waste Discharge submitted in response to the 8 August 2005 letter from the Executive Officer, plus or minus 10 percent of that reported number to account for the natural variation in herd sizes.

For the purposes of this Order, an increase in the number of mature dairy cows of more than 10 percent beyond the number reported in the Report of Waste Discharge submitted in response to the 8 August 2005 letter from the Executive Officer is considered an expansion.

Any existing dairy that expanded in a material way or made a material change in the way waste is handled at the dairy between 27 May 2003 and 17 October 2005 is not eligible for coverage under this General Order unless that dairy filed a ROWD with the Central Valley Water Board for that expansion or change or after a Central Valley Water Board staff review, the dairy was informed by staff that the General Order is sufficient to regulate the dairy. In the 27 May 2003 letter to existing dairies, Central Valley Water Board staff also stated that *“owners and/or operators who build a new dairy or expand their existing dairy are required to submit what is called a Report of Waste Discharge (ROWD) to the Regional Water Board at least 180 days prior to starting any new waste discharge or making any material change in the way waste is handled at an existing dairy.”* If an existing dairy has expanded or made a material change in the way waste is handled since 27 May 2003, this dairy should have already submitted the requested ROWD.

Any dairy that began operation after 27 May 2003 is not eligible for coverage under this General Order unless that dairy filed a ROWD with the Central Valley Water Board and after a Central Valley Water Board staff review, the dairy was informed by staff that the General Order is sufficient to regulate the dairy. This General Order does not apply to any dairy that expanded, or began operation, after 17 October 2005. Owners and/or operators who build a new dairy or

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began operation after 27 May 2003 should have already filed a ROWD with the Central Valley Water Board at least 180 days prior to starting operation of the new facility.

Forty-two (42) existing milk cow dairies in the Region are currently regulated under General WDRs for Milk Cow Dairies, Order No. 96-270. Forty-four (44) additional existing milk cow dairies in the Region are currently regulated under individual WDRs. All of these existing facilities will be placed under this General Order.

On 17 April 1997, the State Water Resources Control Board (State Water Board) adopted the General Industrial Storm Water Permit, Order No. 97-03-DWQ, NPDES No. CAS000001. Order No. 97-03-DWQ implements the final federal regulations (Title 40 Code of Federal Regulations Parts 122, 123, and 124) for storm water runoff published on 16 November 1990, by US EPA in compliance with Section 402(p) of the federal Clean Water Act. Approximately 250 dairy facilities in the Region are currently subject to Order No. 97-03-DWQ.

The Central Valley Water Board may also determine that some individual facilities are not appropriately regulated under a general order and may require owners and operators of such facilities to be regulated under individual WDRs. Dischargers who operate irrigated lands where dairy wastes are not applied but where discharges of irrigation return flows and storm water to surface waters occur are required to seek coverage under either the *Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands* (Central Valley Water Board Resolution No. R5-2003-0105 or subsequent revision) or separate individual WDRs.

DAIRY WASTES

For the purposes of this General Order, dairy waste includes, but is not limited to, manure, leachate, process wastewater and any water, precipitation or rainfall runoff that came into contact with raw materials, products, or byproducts such as manure, compost piles, feed, silage, milk, or bedding.

Waste generated at dairies is stored dry in piles or in liquid form in waste retention ponds. The wastes are then applied to cropland or transported off-site for utilization on cropland as a nutrient source. These nutrient-laden materials are applied to soils of varying character and drainage characteristics, varying proximity to surface drainages and waterways, different character of geology and depth to groundwater. Because of the site variability, this General Order requires the development of a Nutrient Management Plan that is field specific to ensure that optimum nutrient utilization takes place. Although the waste materials provide nutrients to crops, they can create nuisance conditions if improperly managed or cause pollution of surface water and/or groundwater if site conditions are not taken into account in preparing a nutrient utilization and management strategy. This General Order regulates the management of dairy wastes onsite and requires monitoring and continuous tracking of materials being taken off-site for utilization.

Dairy operators typically use chemicals such as cleaning products to disinfect their milking equipment, footbaths to maintain the health of their herd, and pesticides in both the production area and land application area. Some portion of some of these chemicals may be commingled

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with process wastewater before it is stored in the retention pond. This General Order requires Dischargers to identify the chemicals, and amounts, used annually at their dairy.

Manure from dairies contains high concentrations of salts (total dissolved solids, including constituents such as sodium and chloride) derived primarily from the feed and water sources used in the dairy production activities. Some dairies also use water softening devices for milk barn cleaning and other activities and the concentrated brines or reject water is usually sent to the retention pond, thus increasing the salt concentrations further.

Manure from dairies contains nutrients (including nitrogen, ammonia, phosphorus and potassium compounds) that can be used in crop production. A recent review of dairy manure by a University of California Committee of Experts (UCCE) indicates that dairy cows in the Central Valley Region excrete approximately one (1) pound (lb) of nitrogen per head per day and approximately 1.29 lbs of inorganic salts (including only Na⁺, K⁺, and Cl⁻) per head per day. Thus, a 1,000-cow dairy generates approximately 365,000 lbs of nitrogen and 427,000 lbs of inorganic salts (Na⁺, K⁺, and Cl⁻) per year that must be managed to prevent impacts to water quality.

The application of manure or process wastewater to a land application area results in the discharge of salts and nitrogen compounds. Oxidation of nitrogen compounds (i.e., ammonia and organic nitrogen compounds) to nitrites and nitrates has the potential to degrade the quality of surface water and groundwater in the Region, if not properly managed. Runoff from or over-application on these land application areas poses a threat to surface water quality. A similar threat to groundwater exists if the wastes are applied to the land application area at rates that exceed crop needs. The recent UCCC review of dairy waste recommends that in cropland application of dairy manure, the total nitrogen load of the field should not exceed 1.4 to 1.65 times the potential maximum nitrogen uptake by plants, suggesting that successful cropping and minimal nitrate leaching is realistic to achieve at these application rates.

Surface water can also be degraded and polluted by both the type and high concentrations of pollutants in dairy cow manure and manure wastewater. Ammonia in the waste is highly toxic to aquatic life or can suppress dissolved oxygen concentrations. In addition, nitrogen and phosphorus compounds in the waste can cause excessive algal growth in surface waters, resulting in lower oxygen levels and which in turn causes fish and other organisms to die. The presence of pathogens in the waste can create a public health threat through human contact with affected waters.

This General Order includes prohibitions, specifications, and provisions for the production and land application areas that are consistent with the state regulations. Consistent with Title 27, this General Order prohibits the direct or indirect discharge of waste from the production area to surface water. This General Order also prohibits discharges of: (1) wastewater to surface waters from cropland, and (2) waste to surface waters that causes pollution or nuisance, or that causes or contributes to an exceedance of any water quality objective in the Basin Plans or water quality criteria set forth in the California Toxics Rule and the National Toxics Rule. This General Order

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includes groundwater limitations, which specify “Discharge of waste at existing milk cow dairies shall not cause the underlying groundwater to be further degraded, to exceed water quality objectives, unreasonably affect beneficial uses, or cause a condition of pollution or nuisance.” This General Order also requires monitoring of: (1) any discharges to surface water, including tailwater discharges, as well as upstream and downstream surface water quality to ensure that no unforeseen impacts are occurring, and (2) groundwater.

Storm water may contain pollutants from dairy wastes if the storm water is allowed to contact manured areas or commingle with wastewater from the dairy. This General Order prohibits discharges of storm water from the production area to surface water and any discharge of storm water to surface water from the land application areas being used for nutrient utilization unless that discharge is from land that has been managed consistent with a certified Nutrient Management Plan.

APPLICABLE REGULATIONS, PLANS, AND POLICIES

Title 27 California Code of Regulations (CCR)

Division 2, Subdivision 1, Chapter 7, Subchapter 2, Article 1 of Title 27 of the California Code of Regulations (Title 27) prescribes minimum standards for discharges of animal waste at confined animal facilities to protect both surface water and groundwater. For surface water protection, Title 27 includes requirements for adequate design of containment facilities for both storm water and process wastewater and for adequate flood protection.

For groundwater protection, the minimum standards in Title 27 requires existing milk cow dairies to: minimize percolation of wastewater to groundwater in disposal fields; apply manure and wastewater to disposal fields at reasonable agronomic rates; minimize infiltration of water into underlying soils in manured areas; and locate retention ponds in, or line retention ponds with, soils of at least 10% clay and no more than 10% gravel.

The Central Valley Water Board has received documentation of impacts to groundwater quality that indicates the Title 27 minimum standards may not be sufficient to adequately protect groundwater quality at all confined animal facilities in the Region. Adverse impacts to groundwater due to discharges from existing milk cow dairies have been detected in areas where groundwater is as deep as 120 feet below ground surface and in areas underlain by fine-grained sediments.

Most of the existing milk cow dairies covered under the General Order have been operating for many years and it is expected that groundwater quality may already be impacted at many of these dairies due to the past operations, including those dairies in compliance with the Title 27 regulations. For example, groundwater samples collected from 425 water supply wells (domestic and agricultural – stock watering and irrigation) on 88 dairies in Tulare County between August 2000 and June 2006 showed that approximately 39% of the wells sampled had nitrate concentrations greater than the maximum contaminant level for drinking water. At least one nitrate polluted well was found at approximately 63% of these dairies.

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This General Order requires Dischargers to monitor groundwater to ensure that groundwater protection is being achieved, as described below in the section titled “CALIFORNIA ENVIRONMENTAL QUALITY ACT.” Groundwater monitoring at existing dairies is necessary to: determine background groundwater quality; determine existing groundwater conditions near retention ponds, corrals, and land application areas; and determine the effect of the improved management practices required in the General Order on groundwater quality.

It is impractical to require all existing dairies to install monitoring wells within a short time period due to the limited number of professionals available to design and install groundwater monitoring systems and the limited staff to review Monitoring Well Installation and Sampling Plans. To establish the existing groundwater conditions at each dairy within the shortest time period requires staff to prioritize its actions. This General Order requires each Discharger to immediately begin quarterly sampling of each domestic and agricultural well present at the dairy and discharges from any subsurface (tile) drains. After the first four quarters of data are available from this monitoring, the Executive Officer will phase in requirements to install monitoring wells at 100 to 200 dairies per year based on an evaluation of the threat to water quality at each site.

The first dairies required to install monitoring wells will be those where nitrate-nitrogen is detected at 10 mg/l or more and/or ammonia-nitrogen is detected at any concentration in two or more samples from any one domestic well, agricultural well, or subsurface (tile) drainage system. This will establish existing groundwater conditions first in areas with suspected groundwater impacts. If necessary, the Executive Officer will further prioritize these groundwater monitoring requirements based on factors such as: proximity to a municipal or domestic supply well, artificial recharge area, or Department of Pesticide Regulation Groundwater Protection Area; nitrate concentrations in neighboring domestic wells; number of crops grown per year; whether or not the NMP is completed by **[24 months after adoption of the General Order]**; and any other pertinent site-specific conditions. In addition, the Executive Officer may, under authority of the California Water Code, require installation of monitoring wells at a dairy at any time. Such requirement may occur, for instance, if violations of the General Order are documented and/or the dairy is found to be in an area where site conditions and characteristics pose a high risk to groundwater quality.

A summary of how the Executive Officer will determine priorities for monitoring wells is provided in Table 2 of Monitoring And Reporting Program No. _____. This table may be revised as needed with the consent of the Executive Officer to ensure proper prioritization is being implemented.

California Environmental Quality Act (CEQA)

The Central Valley Water Board adopted a Negative Declaration in accordance with CEQA in 1982 with the adoption of Central Valley Water Board Resolution 82-036, which waived waste discharge requirements for confined animal facilities where the Discharger complies with Central Valley Water Board guidelines. That waiver program expired on 1 January 2003.

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The Central Valley Water Board’s preliminary review of this General Order determined that the adoption of this General Order is exempt from the requirements of CEQA based on three categorical exemptions allowed in Title 14 California Code of Regulations (CCR). These categorical exemptions are discussed below.

- CEQA (Title 14 CCR Section 15301) for Existing Facilities that applies to “...*the operation, repair, maintenance, permitting, leasing, licensing, or minor alteration of existing public or private structures, facilities, mechanical equipment, or topographical features, involving negligible or no expansion of use beyond that existing at the time of the lead agency’s determination...*”
- CEQA (Title 14 CCR Section 15302) for “...*replacement or reconstruction of existing structures and facilities where the new structure will be located on the same site as the structure replaced and will have substantially the same purpose and capacity as the structure replaced...*”
- CEQA (Title 14 CCR Section 15304) for “*minor public or private alterations in the condition of land, water, and/or vegetation which do not involve removal of healthy, mature, scenic trees except for forestry and agricultural purposes...*”

The adoption of this Order is categorically exempt from CEQA because:

- Consistent with the “existing facility” exemption in Title 14 CCR Section 15301, eligibility under this Order is limited to milk cow dairies that were existing facilities as of 17 October 2005. This Order does not authorize expansion of use beyond that existing as of 17 October 2005. Restoration of, or improvements to dairy waste management systems to ensure proper function in compliance with this Order will involve minor alterations of existing private facilities.
- Consistent with the categorical exemption of Title 14 CCR Section 15302, this Order will require covered dairies to replace or reconstruct waste management systems to ensure proper function in compliance with this Order.
- Consistent with the categorical exemption of Title 14 CCR Section 15304, this Order will require covered dairies to make improvements to their waste management systems that will result in minor alterations to land, water, and/or vegetation.

Compliance with this General Order will reduce impacts to surface water and groundwater from existing milk cow dairies. The majority of the approximately 1,600 existing milk cow dairies potentially covered under this General Order operated under a waiver program that was in effect from 1982 to December 2002. That waiver was often not effective in protecting water quality. Approximately 86 of these existing facilities are currently operating under either individual WDR Order or a 1996 General WDR Order. The majority of existing milk cow dairies will be

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covered under this General Order, which imposes significantly more stringent requirements compared to the previous WDRs or the waiver of WDRs.

This General Order will reduce impacts to surface water and groundwater at existing milk cow dairies by requiring Dischargers to demonstrate compliance with State Water Board Resolution 68-16 (*Statement of Policy with Respect to Maintaining High Quality Waters in California*), Title 27 CCR for confined animal facilities, and the Basin Plans. This General Order reduces impacts to surface water by prohibiting discharges of: (1) waste and/or storm water to surface water from the production area, (2) wastewater to surface waters from cropland, and (3) storm water to surface water from the land application area where manure or process wastewater has been applied, unless the land application has been managed consistent with a certified Nutrient Management Plan. This General Order also prohibits discharges that cause or contribute to exceedances of any water quality standards.

This General Order reduces impacts to groundwater by requiring Dischargers to: (1) develop and implement Nutrient Management Plans that will control nutrient losses from land application areas; (2) reconstruct existing retention ponds when groundwater monitoring demonstrates that an existing retention pond has impacted groundwater quality; (3) design and construct new retention ponds and reconstructed existing ponds to (a) comply with General Specification B.1 and the groundwater limitations of the General Order, (b) have a seepage rate no greater than 1×10^{-6} cm/sec with no credit for manure sealing, and (c) result in the best practicable treatment or control of the discharge necessary to prevent a condition of pollution or nuisance; (4) document that no cross connections exist that would allow the backflow of wastewater into a water supply well or irrigation well; and (5) submit an Operation and Maintenance Plan to ensure that (a) procedures have been established for solids removal from retention ponds to prevent pond liner damage and (b) corrals and/or pens, animal housing areas, and manure and feed storage areas are maintained to collect and divert process wastewater and runoff to the retention pond and minimize infiltration of wastewater and leachate from these areas to the underlying soils. This General Order also reduces impacts to groundwater by requiring that discharges of waste from existing milk cow dairies shall not cause groundwater to be further degraded, to exceed water quality objectives, unreasonably affect beneficial uses of the groundwater, or cause a condition of pollution or nuisance.

This General Order requires monitoring of discharges, surface water, groundwater, storm water, and tailwater to demonstrate reduced impacts to surface water and groundwater.

Water Quality Control Plans

The Central Valley Water Board has adopted Water Quality Control Plans (Basin Plans) for the Sacramento River and San Joaquin River Basins (4th ed.) and for the Tulare Lake Basin (2nd ed.). These two Basin Plans designate the beneficial uses of groundwater and surface waters of the Region, specify water quality objectives to protect those uses, and include implementation programs for achieving water quality objectives. The Basin Plans also include plans and policies of the State Water Board incorporated by reference, including State Water Board Resolution No. 68-16 (*Statement of Policy with Respect to Maintaining High Quality Waters in California*),

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State Water Board Resolution 88-63 (*Sources of Drinking Water Policy*), and State Water Board Resolution No. 92-49 (*Policies and Procedures for Investigation and Cleanup or Abatement of Discharges Under Water Code Section 13304*). This General Order specifies requirements necessary to comply with the Basin Plans, including requirements to meet the water quality objectives and protect beneficial uses specified in the Basin Plans, and other applicable plans and policies.

Beneficial Uses of Surface Water and Groundwater

Pursuant to Chapter II of the Basin Plans, the beneficial uses of surface water may include: municipal and domestic supply; agricultural supply; agricultural stock watering; industrial process supply; industrial service supply; hydro-power generation; body contact water recreation; canoeing and rafting; other non-body contact water recreation; warm freshwater aquatic habitat; cold freshwater aquatic habitat; warm fish migration habitat; cold fish migration habitat; warm spawning habitat; cold spawning habitat; wildlife habitat; navigation; rare, threatened, and endangered species; groundwater recharge; freshwater replenishment; aquaculture; and preservation of biological habitats of special significance. Both Basin Plans contain a Table that lists the surface water bodies and the beneficial uses and where not listed, the Basin Plans designate beneficial uses based on the waters to which they are tributary or applicable state or federal requirements. These uses are protected in this General Order by, among other requirements, the prohibition of a direct or indirect discharge of waste and/or storm water from the production area to surface waters, by the prohibition of discharge of waste from existing milk cow dairies to surface waters that cause or contribute to any exceedance of water quality objectives in the Basin Plans or water quality criteria set forth in the California Toxics Rule and the National Toxics Rule, and by the prohibitions against pollution and nuisance. Chapter II of the Sacramento River and San Joaquin River Basin Plan states: “*Unless otherwise designated by the Regional Water Board, all groundwaters in the Region are considered as suitable or potentially suitable, at a minimum, for municipal and domestic water supply, agricultural supply, industrial service supply, and industrial process supply.*” Chapter II of the Tulare Lake Basin Plan designates the beneficial uses of groundwater to include municipal and domestic supply, agricultural supply, industrial service supply, industrial process supply, water contact recreation, and wildlife habitat. The Tulare Lake Basin Plan includes a Table that lists the designated beneficial uses of groundwater within the Basin. These beneficial uses are protected in this Order by, among other requirements, the specification that the discharge of waste at an existing milk cow dairy shall not cause a violation of water quality objectives, cause pollution or nuisance, or degrade the groundwater.

Water Quality Objectives

Pursuant to the California Water Code Section 13263(a), WDRs must implement the Basin Plans, which require consideration of the beneficial uses of water, water quality objectives reasonably required to protect the beneficial uses, other waste discharges, the need to prevent nuisance conditions in the disposal area, and the receiving water. The water quality objectives are implemented in WDRs consistent with the Basin Plans’ *Policy for Application of Water Quality Objectives*. The Basin Plans require that WDRs apply the most stringent objective for each constituent to ensure that discharges do not cause adverse affects to any beneficial use.

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Water quality objectives are the limits or levels of water quality constituents or characteristics that are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area. Water quality objectives apply to all waters within a surface water or groundwater resource for which beneficial uses have been designated. Water quality objectives are listed in Chapter III of the Basin Plans and are either numeric or narrative.

The primary waste constituents of concern due to discharges of waste from dairies are ammonia, nitrates, phosphorus, chloride, boron, salts, pathogens, and organic matter. The discharge of waste from dairies must not cause surface or groundwater to exceed the applicable water quality objectives for those constituents.

Applicable water quality objectives that apply to surface water include, but are not limited to, (1) the numeric objectives, including the bacteria objective, the chemical constituents objective (includes listed chemicals and state drinking water standards, i.e., maximum contaminant levels (MCLs) promulgated in Title 22 CCR Division 4, Chapter 15 Sections 64431 and 64444 that are applicable through the Basin Plans to waters designated as municipal and domestic supply), dissolved oxygen objectives, pH objectives, and the salinity objectives; and (2) the narrative objectives, including the biostimulatory substances objective, the chemical constituents objective, and the toxicity objective. The Basin Plans also contain numeric water quality objectives that apply to specifically identified water bodies, including for example, electrical conductivity objectives for the Delta.

Applicable water quality objectives that apply to groundwater include, but are not limited to, (1) numeric objectives, including the bacteria objective and the chemical constituents objective (includes state MCLs promulgated in Title 22 CCR Division 4, Chapter 15 Section 64431 and 64444 and are applicable through the Basin Plans to municipal and domestic supply), and (2) narrative objectives including the chemical constituents, taste and odor, and toxicity objectives. The Tulare Lake Basin Plan also includes numeric salinity limits for groundwater.

The Basin Plan's incorporation of MCLs by reference is prospective to incorporate changes to MCLs as changes in Title 22 CCR take effect. Should a change occur to an MCL and that MCL thereby becomes the most or more stringent objective, implementation of the changed objective would be effected through reopening of this General Order and consideration of a time schedule if compliance cannot be achieved immediately.

The Basin Plans include an implementation program for water quality objectives called the *Policy for Application of Water Quality Objectives*, which states, in relevant part, that the Central Valley Water Board will consider among other information "relevant numerical criteria and guidelines developed and/or published by other agencies and organizations" in establishing numeric limitations based on narrative objectives. Quantifying a narrative water quality objective requires an evaluation of each waste constituent for consistency with the narrative objective using the procedures set forth in the Basin Plans. These translation procedures require the Central Valley Water Board to consider, among other things, relevant numerical criteria and guidelines developed or published by other agencies and organizations. Some of the

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considerations of relevant numerical criteria and guidelines developed or published by other agencies and organizations include:

Water Quality Objectives for Irrigated Agriculture

With respect to water quality objectives protective of agricultural uses, the Basin Plans contain a narrative chemical constituents objective for both groundwater and surface water that states that “[waters] shall not contain chemical constituents in concentrations that adversely affect beneficial uses.” Relevant numerical criteria and guidelines for agricultural uses of groundwater are included in publications from the National Academy of Sciences, the University of California Cooperative Extension, and the Food and Agricultural Organization of the United Nations. This information is summarized in a 1985 publication *Water Quality for Agriculture, Food and Agriculture Organization of the United Nations - Irrigation and Drainage Paper No. 29*, (hereafter U.N. Guidelines) and includes detailed information to evaluate the quality of irrigation water necessary to sustain various crops.

The major constituents used to assess the quality of water for beneficial uses of irrigated agriculture are salinity (expressed as total dissolved solids, or TDS), boron, chloride, and sodium. Salinity reduces crop growth by reducing the ability of plant roots to absorb water. Boron is an essential element in very low concentrations but can become toxic to plants when concentrations in water even slightly exceed the amount required for optimal growth. While boron sensitivity appears to affect a wide variety of crops, sodium and chloride toxicities are mostly limited to tree crops and woody perennials (e.g., citrus, stone-fruit, and vineyard). A predominance of sodium relative to other ions in irrigation water may also disperse soil aggregates, which in turn, affects virtually all crops by decreasing the permeability of the soil to water and air.

Nitrogen in the form of nitrate and ammonium can also affect some nitrogen sensitive crops such as sugar beets, grapes, apricots, citrus, avocado, and some grain crops. Production of nitrogen sensitive crops may be affected at nitrogen concentrations above 5 mg/L nitrate (as nitrogen) or ammonium-nitrogen.

The U.N. Guidelines conclude that 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. The U.N. Guidelines recommend that a site-specific assessment be conducted to determine if water quality above or below the U.N. Guidelines would provide protection of irrigated agricultural uses. The U.N. Guidelines divide water quality characteristics as having “No Problem – Increasing Problems – Severe Problems” and show numerical criteria that protect a full range of crops and would likely be protective under all irrigated agricultural uses. The numerical criteria for agricultural irrigation use are:

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| <u>Problem and Related Constituent</u> | <u>No Problem</u> | <u>Increasing Problems</u> |
|--------------------------------------------------------------------|-------------------|----------------------------|
| Salinity of irrigation water (micromhos per centimeter (µmhos/cm)) | < 700 | 700 – 3,000 |
| Salinity of irrigation water (mg/L) | < 450 | 450 – 2,000 |
| Specific Ion Toxicity | | |
| From ROOT absorption | | |
| Sodium (mg/L) | < 69 | 69 – 207 |
| Chloride (mg/L) | < 142 | 142 – 355 |
| Boron (mg/L) | < 0.7 | 0.7 – 3.0 |
| From FOLIAR absorption | | |
| Sodium (mg/L) | < 69 | > 69 |
| Chloride (mg/L) | < 106 | > 106 |
| Miscellaneous | | |
| NH ₄ -N (mg/L) (for sensitive crops) | < 5 | 5 – 30 |
| NO ₃ -N (mg/L) (for sensitive crops) | < 5 | 5 – 30 |
| HCO ₃ (mg/L) (only with overhead sprinklers) | < 90 | 90 – 520 |
| pH | normal range = | 6.5 – 8.4 |

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In determining the concentrations of the constituents listed above that will not result in adverse affects on agricultural beneficial uses in a given area, multiple criteria can apply. While the most stringent concentration becomes the constraining criterion, it is not necessarily the concentration that is required to protect all crops typically grown in the area. The U.N. Guidelines reflect the highest tolerable level of quality necessary to sustain the most sensitive crops but those crops may or may not be grown in the area. An evaluation of the existing crops grown in an area and crops that could be grown in that area is necessary to determine what the most stringent water quality criteria are that will protect all beneficial uses of water in that area. The highest water quality that is reasonable must be maintained.

Water Quality Objectives for Animal Drinking Water

As shown in the U.N. Guidelines, water quality needed to protect dairy animal drinking water uses are less sensitive than irrigated agriculture for all constituents shown above.

Water Quality Objectives for Municipal and Domestic Supply

With respect to water quality objectives to protect municipal and domestic supply, the Basin Plans contain the narrative taste or odor objective that state in summary that waters shall not contain taste- or odor-producing substances in concentrations that cause nuisance, adversely affects any beneficial use, or impart undesirable tastes or odors in fish flesh or other edible products. Waste from a dairy contains organic nitrogen, a decomposition by-product of which is ammonia, a taste-producing substance that, if present in excessive concentrations, can adversely affect the beneficial use of groundwater for municipal and domestic supply. J.E. Amooore and E. Hautala have established an odor objective for ammonia-nitrogen of 1.5 mg/L (*Odor as an Aid to Chemical Safety: Odor Thresholds Compared with Threshold Limit Values and Volatilities for 214 Industrial Chemicals in Air and Water Dilution*, Journal of Applied Toxicology, Vol. 3, No. 6 (1983)). While this standard is a value that is to be met at the point of use (i.e., the tap, rather

than the receiving water), the Basin Plans state that “[w]ater quality objectives apply to all waters within a surface water or ground water resource for which beneficial uses have been designated, rather than at an intake, wellhead or other point of consumption.” It is appropriate and reasonable to establish a water quality objective of 1.5 mg/L ammonia-nitrogen to protect beneficial use of area groundwaters and surface waters for human consumption.

Water Quality Objectives for Aquatic Life

Ammonia is known to cause toxicity to aquatic organisms in surface waters. Waste from a dairy contains both ammonia and un-ionized ammonia, both of which can cause impact to aquatic life. The US EPA has established Ambient Water Quality Criteria for Ammonia for the protection of freshwater aquatic life. These criteria include an acute criterion (1-hour average) for total ammonia (including ionized and un-ionized ammonia) that is dependent on pH and fish species and a chronic criterion (30-day average) that is dependent on pH and temperature, and at temperatures less than 15 degrees centigrade (59° F) is also dependent on fish species. For freshwater aquatic life protection, the acute criterion for total ammonia-nitrogen ranges from 0.885 (at pH 9.0) to 32.6 (at pH 6.5) milligrams nitrogen per liter (mg N/L) when salmonids are present and from 1.32 (at pH 9.0) to 48.4 (at pH 6.5) mg N/L when salmonids are absent. The chronic criterion for total ammonia-nitrogen ranges from 0.179 (at pH 9.0) to 10.8 (at pH 6.5). These criteria are based on total (un-ionized plus ionized) ammonia.

The California Department of Fish and Game criteria to protect freshwater aquatic life is 0.02 mg/L un-ionized ammonia. The equilibrium between un-ionized and ionized ammonia is controlled by temperature and pH. The California Department of Fish and Game determines the concentration of un-ionized ammonia based on the known percentage of un-ionized ammonia in a concentration of total ammonia at a given temperature and pH.

Water Quality Objectives for Bacteria

The majority of waste collected at a dairy is fecal matter or manure. This waste contains large quantities of pathogenic bacteria and can impact water quality if not properly handled. The Basin Plans contain water quality objectives for bacteria in surface waters and in groundwater. For surface water, the Basin Plans specify that “[i]n waters designated for contact recreation (REC-1), the fecal coliform concentration based on a minimum of not less than five samples for any 30-day period shall not exceed a geometric mean of 200/100 ml, nor shall more than ten percent of the total number of samples taken during any 30-day period exceed 400/100 ml.” For groundwater, the Basin Plans specify that “[i]n ground waters used for domestic or municipal supply the most probable number of coliform organisms over any seven-day period shall be less than 2.2/100 ml.”

Based on the *Policy for Application of Water Quality Objectives* in the Basin Plans for deriving numerical limitations from narrative water quality objectives, the most stringent water quality objectives applicable to groundwater for total coliform are 2.2/100 milliliter (ml), for ammonia-nitrogen 1.5 mg/L, for boron 0.7 mg/L, for chloride 106 mg/L, for nitrogen 5 mg/L, for EC 700 µmhos/cm, and for TDS 450 mg/L. The same water quality objectives also apply to surface water, except that the most stringent water quality objective for ammonia is 0.02 mg/L un-

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ionized ammonia or a concentration of total ammonia determined by the pH and fish species, whichever is less. Less stringent water quality objectives may apply to different areas but can only be determined through a site-specific assessment.

State Water Board Resolution 68-16

State Water Board Resolution 68-16 requires that any discharge of waste to waters must be regulated to achieve the highest water quality consistent with the maximum benefit of the people of the state. Further, it states that high quality water must be maintained unless it is demonstrated that any change in water quality will, among other things, not unreasonably affect present and anticipated beneficial uses or violate the Basin Plans. Further, it states that any activity that discharges waste must be required to meet waste discharge requirements which will result in the best practicable treatment or control (BPTC) of the discharge necessary to assure that (a) pollution or nuisance will not occur and (b) the highest water quality consistent with the maximum benefit to the people of the state will be maintained. Resolution 68-16 must be implemented consistent with the federal “antidegradation” policy (Title 40 Code of Federal Regulations Section 131.12). This General Order is consistent with these policies because it: (1) prohibits the direct or indirect discharge of waste and/or storm water from the production area to surface waters; (2) prohibits the discharge of waste to surface waters that causes or contributes to exceedances of water quality standards in the Basin Plans or the California Toxics Rule and the National Toxics Rule; (3) prohibits pollution and nuisance; and (4) contains groundwater limitations that, at a minimum, prohibit further degradation and adverse impacts to beneficial uses of groundwater or violations of water quality objectives specified in the Basin Plans.

State Water Board Resolution 88-63

State Water Board Resolution 88-63 specifies that all surface waters and groundwaters of the state are considered to be suitable, or potentially suitable, for municipal or domestic water supply except where the groundwater meets one or more of the criteria specified in the Basin Plan, including:

- a. The TDS exceeds 3,000 milligrams per liter (mg/L) (5,000 micromhos per centimeter (umhos/cm) electrical conductivity) and the aquifer cannot reasonably be expected by the Regional Board to supply a public water system;
- b. There is contamination, either by natural processes or by human activity (unrelated to a specific pollution incident), that cannot reasonably be treated for domestic use using either Best Management Practices or best economically achievable treatment practices; or
- c. The water source does not provide sufficient water to supply a single well capable of producing an average, sustained yield of 200 gallons per day.

Both Basin Plans include criteria for granting exceptions to municipal and domestic supply designation based on Resolution 88-63. The Tulare Lake Basin Plan also includes criteria for granting exceptions to the designation of beneficial uses for agricultural supply and industrial supply. De-designation of a beneficial use requires an amendment to the Basin Plan. The Tulare

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Lake Basin Plan specifies exceptions to the designated beneficial uses for some groundwater within the Tulare Lake Basin.

State Water Board Resolution 92-49

State Water Board Resolution 92-49 contains policies and procedures for Regional Water Quality Control Boards (Regional Boards) to follow for the oversight and regulation of investigations and cleanup and abatement activities from all types of discharge or threat of discharge subject to Section 13304 of the California Water Code. It directs the Regional Boards to ensure that dischargers cleanup and abate the effect of discharges. This cleanup and abatement is to be done in a manner that promotes attainment of background water quality, or the highest water quality that is reasonable if background levels of water quality cannot be restored. Any cleanup less stringent than background water quality shall be consistent with maximum benefit to the people of the state and not unreasonably affect present and anticipated beneficial uses of such water.

The Central Valley Water Board may implement State Water Board Resolution 92-49 where groundwater monitoring indicates discharges from a dairy have impacted groundwater quality.

Title 40 Code of Federal Regulations

Title 40 Code of Federal Regulations Section 122.21 (a)(1), as promulgated on 12 February 2003, requires that “All concentrated animal feeding operations have a duty to seek coverage under an NPDES permit...” The federal regulations allow an exception to this requirement. The exception applies if the permitting authority determines that a large concentrated animal feeding operation has no potential to discharge. On 28 February 2005, the 2nd Circuit Court of Appeals, in a decision on an appeal to the federal regulations (*Waterkeeper Alliance, Inc. et al v. U.S. Environmental Protection Agency, ___F.3d___, Case No. 03-4470*), vacated the requirement for all CAFOs to either apply for an NPDES permit (whether or not they had an actual discharge) or demonstrate they have no potential to discharge. US EPA is currently revising the federal regulations to incorporate the 2nd Circuit Court’s decision.

RECEIVING WATER LIMITATIONS

The appropriate receiving water limitations for a particular dairy covered under this General Order depend on the beneficial uses of the water as designated in the Basin Plan(s) and the water quality objectives necessary to protect all beneficial uses of the water.

This Order prohibits: the direct or indirect discharge of waste and/or storm water from the production area to surface waters; the discharge of waste from existing milk cow dairies to surface waters that cause or contribute to an exceedance of water quality standards in the Basin Plans or the California Toxics Rule and the National Toxics Rule; and pollution and nuisance.

The groundwater limitations of this Order require that “Discharge of waste at existing milk cow dairies shall not cause the underlying groundwater to be further degraded, to exceed water quality objectives, unreasonably affect beneficial uses, or cause a condition of pollution or

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nuisance.” These limitations are consistent with the Basin Plan(s) and State Water Board Resolution 68-16.

LAND APPLICATION SPECIFICATIONS

This General Order includes land application specifications that require Dischargers to develop and implement a NMP that provides protection of both surface water and groundwater. The contents of the NMP and technical standards for nutrient management are specified in Attachment C to this General Order.

The technical standards for nutrient management require the Discharger to monitor soil, manure, process wastewater, irrigation water, and plant tissue as specified in Monitoring and Reporting Program No. _____. The results of this monitoring are to be used in the development and implementation of the NMP. The NMP requires the Discharger to include land application areas that receive process wastewater from the Discharger’s dairy but that are under control of a third party in the Discharger’s NMP. Monitoring and Reporting Program No. ___ requires the Discharger to assure that monitoring of irrigation water and soil is conducted for these land application areas that are under a third party’s control. This requirement for the Discharger to monitor soil and applications of irrigation water to land application areas under control of a third party and to include these areas in the Discharger’s NMP is an interim process. In the future, the Central Valley Water Board expects to place land application areas under third party control under separate waste discharge requirements.

This General Order also requires Dischargers to create and maintain specific records to document implementation and management of the minimum elements of the NMP, records for the land application area, a copy of the Discharger’s NMP, and information on manure, bedding, and process wastewater transferred to other persons.

PROVISIONS

Standard Provisions

This General Order includes Central Valley Water Board Standard Provisions and Reporting Requirements.

Monitoring and Reporting Program Requirements

This General Order includes a provision that requires compliance with Monitoring and Reporting Program No. ____, and future revisions thereto, as specified by the Central Valley Water Board or the Executive Officer, or with an individual monitoring and reporting program, as specified by the Executive Officer. The 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

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- daily rainfall monitoring
- annual reporting
- annual reporting of groundwater monitoring
- annual storm water reporting
- noncompliance reporting
- discharge reporting

COMPLIANCE SCHEDULE

This General Order establishes a schedule for Dischargers to develop and implement their WMP and NMP and requires them to make interim facility modifications as necessary to protect surface water, improve storage capacity, and improve the facility's nitrogen balance before all infrastructure changes are completed. This General Order requires that all Dischargers submit:

- **By [4 months after adoption of General Order]**
 - Existing Conditions Report (Attachment A)
- **By [12 months after adoption of General Order]**
 - Annual Report including:
 - Statement of Completion of the following items in Attachment C:
 - Items I (Land Application information), II (Sampling and Analysis Proposal), IV (Setbacks, Buffers, and Other Alternatives to Protect Surface Water), V.A (Field Risk Assessment – identify control measures) and VI (Record-Keeping Requirements) of Attachment C
 - Items I (Facility Description) and V (Operation and Maintenance Plan) in Attachment B
 - Identification of Backflow Problems
 - Proposed interim facility modifications to improve storage capacity and balance nitrogen
 - Rerun of the Preliminary Dairy Facility Assessment (Attachment A) with interim facility modifications considered implemented
- **By [16 months after adoption of General Order]**
 - Statement of Completion of Attachment C items V.B and V.C (Field Risk Assessment – identify constituents detected in discharges and identify further control measures)
 - Preliminary Infrastructure Needs Checklist
 - Status report on interim facility modifications
- **By [24 months after adoption of General Order]**
 - Annual Report including documentation of interim modifications completion for storage capacity and to balance nitrogen, and rerun of the Preliminary Dairy Facility Assessment to re-evaluate current nitrogen and phosphorus balance and storage capacity needs

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- Nutrient Management Plan – Statement of Completion of Attachment C item III (Nutrient Budget). The retrofitting plan to improve nitrogen balance and schedule shall be submitted to the Executive Officer.
- Waste Management Plan with retrofitting plan and schedule, including Attachment B items II (Storage Capacity), III (Flood Protection), IV (Production Area Design and Construction), and VI (Documentation there are no cross-connections)
- Salinity Report

- **By [36 months after adoption of General Order]**
 - Annual Report including the status on infrastructure changes completed or in progress, rerun of the Preliminary Dairy Facility Assessment with changes implemented to date

- **By [48 months after adoption of General Order]**
 - Annual Report including status on infrastructure changes completed or in progress, rerun of the Preliminary Dairy Facility Assessment with changes implemented to date
 - Certification of infrastructure completion
 - Items II.C, III.D, and IV.C of Attachment B

- **By [60 months after adoption of General Order]**
 - Annual Report including rerun of the Preliminary Dairy Facility Assessment with existing conditions

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