

C. Integrated Approaches

California
Central Valley Region



Lagoon Construction Standards

The Central Valley Regional Water Quality Control Board's (Regional Board) [Reissued Waste Discharge Requirements General Order for Existing Milk Cow Dairies \(Order No R5-2013-0122\)](#) acknowledges and incorporates specific standards for new, reconstructed, and existing dairy wastewater ponds to protect groundwater. Order No. R5-2013-0122 (Order) was adopted on October 3, 2013. The Order does not have an expiration date (Herbst 2016).

Milk cow dairies with existing ponds (i.e., ponds in operation as of May 3, 2007) must conduct groundwater monitoring and maintain and operate existing ponds in such a manner so as to constitute best practical treatment or control (BPTC) or best efforts for existing ponds. BPTC for existing ponds recognizes that the design standard set forth in 1984 in [Title 27](#) (Title 27, Chapter 7, Subchapter 2, Article 1, Section 22562(d) "Retention ponds shall be lined with, or underlain by, soils which contain at least 10 percent clay and not more than 10 percent gravel or artificial materials of equivalent impermeability") is not always protective of groundwater but immediate replacement is also not an option for many dairies. As a result, BPTC for existing ponds is an iterative process where ponds are evaluated, either under an individual monitoring program or under a Representative Monitoring Program, to determine whether or not they are protective of the underlying groundwater, and upgraded or replaced as soon as practicable if they are found not to be protective. Joining a Representative Monitoring Program lets dairy operators share groundwater monitoring costs, including monitoring well installation, with other dairies in the Central Valley and collect and report data that is representative of all members.

New and expanded wastewater retention ponds must meet a strict performance standard that only allows for a very conservative pond design unless there has been a demonstration that an alternative design meets the strict performance standard. The Order establishes a two-tier approach for design of new or expanded wastewater retention ponds that is more protective of groundwater than the requirements in [Title 27, § 22562\(d\)](#). Both tiers are protective of groundwater and Tier 1 has an expedited Regional Board approval process. The Tier 1 design consists of a retention pond designed with a double liner constructed with 60-millimeter high density polyethylene or material of equivalent durability with a leachate collection and removal system (constructed in accordance with [Title 27, § 20340](#)) between the two liners. Tier 1 reviews are conducted in less than 30 days of receipt of a complete design plan package submitted to the Regional Board. The Tier 2 design consists of a retention pond designed in accordance with [California Natural Resource Conservation Service \(NRCS\) Conservation Practice Standard 313](#) or equivalent and the discharger must demonstrate that the alternative design is protective of groundwater quality through submittal of technical reports.

**Reissued Waste Discharge Requirements General Order for Existing Milk Cow Dairies
Order No R5-2013-0122**

C. Pond Specifications

C.5. New and Reconstructed Ponds

C.5.b. New and reconstructed pond designs must be reviewed and approved by the Executive Officer prior to construction. This Order provides a tiered approach to pond design requirements to provide an option that will significantly reduce the time required for approval by the Executive Officer as defined below:

- i. Tier 1: A pond designed to consist of a double liner constructed with 60-mil high density polyethylene or material of equivalent durability with a leachate collection and removal system (constructed in accordance with [Section 20340 of title 27](#)) between the two liners will be considered to be consistent with Resolution 68-16. Review for ponds designed to this standard will be conducted in less than 30 days of receipt of a complete design plan package submitted to the Board.
- ii. Tier 2: A pond designed in accordance with California Natural Resource Conservation Service (NRCS) Conservation Practice Standard 313...or equivalent and which the Discharger must demonstrate through submittal of technical reports that the alternative design is protective of groundwater quality as required in Pond Specification 5.C. below.

C.5.c. Prior to the enlargement of an existing pond (settling, storage, or retention) or the construction of any such new pond not associated with an expansion, the Discharger shall submit to the Executive Officer:

- i. For Tier 1 and 2 pond designs, a design report prepared by, or under the direct supervision of, and certified by, a Civil Engineer who is registered pursuant to California law or other person as may be permitted under the provisions of the California Business and Professions Code to assume responsible charge of such work. The design report shall include the following, as specified in Section II.B of Attachment B to this Order:
 1. Design calculations demonstrating that adequate containment will be achieved,
 2. Details on the liner and leachate collection and removal system (if appropriate) materials,
 3. A schedule for construction and certification of completion to comply with the Schedule of Tasks L.1 of this Order,
 4. A construction quality assurance plan describing testing and observations needed to document construction of the pond in accordance with the design and [Sections 20323 and 20324 of title 27](#), and
 5. An operations and maintenance plan for the pond.
- ii. For Tier 2 pond design, the design report shall also include a technical report and groundwater model that demonstrates the proposed pond is in compliance with the groundwater limitations in this Order, including calculations that demonstrate the amount and quality of seepage from the proposed pond and its effect on groundwater quality, and include proposed groundwater monitoring to evaluate the impact of pond seepage on groundwater quality.

Enlargement of any existing pond or construction of any new pond shall not begin until the Executive Officer notifies the Discharger in writing that the design report is acceptable.

a. Schedule of Tasks L.1. Dischargers are required to develop and implement a Waste Management Plan and Nutrient Management Plan, submit an Existing Conditions Report, a Salinity Report, a Proposed Interim Facility Modifications, a Preliminary Infrastructure Needs Checklist, and Annual Reports according to the schedule shown in Table 1. All elements of the Waste Management Plan shall be submitted to the Executive Officer by the deadlines specified in Table 1 and signed and certified by the Discharger as required in Required Reports and Notices J.2.a above and the additional professional specified in Table 1.

Programmatic Framework and Resources

The Regional Board possesses the authority to regulate waste discharges that could affect the quality of the waters of the state, which includes both surface water and groundwater. This authority is derived from the [Porter-Cologne Water Quality Control Act](#).

[California Water Code Section 13260](#) requires any person within a Regional Board discharging waste, or proposing to discharge waste that could affect the quality of the waters of the state (which includes both surface water and groundwater) to file a report of that discharge with the appropriate Regional Board.

In regulating waste discharges, the Regional Board implements State laws and regulations. California regulations governing discharges from confined animal facilities are contained in [Title 27, Chapter 7, Subchapter 2. Confined Animals, Sections 22560 et seq.](#)

Implementation

As of March 2016, the Order applies to approximately 1,300 milk cow dairies within the Central Valley Region. The Regional Board reports 13 Tier 1 ponds on 12 dairies, all regulated out of the Regional Board's Fresno Office. The Central Valley Region has 25 Tier 2 ponds; 21 ponds at 13 dairies regulated out of the Regional Board's Sacramento Office and 4 ponds at 4 dairies regulated out of the Regional Board's Fresno Office (Herbst 2016).

Representative Monitoring Programs began monitoring groundwater in 2012 under the 2007 Waste Discharge Requirements General Order for Milk Cow Dairies (R5-2007-0035). As of 2013, more than 98 percent of the dairies subject to the Order were members of a monitoring collective. The Central Valley Dairy Representative Monitoring Program, for example, collects data from monitoring wells at 42 Central Valley dairies from Tehama County in the north to Kern County in the south. The program extrapolates monitoring results from member dairy farms with groundwater monitoring wells to member dairy farms without wells to understand relationships between surface manure handling practices and subsurface loading of nutrients and salts, and to establish current groundwater quality conditions.

According to the Central Valley Dairy Representative Monitoring Program's [Year 3 Annual Report](#) (2014):

after three years of monitoring activities in what is likely the largest industry-specific monitoring well network of its kind in California, it is becoming increasingly apparent that groundwater monitoring will likely not be the primary tool to evaluate on-farm management practices. This is due to inherent technical limitations of hydrogeologic assessment as applied to agricultural non-point source subsurface mass emissions of nitrogen components and general minerals (commonly referred to as salts), including emissions from lagoons.

Current research into agricultural non-point source pollution and Central Valley Dairy Representative Monitoring Program research suggest that crop fields, rather than lagoon seepage, may be the primary source of subsurface emissions from dairies. Measuring field emissions will be a major focus beginning in 2015 but the Central Valley Dairy Representative Monitoring Program will continue to collect and evaluate lagoon emissions data ([CVDRMP 2015](#)).

References

CVDRMP (Central Valley Dairy Representative Monitoring Program). 2015, April 1. *Year 3 Annual Report (2014)*.

http://www.waterboards.ca.gov/centralvalley/water_issues/dairies/groundwater_monitoring/cvdrmp_2014_y3ar_pt_i.pdf. Accessed April 4, 2016.

Herbst, C. 2016, March 2. Email from Charlene Herbst, Chief, Confined Animal Facilities Unit, Regional Water Quality Control Board, Central Valley Region, to Robert Naeser, Tetra Tech, Inc., regarding R5-2013-0122.