

ATTACHMENT C
Order No. R3-2006-0016

REQUIREMENTS FOR A NUTRIENT MANAGEMENT PLAN

Provision No. D.6 of Waste Discharge Requirements Order No. R3-2006-0016 requires William Furtado Dairy develop and implement a site specific Nutrient Management Plan (NMP) to protect surface water and groundwater.

Rationale

Dairy wastes typically contain high levels of nutrients in the form of nitrogen, potassium and phosphorus compounds. Subsequently, the reuse of dairy waste products such as process wastewater and manure for irrigation and fertilization purposes can provide an agricultural benefit for crop production. If properly controlled, the application of dairy wastes for agricultural purposes can be used to maximize crop yields while minimizing the need for additional water and commercial fertilizers. Insufficient nutrient application can reduce crop yields while over fertilization can also reduce crop yields and is a waste of valuable resources (the need for commercial fertilizers can be reduced and excess manure can be sold or used elsewhere). However, improper handling and reuse of dairy wastes also pose a significant threat to water quality through the discharge of excessive nutrients in localized areas.

The required NMP is intended to protect surface water and groundwater quality through the proper management and controlled land application of facility wastewater, manure, and wastewater pond sludge for agricultural reuse and by maximizing the agricultural nutrient benefit of these waste products. Proper management of wastewater, manure, and sludge will assure waste products and nutrients are adequately contained prior to onsite or offsite reuse. The controlled application of wastewater, manure, and sludge for irrigation and fertilization purposes will assure that water and nutrients are applied at rates that do not exceed the requirements of the receiving crops. In addition to controlled nutrient loading, proper irrigation practices will result in the even application of water and nutrients to cropland and prevent excessive percolation and runoff that can also result in adverse impacts to groundwater and surface water, respectively. If excessive nutrients are applied, or if improper irrigation practices are utilized adverse environmental impacts can result from nutrients entering surface water or groundwater. In short, a properly developed and implemented NMP should minimize the discharge of nutrients to surface water and groundwater by implementing appropriate handling procedures and limiting wastewater, manure, and sludge application to rates at which selected crops can completely uptake the applied water and nutrients.

NMP Components

The NMP is to be a written description of the procedures used to handle, store and apply wastewater, manure, and sludge to onsite irrigation areas for the production of selected crops. The development of agronomic rates for the application of manure and wastewater pond sludge is only required if the Discharger intends to use these waste products onsite. However, adequate onsite management of manure and sludge is still required along with annual nutrient analyses and documentation of offsite reuse by others as specified by Monitoring and Reporting Program No R3-2006-0016.

The NMP shall include a general description of the dairy facility; a description of the physical facilities and procedures used to contain manure, wastewater and wastewater pond sludge; calculations to determine how much wastewater, manure and sludge is needed by the given crops; and a description and record of when and how they are applied.

The development of agronomic rates for the application of wastewater, manure, and sludge shall, at a minimum, consider site specific conditions related to the chosen crops, soil conditions, depth to groundwater, climate, irrigation methods, irrigation area slope, and facility specific wastewater, manure, and sludge nutrient values based on characteristic sampling data.

At a minimum, the NMP must include best management practices and procedures necessary to achieve compliance with Order No R3-2006-0016 and shall also serve as the Facilities Operations and Management Plan. Please note, the NMP is a living document, it is to be kept onsite and updated as necessary to include existing operations and regulatory changes. The plan must, to the extent practicable, contain and address the following minimum elements:

Site Information

1. The address and legal description of the property under control of the Discharger (i.e., Assessor's Parcel Number and Township, Range, Section(s), and Baseline Meridian).
2. The name(s), address(es), and telephone number(s) of the property owner(s), facility operator(s), and the contact person for the facility.
3. A brief description (i.e., total acres, field layout, etc.) of: land used for the dairy production area; all cropland where waste produced at the facility is applied and a notation showing whether the land is owned, leased, or used pursuant to a formal or informal agreement; and cropland that is part of the facility but is not used for waste application.
4. If wastewater is applied to property under different ownership than the dairy facility, a copy of agreements on the application of wastewater, manure or sludge to the property should be included.
5. Present and proposed maximum animal population (total animal population that produces waste).
6. Scaled figures, maps or aerial photographs showing:
 - a. Property boundaries and the location of all existing and proposed facilities including buildings, holding ponds, solids separation facilities (settling basins or mechanical separators), other areas where animal wastes are deposited or stored, wastewater conveyance structures, pumping facilities, structures used for animal housing, drainage controls (berms/levees, etc.), culverts, drainage easements, drainage flow directions, feed and manure storage areas, croplands where wastes are applied (whether farmed by the owner/operator or another party), tailwater drainage controls, and other components of the waste handling and storage system;
 - b. Overall dimensions, elevation contours, a vicinity map, north arrow, and the date the map was prepared. The map shall be drawn on a published base map (i.e., a topographic map) using an appropriate scale that shows sufficient details of all facilities; and
 - c. Size, elevation, and location of all facilities proposed for containment of process generated wastewater and storm water runoff on the property (berms/levees, holding ponds, upstream diversion structures, etc.). Cross section details of these facilities shall be presented.

Manure and Sludge Management

6. Description of handling and storage facilities for manure and wastewater pond sludge:
 - a. Physical facilities designed to minimize leachate from seeping into the soil and groundwater and contain runoff;
 - b. Design holding capacity of the containment facilities; and
 - c. An estimate of the amount of manure and sludge produced annually.
7. Description of best management practices for the handling and storage of manure and sludge:
 - a. Schedule and methods for removing manure and other solids from paddocks and other manured areas;
 - b. Schedule and methods of removing sludge from wastewater ponds;

- c. Schedule for removing collected manure and sludge from storage areas for onsite or offsite reuse (design holding capacity shall dictate removal schedule, but shall not be less than annually in accordance with Specification C.30 of Order R3-2006-0016);
 - d. List of potential end uses with identification of specific haulers and recipients of manure and sludge taken offsite; and
 - e. Maintenance of records/manifests documenting the amount of manure and sludge hauled offsite and its final reuse location (Manifest Form provided as Attachment D).
8. Description of best management practices and documentation for the onsite application of manure or sludge (optional based on the Discharger's intent to reuse these waste products onsite):
- a. Protocols used to apply and incorporate manure or wastewater pond sludge into surface soils in accordance with site-specific nutrient management practices that ensure maximum agricultural utilization of nutrients in the manure and wastewater pond sludge;
 - b. Maintenance of records of onsite application of manure or sludge documenting time, amount and location of application; and
 - c. Calculations showing that the application of manure or sludge is consistent with agronomic loading rates (including additional nutrient loading to the cropland from wastewater, chemical fertilizers, and irrigation water) and will not result in the development of vectors or other nuisance conditions and will not exceed the crop demand and result in the discharge of waste constituents below the root zone at concentrations that could degrade groundwater.
9. Description of methods to estimate the volume of manure and sludge produced annually.
10. Maintenance of manure and sludge quality data.

Wastewater Management

11. Description of handling, storage and treatment facilities for process wastewater including:
- a. Physical facilities designed to collect, store, treat, and convey produced wastewater with flow schematic;
 - b. Design holding and treatment capacities of the wastewater facilities; and
 - c. An estimate of the amount of wastewater produced annually.
12. Description of best management practices for:
- a. Inspection and maintenance of required freeboard;
 - b. Controls or physical methods employed to remove solids from waste stream prior to disposal in the wastewater ponds;
 - c. Schedule for rotating use of ponds to facilitate maintenance and removal of sludge, vegetation or other foreign materials; and
 - d. Schedule and methods for removing sludge from the wastewater ponds.
13. Description of best management practices and documentation for the onsite application of wastewater:
- a. Protocols used to land apply wastewater in accordance with site-specific nutrient management practices that assure maximum agricultural utilization of nutrients in the wastewater;
 - b. Maintenance of records of onsite application of wastewater documenting time, duration, amount, and location of application; and
 - c. Calculations showing that the application of wastewater is consistent with agronomic loading rates (including additional nutrient loading to the cropland from manure, wastewater pond sludge, chemical fertilizers, and irrigation water) and will not result in the development of vectors or other nuisance conditions and will not exceed the crop demand and result in the discharge of waste constituents below the root zone at concentrations that could degrade groundwater.
14. Description of methods to estimate the volume of wastewater produced and applied to irrigation areas annually (these values will likely differ based on recycling of wastewater for flushing production areas and evaporation).
15. Maintenance of wastewater quality data.

Development and Documentation of Agronomic Loading Rates

16. Develop site specific loading rates based on:
 - a. The identification and selection of crops utilized to maximize water and nutrient uptake;
 - b. Calculations determining the irrigation and nutrient requirements of selected crops for the onsite irrigation areas;
 - c. A nutrient budget for nitrogen, phosphorus, and potassium that considers all potential sources of nutrients including, but not limited to wastewater, manure, wastewater pond sludge, commercial fertilizer, crop residues, legume credits, and irrigation water;
 - d. Realistic crop yields based on soil productivity information, historical yield data, climatic conditions, level of management and/or local research on similar soil, cropping systems, and soil and manure/organic by-products tests;
 - e. The source, amount, timing and method of application of nutrients on each field to achieve realistic production goals, while minimizing nitrogen, phosphorus, and potassium movement to surface and ground waters;
 - f. Site specific wastewater, manure, and wastewater sludge nutrient data; and
 - g. Calculations showing that the combined nutrient loading to the cropland, including the nutritive value of wastewater, manure, wastewater pond sludge, chemical fertilizers, and irrigation water is consistent with agronomic loading rates and will not result in the development of vectors or other nuisance conditions and will not exceed the crop demand at the time of application or stage of crop growth and result in the discharge of waste constituents below the root zone at concentrations that could degrade groundwater
17. Description of best management practices for the application of dairy wastes to:
 - a. Land apply wastewater, manure, and wastewater pond sludge in accordance with site specific nutrient requirements that assure maximum agricultural utilization of nutrients in the applied waste products;
 - b. Assure application rates are reasonable for the crop, soil, climate, special local situations, management systems, and type of waste being applied; and
 - c. Address cropland characteristics include the depth to groundwater, soil type(s), field dimensions and topography, irrigation method(s), drainage controls, and annual rainfall patterns.

Note: The evaluation of salts may also be required to assure chosen crops and soils can handle the applied salt loading. Subsequently, measures such as blending wastewater with clean water supply for irrigation purposes or reduced recycling of wastewater pond effluent for paddock flushing may be required to reduce salt loading to levels appropriate for the chosen crops and soil conditions.

Runoff Control & Irrigation Management

18. Develop and implement a drainage plan to:
 - a. Capture and contain all wash water and wastewater from the production areas and convey it to the wastewater ponds;
 - b. Divert clean runoff and storm water as practicable away from production areas; and
 - c. Minimize erosion and runoff to surface water from land that receives wastewater, manure or wastewater pond sludge.
19. Identify appropriate site-specific conservation practices and controls to be implemented, including as appropriate buffers, berms, dikes, levees or equivalent practices, to control runoff of pollutants from irrigated areas to surface waters.
20. Description of best management practices to:
 - a. Apply wastewater to cropland;
 - b. Blend wastewater and "clean" irrigation water as required;
 - c. Measure and control the rate of wastewater and clean irrigation water application;
 - d. Determine when sufficient water has been applied;

- e. Prevent tailwater containing wastewater, manure or wastewater pond sludge from moving off of the facility property;
- f. Apply wastewater to land during the rainy season if it becomes necessary; and
- g. Prevent irrigation with wastewater from creating nuisance conditions.

Sampling & Analytical Protocols

- 21. Description of best management practices for sampling and analysis of wastewater, manure, and wastewater pond sludge.
 - a. Identify protocols for appropriate sampling and testing of wastewater, manure, and sludge; and
 - b. List of local consultants/contractors and analytical laboratories certified to conduct sampling and required analyses.

Animal Mortality Management

- 22. Description of best management practices to handle sick, diseased, or dead animals for offsite disposal.
 - a. List of local haulers, slaughterhouses, rendering and disposal facilities used to remove and dispose of diseased or dead animals; and
 - b. Maintain records/manifest of sick or dead animals removed offsite for disposal.

Record Keeping & Documentation

- 21. Identify specific records that will be maintained onsite for a minimum of five years to document the implementation of the NMP and meet the requirement of Monitoring and Reporting Program No R3-2006-0016.

NMP Preparation Certification

The portions of the NMP that are related to facility and design specifications must be prepared and certified by a Civil Engineer who is registered pursuant to California law or other persons as may be permitted under the provisions of the California Business and Professions Code to assume responsible charge of such work. The portions of the NMP related to nutrient management and irrigation shall be developed by an appropriate professional such as a Soil Scientist, Agronomist, Crop Scientist, or Crop Advisor certified by the American Society of Agronomy or other certification program acceptable to the National Resource Conservation Service (NRCS).

Technical Standards

Technical standards for nutrient and irrigation management are currently under development in California. The National Resource Conservation Center (NRCS) is currently leading the effort to develop NMP guidance pursuant to Title 40 CFR Part 123.36 for Confined Animal Feeding Operations (CAFOs). The Dairy Farm Advisors at the University of California Cooperative Extension Service are also developing a guidance document for preparation of a Nutrient and Irrigation Water Management Plan (NIWMP). The NIWMP guidance document, once available, should be useful in preparing a NMP by identifying essential information, providing generally accepted values, and presenting a logical format. Additional information related to the preparation of NIWMPs is available in the "Environmental Stewardship Short Course for California Dairy Operators" presented by the University of California Cooperative Extension in cooperation with the California Farm Bureau, Milk Producers Council, and Western United Dairywomen.

Until standard guidance documents are available, there is no standard format to follow for preparing an NMP. Therefore, anyone required to prepare a NMP must develop a logical format using available resources at the time of preparation. The required NMP shall contain the minimum elements outlined above and be generally consistent with the NRCS Conservation

Practice Standard for Nutrient Management, Code 590 and utilize California technical standards once developed.

Technical References

- NRCS Conservation Practice Standard, Nutrient Management, Code 590
- NRCS General Manual Title 450, Part 401.03 (Technical Guides, Policy and Responsibilities) and Title 190, Part 402 (Ecological Sciences, Nutrient Management, Policy)
- NRCS Field Office Technical Guide (FOTG)
- National Planning Procedures Handbook (NPPH)
- NRCS National Agronomy Manual (NAM) Section 503

Funding & Technical Support

There are several federal, state, and local programs that can provide financial assistance to dairymen conducting projects that address environmental concerns. These include the Environmental Quality Incentives Program (EQIP), and the Dairy Quality Improvement Grant Program. Each of these is discussed below.

Environmental Quality Incentives Program

The Environmental Quality Incentives Program (EQIP) is a voluntary conservation program that promotes agricultural production and environmental quality. Through EQIP, farmers and ranchers may receive financial and technical assistance to install structural conservation measures and implement conservation practices. EQIP is administered by the Natural Resource Conservation Service (NRCS), which is funded by the federal Farm Bill of 2002. Financial and technical assistance is available to help install or implement structural and management practices on eligible agricultural land. The program and distribution of funds is done at the state level. Producers engaged in livestock or crop production on eligible land may apply for the program. Eligible land includes cropland, rangeland, pasture, private non-industrial forestland, and other farm or ranch lands. Rankings for allocating money to applicants are based on environmental scores obtained by evaluating the project in the context of local, state, and federal priorities.

More information on the EQIP program is available through the NRCS office listed below or at the following NRCS web site:

<http://www.nrcs.usda.gov/programs/eqip/>

Dairy Water Quality Improvement Grant Program

The Dairy Water Quality Improvement Grant Program, implemented through the State Water Resources Control Board Division of Financial Assistance, will provide \$5 million from Proposition 50 to fund regional and on-farm dairy projects to address water quality impacts from dairies. Applications for grant funds were accepted between August 2 and October 3, 2005. Eligible project types include water quality planning and implementation projects. For more information contact the following:

Mr. Ken Coulter
Senior Engineering Geologist
(916) 341-5496
kcoulter@waterboards.ca.gov

<http://www.swrcb.ca.gov/funding/dairy.html>

Resources for Compliance Assistance

Natural Resource Conservation Service

The Natural Resource Conservation Service (NRCS) is a federal agency providing technical assistance to farmers and dairy operators on improved management practices. The NRCS also administers the Environmental Quality Incentives Program (EQIP) (see the discussion above on EQIP Funding). The NRCS USDA Service Center for the Central Coast is located in Hollister.

Natural Resources Conservation Service (NRCS)
USDA Farm Service Agency
Hollister Service Center
2337 Technology Parkway, Suite A
Hollister, CA 95023-2544
(831) 637-4360
(831) 636-7643 fax
URL: <http://www.nrcs.usda.gov>

University Of California Cooperative Extension

The University of California Cooperative Extension has statewide specialists in animal waste management, nutrient management and dairy science. These specialists are located at the Davis campus of the University and throughout the counties in California. Like all agencies, Cooperative Extension has been hit very hard with the recent budget cuts but they continue to provide an effective education, outreach and field research program. The university and county specialists are well trained, well respected by the dairy industry and provide a valuable link between research and field application.

University of California Cooperative Extension (UCCE)
Agricultural and Natural Resources (ANR)
Santa Clara County
1553 Berger Drive, Bldg. 1
San Jose CA, 95112
(408) 282-3110
FAX: (408) 298-5160
E-Mail: cesantaclara@ucdavis.edu
URL: <http://cesantaclara.ucdavis.edu>

California Dairy Quality Assurance Program (CDQAP)

The California Dairy Quality Assurance Program (CDQAP) is a partnership among federal and state agencies, academia, and the dairy industry and is a voluntary cooperative government and industry education and facility evaluation program. The objective of the CDQAP is to assist California dairy producers in meeting all federal, state, local, and regional regulations relating to manure and nutrient management. The program core components include continuing education workshops for producers, creation of Environmental Stewardship Farm Management Plans, and third party on-site evaluations.

California Dairy Quality Assurance Program
502 Mace Blvd., Ste. 12
Davis, CA 95616
(866) 662-3727
URL: <http://www.cdqa.org>