

**STATE OF NEW MEXICO  
BEFORE THE WATER QUALITY CONTROL COMMISSION**

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In the Matter of: )  
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PROPOSED AMENDMENT ) No.: WQCC 09-13(R)  
TO 20.60.2 NMAC (Dairy Rules) )  
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**NOTICE OF INTENT TO PRESENT TECHNICAL TESTIMONY**

COMES NOW, Amigos Bravos, Caballo Concerned Citizens Group, Food and Water Watch and the Sierra Club Rio Grande Chapter (collectively referred to as “the Coalition”), by and through their attorneys New Mexico Environmental Law Center, and pursuant to the Procedural Order entered in this matter, submits this Notice of Intent to Present Technical Testimony.

**1. Identity of the person for whom the witnesses will testify.**

The Coalition (Amigos Bravos, Caballo Concerned Citizens Group, Food and Water Watch and the Sierra Club Rio Grande Chapter).

**2. Identity of each technical witness Coalition intends to present and their qualifications, including a description of their educational and work background.**

**A.** Kathy J. Martin, PE. Ms. Martin’s qualifications are described in her attached testimony. (See Tab A, Coalition Exhibit 1<sup>1</sup>.)

**B.** Ms. Elanor Starmer. Ms. Starmer’s qualifications are described in her attached testimony. (See Tab B.)

**C.** Mr. Brian Shields. Mr. Shield’s qualifications are described in his attached testimony. (See Tab C.)

<sup>1</sup> Coalition Exhibits are designated “C1” through “C7”.

D. Ms. Rachel Conn. Ms. Conn's qualifications are described in her attached testimony. (See Tab D.)

**3. Description of direct testimony of each technical witness and anticipated duration of their testimony.**

Pursuant to the Hearing Examiner's Procedural Order, each witness's pre-filed direct testimony is attached hereto.

**4. Text of recommended modifications to the proposed regulatory change.**

A text of the Coalition's recommended modifications to the proposed regulations is attached as an exhibit to Ms. Martin's pre-filed direct testimony. (Tab A, Coalition Exhibit 2.)

**5. Coalition's exhibits and proposed statement of basis for recommended changes.**

A. The Coalition's Exhibits are attached hereto.

B. Statement of basis: The Coalition's recommended changes would better protect public health and welfare and the environment by:

- 1) assuring adequate setbacks between dairy facilities and human consumptive crops, state parks, public surface drinking water supplies, and populated areas;
- 2) assuring regulatory oversight of waste disposal, whether such disposal occurs onsite or offsite;
- 3) providing for meaningful public notice;
- 4) assuring compliance with environmental permit requirements; and
- 5) requiring closure plans and financial assurance to be in place at the time a new permit is issued or upon renewal or modification of an existing permit.

The Coalition will also provide a proposed statement of reasons after the hearing pursuant to the Scheduling Order.

Respectfully submitted:

NEW MEXICO ENVIRONMENTAL LAW  
CENTER

By: 

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Chapter

### Certificate of Service

I certify that the foregoing document was emailed on the 8<sup>th</sup> day of March  
to the persons identified on the attached service list and that the original and appropriate number  
of copies was filed with the WQCC.



Bruce Frederick

## SERVICE LIST

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**STATE OF NEW MEXICO  
WATER QUALITY CONTROL COMMISSION**

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**IN THE MATTER OF THE PROPOSED AMENDMENT  
TO 20.6.2 NMAC (DAIRY REGULATIONS)**

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)      **WQCC 09-13 (R)**

**TESTIMONY OF KATHY J. MARTIN, PE**

My name is Kathy J. Martin and I am a professional engineer licensed in Oklahoma in the field of Civil Engineering. My education includes a Bachelor's degree in Petroleum Engineering and a Master's degree in Civil Engineering with 50 hours beyond the master's program in areas of civil and chemical engineering. My career started at the Oklahoma Water Resources Board where I performed the duties of a permit writer for non-hazardous industrial wastewater and drafted regulations for the design, construction, operation, maintenance, and closure of waste lagoons and land application used by various industries in Oklahoma. I also served as the third Project Officer of the Tar Creek Superfund Site and oversaw the development and implementation of regional groundwater study on the Roubidoux Aquifer with respect to impacts from intrusion of acid mine drainage from the lead and zinc mines of the Tri-State Mining District. In 1993, I worked for the Oklahoma Department of Environmental Quality in the Customer Assistance Program and focused on the implementation of the Clean Air Act Amendments of 1990 Small Business Assistance Program, as well as provided multi-media permit and compliance assistance in team format.

For the past twelve years, my work has focused on environmental issues related to large scale animal feeding operations, including the technical and regulatory review of nearly 200 CAFO permit applications in 20 States and participation in rule-making in Oklahoma, Kansas, Nebraska, Colorado, Indiana, and New Mexico. In 1998, I was awarded a contract which resulted in the creation of a 50 page, stand-alone CAFO regulation for Seward County, Kansas.

I have been accepted as an expert witness in numerous administrative hearings and a list of those proceedings is attached to my vita (Coalition Exhibit 1). The majority of the hearings were part of the State NPDES permitting process for CAFOs, as well as groundwater discharge permits and in some cases, air and odor aspects of the permits. I have also testified regarding CAFO impacts to the environment in Nebraska (District Court) and Kentucky (Chancery Court).

Even though I live in Norman, Oklahoma, I do have an emotional tie to New Mexico, as my sister and her family live in Bernalillo and several of her oldest children attend college in Albuquerque and Santa Fe. It is an honor to participate in the rule-making process of New Mexico and I greatly appreciate the opportunity to testify on issues important to the public health and environment of New Mexico.

**Scope of Testimony**

My written testimony will span several topics and address specific regulatory language that was introduced by the citizen groups throughout the dairy rule-making process. It should be stated that many suggestions made by citizens have already been adopted in part or in whole by NMED. However, I want to bring to the attention of the Water Quality Control Commission

specific items that the citizens continue to believe are important and constructive additions to the regulations proposed by the NMED. My efforts will cover the topics of: new definitions related to setbacks; increased setbacks distances for new and existing facilities; denial of permit applications with technical deficiencies; maximum capacity of dairy facilities; identification of other dairy and land application areas; identification of past noncompliance; issues related to third-party hauling of dairy waste; separation distance to groundwater; timing of design plan submittals; and professional engineer approvals.

### **Testimony related to Proposed Definitions**

The citizens propose the addition of two phrases into the definition section of the proposed dairy regulation (20.6.2.3202 DEFINITIONS). Both phrases are referred to in the additional setback language also proposed by the citizens.

New definition: (17) "Human consumptive food crops" means any food crop grown primarily for human consumption or within the human food supply, including but not limited to chiles, onions, leafy vegetables, cabbages, and herbs.

The reason for introducing the term "human consumptive food crop" is to focus on the need to prevent contamination of food crops from pollutants known to occur in dairy manure and dairy wastewater. The citizens feel that food crops that are generally eaten raw or with minimal cooking are the most vulnerable. Of particular concern is the possibility of fecal pathogen contamination of human consumptive food crops due to proximity to dairy production facilities and land application fields where manures and wastewaters are land applied.

For the past four years, I have researched issues related to enteric pathogen internalization in food crops. Reports of food crops contaminated with fecal pathogens and the impact on the national food supply have dominated the news in the past few years, including *Escherichia coli* O157:H7 in spinach (2006), *Salmonella* Typhimurium in peanuts (2009), and *Salmonella* Saintpaul in tomatoes (2008). In Georgia where the peanuts were grown related to the 2009 outbreak – peanut farmers commonly double crop with cotton and use chicken litter before the cotton crop because of the unexpected benefit of reducing nematode populations (Gascho, et al, 2001; Endale, et al 1999). The long survival times of *Salmonella* of greater than 180 days means those pathogens applied during the cotton season could still be viable when the same land is used to grow peanuts (Holley, R.A. et al 2006).

The 2002 Rutgers study showed "the transmission of *Escherichia coli* O157:H7 from manure-contaminated soil and irrigation water to lettuce plants" where microphotography proved the bacteria occupied the inner tissues of the plant (Solomon, et al 2002; Coalition Exhibit 3). For nearly 50 years scientists have studied the internalization of pathogens in human consumptive food products, as illustrated by USDA sponsored research in 1962 that showed bacterial populations occurred inside healthy tomatoes, with the largest amounts at the stem and decreasing amounts in the fleshy interior (Samish, et al, 1962).

Over 40% of the US chile pepper production occurs in New Mexico (NASS 2009). The 2009 New Mexico summer onion crop was valued at \$53.9 million dollars. Chile and onion farmers testified at the ParaSol Dairy administrative hearing about their specific concerns that

*Escherichia coli* from the proposed dairy could enter the irrigation system that they rely upon to grow their food crops. The dairy production area was proposed to be located several hundred feet from the flood zone of Percha Creek and parts of the waste handling system would be as close as 10 feet. It was shown that contamination of shallow groundwater would rapidly enter the Percha Creek flow system and any overflows from the proposed waste handling facilities during storm events could flow unimpeded to Caballo Dam, a mere quarter mile downstream. Computer simulations illustrated the transport and fate of *Escherichia coli* from the proposed dairy site along Percha Creek, to Caballo Dam, and finally to the Rio Grande and the downgradient irrigation system.

Routes of exposure of food crops to dairy wastes include contaminated stormwater runoff, contaminated groundwater, communication of contaminated groundwater with surface water, aerial deposition of contaminants, as well as contaminated groundwater from land application of manures and wastewaters. Dairy manure and wastewaters can contain a variety of pathogens including *Escherichia coli* O157:H7 (USDA, 2003), *Salmonella* (van Kessel, et al 2008), *Listeria monocytogenes* (Borucki, et al 2005), *Cryptosporidium* (USEPA 2001), and mycotoxins in silage (Whitlow, NCSU).

Therefore, the citizens feel it is important and necessary to emphasize the importance of identifying lands that are used to grow human consumptive food crops. It is my opinion that New Mexico should not allow land application of untreated dairy manures and wastewaters as fertilizers on any cropland that will also be used to grow food crops.

New definition: (23) "Populated Area" means any area where at least 10 occupied residences or businesses are located, including schools, hospitals, and churches.

The rationale for providing a definition of populated area is to allow for some additional setbacks in rural settings where at least 10 homes and businesses are located. This concept was borrowed from the Oklahoma CAFO statute (Coalition Exhibit 6). Implementation of this setback should be shown on a map of appropriate scale such that the production area can be accurately placed and distances measured from the outside edge of each waste management structure to a distance of one mile. The result of connecting all of the one mile distances should be a circular or elliptical area, depending on the configuration of the dairy barns, feedlots, and lagoons. The applicant should then plot the location of all occupied residences and businesses within that elliptical area. If it can be shown that less than 10 exist in the area, the dairy would pass the setback restriction for that specific farm layout and location. If it is shown there are at least 10 homes and businesses within that area, the dairy would not be permitted.

**Testimony related to general prohibition of land application without a discharge permit.**

New language is proposed by the citizens at 20.6.2.3203 (E) to address the issue of manure solids or compost that is generated at a dairy facility but sold or given away to a third party. (Coalition Exhibit 2). Without this specific prohibition, it is entirely possible for a dairy facility to sell or give away all of its manure to one or many third parties and the agency will not know the final disposition. If that manure or compost is land applied in New Mexico, then the application should be monitored by a discharge permit and an approved nutrient management plan.

**Testimony related to technical deficiencies of renewal and modified permit applications.**

In 20.6.2.3205 (I)(3) of the rules, the agency proposes language to address what happens if there are outstanding technical deficiencies during a permit application review process and how the agency will decide whether to deny an application or to support its issuance.

In paragraph (I) (2), the agency states that a new permit application with technical deficiencies that are not resolved within 30 days causes the permit application to be denied. However, for renewals and modified permit applications, as described in paragraph (I) (3), they may be denied or allowed to proceed to permit issuance with the caveat that the technical deficiencies must be submitted within 30 days after permit issuance.

The citizens propose alternative language that separates out the renewal application from a modified permit application to prevent a modified permit from being issued with outstanding technical deficiencies (Coalition Exhibit 2). The reason for this is to insure that any new construction could not occur under a modified permit until all technical deficiencies are resolved.

With respect to simple renewal of an existing permit, the citizens assume this means that no substantial changes are proposed for the facility. Examples of technical deficiencies that might occur at simple renewal include proof of monitoring well installation, submittal of groundwater monitoring data, submittal of any required record-keeping, or other information that was required in the current permit or that would be required by law at time of permit renewal.

With respect to a modified permit application, the citizens assume that this action does imply substantial change to the existing facility and that those changes could include increased capacity of the dairy, construction of new feedlots or barns, increase in the volume of waste generated, design and construction to expand the capacity of the waste handling system, and identifying additional parcels of land for land application.

The citizens feel strongly that modifications involving new construction or substantial changes in the waste handling system deserve to be thoroughly vetted by the agency and the public before a permit is granted. The current wording of paragraph (I)(3) allows the dairy to acquire a permit for modification without satisfying the technical deficiencies so noted by the agency. This also serves to deny the public the ability to review the design or other documentation related to the modification before permit issuance.

It is my opinion that the citizens' proposed language as (I)(3)(a), (b), and (c) is necessary to protect the public's due process by preventing the agency from granting permission for modification until all technical deficiencies are resolved.

**Testimony related to Setbacks and Location Maps**

Throughout the dairy rule-making process, the citizens vocalized their concerns about adequate setbacks not only for new production facilities, but also for land application areas at new and existing dairy facilities. Rule 20.6.2.3216 contains proposed setbacks to be applied to dairy facilities for new discharge permits with respect to the production areas (subparagraph D) and land application areas (subparagraph E).

Citizens propose greater setbacks for all categories in the dairy regulation plus additional setbacks to irrigation supplies, human consumptive food crop land, occupied residence and business, populated areas, incorporated limits of any municipality, State Parks, public surface water drinking supplies, and facility water supply wells. It is my opinion that increased production area setbacks are necessary to protect the public health and environment.

The dairy regulations, as proposed by NMED, do not provide for a sliding scale of setbacks depending on the size of the dairy, the number of animals housed, or the volume of waste generated. Barring the creation of that type of permitting system, it is my opinion that citizens must insist upon a more conservative setback distance in order to protect future neighbors and communities from dairies of considerable size and volumes of waste associated with large scale animal feeding operations.

The increases recommended attempt to express the associated risk or adverse impacts for each category to be protected, such as proximity to surface features (eg., flood zones, lakes, sinkholes, and springs) that are not associated with water supplies and those features that are definitively tied to private and public water supply. Lesser setbacks are suggested for areas not immediately associated with drinking water supplies and greater setbacks are suggested for wells, rivers, lakes, and springs that are used for drinking water supplies. Even greater setbacks are suggested for homes and businesses, populated areas, and municipalities to address not only potential adverse impacts to groundwater and surface/groundwater interactions, but to also provide a modicum of safety from airborne contaminants generated by the dairy production area and subsequently deposited on lands outside the control of the dairy.

The largest setbacks proposed by the citizens are reserved for State Parks and public surface water drinking supplies. State Parks represent a significant investment through state and federal funding and are an important contributor to state and local revenues. The protection of the pristine nature of New Mexico's state park system and the continued enjoyment by tourists and local visitors should be a high priority. Oklahoma CAFO legislation provides for a minimum of three (3) mile setback to recreational sites that by definition does not limit the setback to only State Parks (Coalition Exhibit 6).

In the NMED excel spreadsheet titled "Nitrate Contamination at Dairy Facilities" (Coalition Exhibit 4), there are a total of 275 permitted dairy facilities. However, 108 facilities do not have groundwater analytical data (39%). Of the remaining facilities (168), only 43 have never had a confirmed exceedance for NO<sub>3</sub>, which means 74% of the 168 facilities with groundwater data have exceeded the nitrate groundwater standard of 10 ppm.

The 108 facilities that do not have groundwater analytical data represent 4.12 million gallons per day discharge or 1.5 billion gallons of wastewater per year. It should be noted that 38 of those 108 facilities do not have the discharge volume listed in the excel spreadsheet, so this is a very low estimate of daily discharge.

Approximately 230 facilities discharge more than 10,000 gallons per day or 83.6% of the permitted facilities each discharge more than 3.5 million gallons per year. In fact, 35 facilities

discharge more than 100,000 gallons per day or 36.5 million gallons per year per facility. In light of the missing data, and the impact of the data that is available - it is my opinion that the citizens' proposal to not only increase the setback distances to features already identified by the agency, but to add to that list new features, is extremely important and will go far to protect public health in terms of removing the pollution source from those areas where drinking water is acquired, as well as preserving the property rights of neighboring lands and land uses.

### **Testimony related to Engineering Licensure**

In 20.6.2.3217 [changed to 3218] (A), regarding the practice of engineering, the citizens propose to add the following language:

Licensed and professional personnel must be vetted and approved by the Agency to ensure proper skill levels and licensing.

At some point in the permit application process, the applicant provides plans and specifications and related documentation describing how the proposed production area was designed and how it will be constructed. In the proposed dairy regulations, NMED does require the signature and seal of the licensed New Mexico professional engineer to be placed on those documents. However, it is my opinion that an additional step must be taken by NMED to confirm that each person that signs as a New Mexico professional engineer is indeed still currently licensed in New Mexico. The reasoning behind this measure is to prevent another ParaSol Dairy situation where the engineer's license expired during the permit review process and documents provided to satisfy technical deficiencies may not have been signed by a currently licensed engineer. The agency can easily contact the New Mexico State Board of Licensure for Professional Engineers and Surveyors and confirm that each license number is valid and current.

### **Testimony related to dairy facility information and location.**

Rule 20.6.2.3206 (E) includes a short list of information required in the permit application related to the facility location, such as its proposed physical address and its location in Township and Range. This location information applies to both the production area and the land application areas. It is my opinion that at the very least this short list should be expanded to include the proposed maximum number of animals to be housed at the dairy facility as item (E)(3). The reason for this is that most waste volume calculations are based on the number of animals by type of animal and the expected manure and wastewater volume generated per animal. This is especially true when designing a new facility where the applicant may not have access to actual waste volumes and must use the published literature and industry standard design factors to make estimates. These design factors are normally expressed as pounds per head per day and gallons or cubic feet per head per day, including factors for volume of manure as excreted, mass of nitrogen and phosphorus in the manure, volumes of milking parlor washwater, and other waste constituents.

Every single State regulation I have read and used the past 12 years requires at least the identification of all animal types and maximum capacity of the proposed facility; therefore, it is my opinion that the applicant should state the maximum capacity of the proposed facility in the permit application. Similar wording is proposed for renewal and modification permit applications as shown in 20.6.2.3207 (E)(4).

Proposed language in 3206(E)(4) and (5), and in 3207(E)(5) and (6) serve to put the agency on notice of all other dairy facilities and land application areas that are owned, controlled, or operated by the applicant and any alleged or proven environmental violations that have occurred at those additional dairy facilities. As the dairy industry faces more strict state regulations, migration to new, possibly less regulated locations does and can occur.

I am personally aware of dairies from California expanding as far as Illinois and Indiana under common familial ownership. In the past decade, I have observed corporate-sponsored dairies from Michigan moving on to Ohio and Indiana leaving in their wake serious compliance issues, impending bankruptcy, and a pattern of behavior. Should their eyes turn westward, New Mexico need not embrace them without fair warning and opportunity to proceed fully informed. This type of movement is occurring right now and involves proposed dairies ranging in size from 1800 head with 20 million gallon capacity lagoons (Vreba-Hoff dairy) to 13,000 head with 70 acres of lagoons (Bos dairy in Jo Davies County, Illinois).

The proposed language requiring identification of all land application areas under the control of the applicant and any compliance issues related to that land serves a similar purpose to that derived from identification of other dairy facilities. In addition, the agency and the public should have access to compliance issues related to the disposal of dairy wastes and wastewaters via land application. It is entirely possible that the dairy facility itself does not have compliance issues, but the disposal by land application has resulted in violations and vice versa.

It is my opinion that the applicant must identify other dairy operations and land application areas owned, operated, or under the control of the applicant and to enumerate any compliance issues related to those facilities so the agency and the public can make a well-informed decision with respect to future expansion in New Mexico.

#### **Testimony regarding separation distance between impoundments and groundwater**

The NMED regulations only require a separation distance of four (4) feet between the finished grade of the floor of the impoundment and the seasonal high groundwater level. NMED has collected data regarding groundwater depth and pollution indicators from those dairy facilities that have installed monitoring wells and the agency has concluded that 65% of those dairies that do have monitoring data indicate pollution has occurred (Coalition Exhibit 4). In most cases, shallow groundwater indicates proximity to surface water, especially when the depth to groundwater is less than 10 feet. The citizens propose a separation distance of 30 feet below the floor of the impoundment to protect groundwater and hydrologically connected surface water.

The excel spreadsheet of dairy facilities (Coalition Exhibit 4) lists 275 dairies with a permitted discharge. Of those facilities, 38 in the table do not have a specified discharge volume. The total permitted discharge of those facilities in the table with a discharge specified (237 facilities) equals 14,055,055 gallons per day or 5.13 billion gallons of dairy wastewater per year (not including the unknown discharge volumes for the remaining 38 permitted facilities).

Of the 237 facilities, 45 show daily discharge less than or equal to 10,000 gallons (19%) and 35 facilities discharge 100,000 gallons per day or more (14.8%), leaving 195 of the 237 facilities

that discharge more than 10,000 gallons per day but less than 100,000 gallons per day (82.3%). Of the 275 permitted dairies, 40 facilities did not have a depth to groundwater listed in the excel spreadsheet. Of the 235 facilities that did have depths recorded, 14 had groundwater 10 feet or less, 31 had groundwater 20 feet or less, 43 had groundwater 30 feet or less, and 65 facilities had groundwater 50 feet or less. Nearly one-third of the 235 facilities were constructed where the groundwater was 50 feet or less below ground elevation.

Of the 14 facilities with groundwater 10 feet or less, one facility had “no exceedance”, two facilities were missing groundwater analytical data, and the remaining 11 all had confirmed exceedance for nitrates, 8 for TDS, and 8 for chlorides – with 7 of the 11 showing exceedance for NO<sub>3</sub>, TDS, and chlorides.

A few items need to be emphasized. First, if the NMED separation distance of four (4) feet was enforced, absolutely none of the currently permitted dairies would have a permit denied. Second, of the permitted facilities with depths to groundwater less than 10 feet – 10 of the 11 with data show exceedance for NO<sub>3</sub>. Third, even if the separation distance was 10 feet, only 14 of 275 facilities would have been denied a permit (5 percent). If the separation distance was enforced at 30 feet, then 15 percent of the currently permitted facilities would have been denied.

It is my opinion that a separation distance of 30 feet will allow the agency to dissuade new construction of dairies in areas with very shallow groundwater and thus protect the most sensitive groundwater and potentially the nearby surface water.

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Kathy J. Martin, PE

Engineering Seal on original  
Signed and dated

## References

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# KATHY J. MARTIN, PE

3122 Tall Oaks Circle · Norman, Oklahoma 73072 · Telephone: (405) 321-3176

## CURRENT POSITION

ENVIRONMENTAL CONSULTANT, MARTIN ENVIRONMENTAL SERVICES, NORMAN, OK  
Professional engineer in Civil Engineering providing expertise in areas of industrial permitting for air quality, non-hazardous industrial wastewater, and closure of surface impoundments. Perform engineering review and critique of permit applications submitted by swine facilities to regulatory agency with respect to wastewater treatment technology and compliance with environmental regulations.

## EDUCATION

UNIVERSITY OF OKLAHOMA

*M.S. Civil Engineering, 1989*

Thesis: The Removal of Polychlorinated Biphenyls from Topsoil Using Nonionic Surfactants

UNIVERSITY OF OKLAHOMA

*B.S. Petroleum Engineering, 1987*

National Dean's List, 1986-87

## EXPERIENCE

SEWARD COUNTY COMMISSIONERS, SEWARD COUNTY, KANSAS

*Subcontracted as Martin Environmental Services, June - October 1998*

Drafted environmental regulations for confined animal feeding operations (CAFOs) with respect to the design, construction, operation, maintenance, and closure of surface impoundments and the disposal of CAFO waste by land application. The resulting work product was a set of regulations that is a complete permitting program including public notice, hearings, permit application processes and fees, as well as provisions for compliance and enforcement.

ADJACENT LANDOWNERS TO SWINE FACILITIES

*Subcontracted as Martin Environmental Services, June 1997 to present*

Perform technical and regulatory review of approximately 100 CAFO permit applications nationally to determine if the application is sufficient for a permit writer to draft a permit. The purpose was to determine if there were technical and/or regulatory deficiencies in the application and prepare a written report for use in administrative proceedings by concerned citizens and adjacent landowners.

DEPARTMENT OF ENVIRONMENTAL QUALITY

*Environmental Engineer II, July 1, 1993 to November 1, 1996*

Special training in areas of Air Quality and Hazardous Waste permits and regulatory requirements. Provided technical and regulatory assistance to business and industry with respect to environmental permits issued by the ODEQ in water quality, air quality, and solid waste programs.

OKLAHOMA WATER RESOURCES BOARD

*Environmental Engineer I, April 1990 to June 30, 1993*

Special training in areas of industrial wastewater disposal permits and inspections. Drafted state regulations for surface impoundments and land application of non-hazardous industrial wastewater. Issued state permits for non-discharge facilities. Project officer of Tar Creek Superfund Site.

## TECHNICAL EXPERTISE

- 11 years continuing education regarding CAFO waste management systems
- Extensive research and knowledge of lagoon liner systems and waste/liner compatibility
- 6 years continuing education regarding pathogen transport and fate from CAFOs
- 11 years continuing education regarding air pollution and odors from CAFOs
- Other topics of continuing education: GPS, perimeter tile design, concrete, and soil science
- Drafted Oklahoma state regulations for permitting of surface impoundments and disposal by land application used by facilities with non-hazardous industrial wastewater
- Drafted county regulations for CAFO impoundments and land application of manure
- Familiarity with CAFO regulations in AR, CA, CO, GA, IA, ID, IL, IN, KS, KY, MO, MS,

EXHIBIT

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tabbles

ND, NE, NM, OK, PA, SD, TX, UT, and WY

- Professional Engineer in Oklahoma (No. 18254) February 1997 to present
- Coordinated Superfund activities between USGS, Oklahoma State and EPA
- Interacted with State Legislators (OK and KS) on technical issues related to CAFOs
- Provide expert testimony regarding CAFO waste management systems in Arkansas, Indiana, Kansas, Kentucky, Missouri, Nebraska, New Mexico, Oklahoma, and Utah
- Provide technical and regulatory reviews of CAFO permit applications in AR, CA, CO, GA, IA, ID, IL, IN, KS, KY, MO, MS, ND, NE, NM, OK, PA, SD, TX, UT, and WY
- Graduate Degree coursework included: Groundwater Protection, Groundwater Seepage, Groundwater Modeling, Groundwater Pollution Control, Air Pollution Controls, Air Pollution Engineering, Environmental Impact Assessment, Risk Assessment, Industrial Hygiene, Reservoir Dam Engineering, Open Channel Flow, Chemical and Biological Aspects of Environmental Engineering, Advanced Wastewater Treatment, Soil Classification, Soil Science, Hazardous Waste Control, Solid Waste Engineering/Landfill Design, Land Use Management, Surfactants and Colloidal Science, Corrosion Engineering, Field Applications, and Nonparametric Statistics.
- Three years Chinese language
- Ten years leadership positions in local, state, and national organizations
- Developed state-wide foundry and metal casting facility environmental program in Oklahoma – and trained state agencies in Louisiana and Arkansas to do the same.
- Active contributor to proposed regulatory language with respect to CAFOs at local, state, and federal levels for past five years.
- Provided lectures on CAFO environmental issues to groups in Oklahoma, Kansas, Nebraska, Indiana and Utah to groups as large as 600 people at a time.

## ORGANIZATIONS AND BOARD POSITIONS

- STRONGER NATIONAL BOARD MEMBER – ENVIRONMENTAL STAKEHOLDER (2006 TO PRESENT)
- DEQ Hazardous Waste Management Council - governor appointed member (past)
- STRONGER Audit Team - Oil and Gas Environmental Regulations in Oklahoma (2005), Kentucky (2006) and Tennessee (2007)
- Oklahoma Corporation Commission - Citizen Advisory Board member (past)
- Oklahoma Society of Environmental Professionals – Past President, Past Newsletter Editor, Past Secretary, Past Engineering Board Member
- American Society of Agricultural and Biological Engineers (ASABE) – member
- Society of Petroleum Engineers - Past Executive Committee two years, member 10 years
- National Association of Professional/Graduate Students - Past Board member and National Conference Chairperson
- Graduate Student Senate, University of Oklahoma - Past Chair two years, Past Vice Chair, Past Senator for Civil Engineering Department
- Oklahoma Chapter of Sierra Club - past member, 1 year
- Engineering Club of Oklahoma City - past member, 6 years
- OU Petroleum Engineers Club - past Vice President, member 4 years
- OU Society of Women Engineers - past President, member 7 years
- OU Engineer's Club - Loyal Knight of St. Pat, member 7 years

# List of Administrative Hearings

List updated February 2009

Sworn Testimony of Kathy J. Martin at the following hearings:

Location	File Name	Date	Other
Okla Water Resources Board	Seaboard - Nichols Radcliffe Nursery Beaver County, OK	Oct 1997	OWRB Water permit administrative hearing
Okla Dept of Ag	BAR-D swine finisher Caddo County, OK	Dec 1997	CAFO permit administrative hearing
Okla Dept of Ag	Seaboard Fisher facility Texas County, OK	Dec 1997	CAFO permit administrative hearing
Okla Water Resources Board	PIC Gilt Facility Woodward County, OK	Aug 1997	OWRB Water permit administrative hearing
Utah DEQ	Circle Four Farms Administrative Hearing	mid 1998?	CAFO permit Board hearing
Okla Dept of Ag	Hanor/Kronseder Huffman Fac. Woodward County, OK	Jan 1998	CAFO permit administrative hearing
Okla Water Resources Board	Murphy Family Farms Luthi Facility Ellis County, OK	Jan 1998	OWRB water permit administrative hearing
Okla Dept of Ag	Tyson Chapman Facility Seminole, OK	Dec 1999	OWRB water permit administrative hearing
Okla Water Resources Board	Land of Lakes Taylor Facility Beaver County, OK	Mar 2000	OWRB water permit administrative hearing
Platte County Nebraska	TeVelde Dairy District Court	Nov-Dec 2000	County Permit Appeal to District Court
Okla Dept of Ag	Seaboard - Kendra East Beaver County, OK	May 2001	CAFO permit administrative hearing
Okla Dept of Ag	Land of Lakes Reddick Beaver County, OK	Mar 2002	CAFO permit administrative hearing
Okla Dept of Ag	Seaboard Schnackenberg Texas County, OK	Jan-Feb 2003	CAFO permit administrative hearing
Okla Dept of Ag	Land of Lakes, T Venable Beaver County, OK	Jan-June 2005	CAFO permit administrative hearing
Okla Dept of Ag	Land of Lakes, J. Venable Beaver County, OK	Jan-June 2005	CAFO permit administrative hearing
Okla Dept of Ag	Land of Lakes - Ferguson Nursery #1 & #2 Beaver County TX	Jan-Jun 2005	CAFO permit administrative hearing

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<b>Location</b>	<b>File Name</b>	<b>Date</b>	<b>Other</b>
Okla Dept of Ag	C&M Cattle Feedlot Cimarron County, OK	April 2006	CAFO permit Administrative hearing
Kentucky Cabinet of Public Health and Environment	9 contract hog operations (Tosh) Fulton, Hickman and Carlisle counties combined into one hearing (wean-to-finish)	Jan 2007	CAFO permit (KDNOP) Administrative hearing
Kentucky Circuit Court	9 contract hog operations (Tosh) Fulton, Hickman and Carlisle counties combined into one hearing (wean-to-finish)	Oct 2007	Stay Hearing on agency permit action – air toxics
Indiana Office of Environmental Adjudication	Union Go Dairy (Vreba-Hoff) Appeal of Permit Issuance Appeal Hearing	Jan-Feb 2008	CAFO Permit (NPDES) Administrative Hearing
Missouri Administration Hearing Commission	Ozbun Poultry Facility Appeal of Permit Issuance Appeal Hearing	Jan 2009	CAFO Permit (state) Administrative Hearing
New Mexico Environmental Department	ParaSol Dairy Appeal of Ground Water Discharge Permit	Feb 2009	Discharge permit (state) Administrative Hearing

Proposed materials to be deleted are indicated by ~~strikethrough~~ (red in color copies) and proposed new language is indicated by underlining (red in color copies).

**DEFINITIONS: 20.6.2.3202.B**

(17) "Human consumptive food crops" means any food crop grown primarily for human consumption or within the human food supply, including but not limited to chiles, onions, leafy vegetables, cabbages, and herbs.

(23) "Populated Area" means any area where at least 10 occupied residences or businesses are located, including schools, hospitals, and churches.

**REQUIREMENTS FOR DISCHARGING FROM DAIRY FACILITIES 20.6.2.3203:**

E. No manure solids or compost generated at a dairy facility shall be land applied or otherwise disposed of except in accordance with an approved discharge permit

~~E-F.~~ Complying with the requirements of Sections 20.6.2.3200 through 20.6.2.3235 NMAC does not relieve a dairy facility's owner, operator or permittee from complying with the requirements of other applicable local, state and federal regulations or laws.

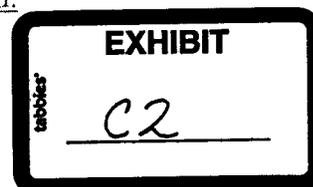
**GENERAL APPLICATION REQUIREMENTS FOR ALL DAIRY FACILITIES**

**20.6.2.3205:**

E. If an applicant filing an application for a new discharge permit, renewal, or modified permit does not certify that the dairy facility complies with the setback requirements of Section 20.6.2.3216 or [NEW] 3217 NMAC, as required by Subsection D of 20.6.2.3206 NMAC, the department shall reject the application. The department shall provide notice of the rejection to the applicant by certified mail.

F. Setback compliance must be depicted on a scaled map showing the location of the facility and its land application areas with applicable setbacks certified by a Surveyor licensed in New Mexico.

G. Applicant must document the Public Notice plan to be implemented upon notification of an administratively complete application or the permit will be denied.



H. If the applicant has any unresolved violations as identified in Subsection E(5) of 20.6.2.3206 the department shall reject the application.

**J. (3)** If an applicant for a renewed or modified discharge permit does not provide all information required by this section to the department within 30 days of the date of the notice of technical deficiency, the department may deny the application or propose a discharge permit for approval consistent with the requirements of these regulations.

(a) If the department denies the application, the department shall provide notice of denial to the applicant by certified mail.

~~(b) If the department proposes approval of the discharge permit and the secretary approves the discharge permit, the permittee shall submit the required information in the notice of technical deficiency within 30 days of the effective date of the discharge permit.~~

(b) If the department proposes to approve the renewal of an existing discharge permit and the secretary approves the renewal, the permittee shall submit the required information in the notice of technical deficiency within 30 days of the effective date of the renewal of the discharge permit. If the information is not submitted within 30 days, the permit renewal may be revoked.

(c) In the case of an application for the modification of an existing permit that includes expansion of existing waste facilities or land application areas, the department shall not propose approval of the modified permit until all required information in the notice of technical deficiency is submitted.

#### **APPLICATION REQUIREMENTS FOR NEW DISCHARGE PERMITS 20.6.2.3206:**

**D. Setbacks:** The applicant shall certify that the setback requirements of Section 20.6.2.3216 NMAC or [NEW] 20.6.2.3217 NMAC whichever is applicable are met. An application shall include a scaled map of the dairy facility layout demonstrating that the proposed layout of the dairy facility meets the setback requirements of Section 20.6.2.3216 NMAC or [NEW] 20.6.4.3217 NMAC whichever is applicable.

**E. Dairy Facility Information and Location:** An application shall include:

- (1) the dairy facility name, physical address and county; and
- (2) the Township, Range and Section for the entire dairy facility, which includes the

production area and fields within the land application area;

(3) the proposed maximum number of animals to be housed at the dairy facility;

(4) a list of all other dairy facilities and/or land application areas owned or operated by the applicant and the address(es) of such; and

(5) with respect to all facilities or land application areas previously or currently owned, controlled, or operated by the applicant, a description of all past and present alleged or proven environmental violations of which the applicant has received notice from a regulatory agency, including verification of resolution of such alleged or proven violations.

**0. Location Map:** An application shall include a location map with topographic surface contours identifying all of the following features located within a one-mile radius, or greater distance sufficient to show all applicable setbacks, of the dairy facility:

(1) watercourses, lakebeds, sinkholes, playa lakes and springs (springs used to provide water for human consumption shall be so denoted);

(2) wells supplying water for a public water system and private domestic water wells;

(3) irrigation supply wells; and

(4) ditch irrigations systems, acequias, irrigation canals and drains;

(5) human consumptive food crops;

(6) State Parks;

(7) public surface water drinking supplies; and

(8) all residences, businesses, and populated areas.

**S. Closure Plan:** A completed closure plan pursuant to 20.6.2.3230 NMAC is to be submitted for approval at the time of the permit application.

**T. Financial Assurance:** Applicants shall provide financial assurance in an amount necessary to close the facility in accordance with applicable closure requirements. The Assurance must cover the cost of closure based on estimates from at least three third party contractors to perform the work required to close the facility, and the cost of remediation and restoration of environmental harm that has been or will foreseeably be caused by the operation of the facility. The amount of financial assurance shall at a minimum be equal to the average cost of the

estimates provided by the third party contractors. Financial assurance shall be in place upon the date the department issues the discharge permit and updated throughout the facility's operational period. Evidence of the financial assurance shall be submitted to the department prior to the issuance of the discharge permit and upon each renewal.

(1) Terms of financial assurance: The financial assurance shall be payable to the state of New Mexico and conditioned upon the facility's proper operation, closure and post-closure monitoring in compliance with state of New Mexico statutes, these rules and the discharge permit conditions. The applicant shall notify the department of a material change affecting the financial assurance within 30 days of discovery of such change.

(2) Forfeiture of financial assurance: The department shall give the facility 20 days notice and an opportunity for a hearing prior to forfeiting financial assurance.

(3) Forms of financial assurance: The department may accept the following forms of financial assurance.

(a) Surety bonds: A surety bond shall be executed by the applicant and by a corporate surety licensed to do business in the state, and shall be non-cancelable.

(b) Letters of credit: A letter of credit shall be issued by a bank organized or authorized to do commercial banking business in the United States. The letter of credit shall be irrevocable. The letter of credit shall be payable to the state of New Mexico in part or in full upon receipt from the director or the director's authorized representative of demand for payment accompanied by a notice of forfeiture.

(c) Cash accounts: An applicant may provide financial assurance in the form of a federally insured or equivalently protected cash account or accounts in a financial institution, provided that the facility and the financial institution shall execute as to each such account a collateral assignment of the account to the department, which shall provide that only the division may authorize withdrawals from the account. In the event the facility is unable to or refuses to operate, close or monitor post-closure according to these rules or the conditions of its discharge permit, the department may, at any time and from time to time, direct payment of all or part of the balance of such account (excluding interest accrued on the account) to itself or its designee for the facility's closure.

(4) Replacement of financial assurance.

(a) The department may allow an operator to replace existing forms of financial

assurance with other forms of financial assurance that provide equivalent coverage.

(b) The department shall not release existing financial assurance until the facility has submitted, and the division has approved, an acceptable replacement.

(5) Review of adequacy of financial assurance: The department may at any time not less than five years after initial acceptance of financial assurance for a facility, or whenever the operator applies for a modification of the facility's permit, initiate a review of such financial assurance's adequacy. Additionally, the department may review the adequacy of the financial assurance, without regard to the date of its last review. Upon determination, after notice to the operator and an opportunity for a hearing, that the financial assurance is not adequate to cover the reasonable and probable cost of a facility's closure and post closure monitoring, the department may require the operator to furnish additional financial assurance sufficient to cover such reasonable and probable cost.

**APPLICATION REQUIREMENTS FOR DISCHARGE PERMIT RENEWAL OR MODIFICATION 20.6.2.3207:**

**D. Dairy Facility Information and Location:** An application shall include:

- (1) the dairy facility name, physical address and county;
- (2) the Township, Range and Section for the entire dairy facility, which includes the production area and fields within the land application;
- (3) the date of initial discharge at the dairy facility;
- (4) the proposed maximum number of animals to be housed at the dairy facility;
- (5) a list of all other dairy facilities and/or land application areas owned, controlled or operated by the applicant and the address(es) of such; and
- (6) a description of all past and present alleged or proven environmental violations of which the applicant has received notice from a regulatory agency, including verification of resolution of such alleged or proven violations.

**M. Location Map:** An application shall include a location map with topographic surface contours identifying all of the following features located within a one-mile radius or greater distance sufficient to show all applicable setbacks of the dairy facility:

- (1) watercourses, lakebeds, sinkholes, playa lakes and springs (springs used to provide water for human consumption shall be so denoted);
- (2) wells supplying water for a public water system and private domestic water wells;
- (3) irrigation supply wells;
- (4) ditch irrigations systems, acequias, irrigation canals and drains;
- (5) Human consumptive food crops;
- (6) State Parks
- (7) Public surface water drinking supplies, and
- (8) all residences, businesses, and populated areas.

**Q. Closure Plan:** A completed closure plan pursuant to 20.6.4.3230 NMAC is to be submitted for approval at the time of permit renewal or modification.

**R. Financial Assurance:** Applicants shall provide financial assurance as set forth in Subsection 20.6.2.3206 NMAC.

## **APPLICATION REQUIREMENTS FOR A DISCHARGE PERMIT FOR CLOSURE**

### **20.6.2.3208:**

A closure plan must be submitted at the time of application for a new, renewal, modified, or modified & renewed permit. Financial assurance is required for closure at the time of the initial discharge application. An application for a discharge permit for closure shall include the information required by Subsections B, C, D, E, F, J, K, L, M and N of 20.6.2.3207 NMAC and Paragraphs (1), (2), (3) and (4) of Subsection H of 20.6.2.3207 NMAC. For dairy facilities with or previously having a land application area, the application shall also include Paragraph (2) of Subsection P of 20.6.2.3207 NMAC, specifically pertaining to the past method(s) of wastewater discharge and stormwater application to the land application area.

## **ADDITIONAL PUBLIC NOTICE REQUIREMENTS FOR APPLICATIONS FOR NEW DISCHARGE PERMITS 20.6.2.3209:**

**A.** The requirements of this section shall apply to dairy facilities whose application for a new discharge permit is received by the department after the effective date of the dairy rules.

**B.** Instead of the requirement for public notice specified in Paragraph (2) of Subsection B of 20.6.2.3108 NMAC, the applicant shall provide written notice of the discharge by certified mail (return receipt requested) to owners of record of all properties within a one-mile distance from the boundary of the property where the discharge site is located. If there are no properties other than properties owned by the discharger within a one-mile distance of the boundary of the property where the dairy facility is located, the applicant shall provide notice to owners of record of the next nearest properties not owned by the discharger.

**C.** Proof of notice required by Subsection D of 20.6.2.3 108 NMAC shall include an affidavit of mailing(s), ~~and~~ a list of property owner(s) notified, and copies of all certified mail return receipts pursuant to Subsection B of this section.

**D.** In addition to the public notice requirement set forth in Paragraph (4) of Subsection B of 20.6.2.3108 NMAC, the applicant shall provide notice in a newspaper of state-wide circulation.

**E.** Mailings of notice to property owners shall include a copy of the facility location map with all applicable setbacks clearly shown.

**SETBACK REQUIREMENTS FOR DAIRY FACILITIES APPLYING FOR NEW DISCHARGE PERMITS 20.6.2.3216:**

**D. Production Area Setback Requirements:**

(1) The production area, excluding feed storage silos, feed storage barns and liquid feed tanks, shall be located:

(a) greater than ~~200~~ 1000 feet from the 100-year flood zone of any watercourse, or from the ordinary high-water mark of any watercourse for which no 100-year flood zone has been established. This setback distance shall not apply to ditch irrigations systems, acequias, irrigation canals and drains;

(b) greater than ~~200~~ 1000 feet (measured from the ordinary high-water mark) from a lakebed, sinkhole or playa lake that are not identified as a supply of water for human consumption;

(c) greater than 1000 feet from any spring identified on a US Geological Survey (USGS) topographic map and not identified as a supply of water for human consumption;

(d) greater than ~~350~~ 1500 feet from a private domestic water well or spring that supplies water for human consumption; ~~and~~

(e) greater than ~~400~~ 1/2 mile from any water well or spring that supplies water for a public water system as defined by Part 20.7.10 NMAC, unless a wellhead protection program established by the public water system requires a greater distance;

(f) greater than 1/2 mile from an irrigation supply well, ditch irrigation system, acequia, irrigation canal or drain;

(g) greater than 1/2 mile from human consumptive food crops;

(h) greater than 1/2 mile from an occupied residence or business;

(i) greater than 1 mile from a populated area; and

(j) greater than 3 miles from the incorporated limits of any municipality.

(k) greater than 5 miles from State Parks

(l) greater than 5 miles from public surface water drinking supplies

(2) The requirements of Subparagraph (d) of Paragraph (1) of this subsection shall not apply to wells or springs that supply water to the dairy facility for human consumption and are located on the dairy facility. There shall be a minimum setback of 300 feet from the nearest waste storage structure to all wells and springs located on the dairy facility.

(3) Setback distances for impoundments shall be measured from the top inside edge of the impoundment; distances for all other features shall be measured from the outer extent of the feature.

(4) Setback distances from occupied residences and businesses shall be measured from the legal property boundary of the residence or business, to the nearest waste storage structure.

(5) Setback distances from public surface water supplies shall be measured from the ordinary high water mark or other legal boundary of the supply, to the nearest waste storage structure.

#### **E. Land Application Area Setback Requirements:**

(1) Any field within a land application area shall be located:

(a) greater than ~~400~~ 500 feet from the 100-year flood zone of any watercourse, or from the ordinary high-water mark of any watercourse for which no 100-year flood zone has been established. This setback distance shall not apply to ditch irrigations systems, acequias, irrigation canals and drains;

(b) greater than ~~400~~ 500 feet (measured from the ordinary high-water mark) from any lakebed, sinkhole or playa lake that are not identified as a supply of water for human

consumption;

(c) greater than 500 feet from any spring identified on a US Geological Survey (USGS) topographic map and not identified as a supply of water for human consumption;

(~~e~~) (d) greater than ~~400~~ 750 feet from a private domestic water well or spring that supplies water for human consumption; and

(~~d~~) (e) greater than ~~200 feet~~ 1/4 mile from any water well or spring that supplies water for a public water system as defined by Part 20.7.10 NMAC, unless a wellhead protection program established by the public water system requires a greater distance.

(f) greater than 1/4 mile from an irrigation supply well, ditch irrigation system, acequia, irrigation canal or drain;

(g) greater than 1/4 mile from human consumptive food crops;

(h) greater than 1/4 mile from an occupied residence or business;

(i) greater than 1/2 mile from a populated area; and

(j) greater than 1 mile from the incorporated limits of any municipality.

(k) greater than 2.5 miles from State Parks

(l) greater than 2.5 miles from public surface water drinking supplies

(2) The requirements of Subparagraph (c) of Paragraph (1) of this subsection shall not apply to wells or springs that supply water for human consumption to the dairy facility and are located on the dairy facility. There shall be a minimum setback of 300 feet from the nearest land application area to all wells and springs located on the dairy facility.

(3) Setback distances for fields shall be measured from the outer edge of the field.

(4) Setback distances from occupied residences and businesses shall be measured to the legal property boundary of the residence or business.

(5) Setback distances from public surface water supplies shall be measured to the ordinary high water mark or other legal boundary of the supply.

#### **20.6.2.3217 SETBACK REQUIREMENTS FOR DAIRY FACILITIES APPLYING FOR PERMIT RENEWAL OR MODIFICATION:**

**A.** The setback requirements of this section apply to a dairy facility whose application for a permit renewal or modification is received by the department after the effective date of the dairy rules.

B. The setback requirements shall be measured as horizontal map distances as of the receipt date of the application for permit renewal or modification by the department.

**C. Land Application Area Setback Requirements:**

(1) Any field within a land application area shall be located:

(a) greater than 500 feet from the 100-year flood zone of any watercourse, or from the ordinary high-water mark of any watercourse for which no 100-year flood zone has been established. This setback distance shall not apply to ditch irrigations systems, acequias, irrigation canals and drains;

(b) greater than 500 feet (measured from the ordinary high-water mark) from any lakebed, sinkhole or playa lake that are not identified as a supply of water for human consumption;

(c) greater than 500 feet from any spring identified on a US Geological Survey (USGS) topographic map and not identified as a supply of water for human consumption;

(d) greater than 750 feet from a private domestic water well or spring that supplies water for human consumption;

(e) greater than 1/4 mile from any water well or spring that supplies water for a public water system as defined by Part 20.7.10 NMAC, unless a wellhead protection program established by the public water system requires a greater distance.

(f) greater than 1/4 mile from an irrigation supply well, ditch irrigation system, acequia, irrigation canal or drain;

(g) greater than 1/4 mile from human consumptive food crops;

(h) greater than 1/4 mile from an occupied residence or business;

(i) greater than 1/2 mile from a populated area; and

(j) greater than 1 mile from the incorporated limits of any municipality.

(k) greater than 2.5 miles from State Parks

(l) greater than 2.5 miles from public surface water drinking supplies

(2) The requirements of Subparagraph (c) of Paragraph (1) of this subsection shall not apply to wells or springs that supply water for human consumption to the dairy facility and are located on the dairy facility. There shall be a minimum setback of 300 feet from the nearest land application area to all wells and springs located on the dairy facility.

(3) Setback distances for fields shall be measured from the outer edge of the field.

(4) Setback distances from occupied residences and businesses shall be measured to the legal property boundary of the residence or business.

(5) Setback distances from public surface water supplies shall be measured to the ordinary high water mark or other legal boundary of the supply.

## **ENGINEERING AND SURVEYING REQUIREMENTS FOR ALL DAIRY FACILITIES**

### **20.6.2.3218:**

**A. Practice of Engineering:** All plans and specifications, supporting design calculations, record drawings, final specifications, final capacity calculations, grading and drainage reports and plans, and other work products requiring the practice of engineering shall bear the seal and signature of a licensed New Mexico professional engineer pursuant to the New Mexico Engineering and Surveying Practice Act, Sections 61-23- 1 through 6 1-23-32 NMSA 1978, and the rules promulgated under that authority. Licensed and professional personnel must be vetted and approved by the Agency to ensure proper skill levels and licensing.

### **D. Engineering Design Requirements:**

**(8) Separation Between Impoundments and Ground Water:** Impoundments shall not be constructed in a location where the vertical distance between the seasonal high ground water level and the finished grade of the floor of the impoundment is less than or equal to ~~4~~ 30 feet as documented through the most recent ground water data obtained from an on-site test boring(s) or monitoring well(s).

## **GROUND WATER MONITORING REQUIREMENTS FOR ALL DAIRY FACILITIES**

### **20.6.2.3223:**

**G. Ground Water Sampling and Reporting - Routine:** A permittee shall collect ground water samples quarterly from all monitoring wells required by Subsection A of this section and Subsection C of 20.6.2.3227 NMAC. Samples shall be analyzed for general water chemistry, including the following: total Kjeldahl nitrogen, nitrate as nitrogen, ammonia nitrogen; chloride, sulfate, total phosphorus, bicarbonates; calcium, magnesium, and sodium; and total dissolved solids, total coliform bacteria and Escherichia coli; and other constituents of concern as may be

required by the department through a discharge permit pursuant to Subsection B of 20.6.2.3224 NMAC. A permittee shall submit to the department in the quarterly monitoring reports the depth-to-most-shallow ground water, the field parameter measurements, the parameter stabilization log (if applicable), the analytical results (including the laboratory quality assurance and quality control summary report) and a map showing the location and number of each well in relation to the contamination source it is intended to monitor.

**H. Ground Water Sampling - New Monitoring Wells:** A permittee shall collect ground water samples from all newly installed monitoring wells. Samples shall be analyzed for general water chemistry, including the following: total Kjeldahl nitrogen, nitrate as nitrogen, ammonia nitrogen; chloride, sulfate, total phosphorus, bicarbonates; calcium, magnesium, and sodium; and total dissolved solids, total coliform bacteria and Escherichia coli; and other constituents of concern as may be required by the department through a discharge permit pursuant to Subsection B of 20.6.2.3224 NMAC.

**MONITORING REQUIREMENTS FOR ALL DAIRY FACILITIES 20.6.2.3224:**

**D. Stormwater Sampling and Reporting:** A permittee shall collect stormwater samples on a quarterly basis from each stormwater impoundment. The samples shall be collected as soon as possible after a storm event and before transferring the stormwater to a wastewater impoundment(s) or a land application area. Surface water parameters to be measured on site during sampling event include pH, electrical conductivity, and dissolved oxygen. Samples shall be analyzed for total Kjeldahl nitrogen; nitrate as nitrogen, ammonia nitrogen; chloride, sulfate, total phosphorus, and total dissolved solids; Escherichia coli; and other constituents of concern as may be required by the department through a discharge permit pursuant to Subsection B of 20.6.2.3224 NMAC. The permittee shall include analytical results, or a statement that stormwater runoff did not occur, in the quarterly monitoring reports submitted to the department.

**ADDITIONAL MONITORING REQUIREMENTS FOR DAIRY FACILITIES WITH A LAND APPLICATION AREA 20.6.2.3225:**

**C. Wastewater to be Land Applied - Sampling and Reporting:** A permittee shall collect and

analyze wastewater samples on a quarterly basis for total Kjeldahl nitrogen, nitrate as nitrogen, ammonia-N, total phosphorus, chloride, sulfate, bicarbonates, total dissolved solids, total coliforms, and other constituents of concern as may be required by the department through a discharge permit pursuant to Subsection B of 20.6.2.3224 NMAC. Samples shall be collected during active milking from a location between the manure solids separator(s) and wastewater impoundment(s) for each separator associated with an individual parlor. Wastewater samples shall be collected from the sampling location(s) proposed in the application for a new, renewed and modified discharge permit, and specified in the discharge permit. A permittee shall submit the analytical results to the department in the quarterly monitoring reports.

### **CLOSURE REQUIREMENTS FOR ALL DAIRY FACILITIES 20.6.2.3230:**

**A. Permanent Closure of Dairy Facility or Impoundments: Existing Closure Plans** The following closure actions shall be performed at dairy facilities:

(1) For permanent closure of a dairy facility:

(a) The department shall be notified immediately ~~no later than 30 days~~ after wastewater discharge has permanently ceased at the dairy facility.

(b) Installation of all monitoring wells shall be completed pursuant to Section 20.6.2.3223 NMAC.

(c) A pre-closure sampling and analysis plan shall be developed and submitted to the department for review and approval prior to commencement of closure activities. At a minimum, this plan will include sample location maps, sample type (eg., grab or composite), number of samples per location, written description of field sampling procedures, QA/QC, sample preservation methods, parameters to be analyzed, reporting units, laboratory methods, and chain of custody.

(e) (d) All wastewater and combination wastewater/stormwater impoundments shall be emptied of wastewater and stormwater within six months of permanently ceasing wastewater discharge at the dairy facility. All stormwater and combination wastewater/stormwater impoundments shall be emptied of stormwater within six months of removing all livestock from the dairy facility. Wastewater and stormwater removed from impoundments shall be applied to the designated land application area according to the procedures described in the department approved closure plan, as authorized by a discharge

permit. In the event that land application is not authorized by a discharge permit, a detailed closure plan describing all land application activities associated with closure plan shall be submitted for department approval and the plan implemented upon department approval.

(~~e~~) (c) Manure solids and compost shall be removed from surface areas at the dairy facility and applied to the designated land application area, according to the procedures described in the department approved closure plan, as authorized by a discharge permit, or transferred off-site for proper disposal within one year of removing all livestock from the facility. A record shall be kept of the amounts of manure solids and compost that are transferred off-site and the name and address of the recipient(s).

(~~e~~) (f) Complete removal of manure solids from the wastewater impoundment(s) shall be achieved within ~~two years~~ 18 months of permanently ceasing wastewater discharge. Complete removal of manure solids from the stormwater and combination wastewater/stormwater impoundment(s) shall be achieved within ~~two years~~ 18 months of removing all livestock from the dairy facility. Manure solids shall be applied to the designated land application area, according to the procedures described in the department approved closure plan, as authorized by a discharge permit. In the event that land application is not authorized by a discharge permit, a detailed closure plan describing all land application activities associated with closure plan shall be submitted for department approval and the plan implemented upon department approval.

(~~f~~) (g) Impoundment liners shall be perforated or removed and the impoundments shall be re-graded with clean fill to blend with surface topography to prevent ponding within two years of permanently ceasing wastewater discharge and removing all livestock from the facility, as per the approved closure plan.

## Transmission of *Escherichia coli* O157:H7 from Contaminated Manure and Irrigation Water to Lettuce Plant Tissue and Its Subsequent Internalization

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**The transmission of *Escherichia coli* O157:H7 from manure-contaminated soil and irrigation water to lettuce plants was demonstrated using laser scanning confocal microscopy, epifluorescence microscopy, and recovery of viable cells from the inner tissues of plants. *E. coli* O157:H7 migrated to internal locations in plant tissue and was thus protected from the action of sanitizing agents by virtue of its inaccessibility. Experiments demonstrate that *E. coli* O157:H7 can enter the lettuce plant through the root system and migrate throughout the edible portion of the plant.**

In recent years, *Escherichia coli* O157:H7 has been isolated with increasing frequency from fresh produce, including bean sprouts, cantaloupes, apples, and leaf lettuce (1, 10). The mechanisms by which the pathogen is introduced into the lettuce plant are not fully understood; however, one hypothesis states that the plant becomes contaminated when grown in fields fertilized with improperly treated manure (3). Epidemiological data indicate that *E. coli* O157:H7 may be present in up to 8.3% of dairy and beef cattle (8) and that it is shed asymptotically in the feces. Current manure-handling guidelines suggest a composting period before application of the manure to a field as fertilizer (9). Research has demonstrated the long-term survival of *E. coli* O157:H7 in manure held under a variety of conditions (11, 15), so even strict adherence to the guideline may result in the application of manure containing culturable *E. coli* O157:H7 to production fields (15).

A second vehicle by which *E. coli* O157:H7 may be introduced is flood irrigation with water contaminated with cattle feces or contact with contaminated surface runoff (1, 10). A number of recent *E. coli* O157:H7 outbreaks have been linked to contaminated water (6); furthermore, studies have demonstrated the ability of the pathogen to survive for extended periods in water (7, 16). Cattle in an adjacent field were implicated as the source of *E. coli* O157:H7 during a multistate outbreak associated with the consumption of mesclun lettuce in 1996 (10). The authors speculated that contaminated water was used to irrigate the lettuce fields.

Lettuce production practices commonly include a rinse step in which the leaves are sanitized using tap water containing 100 to 200 ppm of free chlorine (2). This level of chlorine has been shown to be only marginally effective at reducing the level of *E. coli* O157:H7 on lettuce tissue surfaces (3). The ineffectiveness of chlorine and other surface-sanitizing agents is likely dependent on whether the target organisms are readily accessible. Cells of *E. coli* O157:H7 were shown to penetrate into the stomata and junction zones of cut lettuce leaves, becoming

entrapped 20 to 100  $\mu\text{m}$  below the surface of the cut edge (12). Cells entrapped at subsurface locations were protected from sanitation with chlorine.

Previous studies have not provided a direct link for contamination of lettuce in the field through fertilization with *E. coli* O157:H7-contaminated manure or irrigation with contaminated water. Moreover, the sites of association, surface or subsurface, of the pathogen following in-field contamination have not been delineated. We investigated whether *E. coli* O157:H7 associated with contaminated manure or irrigation water can be transported from the root system into the edible portion, putatively by the plant vascular system. In this study, we demonstrated the transmission of *E. coli* O157:H7 to lettuce plants from contaminated manure incorporated into the soil. Furthermore, the contamination of lettuce through flood irrigation with contaminated water was demonstrated. *E. coli* O157:H7 expressing green fluorescent protein (GFP) was used to facilitate detection of the target organism in association with lettuce tissue.

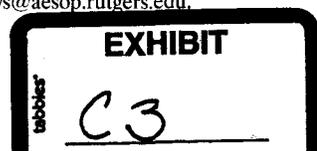
**Bacteria.** *E. coli* O157:H7 (ATCC 43895) was transformed using the pGFP plasmid (Clontech, Palo Alto, Calif.), encoding GFP. The GFP reporter system was selected for its utility in visualizing bacteria in biological systems and because cells can be studied nondestructively, without further processing or substrate addition (4). GFP-expressing *E. coli* O157:H7 (*E. coli*

TABLE 1. Detection of *E. coli* O157:H7 associated with lettuce seedlings treated with  $\text{HgCl}_2$

Surface examined	Sample day	No. of positive samples according to soil concentration of <i>E. coli</i> O157:H7 <sup>a</sup>					
		$10^4$ CFU $\text{g}^{-1}$ soil		$10^6$ CFU $\text{g}^{-1}$ soil		$10^8$ CFU $\text{g}^{-1}$ soil	
		5 min	10 min	5 min	10 min	5 min	10 min
Inner	3	0/8	0/8	0/8	0/8	6/8	2/8
	6	0/8	0/8	2/8	1/8	3/8	2/8
	9	2/6	0/6	1/6	3/6	3/6	2/6
Outer	3	0/8	0/8	2/8	0/8	2/8	2/8
	6	0/8	0/8	1/8	0/8	0/8	0/8
	9	0/6	0/6	0/6	0/6	0/6	0/6

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<sup>a</sup> Number of *E. coli* O157:H7-positive sections/total number of sections. Five minutes and 10 min refer to treatment times of sprouts in 0.1%  $\text{HgCl}_2$ .



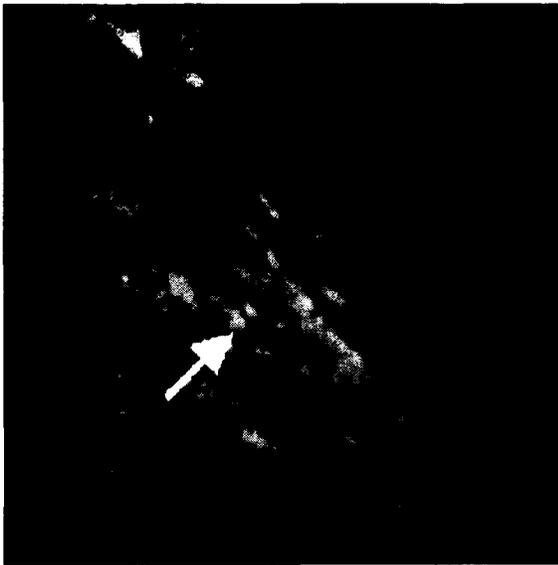


FIG. 1. Photomicrograph showing colonization of the surface of a 3-day-old lettuce seedling grown in soil containing  $10^6$  CFU of *E. coli* O157:H7/pGFP  $g^{-1}$ . Cells appear as aggregates and attach preferentially to junction zones of lettuce cells. The arrow indicates foci of *E. coli* O157:H7 cells.

O157:H7/pGFP) was cultured at 37°C for 24 h in tryptic soy broth (Difco, Cockeysville, Md.) supplemented with 100  $\mu$ g of ampicillin (Sigma, St. Louis, Mo.)  $ml^{-1}$ . The cells were harvested by centrifugation ( $3,500 \times g$ ; 10 min.) and resuspended

in sterile distilled water (SDW). Inocula were prepared by serial dilution in SDW to achieve the desired cell concentrations. All experiments were conducted using *E. coli* O157:H7/pGFP.

**Preparation of planting mixture.** Fresh cow manure (475 g) collected at the Rutgers University dairy barn was inoculated with a suspension of *E. coli* O157:H7/pGFP and vigorously mixed by hand. Manure collected from the farm for inclusion in research experiments is routinely screened for the presence of *E. coli* O157:H7 and is consistently negative. The manure was collected immediately following evacuation from the animal and was used in experiments within 48 h. The inoculated manure was then mixed with 4.5 kg of soil (sandy loam; pH 7.13) to give 5 kg of planting mixtures with final *E. coli* O157:H7/pGFP concentrations of approximately  $10^8$ ,  $10^6$ , and  $10^4$  CFU  $g^{-1}$ . The planting mixtures were dispensed into vegetable flats, and seeds of green ice lettuce (lot no. 52977; W. Atlee Burpee & Co., Warminster, Pa.) were planted. The flats were kept at 20°C, illuminated for 14 h using Agro-Lite lights (Phillips Lighting Company, Somerset, N.J.), and watered daily.

**Sampling procedures and detection by culture methods.** On days 3, 6, and 9 postplanting, seedlings were collected from each flat. The seedlings were cut from the root systems approximately 1 cm above the soil surface to minimize surface contamination of the edible portion of the plant through contact with the planting mixture. The seedlings were surface disinfected by being dipped in 80% ethanol for 5 s followed by immersion in 0.1% (wt/vol)  $HgCl_2$  for either 5 or 10 min. The seedlings were washed twice in sterile water and allowed to air

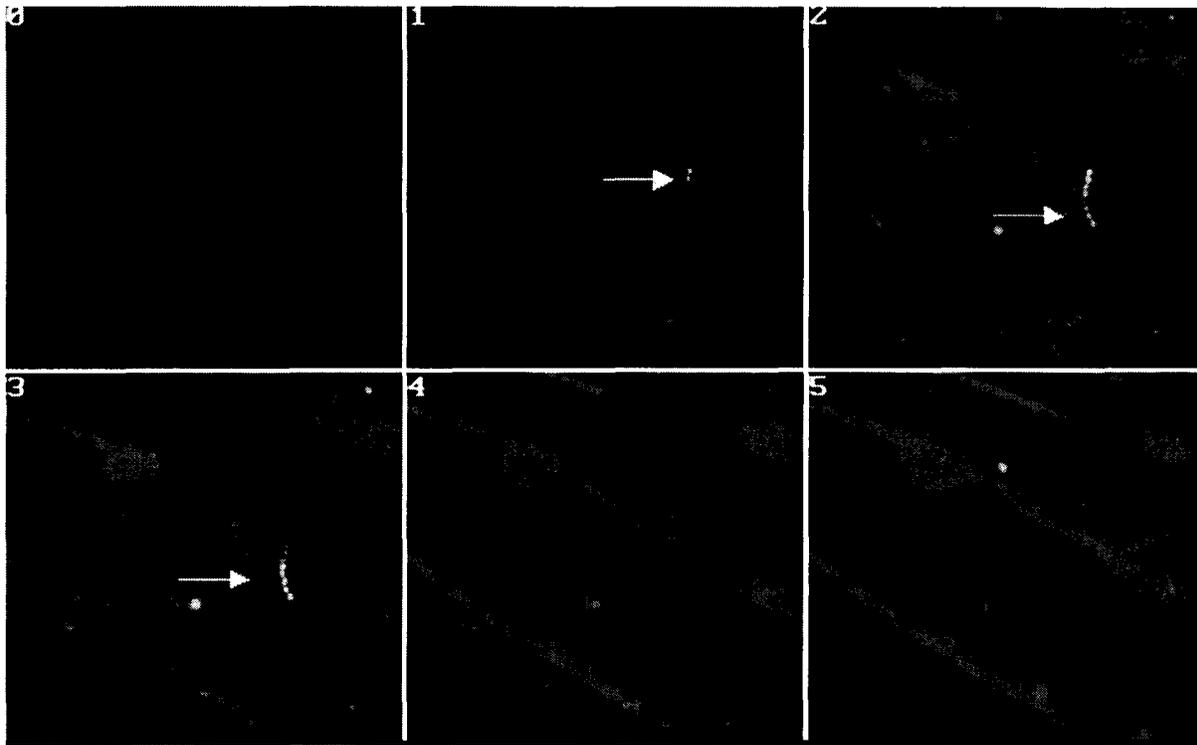


FIG. 2. Representative LSCM optical thin section of a lettuce seedling contaminated with *E. coli* O157:H7/pGFP. *E. coli* O157:H7/pGFP cells can be found in the subsurface tissue of the seedling. *E. coli* O157:H7/pGFP cells appear green (arrows), while lettuce tissue appears red. Each successive image progresses 1  $\mu$ m deeper into the lettuce seedling.

dry at room temperature in a laminar flow hood. Of the 16 seedlings treated for 5 min, 8 were placed directly on tryptic soy agar (TSA) plates supplemented with 100  $\mu\text{g}$  of ampicillin (Amp)  $\text{ml}^{-1}$ . The remaining eight seedlings were sliced longitudinally to the base of the cotyledons, and the inner surfaces were placed on TSA-Amp plates. After incubation at 37°C for 1 h, the seedlings or sections of seedlings were removed and the plates were further incubated at 37°C overnight. The 16 seedlings immersed in  $\text{HgCl}_2$  for 10 min were examined as described above. The plates were illuminated with UV light, and GFP-expressing colonies were enumerated. *E. coli* O157:H7/pGFP was recovered from the surfaces of sanitized seedlings grown in planting mixtures containing the highest levels of the target pathogen (Table 1). Based on culture, 10-min exposure of exterior surfaces of seedlings to  $\text{HgCl}_2$  eliminated most culturable bacteria, suggesting that the target pathogen was located within the seedling tissue and therefore was protected from the action of the sanitizing agent. Under the experimental conditions outlined in the present study, *E. coli* O157:H7 maintained the plasmid encoding GFP.

**Fluorescence microscopy and laser scanning confocal microscopy (LSCM).** Sections of seedlings were further examined by fluorescence microscopy on days 3, 6, and 9 postplanting. Samples were stained with propidium iodide (10  $\mu\text{g}$   $\text{ml}^{-1}$ ; Molecular Probes, Eugene, Oreg.) for 30 min, washed twice in phosphate-buffered saline (Sigma), and then mounted on glass microscope slides and examined with an Olympus BH-2 epifluorescence microscope equipped with a 100 $\times$  oil objective. Images were captured with a charge-coupled device camera (Photometrics, Tucson, Ariz.) and formatted using Adobe Photoshop. Cells of *E. coli* O157:H7/pGFP were visualized on the cotyledons and hypocotyl of the lettuce seedlings, regardless of the level of soil contamination or day of sampling (Fig. 1). The surfaces of the seedlings likely became contaminated as the seedlings grew and broke through the soil surface.

Based on fluorescence microscopy, seedlings found to contain surface-associated *E. coli* O157:H7/pGFP were further examined using LSCM to determine if the target pathogen was located below the tissue surface. Slides were examined using a Zeiss Axioplan 410 microscope equipped with an Ar-Kr laser source and a 100 $\times$  oil objective. *E. coli* O157:H7/pGFP was excited using the 488-nm laser line. Propidium iodide-stained tissue was excited with the 568-nm laser line. Emissions were detected using a 515- to 540-nm band-pass filter for *E. coli* O157:H7/pGFP and a 590-nm long-pass filter for propidium iodide-stained lettuce tissue. Confocal images were captured and merged using the Zeiss LSM software. In some instances, target bacteria were not visualized on the surface of lettuce tissue but were found in high numbers at subsurface locations (Fig. 2). The target pathogen was visualized at depths of up to 45  $\mu\text{m}$  below the tissue surface, suggesting migration to an internal location (Fig. 3). These results confirm the culture results of the present study (Table 1) and previous studies (13) indicating *E. coli* O157:H7 can localize within lettuce tissue.

**Effect of irrigation with contaminated water and manure slurry.** To determine whether direct surface contact with the edible portion of the plant is required for internal contamination, 25 green ice lettuce plants were grown in 15-cm-diameter plastic pots containing Pro-Mix BX (Premier Horticulture Inc., Red Hill, Pa.). The plants were fertilized weekly with Peter's



FIG. 3. LSCM photomicrograph of lettuce leaf showing cells of *E. coli* O157:H7/pGFP at an internal location 45  $\mu\text{m}$  from the outer leaf surface. *E. coli* O157:H7/pGFP cells (arrow) were not randomly dispersed but rather formed a band of aggregates restricted to the intercellular space.

General Purpose 20-20-20 fertilizer (Grace Sierra Horticultural Products, Milpitas, Calif.) in the Rutgers University greenhouse. Mature plants (approximately 50 days old) were moved to our laboratory and bundled with twine to prevent the edible portion of the plant from touching the soil. *E. coli* O157:H7/pGFP was processed as described above and resuspended in SDW. The soil in each of 15 pots was irrigated with 200 ml of water containing  $7.5 \times 10^7$  CFU of *E. coli* O157:H7/pGFP  $\text{ml}^{-1}$ . The inoculum was applied carefully to prevent splashing of the inoculum onto the edible portion of the lettuce plant. Five plants were harvested on days 1, 3, and 5 postinoculation and processed as follows. The plants were cut 2 cm above the soil surface with a sterile scalpel; the entire edible portion of the plant was combined with 200 ml of SDW in a sterile polyethylene bag and homogenized for 2 min in a stomacher (Dynatech Laboratories, Alexandria, Va.). The liquid phase was removed, centrifuged (3,500  $\times$  g; 10 min.), resuspended in 1 ml of SDW, and plated onto the surface of a

TABLE 2. Detection of *E. coli* O157:H7 in edible lettuce tissue following plant growth in soil exposed to contaminated irrigation water or manure slurry

Day post-exposure	Soil exposure <sup>a</sup>	
	Contaminated irrigation water	Contaminated manure slurry
1	4/5	4/5
3	2/5	3/5
5	2/5	ND

<sup>a</sup> Number of plants positive for *E. coli* O157:H7/number of plants tested. ND, no plants were tested.

TSA-Amp plate. The plates were incubated at 37°C overnight, and GFP-expressing colonies were visualized under UV light.

Contamination of the edible portion of the lettuce plant through exposure of soil, and consequently the plant root system, to manure runoff was also examined. Manure slurry was prepared by the method of Calicioglu et al. (5) and inoculated to achieve a concentration of  $1.25 \times 10^8$  CFU of *E. coli* O157:H7/pGFP ml<sup>-1</sup>. Inoculated slurry (200 ml) was applied to the soil of the 10 remaining lettuce plants. On days 1 and 3 post-inoculation, five plants were processed as described above, and the presence of *E. coli* O157:H7/pGFP colonies was determined. The results indicate that *E. coli* O157:H7 is capable of entering the roots of mature lettuce plants and can be transported upward to locations within the edible portions of the plant (Table 2). Direct contact between the leaves and a contamination source is not required for the organism to become integrated into edible lettuce tissue.

Application of *E. coli* O157:H7-contaminated manure to the production field or irrigation with *E. coli* O157:H7-contaminated water may result in contamination of the crop in the field. Studies have indicated that *E. coli* can survive for extended periods in manure and water (7, 11). We have demonstrated that lettuce grown in soil containing contaminated manure or irrigated with contaminated water results in contamination of the edible portion of the lettuce plant. Moreover, the results suggest that edible portions of a plant can become contaminated without direct exposure to a pathogen but rather through transport of the pathogen into the plant by the root system. We recognize that the levels of *E. coli* O157:H7 used in this study are far greater than what may be found on an agricultural field; however, numbers of bacteria were used that could be readily detected by the assays used in the present study. Under natural conditions, even a low level of contamination could present a significant human health risk, since the infective dose of *E. coli* O157:H7 is less than 1,000 cells (1). Research suggests that surface sanitizing of lettuce is not an effect method to eliminate all *E. coli* O157:H7 cells (3, 14). The inaccessibility of a large number of organisms, as a

consequence of their subsurface location, is perhaps the reason for the lack of effectiveness of surface-sanitizing treatments. The impacts of on-farm practices which may result in *E. coli* O157:H7 becoming associated with lettuce, or for that matter other crops, have not been sufficiently explored.

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## Nitrate Contamination at Dairy Facilities

DP#	Facility Name	Previous Facility Name(s)	Name of Responsible Party	Consultant	GWQB Reviewer	Spreadsheet last updated	Year Discharge Began		County	Closest City	
1233	Mickey's Dairy		McMahon, Danny	EnviroCompliance Services, Inc.	Sara Arthur	26-Mar-09	1997	Active	Bernalillo	Albuquerque	3,000
568	Vanderploeg Dairy		Vanderploeg, Titus	Glorieta Geoscience, Inc.	Sara Arthur	12-Mar-09	6/2/1988	Active	Bernalillo	Albuquerque	2,000
585	McCatharn Dairy		McCatharn, John	Glorieta Geoscience, Inc.	Kim Kirby	18-Mar-09	1950's	Active	Bernalillo	Albuquerque	4,000
1195	Elmira Dairy		Heilbult, Earl	Glorieta Geoscience, Inc.	Bill Pearson	26-Mar-09	1998	Active	Bernalillo	Albuquerque	9,999
1203	Beaty Dairy	Zia Dairy	Beaty, Stan	EnviroCompliance Services, Inc.	Kathie Deal	20-Mar-09	before 1998	Active	Chaves	Artesia	14,000
689	P-2 Dairy	Waggoner Dairy	Porte, Gary	EnviroCompliance Services, Inc.	Bill Pearson	26-Mar-09	1990	Active	Chaves	Dexter	90,000
1439	Secondwind Dairy		Squire, Al	Ashcraft Consulting, Inc.	Bill Pearson	26-Mar-09	2004	Active	Chaves	Hagerman	15,000
480	Double Aught Dairy	Chaslee Dairy, Porte Dairy	Visser, Tom: Owner Flores, Jason: Operator	EnviroCompliance Services, Inc.	Shawna Clark	24-Mar-09	1987	Active	Chaves	Dexter	70,000
533	Dandee Dairy	El Visto Dairy, Abel's Dairy	Flores, Jason	EnviroCompliance Services, Inc.	Bill Pearson	26-Mar-09	1988	Active	Chaves	Dexter	27,000
606	Dexter Dairy	J & T Dexter Dairy	Villalpondo, Abel	none	Bill Pearson	26-Mar-09	1989	Active	Chaves	Dexter	40,000
633	Greenfield Dairy	D & G Dairy	Porte, Gary	EnviroCompliance Services, Inc.	Kim Kirby	18-Mar-09	~1989	Active	Chaves	Dexter	80,000
677	Cheyenne Dairy I and III	Wade Farms, Flying V Dairy	Hoekstra, David	Ashcraft Consulting, Inc.	Shawna Clark	24-Mar-09	1991	Active	Chaves	Dexter	180,000
727	Shawnee Dairy		Kamper, Larry	Ashcraft Consulting, Inc.	Sara Arthur	16-Mar-09	1991	Active	Chaves	Dexter	81,000
738	El Visto Dairy 2	J & T Dexter Dairy #2	Visser, Ellis	Glorieta Geoscience, Inc.	Bill Pearson	26-Mar-09	1991	Active	Chaves	Dexter	55,000
742	Breedyk Dairy	Underwood Dairy	Breedyk, Arie	Glorieta Geoscience, Inc.	Sara Arthur	16-Mar-09	1991				92,000

**EXHIBIT**

    C4

## Nitrate Contamination at Dairy Facilities

DP#	Facility Name	Previous Facility Name(s)	Name of Responsible Party	Consultant	GWQB Reviewer	Spreadsheet last updated	Year Discharge Began	Status	County	Closest City	Permitted GPD
952	Rockhill Dairy	Jon Al Dairy, Acar Dairy	Villalpondo, Abel	none	Bill Pearson	26-Mar-09	1998	Active	Chaves	Dexter	80,000
1003	Three Amigos Dairy	Price's Roswell Farm Dairy	Visser, Mike; DeGroot, Pete; DeGroot, Charley	Ashcraft Consulting, Inc.	Shawna Clark	24-Mar-09	1994	Active	Chaves	Dexter	120,000
1131	Par 5 Dairy and Select Milk	Casarez Farms Dairy	Miles, Rance; Visser, Mitch	Glorieta Geoscience, Inc.	Bill Pearson	26-Mar-09	1997	Active	Chaves	Dexter	410,000
717	Epicenter Dairy	Ver Hoven Dairy	Smith, Bruce	Glorieta Geoscience, Inc.	Shawna Clark	24-Mar-09	1993	Active	Chaves	Hagerman	48,000
776	Southwind Dairy	Hagerman West Dairy	Squire, Al	Ashcraft Consulting, Inc.	Bill Pearson	26-Mar-09	1991	Active	Chaves	Hagerman	96,000
1141	Enchantment Dairy		Bollema, Colleen	Glorieta Geoscience, Inc.	Kim Kirby	18-Mar-09	1997	Active	Chaves	Lake Arthur	128,000
162	Yocktown Dairy	none	Richardson, Jim	none	Kim Kirby	18-Mar-09	~1981	Active	Chaves	Roswell	21,000
163	Pirtle Farms Dairy	Sundance Dairy, Davis Dairy	Pirtle, Randy	EnviroCompliance Service, Inc.	Bill Pearson	26-Mar-09	1981	Active	Chaves	Roswell	35,000
164	Southern Skies Dairy	DeGroot Dairy	Visser, Mike	Ashcraft Consulting, Inc.	Bill Pearson	26-Mar-09	1981	Active	Chaves	Roswell	42,000
207	Nature's Dairy Inc	Pollard Dairy	Greathouse, Jerry	Joy Wagner	Bill Pearson	26-Mar-09	1982	Active	Chaves	Roswell	84,000
227	Queso Grande Dairy	Old Par 5 Dairy, S&T Dairy	Heilbult, Earl	Ashcraft Consulting, Inc.	Bill Pearson	26-Mar-09	1982	Active	Chaves	Roswell	100,000
343	Tom Visser Dairy	El Visto Dairy	Visser, Tom	EnviroCompliance Services, Inc.	Shawna Clark	24-Mar-09	24-Jun-84	Active	Chaves	Roswell	60,000
554	Break-Away Dairy		Breedyk, Arie	Glorieta Geoscience, Inc.	Sara Arthur	12-Mar-09	1988	Active	Chaves	Roswell	35,000
635	Woodcrest Dairy		Vander Meulan, Randy	Joy Wagner	Bill Pearson	26-Mar-09	1989	Active	Chaves	Roswell	100,000
646	Rio Vista Dairy	H & R Gorzeman Dairy, Ron Gorzeman Dairy	Vaz, Ray	Glorieta Geoscience, Inc.	Bill Pearson	26-Mar-09	1989	Active	Chaves	Roswell	60,000

### Nitrate Contamination at Dairy Facilities

DP#	Facility Name	Previous Facility Name(s)	Name of Responsible Party	Consultant	GWQB Reviewer	Spreadsheet last updated	Year Discharge Began	Status	County	Closest City	Permitted (GPD)
707	Vaz Dairy	C and R Dairy	Vaz, Jerry	Barron's Environmental Solutions	Bill Pearson	26-Mar-09	1991	Active	Chaves	Roswell	100,000
718	De Groot Dairy	Pete DeGroot Dairy, Vista Grande Dairy, De Graaf Dairy	DeGroot, Pete	Ashcraft Consulting, Inc.	Bill Pearson	26-Mar-09	1991	Active	Chaves	Roswell	120,000
764	Arroyo Dairy		DeGroot, Pete	Ashcraft Consulting, Inc.	Bill Pearson	26-Mar-09	1993	Active	Chaves	Roswell	80,000
791	3-V Dairy	South Springs Dairy	Vander Dussen, Casey	Ashcraft Consulting, Inc.	Kim Kirby	18-Mar-09	1992	Active	Chaves	Roswell	120,000
797	Cheyenne Dairy 2	Zwaagstra Dairy Dexter	Hoekstra, David	Ashcraft Consulting, Inc.	Shawna Clark	24-Mar-09	1992	Active	Chaves	Roswell	80,000
804	Sunshine Dairy-Dexter	Wade Dairy, Flying V Dairy	Breedyk, John and Kevin	Glorieta Geoscience, Inc.	Sara Arthur	18-Mar-09	1978	Active	Chaves	Roswell	24,000
904	Wild West Farms	SDR Dairy	Hoekstra, David	Ashcraft Consulting, Inc.	Sara Arthur	13-Mar-09	1993	Active	Chaves	Roswell	125,000
1200	Milky Way Dairy	Tony Vander Hulst Dairy	Borba, John (Linda Durham, daughter overseeing compliance activities)	Ashcraft Consulting, Inc.	Shawna Clark	24-Mar-09	1999	Active	Chaves	Roswell	8,400
674	SAS Dairy	DO-RENE Dairy	Smith, Albin	EnviroCompliance Services, Inc.	Bill Pearson	26-Mar-09	1992	Active	Curry	Clovis	24,000
703	Desperado Dairy		Hellman, Howard	EnviroCompliance Services, Inc.	Sara Arthur	16-Mar-09	26-Oct-90	Active	Curry	Clovis	48,000
851	Highland Dairy	Art Schaap Dairy	Schaap, Art	EnviroCompliance Services, Inc.	Kathie Deal	20-Mar-09	1994	Active	Curry	Clovis	67,500
878	Rajen Dairy II	Boersma's A&T Dairy; Pleasant Meadows Dairy	Vander Dussen, Randy	Texas Nutrient Management Co.	Kim Kirby	18-Mar-09	1993	Active	Curry	Clovis	72,000
934	South Slope Dairy	Opplinger Dairy	Abacherli, Jim	EnviroCompliance Services, Inc.	Sara Arthur	18-Mar-09	1993	Active	Curry	Clovis	225,000
956	Day Star Dairy	DeVry Dairy	Teune, Todd	EnviroCompliance Services, Inc.	Kim Kirby	18-Mar-09	1994	Active	Curry	Clovis	74,000

## Nitrate Contamination at Dairy Facilities

DP#	Facility Name	Previous Facility Name(s)	Name of Responsible Party	Consultant	GWQB Reviewer	Spreadsheet last updated	Year Discharge Began	Status	County	Closest City	Permitted (GPD)
1022	Southern Draw Dairy	Ford Dairy/Animal Waste Disposal Site (DP-307)	Schaap, Ron	Enviro-Ag Engineering	Shawna Clark	24-Mar-09	1983 or earlier	Active	Curry	Clovis	45,000*
1026	Mid Frisian Dairy	H Five Dairy	Vanderpleog, Andle	EnviroCompliance Services, Inc.	Kim Kirby	18-Mar-09	2000	Active	Curry	Clovis	40,000
1111	Do-Rene Dairy 2	Do-Rene Dairy #2	Handley, Doug and Irene	Barron's Environmental Solutions	Kim Kirby	18-Mar-09	~1997	Active	Curry	Clovis	120,000
1197	Rajen Dairy III	Powerline Dairy	Vander Dussen, Randy	Texas Nutrient Management Co.	Kim Kirby	18-Mar-09	2000	Active	Curry	Clovis	160,000
1288	Sunwest Dairy	Kay Dee Farms, Inc.: Rio Leche Dairy	Schaap, Ron	Enviro-Ag Engineering, Inc.	Kim Kirby	18-Mar-09	2001	Active	Curry	Clovis	60,000
1413	Stark Dairy		Stark, Mike	Enviro-Ag Engineering, Inc.	Sara Arthur	11-Mar-09	19-Feb-03	Active	Curry	Clovis	109,250
1455	Route 77 Dairy	T & T Farms	Rucker, Billy	EnviroCompliance Services, Inc.	Kathie Deal	2-Apr-09	2007	Active	Curry	Clovis	90,000
1475	Dutch Valley Farms	Highway 288 Dairy	Visser, Dan	EnviroCompliance Services, Inc.	Sara Arthur	31-Mar-09	2006	Active	Curry	Clovis	99,000
1553	Arrowhead Dairy		Smith, Albin	EnviroCompliance Services, Inc.	Bill Pearson	26-Mar-09	2007	Active	Curry	Clovis	70,000
1001	James Idsinga & Son Dairy	V. R. Dairy	Idsinga Sr., Jim	EnviroCompliance Services, Inc.	Sara Arthur	23-Mar-09	1995	Active	Curry	Portales	32,000
1423	Sandcrest Dairy	Pleasant Valley Dairy	Jones, Stanley	EnviroCompliance Services, Inc.	Kathie Deal	20-Mar-09	2006	Active	Curry	Portales	65,000
1321	Providence Dairy	Randy and Jenise Vander Dussen Dairy	Vander Dussen, George	EnviroCompliance Services, Inc.	Shawna Clark	24-Mar-09	11/17/2001	Active	Curry	Texico	105,00
1346	Ridgecrest Dairy	Cross-Roads Farms	Rucker, Billy	EnviroCompliance Services, Inc.	Bill Pearson	26-Mar-09	2002	Active	Curry	Texico	87,500
1091	Native Pastures Dairy	T & J Dairy	Johnson, Tom ; leased by Art Schaap	EnviroCompliance Services, Inc.	Kathie Deal	20-Mar-09	1996	Active	Curry	Clovis	2,000
1163	North Point Dairy		Schaap, Eddie	EnviroCompliance Services, Inc.	Kim Kirby	18-Mar-09	1999	Active	Curry	Clovis	180,000
1379	Cross Country Dairy	Barnes Farm #2	DeGroot, Pete	EnviroCompliance Services, Inc.	John Rebar	27-Mar-09	2005	Active	Curry	Clovis	75,000
1578	Hide A Way Dairy 2		Vander Dussen, Robert	Enviro-Ag Engineering, Inc.	Kim Kirby	18-Mar-09	2008	active	Curry	Clovis	61,250
706	Rajen Dairy		VanderDussen, Randy	Barron's Environmental Solutions	Sara Arthur	17-Mar-09	1992	Active	Curry	Clovis	200,000

## Nitrate Contamination at Dairy Facilities

DP#	Facility Name	Previous Facility Name(s)	Consultant	GWQB Reviewer	Spreadsheet last updated	Year Discharge Began	County	Closest City	Permitted (GPD)		
1136	Heritage Dairy		Daale, Eric	EnviroCompliance Services, Inc.	Kim Kirby	18-Mar-09	1997	Active	Curry	Clovis	100,000
1199	Palla Dairy		Palla, Eric	Enviro-Ag Engineering, Inc.	Sara Arthur	25-Mar-09	27-Apr-98	Active	Curry	Clovis	160,000
1277	El Dorado Dairy	Hanson/Ware Dairy	Hanson, Steve	EnviroCompliance Services, Inc.	Sara Arthur	26-Mar-09	2000	Active	Curry	Clovis	95,000
932	Midway Dairy	none	Teune, Tom	EnviroCompliance Services, Inc.	Shawna Clark	24-Mar-09	1993	Active	Curry	Portales	42,074
967	Las Uvas Valley Dairy #6		Horton, Dean and Francis	Ricardo Jacquez / Mark Turnbough	Kim Kirby	18-Mar-09	1993	Active	Doña Ana	Hatch	44,000
1265	Turner Dairy		Turner, James (however dairy sold recently)	GL Environmental, Inc.	Kim Kirby	19-Mar-08	1999	Active	Doña Ana	Hatch	15,000
342	Las Uvas Valley Dairy #s 1-2-3-4-5	Las Uvas Valley Dairy	Horton, Dean and Francis	Ricardo Jacquez / Mark Turnbough	Kim Kirby	18-Mar-09	1980	Active	Doña Ana	Hatch	103,000
692	Del Oro Dairy		Settles, Jerry	Magee & Associates	Bill Pearson	26-Mar-09	1990	Active	Doña Ana	Anthony	60,000
170	Sun Valley Dairy LLC	Bonestroo Dairy	Bonestroo, Bruce	EnviroCompliance Services, Inc.	Kim Kirby	18-Mar-09	~1981	Active	Doña Ana	Berino	35,000
1350	Loma Parda Dairy		Ortiz, Herman	none	Shawna Clark	24-Mar-09	2003	Active	Doña Ana	Garfield	26,000
42	Dominguez Farms II & III	D and J Dairy, LLC, BJZ Dairy	Dominguez, Issac	Magee & Associates	Shawna Clark	24-Mar-09	8-Dec-78	Active	Doña Ana	Mesquite	60,000
70	Mountain View Dairy	DeRuyter Dairy, Morningside Dairy	DeRuyter, John	Ricardo Jacquez	Bill Pearson	26-Mar-09	1980	Active	Doña Ana	Mesquite	60,000
126	Del Norte Dairy	Gorzeman Dairy #2, Daybreak Dairy	DeRuyter, John	EnviroCompliance Service, Inc.	Bill Pearson	26-Mar-09	1980	Active	Doña Ana	Mesquite	24,000
167	River Valley Dairy	Valley View Dairy Inc	Bonestroo, Bruce	EnviroCompliance Services, Inc.	Kim Kirby	18-Mar-09	~1981	Active	Doña Ana	Mesquite	35,000
177	Gonzalez Dairy		Gonzales, Joe	Glorieta Geoscience, Inc.	Shawna Clark	24-Mar-09	25-Jun-81	Active	Doña Ana	Mesquite	49,000
340	Bright Star Dairy		Hyde, Tim	Ricardo Jacquez	Bill Pearson	26-Mar-09	1987	Active	Doña Ana	Mesquite	60,000

## Nitrate Contamination at Dairy Facilities

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624	Dominguez Dairy		Dominguez, Issac	other	Shawna Clark	24-Mar-09	1-Feb-90	Active	Doña Ana	Mesquite	85,000
833	Big Sky/Desertland Dairy		DeRuyter, Ed	Ricardo Jacquez	Bill Pearson	26-Mar-09	1992	Active	Doña Ana	Mesquite	80,000
1208	Tallmon Dairy		Loper, Chuck	Magee & Associates	Shawna Clark	24-Mar-09	1954	Active	Doña Ana	Santa Teresa	16,945
257	Sunset Dairy	Gorzeman Dairy #1, HLGLLC Dairy	DeRuyter, Ed	Ricardo Jacquez	Bill Pearson	26-Mar-09	1983	Active	Doña Ana	Vado	45,000
683	Top Line Dairy	Cottonwood Creek Dairy Countyline Dairy	Martins, Robert	Glorieta Geoscience, Inc.	Shawna Clark	24-Mar-09	1990	Active	Eddy	Artesia	550,000
765	J&M Dairy	Artesia Dairy	Borges, Maria	none	Kim Kirby	18-Mar-09	1991	Active	Eddy	Artesia	90,000
796	Cornerstone Dairy		Tuls, Jack selling to Hoekstra, David	Glorieta Geoscience, Inc.	Shawna Clark	24-Mar-09	20-Jun-91	Active	Eddy	Artesia	90,000
921	Flecha Dairy	Hafliger Dairy	Bogle, Aaron	Ashcraft Consulting, Inc.	Shawna Clark	24-Mar-09	1994	Active	Eddy	Artesia	99,000
<b>734</b>	<b>Cottonwood Springs Dairy 1</b>	<b>Phillip Troost Dairy</b>	<b>Troost Jr., Phillip</b>	<b>Glorieta Geoscience, Inc.</b>	<b>Kim Kirby</b>	<b>18-Mar-09</b>	<b>~1991</b>	<b>Active</b>	<b>Eddy</b>	<b>Lake Arthur</b>	<b>84,000</b>
913	Creekside Dairy	285 Dairy, Vierra Dairy	Villalpondo, Abel	none	Bill Pearson	26-Mar-09	1993	Active	Eddy	Lake Arthur	56,000
461	Beestra Family Dairy	Mortensen Dairy, Goodwin Dairy	Adams, Jesse	EnviroCompliance Services, Inc.	Shawna Clark	24-Mar-09	Prior 1984	Active	Lea	Hobbs	40,000
988	Boyd Brothers Inc. Dairy		Boyd Jr., Lee	none	Sara Arthur	18-Mar-09	1996	Active	Lea	Lovington	3,000
1168	Goff Dairy		Goff, Buster	EnviroCompliance Services, Inc.	Sara Arthur	25-Mar-09	14-Jan-98	Active	Lea	Lovington	160,000
1302	Bos Dairy - North	New Direction Dairy	Bos, Isaak	EnviroCompliance Services, Inc.	Kim Kirby	18-Mar-09	2001	Active	Lea	Lovington	60,000
1323	Brand West Dairy 2		Brand, Frank	EnviroCompliance Services, Inc.	Bill Pearson	26-Mar-09	2007	Active	Lea	Lovington	99,900

### Nitrate Contamination at Dairy Facilities

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259	RockView Dairy	High Desert Dairy, Rockview Dairy, Goff Dairy	Schaap, Rick	EnviroCompliance Services, Inc.	Bill Pearson	26-Mar-09	1983	Active	Lea	Hobbs	27,500
762	High Lonesome Dairy	Rockview Dairy #2	Schaap, Eddie	EnviroCompliance Services, Inc.	Kathie Deal	20-Mar-09	1991	Active	Lea	Hobbs	60,000
909	Tee Vee Dairy	West Star Ranch: Goff Dairy II	VanDam, Ken	EnviroCompliance Services, Inc.	unassigned	30-Mar-09	1993	Active	Lea	Hobbs	48,000
1025	Landmark Dairy (Doldersum Dairy)	Wormont Dairy, Wordon Dairy	Doldersum, Wessel	EnviroCompliance Services, Inc.	Shawna Clark	24-Mar-09	1995	Active	Lea	Lovington	40,000
1135	Bos Dairy		Bos, Isaak	EnviroCompliance Services, Inc.	Kathie Deal	20-Mar-09	btw 1997 and 2000	Active	Lea	Lovington	120,000
1559	Rocky Top Dairy		Goff, Buster	EnviroCompliance Services, Inc.	Sara Arthur	31-Mar-09	2006	Active	Lea	Lovington	60,000
1331	Butterfield Dairy Farm		Van Ryan, Jon	Glorieta Geoscience, Inc.	Kim Kirby	18-Mar-09	2001	Active	Luna	Deming	60,000
1391	Nutt Dairy	S & T Dairy	Shiflett, Gary on new App./ Titus Vanderploeg signs reports	Glorieta Geoscience, Inc.	Shawna Clark	24-Mar-09	2002	Active	Luna	Deming	20,000
1257	Mariposa Farms Dairy		Skelley, Larry	EnviroCompliance Services, Inc.	Bill Pearson	26-Mar-09	1999	Active	Roosevelt	Causey	30,000
1332	Oppurtunity Dairy	Teune Dairy #5	Dollins, John Managing Member; Opportunity Dairy LLC	EnviroCompliance Services, Inc.	Kathie Deal	20-Mar-09	2004	Active	Roosevelt	Clovis	65,000
514	Amistad Dairy	Idsinda Bros. Dairy, Murry East Dairy, Six Arrows	Jimenez, John	EnviroCompliance Services, Inc.	Bill Pearson	26-Mar-09	1988	Active	Roosevelt	Portales	6,000
880	W-Diamond Dairy		Rogers, Robert	none	Bill Pearson	26-Mar-09	1992	Active	Roosevelt	Portales	49,999
926	Carter's Milk Factory	Alva Carter Dairy, Carter Dairy	Carter Jr., Alva	EnviroCompliance Services, Inc.	Kathie Deal	20-Mar-09	1992	Active	Roosevelt	Portales	64,000
963	Red Roof Dairy	Ryan Dairy	Smith, Albin	EnviroCompliance Services, Inc.	Bill Pearson	26-Mar-09	1993	Active	Roosevelt	Portales	37,500
1251	Crosswinds Dairy	Stanley & Valerie Jones Dairy	Idaung Jr., Doug	EnviroCompliance Services, Inc.	Kim Kirby	18-Mar-09	1999	Active	Roosevelt	Portales	50,000

## Nitrate Contamination at Dairy Facilities

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1315	J-Lu Dairy	D&D dairy	Wagner, Jim	EnviroCompliance Services, Inc.	Sara Arthur	31-Mar-09	2002	Active	Roosevelt	Portales	85,000
1517	Sunridge Dairy	Jones and Allen LLC	Jones, Stanley	EnviroCompliance Services, Inc.	Bill Pearson	31-Mar-09	2008	Active	Roosevelt	Portales	75,000
1531	Arch Diamond	Sandhill Dairy	Douma, Phil	EnviroCompliance Services, Inc.	Bill Pearson	26-Mar-09	2007	Active	Roosevelt	Portales	65,000
1320	Clover Knolls	Milagro Dairy	Handley, Doug and Irene	Barron's Environmental Solutions	Kim Kirby	18-Mar-09	2003	Active	Roosevelt	Texico	124,000
390	Bright Horizon Dairy	Causey Dairy, Double J Dairy, Sunplains Dairy	Land, John	EnviroCompliance Services, Inc.	Sara Arthur	12-Mar-09	1985	Active	Roosevelt	Causey	6,000
1246	Hide-A-Way Dairy	South Slope Dairy SSDP	Vander Dussen, Robert	Enviro-Ag Engineering, Inc.	Kim Kirby	18-Mar-09	2000	Active	Roosevelt	Clovis	61,250
384	Philmar Dairy	Stanley Ray Jones Dairy; S&V Dairy	Douma, Phil	EnviroCompliance Services, Inc.	Kim Kirby	19-Mar-09	1985	Active	Roosevelt	Portales	40,000
537	Van Dam Dairy	Andy Schaap Dairy	VanDam, Ken	Enviro-Ag Engineering, Inc.	unassigned	30-Mar-09	1987	Active	Roosevelt	Portales	35,463
595	Back Nine Dairy	Triple J, Triple E Dairy, Milk Makers #2	Schaap, Art	EnviroCompliance Services, Inc.	Kathie Deal	20-Mar-09	before 1988	Active	Roosevelt	Portales	10,000
666	Western Star Dairy	Titos Dairy	Teune, Todd	EnviroCompliance Services, Inc.	Bill Pearson	26-Mar-09	1990	Active	Roosevelt	Portales	20,000
667	H and R Westra Dairy	Milk Makers #1, Dependence Dairy	Westra, Roger	EnviroCompliance Services, Inc.	Shawna Clark	24-Mar-09	1990	Active	Roosevelt	Portales	20,000
737	Parkland Dairy	E & C Dairy	Visser, Alice	EnviroCompliance Services, Inc.	Bill Pearson	26-Mar-09	1992	Active	Roosevelt	Portales	15,000
753	Brouwer Dairy	J-Lu Dairy #2, S&V Dairy	Brouwer, Robert	EnviroCompliance Services, Inc.	Kathie Deal	20-Mar-09	1991	Active	Roosevelt	Portales	24,000
826	Anderson Dairy 2		Anderson, Alan	EnviroCompliance Services, Inc.	Bill Pearson	26-Mar-09	1992	Active	Roosevelt	Portales	4,500
898	Bonestroo Dairy LLC	Van Ruiten Dairy North	Bonestroo, Gary	EnviroCompliance Services, Inc.	Bill Pearson	26-Mar-09	1993	Active	Roosevelt	Portales	43,000
987	Mitchell Dairy		Mitchell, Ronnie	EnviroCompliance Services, Inc.	Bill Pearson	26-Mar-09	1995	Active	Roosevelt	Portales	15,000
1154	Saltridge Dairy	Outlaw Dairy	Schaap, Art	EnviroCompliance Services, Inc.	Shawna Clark	24-Mar-09	1997	Active	Roosevelt	Portales	30,000

## Nitrate Contamination at Dairy Facilities

DP#	Facility Name	Previous Facility Name(s)	Name of Responsible Party	Consultant	GWQB Reviewer	Spreadsheet last updated	Year Discharge Began	Status	County	Closest City	Permitted Cap
1245	4-Way Dairy	Mitchell Price Dairy	Mitchell, Ronnie	EnviroCompliance Services, Inc.	Kim Kirby	18-Mar-09	2000	Active	Roosevelt	Portales	90,000
1250	Sky County Farms	Sloping Hills Dairy	Fiske, Al	EnviroCompliance Services, Inc.	Shawna Clark	24-Mar-09	2005	Active	Roosevelt	Portales	90,000
1286	Greenfield Park Dairy	Jodre Dairy 1	Heavyside, John and Loretta	Enviro-Ag Engineering, Inc.	Kim Kirby	18-Mar-09	2000	Active	Roosevelt	Portales	40,000
1287	Lajolla Dairy		Abarca, Miguel	EnviroCompliance Services, Inc.	Bill Pearson	26-Mar-09	2000	Active	Roosevelt	Portales	9,750
1299	Cooper-Legacy Dairy	Premier Dairy	Cooper, Jered	EnviroCompliance Services, Inc.	Sara Arthur	26-Mar-09	2000	Active	Roosevelt	Portales	65,000
1312	Milk Flow Dairy	Promise Land Dairy	Unknown at this time (Gene Newman as of Feb. 2008)	EnviroCompliance Services, Inc.	Shawna Clark	24-Mar-09	2000/2001	Active	Roosevelt	Portales	40,000
1377	Grande Vida Dairy	Jorde Dairy VI. Utopia Dairy	Mitchell, Mike	EnviroCompliance Services, Inc.	Bill Pearson	26-Mar-09	2006	Active	Roosevelt	Portales	49,500
1313	Desert Star Dairy		McDermid, David	EnviroCompliance Services, Inc.	Kathie Deal	20-Mar-09	2001	Active	Roosevelt	Texico	40,000
380	Barrera Dairy		Barrera, Lorenzo	none	Kim Kirby	18-Mar-09	1986	Active	Sierra	Arrey	25,650
546	Caballo Dairy Inc	Price's Dairy; Price Black Dairy	Vanderploeg, Titus et al.	Glorieta Geoscience, Inc.	Kim Kirby	18-Mar-09	1931	Active	Sierra	Arrey	72,000
1477	HAW Farms	None	Woelber, John	EnviroCompliance Services, Inc.	John Rebar	27-Mar-09	2005	Active	Socorro	Becker	7,000
563	A&M Dairy	Sand Hill Dairy; Richard Handley Dairy	Ghoreishi, Pedram	EnviroCompliance Services, Inc.	John Rebar	27-Mar-09	1988	Active	Socorro	Veguita	4,200
772	Othart Dairy 2	Keith Miller Dairy	Othart, Leon	Glorieta Geoscience, Inc.	Melanie Sanchez	26-Mar-09	6/13/1905	Active	Socorro	Veguita	7,500
865	Pareo Dairy		Pareo, Jordan and Beverly	Glorieta Geoscience, Inc.	Kim Kirby	18-Mar-09	prior to 1984	Active	Socorro	Veguita	11,000
1194	Handley Dairy		Handley, Loring	EnviroCompliance Services, Inc.	unassigned	18-Mar-09	early 1970's	Active	Socorro	Veguita	6,150
1294	R & R Ranch Dairy	Mountain View	Pareo, Jordan and Beverly	Glorieta Geoscience, Inc.	Kim Kirby	18-Mar-09	2001	Active	Socorro	Veguita	160,000

## Nitrate Contamination at Dairy Facilities

DP#	Facility Name	Previous Facility Name(s)	Name of Responsible Party	Consultant	GWQB Reviewer	Spreadsheet last updated	Year Discharge Began	Status	County	Closest City	Permitted GW
1032	Bosque Dairy	Black and White Dairy	Vanderploeg, Titus	Glorieta Geoscience, Inc.	Sara Arthur	18-Mar-09	11/1/1993	Active	Socorro	Bosque	3,000
190	Othart Dairy	Ken Miller Dairy	Othart, Leon	Glorieta Geoscience, Inc.	Melanie Sanchez	26-Mar-09	6/4/1905	Active	Socorro	Veguita	8,000
290	Tres Hermanos Dairy LLC	Abo Dairy, Ken Miller Dairy	Sanchez, Jericho	none	Sara Arthur	11-Mar-09	1983	Active	Socorro	Veguita	5,000
1004	Willard Dairy	Zens Dairy, Prices Willard Farms Circle 6 Dairy	Zens, Butch	EnviroCompliance Services, Inc.	Kathie Deal	20-Mar-09	1998	Active	Torrance	Willard	80,000
1034	Edeal Dairy		Edeal, Scott	EnviroCompliance Services, Inc.	Sara Arthur	25-Mar-09	1995	Active	Valencia	Los Lunas	35,000
115	Jones Dairy, Inc.	Carlos Martinez Dairy	Jones, Ron	Glorieta Geoscience, Inc.	Sara Arthur	11-Mar-09	1979	Active	Valencia	Veguita	18,000
1181	Rasband Dairy		Rasband, Scott	EnviroCompliance Services, Inc.	Kim Kirby	18-Mar-09	pre-1996	Active	Valencia	Belen	37,060
1176	Jarratt Dairy		Jarratt, Raymond		Jake Knutson	26-Mar-09	5/19/1995	Active	Valencia	Los Lunas	2,500
1153	Rizzo Dairy		Rizzo, Leo		Brad Reid	2-May-08	1975	Ceased	Bernalillo	Albuquerque	2,040
408	Truog Dairy		Squire, Al	Ashcraft Consulting, Inc.	Sarah McGrath	18-Feb-08	1985	Ceased	Chaves	Hagerman	40,000
638	Chisum Trail Dairy	Pendergrass Dairy; Lee-Van Dairy	Silva, Rick?		Kim Kirby	18-Mar-09	prior to 1989	Ceased	Chaves	Dexter	11,000
613	Dominic Batista & Family Dairy	Bizzell Dairy	Batista, Dominic		Shawna Clark	24-Mar-09	pre-88	Ceased	Chaves	Hagerman	9,600
84	Luiz Dairy	Bert Zwaagstra Dairy	Luiz, John	none	unassigned	22-Jan-08	1979	Ceased	Chaves	Dexter	unknown
743	Hepp Dairy		Hepp, Ron		unassigned	22-Feb-08		Ceased	Chaves	Dexter	
821	B&B Dairy		Bizzell, Ron		Brad Reid	2-May-08	1996	Ceased	Chaves	Roswell	4,800
905	Hobson Dairy		Hobson, Harold		unassigned	22-Jan-08	unknown	Ceased	Chaves	Roswell	
953	Hobson Dairy		Hobson, Harold		unassigned	22-Jan-08	unknown	Ceased	Chaves	Roswell	
307	Ford Dairy		Ford, Edwin		unassigned	22-Feb-08	1984	Ceased	Curry	Clovis	
159	Lopez's Dairy		Lopez, Je		unassigned	22-Jan-08	unknown	Ceased	Doña Ana	Mesquite	
740	Cottonwood Dairy		Needham, Robert		unassigned	22-Aug-08		Ceased	Eddy	Artesia	90,000
744	Tumbleweed Dairy 1		Wade, Robert		unassigned	22-Feb-08		ceased	Eddy	Artesia	
770	Bob Mayberry Dairy	13th Street Dairy	Mayberry, Bob		unassigned	22-Aug-08		Ceased	Eddy	Artesia	90,000

## Nitrate Contamination at Dairy Facilities

DP#	Facility Name	Previous Facility Name(s)	Name of Responsible Party	Consultant	GWQB Reviewer	Spreadsheet last updated	Year Discharge Began	Status	County	Closest City	Permitted Discharge	
889	Seven Rivers Cattle	Chaparral Cattle Co.	Paul, Larry			unassigned	24-Feb-08	pre-1992	ceased	Eddy	Carlsbad	
1268	Just Fine Dairy		Matthews, John	EnviroCompliance Services, Inc.		unassigned	30-Mar-09	2001	Ceased	Lea	Lovington	45,000
1211	Alexander Brothers Dairy		Alexander, Mark	none		unassigned	30-Mar-09	1962	ceased	Lea	McDonald	2,500
888	Woods Dairy	MWC Dairy	Woods, Martin	none	Bill Pearson	26-Mar-09	1992	Ceased	Lea	Lovington	5,000	
951	Brand West Dairy	Alameida Dairy	Brand, Frank	EnviroCompliance Services, Inc.	Bill Pearson	26-Mar-09	1995	Ceased	Lea	Lovington	99,990	
1066	Caprock Dairy		Dunn, Robert			unassigned	22-Jan-08	unknown	Ceased	Lea	Hobbs	
235	Alexander Dairy		Alexander, Dean			unassigned	22-Feb-08	~ 1982	Ceased	Lea	Lovington	22,500
1239	D&J Dairy		Baker, David	None	Shawna Clark	24-Mar-09	1971	Ceased	Roosevelt	Rogers	1,500	
252	Schaap Estate	Schaap Sanchez Dairy Valley View Dairy Eric Hettinga Dairy Raw Hide Dairy	Schaap, Attie	EnviroCompliance Services, Inc.		unassigned	22-Jan-08	1983	Ceased	Roosevelt	Arch	500
123	Genesis Dairy	Ronald McPherson Dairy; Triple H Dairy	Unknown at this time (Daniel Clouser as of Oct. 2002)	none	John Rebar	27-Mar-09	1982	Ceased	Socorro	Bernardo	1,125	
347	Double Rd Dairy		Gomez, Robert			unassigned	22-Jan-08	unknown	Ceased	Taos	Taos	
1207	Cottonwood Dairy-Belen	None	Edeal, Scott	EnviroCompliance Services, Inc.	John Rebar	27-Mar-09	Pre-1977	Ceased	Valencia	Belen	7,400	
893	Los Lunas Correctional Center		NM Corrections - Baca, Arnold	none	Kim Kirby	18-Mar-09	pre 1992	Ceased	Valencia	Los Lunas	6,300	
936	Clouser Dairy		Clouser, Ronald			unassigned	22-Jan-08	pre-1977	Ceased	Valencia	Belen	3,000
197	Merrill Dairy-Alexander 2		Alexander, Merrill			unassigned	22-Jan-08	unknown	Ceased		Turn	
208	Oasis Dairy		Krasowsky, John (deceased)	EnviroCompliance Service, Inc.	Bill Pearson	26-Mar-09	1982	Inactive	Chaves	Roswell	64,000	
228	New Horizon Dairy	Sky Country Farms; V & M Stahl Dairy	Bouma, Brad - de Graff Family Trust	Glorieta Geoscience, Inc.	Kim Kirby	18-Mar-09	1982	Inactive	Chaves	Roswell	120,000	
487	Baca Linda Dairy		Visser, Tom: Owner Flores, Jason: Operator	Glorieta Geoscience, Inc.	Shawna Clark	24-Mar-09	1987	Inactive	Chaves	Roswell	56,000	
74	Buena Vista 2	Sunshine Dairy	Weatherly, Mike	Ricardo Jacquez	Bill Pearson	26-Mar-09	1979	Inactive	Doña Ana	Mesquite	55,000	

## Nitrate Contamination at Dairy Facilities

DP#	Facility Name	Previous Facility Name(s)	Name of Responsible Party	Consultant	GWQB Reviewer	Spreadsheet last updated	Year Discharge Began	Status	County	Closest City	Permitted CAP
86	Buena Vista Dairy	Bright Star Dairy	Weatherly, Mike	Ricardo Jacquez	Bill Pearson	26-Mar-09	1979	Inactive	Doña Ana	Mesquite	60,000
923	Faria Dairy	S&A Dairy; Dean Alexander Dairy (DP-235)	Faria, Sebastiao	EnviroCompliance Services, Inc.	Kathie Deal	20-Mar-09	in or before 1984	Inactive	Lea	Lovington	49,900
699	Ruch Dairy	K&B Dairy; Goff Dairy	Ruch, John	EnviroCompliance Services, Inc.	Sara Arthur	25-Mar-09	est.1991	Inactive	Lea	Hobbs	40,000
911	Chalk Hill Dairy	Campbell Dairy . Double R Dairy, Jay Vee Dairy	Campbell, John	EnviroCompliance Services, Inc.	Kathie Deal	20-Mar-09	before 1992	Inactive	Roosevelt	Portales	1,250
1067	Stepping Stone Dairy	College Heights Dairy, Westview Dairy	Breshears, Kevin	EnviroCompliance Services, Inc.	Bill Pearson	26-Mar-09	1996	Inactive	Roosevelt	Portales	5,000
299	Blackwater Draw Dairy	Mirage Dairy, Sandhill Dairy	Bouldin, Randy	EnviroCompliance Services, Inc.	Kathie Deal	20-Mar-09	before 1983	Inactive	Roosevelt	Portales	25,000
346	Abarca Dairy		Abarca, Miguel	EnviroCompliance Services, Inc.	Bill Pearson	26-Mar-09	1984	Inactive	Roosevelt	Portales	2,500
1157	High Plains Dairy	Jones Dairy #2, Moo Tech	Albers, Teo	EnviroCompliance Services, Inc.	Kathie Deal	20-Mar-09	1997	Inactive	Roosevelt	Portales	60,000
195	Heraa Dairy	None	Ghoreishi, Pedram	EnviroCompliance Service, Inc.	John Rebar	27-Mar-09	1982	Inactive	Socorro	Veguita	3,000
1061	Vergeer Dairy		Vergeer, Louis	EnviroCompliance Services, Inc.	Melanie Sanchez	26-Mar-09	6/17/1905	Inactive	Valencia	Los Lunas	2,600
885	Jersey Gold Dairy	Dahl Dairy	Lucero, Ferron	none	John Rebar	27-Mar-09	1986	Inactive	Valencia	Belen	2,000
1360	Rio Felix Dairy		Villalpondo, Abel	Ashcraft Consulting, Inc.	Sarah McGrath	12-Apr-09	N/A	Paper Dairy	Chaves	Hagerman	120,000
1418	Nutt-Hockett Dairy		Pope, Ray	Glorieta Geoscience, Inc.	Sarah McGrath	12-Apr-09	N/A	Paper Dairy	Chaves	Hatch	100,000
1374	Nature's Dairy 2		Greathouse, Jerry	Glorieta Geoscience, Inc.	Sarah McGrath	12-Apr-09	N/A	Paper Dairy	Chaves	Roswell	96,000
1290	Martin Grain		Martin, Wayne	EnviroCompliance Services, Inc.	Sarah McGrath	12-Apr-09	N/A	Paper Dairy	Curry	Clovis	40,000
1292	Jorde Dairy II		Jorde, Jeffrey	EnviroCompliance Services, Inc.	Sarah McGrath	12-Apr-09	N/A	Paper Dairy	Curry	Clovis	40,000
1310	Palla Dairy II		Palla, Eric	EnviroCompliance Services, Inc.	Sara Arthur	11-Mar-09	N/A	Paper Dairy	Curry	Clovis	137,000
1335	Squanderosa Dairy		Schaap, Ron	Enviro-Ag Engineering, Inc.	Sarah McGrath	12-Apr-09	N/A	Paper Dairy	Curry	Clovis	90,000

## Nitrate Contamination at Dairy Facilities

DP#	Facility Name	Previous Facility Name(s)	Name of Responsible Party	Consultant	GWQB Reviewer	Spreadsheet last updated	Year Discharge Began	State	County	Closest City	Permitted (lbs)
1338	Palla Dairy III		Palla, Eric	EnviroCompliance Services, Inc.	Sara Arthur	11-Mar-09	N/A	Paper Dairy	Curry	Clovis	137,000
1352	Running M Land And Cattle		de Maio, Vincent	EnviroCompliance Services, Inc.	Sarah McGrath	12-Apr-09	N/A	Paper Dairy	Curry	Clovis	75,000
1364	Three County Farms Inc		Williams, Bert	Enviro-Ag Engineering, Inc.	Sarah McGrath	12-Apr-09	N/A	Paper Dairy	Curry	Clovis	72,000
1460	Highland Dairy II		Schaap, Art	EnviroCompliance Services, Inc.	unassigned	30-Mar-09		Paper Dairy	Curry	Clovis	150,000
1496	Myrick Property Dairy		Myrick, J.D. and Freddie Sue	Enviro-Ag Engineering, Inc.	Sarah McGrath	22-Feb-08	N/A	Paper Dairy	Curry	Clovis	77,250
1557	Starbuck Inc		Starbuck, Jim	EnviroCompliance Services, Inc.	Sarah McGrath	22-Feb-08	N/A	Paper Dairy	Curry	Clovis	90,000
1567	The Udder Place Dairy		Cooper, Jered	EnviroCompliance Services, Inc.	Sarah McGrath	22-Feb-08	N/A	Paper Dairy	Curry	Clovis	90,000
1330	Outback Dairy		Essary, Don	EnviroCompliance Services, Inc.	Sarah McGrath	12-Apr-09	N/A	Paper Dairy	Curry	Melrose	50,000
1276	Eddie Schaap Dairy	CJW Dairy #1 Launchpad Dairy	Schaap, Eddie	EnviroCompliance Services, Inc.	Shawna Clark	24-Mar-09	N/A	Paper Dairy	Curry	Pleasant Hill	40,000
1348	Barnes Farms		Barnes, Paul	EnviroCompliance Services, Inc.	Sarah McGrath	12-Apr-09	N/A	Paper Dairy	Curry	Texico	40,000
1361	Kendall Devault		DeVault, Kendall	Enviro-Ag Engineering, Inc.	Sarah McGrath	12-Apr-09	N/A	Paper Dairy	Curry	Texico	72,000
1415	Tim Foote		Foote, Tim	EnviroCompliance Services, Inc.	Sarah McGrath	12-Apr-09	N/A	Paper Dairy	Curry	Texico	75,000
1317	Fort Sumner (Village of) - Dairy		Lopez, Raymond (Mayor)	EnviroCompliance Services, Inc.	Sarah McGrath	12-Apr-09	N/A	Paper Dairy	De Baca	Fort Sumner	20,000
1376	KC Dairy		Goff, Buster	EnviroCompliance Services, Inc.	Sarah McGrath	12-Apr-09	N/A	Paper Dairy	Lea	Lovington	60,000
1373	G and C Enterprises LLC	Trio Farms Dairy	Newman, Gene	EnviroCompliance Services, Inc.	Sarah McGrath	12-Apr-09	N/A	Paper Dairy	Roosevelt	Arch	105,000
1394	SunnyVale Dairy		Vidlar, Dwayne	EnviroCompliance Services, Inc.	Sarah McGrath	12-Apr-09	N/A	Paper Dairy	Roosevelt	Floyd	40,000

### Nitrate Contamination at Dairy Facilities

DP#	Facility Name	Previous Facility Name(s)	Facility Type	Consultant	GWQB Reviewer	Spreadsheet last updated	Year Discharge Began	Discharge Type	County	Closest City	Flow (gpd)	
1601	North Floyd Dairy			Buzzard, Charlie	EnviroCompliance Services, Inc.	Sarah McGrath	22-Feb-08	N/A	Paper Dairy	Roosevelt	Floyd	25,000
1309	R & L Farm Service, Inc 1			Jorde, Jeffrey	EnviroCompliance Services, Inc.	Sarah McGrath	12-Apr-09	N/A	Paper Dairy	Roosevelt	Portales	40,000
1316	Jorde Dairy III			Jorde, Jeffrey	EnviroCompliance Services, Inc.	Sarah McGrath	12-Apr-09	N/A	Paper Dairy	Roosevelt	Portales	40,000
1372	Sanders Dairy			Sanders Jr, David	EnviroCompliance Services, Inc.	Sarah McGrath	12-Apr-09	N/A	Paper Dairy	Roosevelt	Portales	40,000
1384	Cameo Dairy			McAlister, Aileen	EnviroCompliance Services, Inc.	Sarah McGrath	12-Apr-09	N/A	Paper Dairy	Roosevelt	Portales	75,000
1447	Launchpad Dairy II			Peacock, Steve	EnviroCompliance Services, Inc.	Sarah McGrath	12-Apr-09	N/A	Paper Dairy	Roosevelt	Portales	6,000
1476	Ponderosa Dairy			Oppliger, Don	EnviroCompliance Services, Inc.	Sarah McGrath	12-Apr-09	N/A	Paper Dairy	Roosevelt	Portales	150,000
1483	Lake View Dairy			Walker, Vernon	EnviroCompliance Services, Inc.	Sarah McGrath	12-Apr-09	N/A	Paper Dairy	Roosevelt	Portales	75,000
1485	West Farms Dairy 1			West, Brad	EnviroCompliance Services, Inc.	Sarah McGrath	12-Apr-09	N/A	Paper Dairy	Roosevelt	Portales	95,000
1486	West Farms Dairy 2			West, Craig	EnviroCompliance Services, Inc.	Sarah McGrath	17-Jun-08	N/A	Paper Dairy	Roosevelt	Portales	95,000
1487	West Farms Dairy 3			West, Dennis	EnviroCompliance Services, Inc.	Sarah McGrath	17-Jun-08	N/A	Paper Dairy	Roosevelt	Portales	95,000
1530	North Shore Dairy			Hardin, Wayne	EnviroCompliance Services, Inc.	Sarah McGrath	17-Jun-08	N/A	Paper Dairy	Roosevelt	Portales	85,000
1593	Mirage Dairy 2			Bouldin, Randy	EnviroCompliance Services, Inc.	Sarah McGrath	22-Feb-08	N/A	Paper Dairy	Roosevelt	Portales	49,500
1349	Barrera Dairy 2			Barrera, Lorenzo	Edward Ogaz	Sarah McGrath	12-Apr-09	N/A	Paper Dairy	Sierra	Arrey	26,000
1507	Valle Vista Dairy			Edeal, Scott	EnviroCompliance Services, Inc.	Sarah McGrath	22-Feb-08	N/A	Paper Dairy	Socorro	Veguita	75,000
1587	John Visser Dairy Site #2			Visser, John	Enviro-Ag Engineering, Inc.	Bill Pearson	26-Mar-09	N/A	pending	Curry	Clovis	

### Nitrate Contamination at Dairy Facilities

DP#	Facility Name	Previous Facility Name(s)	Name of Responsible Party	Consultant	GWQB Reviewer	Spreadsheet last updated	Year Discharge Began	Status	County	Closest City	Permitted GPD
1641	ParaSol Dairy		McCatharn, John	Glorieta Geoscience, Inc.	Sarah McGrath	22-Feb-08	N/A	Pending	Sierra	Caballo	8,000
1196	Jacobi Dairy		Jacobi, Charles		Sarah McGrath	18-Feb-08		Terminated	Bernalillo	Albuquerque	
440	Price's Valley Gold, South D	Price's South Valley Dairy; Zen's Dairy	Price, Dudley	Faith Engineering, Inc.	unassigned	22-Feb-08	1946	Terminated	Bernalillo	Albuquerque	55,000
860	Two Dandee Dairy	Verhoven Dairy	Verhoven, Gary		Melanie Sanchez	20-Feb-08	6/14/1905	Terminated	Chaves	Roswell	4,850
741	Cheyenne Dairy	Bonnie Dairy	Hoekstra, David	EnviroCompliance Services, Inc.	unassigned	22-Jan-08	1991	Terminated	Chaves	Dexter	68,000
1397	Sunset Dairy-Lake Arthur		Tuls, Jack		unassigned	22-Jan-08	N/A	Terminated	Chaves	Lake Arthur	
547	Country Club Dairy		Estes, Robert		unassigned	22-Jan-08	pre-1977	Terminated	Chaves	Roswell	3,000
801	Norris Dairy North		Norris, Rachel		unassigned	22-Jan-08	unknown	Terminated	Chaves	Roswell	
802	Norris Dairy South		Norris, Rachel		unassigned	22-Jan-08	unknown	Terminated	Chaves	Roswell	
1082	Buena Suerte Dairy		Borba, John		Sarah McGrath	22-Feb-08	N/A	Terminated	Chaves	Roswell	
1365	Three County Farms 2		Williams, Bert	Enviro-Ag Engineering, Inc.	unassigned	22-Jan-08	N/A	Terminated	Curry	Clovis	
184	Romig Dairy Farm		Romig, John	none	Kim Kirby	18-Mar-09	1946	Terminated	Doña Ana	Las Cruces	
183	Las Uvas Valley Dairy #3	Hilburn Dairy	Horton, Dean and Francis	Ricardo Jacquez / Mark Turnbough	Kim Kirby	24-Apr-08	~1981	Terminated	Doña Ana	Hatch	
124	Whitaker's Dairy		Whitaker, Ben		unassigned	22-Jan-08	unknown	Terminated	Doña Ana	Chamberino	
655	Las Uvas Valley Dairy #5		Horton, Dean and Francis	Ricardo Jacquez / Mark Turnbough	Kim Kirby	5-May-08	1980	Terminated	Doña Ana	Hatch	
260	Desertland Dairy	Morningside Dairy	DeRuyter, Ed	Ricardo Jacquez	Bill Pearson	26-Mar-09	1984	Terminated	Doña Ana	Mesquite	
684	County Line Dairy 2	Cottonwood Creek Dairy II	Miles, Rance	Glorieta Geoscience, Inc.	Shawna Clark	24-Mar-09	1990	Terminated	Eddy	Artesia	
775	Wesley Menefee Dairy	Section 5 Dairy	Menefee, Wesley		unassigned	22-Feb-08		terminated	Eddy	Artesia	90,000
1002	Cottonwood Springs Dairy II		Troost, Phil		unassigned	24-Feb-08		Terminated	Eddy	Artesia	
1339	Tucumcari Dairy		Primrose, Richard	Engineers Inc.	Sarah McGrath	28-Apr-08	never built	Terminated	Quay	Tucumcari	
834	Gaines Dairy		Gaines, Gerald		unassigned	22-Jan-08	unknown	Terminated	Roosevelt	Dora	

### Nitrate Contamination at Dairy Facilities

DP#	Facility Name	Previous Facility Name(s)		Consultant	GWQB Reviewer	Spreadsheet last updated	Year Discharge Began		County	Closest City	
503	Danbom Dairy	Rogers Dairy, Sand Dollar Dairy	Danbom, Charlie	EnviroCompliance Services, Inc.	Sarah McGrath	28-Apr-08	1988	Terminated	Roosevelt	Elida	1,500
217	Bonestroo & Sons Dairy 3		Bonestroo, Gary	EnviroCompliance Service, Inc.	Bill Pearson	26-Mar-09		Terminated	Roosevelt	Portales	
623	Cisneros Dairy	La Reina Dairy Arrow Dairy	Sisneros, Joe	EnviroCompliance Services, Inc.	unassigned	22-Jan-08	unknown	Terminated	Roosevelt	Portales	700
1261	Terry Dairy		Terry, David		Sarah McGrath	22-Feb-08	pre-1977	Terminated	Roosevelt	Portales	
1293	Rising Hills Dairy		Carter Jr., Alva	EnviroCompliance Services, Inc.	Bill Pearson	26-Mar-09		Terminated	Roosevelt	Portales	
1319	Twin Palms Dairy	Jorde V	Idsinga Jr., Doug and Dawn Idsinga	EnviroCompliance Services, Inc.	Kathie Deal	20-Mar-09	never built	Terminated	Roosevelt	Portales	40,000
1565	Utopia Dairy		Lieb, Johnny		unassigned	22-Jan-08	N/A	Terminated	Roosevelt	Portales	
437	Price's Valley Gold, North Dairy		Price, Dudley	Faith Engineering, Inc.	unassigned	22-Jan-08	pre-1977	Terminated	Sandoval	Rio Rancho	70,000
1005	Zens Dairy #2		Zens, Butch	EnviroCompliance Services, Inc.	Sarah McGrath	28-Apr-08	never built	terminated	Torrance	Willard	
648	Nightingale Dairy		Nightingale, Eli		unassigned	22-Feb-08	1982	Terminated	Union	Clayton	500
1414	Sierra Vista Dairy		Troost, Phil	Glorieta Geoscience, Inc.	Sarah McGrath	31-Jul-08	never built	Withdrawn	Chaves	Lake Arthur	140,000
789	Valley View Dairy		Schaap, Attie		unassigned	24-Feb-08		Withdrawn	Curry	Clovis	
1604	Nelson Faria Dairy		Faria, Nelson	EnviroCompliance Services, Inc.	Kathie Deal	20-Mar-09	never built	Withdrawn	Hidalgo	Cotton City	
1448	Sandy Land Dairy		Hays, Eldon; Jones, Stanley	EnviroCompliance Service, Inc.	Sarah McGrath	22-Jan-08	never built	Withdrawn	Roosevelt	Portales	
515	Anderson Dairy		Anderson, Alan		unassigned	22-Jan-08	N/A		Curry	Melrose	700 - 2,000
656	Buena Vista II Dairy		Weatherly, Mike		unassigned	22-Jan-08	N/A		Doña Ana	La Union	
795	Atoka Dairy		Lanning, John		unassigned	22-Jan-08	N/A		Eddy	Artesia	
998	Dos Arboles Dairy		Schubert, Gary		unassigned	22-Jan-08	N/A		Lea	Hobbs	

**Note:** This spreadsheet is for informational purposes and has not undergone a thorough quality control/quality assurance review.

### Nitrate Contamination at Dairy Facilities

DP#	ww management practices	Actual most shallow DtW (ft)	GW Flow Direction Determination	Exceedance of GW Standards			MW Inspections (Cameraed)			Upgradient Group								
				Exceedance of GW Standards	Exceedance of GW Standards	Do current TDS / Cl levels exceed 400?	MW Inspected (Cameraed)	Are those cameraed properly cameraed?	Do they match well logs?	Last Inspection	Permit Issuance Date	Permit Expiration Date	Upgradient MW?	Type of Well				
1233	evaporation lagoon only	12	unknown	###	No	Yes	TDS -yes	###	No			###	25-Sep-08	21-Aug-03	21-Aug-08	###	Yes	MW
568	evaporation lagoon only	70	questionable	568	Yes	Yes	no	568	Yes	some; not all	some match	568	25-Jun-08	30-Jun-01	30-Jun-06	568	No	
585	evaporation lagoon only	65	good	585	yes	yes	TDS & Cl - yes	585	no			585	8-Jun-06	17-Nov-03	17-Nov-08	585	yes	MW
1195	evaporation lagoon only	108-126	good	###	Yes	Yes	no	###	no			###	31-Oct-07	14-Dec-98	14-Dec-11	###	Yes	MW
1203	direct land apply	41	unknown	###	No	Yes	TDS & Cl - yes	###	No	not inspected		###	7-Jan-09	5-Mar-01	5-Mar-06	###	Yes	MW
689	storage lagoon & land apply	35-75	good	689	No	Yes	TDS & Cl - yes	689	no			689	11-Apr-07	18-Jul-02	18-Jul-07	689	Yes	MW
1439	storage lagoon & land apply	167	good	###	No	No	no	###	no			###	31-Jul-08	26-Mar-04	6-Jul-09	###	No	
480	storage lagoon & land apply	75	unknown	480	Yes	Yes	TDS & Cl - yes	480	Some; not all	some; not all	Yes - all match	480	2-Dec-08	13-Jul-00	13-Jul-05	480	Yes	MW
533	storage lagoon & land apply	24-90	unknown	533	Yes	Yes	TDS -yes	533	no			533	31-Jul-08	31-Dec-01	31-Dec-06	533	Yes	MW
606	storage lagoon & land apply	95-110	questionable	606	Yes	Yes	TDS -yes	606	no			606	31-Jul-08	30-May-01	30-May-06	606	Yes	MW
633	storage lagoon & land apply	106	questionable	633	yes	yes	TDS & Cl - yes	633	some; not all	some; not all	some match	633	3-Dec-08	18-Oct-06	18-Oct-11	633	no	
677	storage lagoon & land apply	50-100	good	677	Yes	Yes	TDS & Cl - yes	677	no			677	4-Dec-08	25-Mar-05	25-Mar-10	677	Yes	MW
727	storage lagoon & land apply	43	unknown	727	Yes	Yes	TDS -yes	727	no			727	20-Nov-08	27-Feb-04	27-Feb-09	727	Yes	MW
738	storage lagoon & land apply	97	questionable	738	Yes	Yes	no	738	no			738	28-Jan-08	18-Nov-04	18-Nov-09	738	Yes	MW
742	storage lagoon & land apply	51	unknown	742	Yes	Yes	TDS & Cl - yes	742	No			742	20-Nov-08	27-Nov-01	27-Nov-06	742	No	

### Nitrate Contamination at Dairy Facilities

DP#	ww management practices	Actual most shallow DtW (ft)	GW Flow Direction Determination	Exceedances of GW Standards			MW Inspections (Concerned)			Upgradient Group								
				column	Exceeds standard NO <sub>3</sub> -N	Do current TDS / Cl levels exceed?	column	MW's inspected (concerned)?	Are these concerned property owners?	Do they match well logs?	column	Last Inspection	Permit Issuance Date	Permit Expiration Date	column	Upgradient MW?	Type of Well	
952	storage lagoon & land apply	105	unknown	952	Yes	Yes	TDS & Cl - yes	952	no			952	17-Mar-09	26-Sep-05	26-Sep-10	952	Yes	supply well
1003	storage lagoon & land apply	45	good	###	Yes	Yes	TDS & Cl - yes	###	No			###	17-Dec-04	5-Apr-05	5-Apr-10	###	Yes	MW
1131	storage lagoon & land apply	40-52	good	###	Yes	Yes	TDS & Cl - yes	###	no			###	30-Jul-08	23-Jun-06	23-Jun-11	###	Yes	supply well
717	storage lagoon & land apply	145	good	717	Yes	Yes	TDS & Cl - yes	717	No			717	4-Apr-05	12-Sep-05	12-Sep-10	717	Yes	MW
776	storage lagoon & land apply	165-210	good	776	Yes	Yes	TDS & Cl - yes	776	no			776	31-Jul-08	26-Sep-05	26-Sep-10	776	Yes	supply well
1141	storage lagoon & land apply	10	questionable	###	Yes	yes	TDS & Cl - yes	###	some; not all	some; not all	some match	###	3-Dec-08	3-Sep-03	3-Sep-08	###	Yes	MW
162	storage lagoon & land apply	8	unknown	162	Yes	Yes	TDS & Cl - yes	162	yes - all	some; not all	some match	162	2-Dec-08	24-Jul-01	24-Jul-06	162	Yes	MW
163	storage lagoon & land apply	16	unknown	163	Yes	Yes	TDS & Cl - yes	163	yes - all	Yes - all are	some match	163	16-Mar-09	21-Mar-06	21-Mar-11	163	Yes	MW
164	storage lagoon & land apply	22	unknown	164	Yes	Yes	TDS & Cl - yes	164	yes - all	Yes - all are	some match	164	16-Mar-09	1-Jul-05	1-Jul-10	164	Yes	MW
207	storage lagoon & land apply	14-17	unknown	207	Yes	Yes	TDS & Cl - yes	207	yes - all	some; not all	some match	207	16-Mar-09	7-Nov-06	7-Nov-11	207	Yes	MW
227	storage lagoon & land apply	40	unknown	227	Yes	Yes	TDS & Cl - yes	227	no			227	30-Jul-08	8-Apr-03	8-Apr-08	227	Yes	MW
343	storage lagoon & land apply	10	unknown	343	Yes	Yes	TDS & Cl - yes	343	Yes	some; not all	some match	343	31-Oct-07	8-Jul-02	8-Jul-07	343	Yes	MW
554	storage lagoon & land apply	13	unknown	554	Yes	Yes	TDS & Cl - yes	554	No			554	5-Nov-03	16-Jan-01	16-Jan-06	554	Yes	MW
635	storage lagoon & land apply	8-15	questionable	635	Yes	Yes	TDS & Cl - yes	635	no			635	6-Oct-05	31-Mar-06	31-Mar-11	635	Yes	MW
646	storage lagoon & land apply	20-30	questionable	646	Yes	Yes	TDS & Cl - yes	646	no			646	30-Jul-08	22-Nov-06	22-Nov-11	646	Yes	MW

### Nitrate Contamination at Dairy Facilities

DP#	ww management practices	Actual most shallow DtW (ft)	GW Flow Direction Determination	Exceedance of GW Standards			MW Inspections (Cameraed)			Upgradient Group								
				Exceedance of GW Standards	Do current TDS / Cl levels exceed stds?	Do current TDS / Cl levels exceed stds?	MW's inspected (cameraed)?	Are those cameraed properly const.?	Do they match well logs?	Last Inspection	Permit Issuance Date	Permit Expiration Date	Upgradient MW?	Type of Well				
707	storage lagoon & land apply	15-25	good	707	Yes	Yes	TDS & Cl - yes	707	no			707	30-Jul-08	8-Sep-03	8-Sep-08	707	Yes	MW
718	storage lagoon & land apply	15-26	unknown	718	Yes	Yes	TDS & Cl - yes	718	no			718	30-Jul-08	26-Sep-05	26-Sep-10	718	Yes	MW
764	storage lagoon & land apply	17-35	questionable	764	Yes	Yes	TDS & Cl - yes	764	some; not all	some; not all	no logs	764	16-Mar-09	26-Sep-05	26-Sep-10	764	Yes	MW
791	storage lagoon & land apply	10	good	791	Yes	yes	Cl - yes	791	yes - all	some; not all	some match	791	2-Dec-08	28-Mar-05	28-Mar-10	791	yes	MW
797	storage lagoon & land apply	110-117	good	797	Yes	Yes	TDS -yes	797	no			797	4-Dec-08	16-Aug-09	16-Aug-09	797	Yes	MW
804	storage lagoon & land apply	30	unknown	804	Yes	Yes	TDS & Cl - yes	804	No			804	25-Mar-03	24-Sep-03	24-Sep-08	804	No	
904	storage lagoon & land apply	52	unknown	904	Yes	Yes	TDS & Cl - yes	904	no			904	26-May-06	11-Jun-07	11-Jun-12	904	Yes	MW
1200	storage lagoon & land apply	25	questionable	###	Yes	Yes	TDS & Cl - yes	###	No			###	8-Jun-04	4-Jan-05	4-Jan-10	###	Yes	MW
674	storage lagoon & land apply	190	good	674	No	No	no	674	no			674	13-Mar-09	3-Nov-98	3-Nov-03	674	No	
703	storage lagoon & land apply	350	unknown	703	No	No	no	703	No			703	10-Sep-08	26-Mar-02	26-Mar-07	703	Yes	MW
851	storage lagoon & land apply	250	unknown	851	No	No	no	851	No	not inspected		851	8-Nov-05	17-Sep-98	17-Sep-03	851	No	
878	storage lagoon & land apply	310	unknown	878	No	no	no	878	no			878	11-Mar-09	4-Jun-04	4-Jun-09	878	no	
934	storage lagoon & land apply	344	questionable	934	No	Yes	no	934	no			934	18-Oct-07	30-Aug-04	30-Aug-09	934	No	
956	storage lagoon & land apply	280	unknown	956	No	No	No	956	no			956	16-Jun-04	31-Mar-05	31-Mar-10	956	yes	supply well

### Nitrate Contamination at Dairy Facilities

DP#	ww management practices	Actual most shallow DtW (ft)	GW Flow Direction Determination	column	GW Standards			column	MW Inspections (Cameraed)			column	Permit			column	Upgradient Grou	
					Exceeds GW Standards?	Exceeds GW Standards?	Exceeds GW Standards?		MW's Inspected Cameraed?	Are those cameraed properly done?	Do they match well logs?		Last Inspection	Permit Issuance Date	Permit Expiration Date		Upgradient MW?	Type of Well
1022	storage lagoon & land apply	375	questionable	###	No	No	no	###	No			###	13-Feb-08	17-Oct-00	17-Oct-05	###	Yes	supply well
1026	storage lagoon & land apply	335	unknown	###	no	no	no	###	no			###	10-Mar-09	26-Sep-05	26-Sep-10	###	Yes	MW
1111	storage lagoon & land apply	315	good	###	No	no	no	###	no			###	13-Feb-08	24-Sep-02	24-Sep-07	###	yes	MW
1197	storage lagoon & land apply	260	questionable	###	No	No	no	###	no			###	21-Feb-07	1-Sep-99	4-Oct-05	###	Yes	MW
1288	storage lagoon & land apply	300	questionable	###	no	yes	no	###	no			###	21-Feb-07	8-Sep-00	28-Jun-06	###	yes	supply well
1413	storage lagoon & land apply	400	unknown	###	No	Yes	no	###	No			###	2-Nov-07	19-Feb-03	1-Mar-09	###	Yes	MW
1455	storage lagoon & land apply	314	unknown	###	No	No	no	###	yes - all	some; not all	Yes - all match	###	10-Mar-09	25-Jun-04	25-Jun-11	###	Yes	MW
1475	storage lagoon & land apply	428	unknown	###	No	No	no	###	some; not all	Yes - all are	some match	###	10-Sep-08	22-Mar-05	29-Dec-11	###	Yes	supply well
1553	storage lagoon & land apply	205-220	good	###	No			###	yes - all	Yes - all are	Yes - all match	###	12-Mar-09	22-Mar-06	6-Jul-12	###	Yes	MW
1001	storage lagoon & land apply	225	unknown	###	No	No	no	###	no			###	19-Oct-07	22-Nov-06	22-Nov-11	###	Yes	MW
1423	storage lagoon & land apply	108	questionable	###	No	No	no	###	No	not inspected		###	18-Aug-03	3-Jun-04	10-Jan-11	###	No	
1321	storage lagoon & land apply	300	unknown	###	No	No	no	###	No			###	10-Mar-09	10-Jan-01	17-Nov-06	###		
1346	storage lagoon & land apply	375	questionable	###	No	No	no	###	no			###	18-Oct-07	9-Apr-02	9-Apr-07	###	Yes	MW
1091	direct land apply	230	unknown	###	no MWs	no MWs	no MWs	###	No	not inspected		###	13-Mar-08	18-Dec-01	18-Dec-06	###	No	
1163	storage lagoon & land apply	380	questionable	###	no MWs			###	no			###	25-Mar-03	20-Jan-05	20-Jan-10	###	yes	supply well
1379	storage lagoon & land apply	390	unknown	###	no MWs	no MWs	no MWs	###	No	not inspected	no logs	###	8-Nov-05	28-Jun-02	28-Jun-09	###	Yes	supply well
1578	storage lagoon & land apply	230	unknown	###	no MWs			###	no			###	10-Mar-09	27-Aug-07	27-Aug-12	###	No	
706	storage lagoon & land apply	291	good	706	Yes	Yes	TDS & Cl - yes	706	No			706	18-Oct-07	13-Dec-03	13-Dec-08	706	Yes	MW

### Nitrate Contamination at Dairy Facilities

DP#	ww management practices	Actual most shallow DtW (ft)	GW Flow Direction Determination	Exceedance of GW Standards			MW Inspections (Cameraed)			Upgradient Group								
				Exceedance of GW Standards	Exceedance of GW Standards	Exceedance of GW Standards	MW Inspected (Cameraed)	Are those cameraed properly const?	Do they match well logs?	Last Inspection	Permit Issuance Date	Permit Expiration Date	Upgradient MW?	Type of Well				
1136	storage lagoon & land apply	230	questionable	###	yes	yes	no	###	no			###	4-Aug-05	4-Sep-03	4-Sep-08	###	yes	MW
1199	storage lagoon & land apply	410	unknown	###	Yes	Yes	no	###	No			###	1-Mar-06	4-Oct-06	4-Oct-11	###	Yes	supply well
1277	storage lagoon & land apply	317	questionable	###	Yes	Yes	TDS & Cl - yes	###	no			###	10-Sep-08	23-Mar-06	23-Mar-11	###	Yes	supply well
932	storage lagoon & land apply	195	questionable	932	Yes	Yes	no	932	No			932	14-Feb-08	7-Oct-05	7-Oct-10	932	Yes	supply well
967	storage lagoon & land apply	170	questionable	967	No	No	no	967	some; not all	none are	none match	967	9-Oct-07	21-Sep-07	21-Sep-12	967	No	
1265	evaporation lagoon only	250	good	###	No	No	no	###	no			###	23-Apr-08	5-Nov-99	5-Nov-04	###	Yes	MW
342	storage lagoon & land apply	60	unknown	342	Unknown			342	some; not all	none are	none match	342	9-Oct-07	21-Sep-07	21-Sep-12	342	no	
692	evaporation lagoon only	55-80	questionable	692	Yes	Yes	TDS & Cl - yes	692	no			692	25-Mar-08	15-Aug-07	15-Aug-12	692	Yes	MW
170	evaporation lagoon only	37-80	good	170	yes	yes	TDS & Cl - yes	170	No			170	24-Feb-09	25-Jul-05	25-Jul-10	170	yes	MW
1350	storage lagoon & land apply	40	unknown	###	Yes	Yes	TDS -yes	###	no			###	22-Apr-08	27-Sep-01	27-Sep-08	###	Yes	MW
42	evaporation lagoon only	40	good	42	Yes	Yes	TDS & Cl - yes	42	No			42	21-Apr-08	17-Sep-07	17-Sep-12	42	No	
70	storage lagoon & land apply	32-58	good	70	Yes	Yes	TDS & Cl - yes	70	No	not inspected		70	25-Mar-08	9-Oct-01	9-Oct-06	70	Yes	MW
126	storage lagoon & land apply	15-29	good	126	Yes	Yes	TDS -yes	126	No	not inspected		126	25-Mar-08	30-Aug-07	30-Aug-12	126	Yes	MW
167	storage lagoon & land apply	11	questionable	167	yes	Yes	TDS & Cl - yes	167	No			167	24-Feb-09	28-Aug-07	28-Aug-12	167	yes	MW
177	storage lagoon & land apply	14	good	177	Yes	Yes	TDS & Cl - yes	177	Yes			177	24-Feb-09	15-Oct-99	15-Oct-04	177	Yes	MW
340	storage lagoon & land apply	36-47	good	340	Yes	Yes	TDS & Cl - yes	340	no			340	25-Mar-08	9-Oct-01	9-Oct-06	340	Yes	MW

### Nitrate Contamination at Dairy Facilities

DP#	ww management practices	Actual most shallow DtW (ft)	GW Flow Direction Determination	Exemptions of GW Standards			MW Inspections (Cameraed)			Upgradient Group								
				column	Does land apply?	Do current TDS / Cl levels exceed state?	column	MW's inspected cameraed?	Are these cameraed properly done?	Do they match well logs?	column	Last Inspection	Permit Issuance Date	Permit Expiration Date	column	Upgradient MW?	Type of Well	
624	storage lagoon & land apply	9	good	624	Yes	Yes	TDS & Cl - yes	624	no			624	21-Apr-08	2-29-01	2-29-06	624	Yes	MW
833	storage lagoon & land apply	32-60	good	833	Yes	Yes	TDS & Cl - yes	833	no			833	25-Mar-08	5-Apr-07	5-Apr-12	833	Yes	MW
1208	storage lagoon & land apply	9	good	###	Yes	Yes	TDS & Cl - yes	###	No			###	21-Apr-08	14-Feb-07	14-Feb-12	###	Yes	MW
257	storage lagoon & land apply	21-26	good	257	Yes	Yes	TDS & Cl - yes	257	no			257	25-Mar-08	1-Feb-02	2-Feb-07	257	Yes	MW
683	storage lagoon & land apply	18	questionable	683	Yes	Yes	TDS & Cl - yes	683	No			683	29-Jan-08	1-Apr-03	1-Apr-08	683	Yes	MW
765	storage lagoon & land apply	37	good	765	Yes	yes	TDS & Cl - yes	765	no			765	25-Oct-06	3-Apr-02	3-Apr-07	765	yes	mw
796	storage lagoon & land apply	46	questionable	796	Yes	Yes	TDS & Cl - yes	796	No			796	6-Nov-08	7-Jun-99	7-Jun-04	796	Yes	MW
921	storage lagoon & land apply	35	good	921	Yes	Yes	TDS -yes	921	No			921	3-Dec-08	20-Dec-04	20-Dec-09	921	Yes	MW
734	storage lagoon & land apply	25	questionable	734	Yes	yes	TDS & Cl - yes	734	yes - all	some; not all	some match	734	11-Apr-07	2-Nov-01	2-Nov-06	734	yes	MW
913	storage lagoon & land apply	29-75	questionable	913	Yes	Yes	TDS & Cl - yes	913	Yes	Yes - all are	Yes - all match	913	17-Mar-08	16-Jun-04	16-Jun-09	913	Yes	MW
461	storage lagoon & land apply	65	good	461	No	No	no	461	No			461	15-Dec-05	1-Jul-04	1-Jul-09	461	Yes	MW
988	direct land apply	93	unknown	988	No	Yes	no	988	no			988	23-Jun-08	9-Mar-04	9-Mar-09	988	No	
1168	storage lagoon & land apply	60	unknown	###	No	No	no	###	No			###	23-Jun-08	31-Dec-03	31-Dec-08	###	Yes	MW
1302	storage lagoon & land apply	70	questionable	###	No	no	no	###	no			###	6-Mar-07	20-Jan-09	20-Jan-14	###	Yes	MW
1323	storage lagoon & land apply	65-75	good	###	no MWs			###	no			###	29-Jan-08	26-Jan-01	26-Jan-08	###	No	

### Nitrate Contamination at Dairy Facilities

DP#	ww management practices	Actual most shallow DtW (ft)	GW Flow Direction Determination	Compliance of GW Standards			MW Inspections (Cameraed)			Last Inspection	Permit Issuance Date	Permit Expiration Date	Upgradient Group					
				column	Have had treatment ND - M compliance	Determine TDS / Cl levels exceed risk?	column	MW Inspected (Cameraed)	Are these cameraed properly (cost)?				Do they match well logs?	column	Upgradient MW?	Type of Well		
259	storage lagoon & land apply	90	good	259	Yes	Yes	TDS & Cl - yes	259	yes - all	Yes - all are	Yes - all match	259	29-Oct-08	12-Mar-06	21-Mar-11	259	Yes	MW
762	storage lagoon & land apply	99	questionable	762	Yes	Yes	TDS -yes	762	some; not all	Yes - all are	Yes - all match	762	8-Jan-09	16-Jun-06	16-Jun-11	762	Yes	MW
909	storage lagoon & land apply	76	unknown	909	Yes	Yes	no	909	No			909	6-Mar-07	13-Apr-06	13-Apr-11	909	Yes	supply well
1025	storage lagoon & land apply	60	unknown	###	Yes	Yes	TDS & Cl - yes	###	No			###	19-Feb-08	29-Mar-05	29-Mar-10	###	No	
1135	storage lagoon & land apply	87	questionable	###	Yes	Yes	no	###	No	not inspected		###	5-Mar-08	28-Mar-06	28-Mar-11	###	Yes	supply well
1559	storage lagoon & land apply	77	questionable	###	Yes	Yes	no	###	no			###	23-Jun-08	23-Mar-06	23-Oct-11	###	Yes	MW
1331	storage lagoon & land apply	90	unknown	###	No	No	no	###	no			###	23-Apr-08	8-Jun-01	24-Oct-06	###	yes	MW
1391	storage lagoon & land apply	65-135	unknown	###	Yes	Yes	MW(s)-unable to sample	###	no			###	23-Apr-08	24-Sep-02	24-Sep-07	###	Yes	MW
1257	direct land apply	110	unknown	###	No	No	no	###	no			###	17-May-05	23-Mar-06	23-Mar-11	###	Yes	supply well
1332	storage lagoon & land apply	271	questionable	###	No	Yes	no	###	No	not inspected		###	10-Mar-09	28-Mar-01	28-Mar-08	###	Yes	MW
514	evaporation lagoon only	90	good	514	No	No	TDS -yes	514	no			514	4-Dec-07	5-Jul-07	5-Jul-12	514	Yes	supply well
880	evaporation lagoon only	75	questionable	880	No	No	TDS & Cl - yes	880	no			880	17-Mar-06	16-Nov-06	16-Nov-11	880	Yes	MW
926	storage lagoon & land apply	110	questionable	926	No	No	TDS -yes	926	Yes	none are	some match	926	13-Mar-08	15-Aug-01	15-Aug-06	926	Yes	MW
963	storage lagoon & land apply	124-142	questionable	963	No	Yes	no	963	some; not all	Yes - all are	Yes - all match	963	12-Mar-09	12-Jun-06	6-Jun-12	963	Yes	MW
1251	storage lagoon & land apply	160	questionable	###	no	No	no	###	no			###	15-Jun-04	1-Sep-04	1-Sep-09	###	yes	MW

### Nitrate Contamination at Dairy Facilities

DP#	ww management practices	Actual most shallow DtW (ft)	GW Flow Direction Determination	Presence of GW Standards			MW Inspections (Cameraed)			Last Inspection	Permit Issuance Date	Permit Expiration Date	Upgradient Group					
				column	Have land management practices been implemented?	Do current TDS/Cl levels exceed state?	column	Were MWs inspected cameraed?	Are those cameraed properly posted?				Do they match well logs?	column	Upgradient MW?	Type of Well		
1315	storage lagoon & land apply	118	questionable	###	No	Yes	no	###	some; not all	Yes - all are	Yes - all match	###	3-Oct-05	23-Mar-06	23-Mar-11	###	Yes	MW
1517	storage lagoon & land apply	360	good	###	No			###	yes - all	some; not all	some match	###	12-Mar-09	8-Aug-06	11/5/2008 ????	###	Yes	MW
1531	storage lagoon & land apply	75	good	###	No			###	yes - all	Yes - all are	Yes - all match	###	12-Mar-09	7-Nov-05	24-Mar-12	###	Yes	MW
1320	storage lagoon & land apply	160	questionable	###	No	no	no	###	no			###	13-Feb-08	15-Dec-00	15-Dec-07	###	yes	mw
390	direct land apply	150	unknown	390	Unknown	no MWs	no MWs	390	no			390	19-Feb-03	1-Aug-03	1-Aug-08	390	No	
1246	storage lagoon & land apply	250	unknown	###	yes	yes	no	###	no			###	10-Mar-09	27-Aug-07	27-Aug-12	###	yes	supply well
384	storage lagoon & land apply	80-103	questionable	384	Yes	yes	TDS & Cl - yes	384	No			384	28-Feb-06	11-Jun-01	11-Jun-06	384	No	
537	storage lagoon & land apply	90	unknown	537	Yes	Yes	TDS -yes	537	No			537	19-Feb-03	28-Dec-04	28-Dec-09	537	No	
595	storage lagoon & land apply	67	questionable	595	Yes	Yes	TDS & Cl - yes	595	some; not all	Yes - all are		595	12-Mar-09	15-Feb-07	29-Oct-09	595	Yes	MW
666	evaporation lagoon only	80-90	questionable	666	Yes	Yes	Cl - yes	666	no			666	28-Sep-06	9-Sep-03	9-Sep-08	666	Yes	MW
667	storage lagoon & land apply	45	unknown	667	Yes	Yes	TDS & Cl - yes	667	No			667	14-Feb-08	19-May-05	19-May-10	667	No	
737	storage lagoon & land apply	80	unknown	737	Yes	Yes	Cl - yes	737	yes - all	none are	none match	737	30-Oct-08	26-Sep-05	26-Sep-10	737	Yes	supply well
753	storage lagoon & land apply	87	questionable	753	Yes	Yes	TDS -yes	753	No	not inspected		753	13-Mar-08	19-Apr-06	19-Apr-11	753	Yes	MW
826	evaporation lagoon only	86	unknown	826	Yes	No	no	826	no			826	26-Mar-06	19-Dec-03	19-Dec-08	826	Yes	supply well
898	storage lagoon & land apply	60	questionable	898	Yes	Yes	no	898	no			898	17-Jun-08	26-Sep-05	26-Sep-10	898	Yes	MW
987	storage lagoon & land apply	98-133	unknown	987	Yes	Yes	no	987	no			987	17-Jun-08	16-Jan-02	16-Jan-07	987	Yes	MW
1154	storage lagoon & land apply	72	unknown	###	Yes	Yes	TDS & Cl - yes	###	No			###	13-Feb-08	21-Dec-04	21-Dec-09	###	No	

### Nitrate Contamination at Dairy Facilities

DP#	ww management practices	Actual most shallow DfW (ft)	GW Flow Direction Determination	Exceedance of GW Standards			MW Inspections (Contract)			Upgradient Group								
				Exceedance of GW Standards	Exceedance of GW Standards	Exceedance of GW Standards	Inspected (Contract)	Are those inspected properly (Contract)	Do they match well logs?	Last Inspection	Permit Issuance Date	Permit Expiration Date	Upgradient MW?	Type of Well				
1245	storage lagoon & land apply	90	questionable	###	yes	Yes	no	###	no			###	16-Jun-04	22-Nov-04	22-Nov-09	###	yes	MW
1250	storage lagoon & land apply	128	questionable	###	Yes	Yes	no	###	No			###	5-Aug-08	11-Oct-06	11-Oct-11	###	Yes	MW
1286	storage lagoon & land apply	145	questionable	###	yes	Yes	no	###	no			###	10-Mar-09	30-Jan-06	30-Jan-11	###	yes	mw
1287	storage lagoon & land apply	65	questionable	###	Yes	Yes	no	###	no			###	28-Sep-06	23-Mar-06	23-Mar-11	###	Yes	supply well
1299	storage lagoon & land apply	271	questionable	###	Yes	Yes	no	###	no			###	3-Oct-05	22-Nov-00	1-Jul-06	###	Yes	MW
1312	storage lagoon & land apply	120	unknown	###	Yes	Yes	no	###	No			###	14-Feb-08	19-Dec-00	19-Dec-05	###	Yes	MW
1377	storage lagoon & land apply	191	good	###	Yes	No	no	###	some; not all	Yes - all are	Yes - all match	###	12-Mar-09	26-Jun-06	1-Dec-11	###	Yes	MW
1313	storage lagoon & land apply	222	questionable	###	Yes	Yes	TDS -yes	###	No	not inspected		###	30-Oct-08	5-Jan-01	11-Jun-06	###	No	
380	evaporation lagoon only	60	unknown	380	no	No	no	380	no			380	22-Apr-08	2-Oct-01	2-Oct-06	380	Yes	MW
546	storage lagoon & land apply	10	questionable	546	yes	no	no	546	no			546	22-Apr-08	8-Dec-05	8-Dec-10	546	no	
1477	evaporation lagoon only	360	good	###	No	No	no	###	No	not inspected	no logs	###	18-Mar-08	11-Apr-05	11-Apr-10	###	Yes	MW
563	evaporation lagoon only	65	good	563	No	No	no	563	No	not inspected	no logs	563	18-Mar-08	1-Nov-06	1-Nov-11	563	No	
772	evaporation lagoon only	70	good	772	No	No	No	772	No			772	9-Apr-07	3-Jul-02	3-Jul-07	772	No	
865	evaporation lagoon only	30	questionable	865	No	no	no	865	no			865	3-Jan-08	9-Jul-03	9-Jul-08	865	yes	MW
1194	storage lagoon & land apply	12	unknown	###	No	no	no	###	No			###	27-Apr-06	8-Aug-06	8-Aug-11	###	Yes	MW
1294	evaporation lagoon only	75	questionable	###	No	no	no	###	yes - all	none are	Yes - all match	###	20-Mar-07	12-Sep-00	15-May-06	###	Yes	MW

### Nitrate Contamination at Dairy Facilities

DP#	ww management practices	Actual most shallow DtW (ft)	GW Flow Direction Determination	Exceedance of GW Standards			MW Inspections (Cameraed)			Last Inspection	Permit Issuance Date	Permit Expiration Date	Upgradient Group	
				column	Exceedance of GW Standards	Exceedance of GW Standards	column	MW's inspected (cameraed)	Are those cameraed properly const.?				Do they match well logs?	column
1032	evaporation lagoon only	48	questionable	###	Yes	Yes	TDS -yes	###	Yes			###	Yes	MW
190	evaporation lagoon only	66	good	190	Yes	Yes	No	190	No			190	Yes	MW
290	evaporation lagoon only	70	good	290	Yes	Yes	no	290	no			290	Yes	MW
1004	storage lagoon & land apply	100	questionable	###	No	No	no	###	yes - all	Yes - all are	Yes - all match	###	yes	MW
1034	storage lagoon & land apply	6	unknown	###	No	Yes	TDS -yes	###	no			###	Yes	MW
115	evaporation lagoon only	116	good	115	No	No	no	115	No			115	Yes	MW
1181	storage lagoon & land apply	35	unknown	###	Yes	yes	no	###	no			###	Yes	MW
1176	storage lagoon & land apply	5	good	###	Yes	Yes		###	No			###	Yes	MW
1153		130	unknown	###				###	No			###	No	
408	direct land apply	170		408	No			408	No			408	No	
638	storage lagoon & land apply	110	unknown	638	Unknown			638	no			638	No	
613		160	unknown	613	Unknown			613	no			613		
84		120	unknown	84				84				84		
743				743				743				743		
821		90	unknown	821				821				821	No	
905				905				905				905		
953				953				953				953		
307				307				307				307		
159				159				159				159		
740				740				740				740		
744				744				744				744		
770				770				770				770		

### Nitrate Contamination at Dairy Facilities

DP#	ww management practices	Actual most shallow DiW (ft)	GW Flow Direction Determination	Exceedance of GW Standards			MW Inspections (Cameraed)			Upgradient Group								
				Do current TDS / Cl levels exceed 200?	Are there any nitrate exceedances?	Do current TDS / Cl levels exceed 200?	MW's inspected cameraed?	Are those cameraed properly const.?	Do they match well logs?	Last Inspection	Permit Issuance Date	Permit Expiration Date	Upgradient MW?	Type of Well				
889		80																
1268	storage lagoon & land apply	70	good	###	No	No	no	###	No			###	8-Oct-03	15-Dec-99	15-Dec-04	###	Yes	MW
1211	storage lagoon & land apply	95	unknown	###	No	No	no	###	No			###	5-Mar-07	29-Mar-06	29-Mar-11	###	No	
888	direct land apply	65	unknown	888	no MWs			888	no			888	23-Jun-08	20-Apr-01	20-Apr-06	888	No	
951	storage lagoon & land apply	82	good	951	Yes	Yes	no	951	no			951	29-Jan-08	25-Apr-00	25-Apr-05	951	No	
1066				###				###				###				###		
235				235				235				235	17-Apr-84	18-Oct-82	18-Oct-87	235		
1239	direct land apply	140	unknown	###	Unknown			###	No			###	13-Feb-08	24-Nov-99	24-Nov-04	###		
252		55	unknown	252				252				252	15-May-02	28-Jan-00	28-Jan-05	252		
123	evaporation lagoon only	195	unknown	123	no MWs	no MWs	no MWs	123	No	not inspected	no logs	123	18-Mar-08	16-Jan-96	16-Jan-01	123	Yes	supply well
347				347				347				347				347		
1207	storage lagoon & land apply	5	unknown	###	No	Yes	TDS & Cl - yes	###	No	not inspected	no logs	###	18-Mar-08	23-May-05	23-May-10	###	Yes	MW
893	storage lagoon & land apply	36	unknown	893	Yes	yes	no	893	no			893	25-Sep-02	10-Sep-01	10-Sep-06	893	yes	MW
936		6		936				936				936	20-May-03	4-Jan-00	4-Jan-05	936		
197				197				197				197				197		
208	storage lagoon & land apply	28	unknown	208	No	No	TDS & Cl - yes	208	No			208	28-Jan-08	9-Oct-02	9-Oct-07	208	Yes	MW
228	storage lagoon & land apply	29	unknown	228	Yes	Yes	no	228	no			228	6-Nov-08	9-Dec-03	9-Dec-08	228	yes	MW
487	storage lagoon & land apply	47	good	487	Yes	Yes	TDS & Cl - yes	487	some; not all	Yes - all are	Yes - all match	487	2-Dec-08	12-Sep-05	12-Sep-10	487	Yes	MW
74	storage lagoon & land apply	13-32	good	74	Yes	Yes	TDS & Cl - yes	74	No	not inspected		74	25-Mar-08	30-Aug-07	30-Aug-12	74	Yes	MW

### Nitrate Contamination at Dairy Facilities

DP#	ww management practices	Actual most shallow DtW (ft)	GW Flow Direction Determination	Exceedance of GW Standards			MW Inspections (Cameraed)			Upgradient Group								
				Exceedance of GW Standards	Exceedance of GW Standards	Exceedance of GW Standards	MW Inspected (Cameraed)	Are these cameraed properly const.?	Do they match well logs?	Last Inspection	Permit Issuance Date	Permit Expiration Date	Upgradient MW?	Type of Well				
86	storage lagoon & land apply	25-45	good	86	Yes	Yes	TDS & Cl - yes	86	No	not inspected		86	25-Mar-08	9-Oct-01	9-Oct-06	86	Yes	MW
923	storage lagoon & land apply	77	questionable	923	No	No	no	923	yes - all	none are	some match	923	9-Feb-09	5-Sep-08	5-Sep-13	923	Yes	supply well
699	storage lagoon & land apply	60	unknown	699	Yes	Yes	TDS -yes	699	No			699	4-Mar-08	27-Mar-02	27-Mar-07	699	Yes	supply well
911		90	questionable	911	No	Yes	TDS & Cl - yes	911	No	not inspected		911	14-Mar-08	15-Aug-00	15-Aug-05	911	Yes	supply well
1067	evaporation lagoon only	75	questionable	###	No	Yes	No	###	no			###	19-Oct-07	6-Nov-07	6-Nov-12	###	No	
299	storage lagoon & land apply	115	questionable	299	Yes	Yes	no	299	No	not inspected		299	14-Mar-08	18-Nov-02	18-Nov-07	299	No	
346	storage lagoon & land apply	70	unknown	346	Yes	Yes	TDS -yes	346	No			346	30-Aug-06	27-Dec-01	27-Dec-06	346	Yes	supply well
1157	storage lagoon & land apply	108	questionable	###	Yes	Yes	no	###	No	not inspected		###	13-Mar-08	20-Nov-03	20-Nov-08	###	Yes	MW
195	evaporation lagoon only	32	good	195	No	Yes	TDS & Cl - yes	195	No	not inspected	no logs	195	18-Mar-08	28-Sep-00	1-Sep-05	195	No	
1061	storage lagoon & land apply	5	good	###	No	No	No	###	No			###	18-Nov-05	20-Mar-07	20-Mar-12	###	Yes	MW
885	evaporation lagoon only	40	unknown	885	no MWs	no MWs	no MWs	885	No	not inspected	no logs	885	18-Mar-08	21-Apr-04	21-Apr-09	885	No	
1360		100	unknown	###				###				###	31-Jul-08	18-Jan-02	18-Jan-09	###		
1418		90	unknown	###				###				###	N/A	12-Dec-06	12-Dec-13	###		
1374		20	unknown	###				###				###	30-Jul-08	5-Apr-02	5-Apr-09	###		
1290		375	unknown	###				###				###	13-Mar-08	30-Nov-00	30-Nov-07	###		
1292		120	unknown	###				###				###	13-Mar-08	15-Nov-00	15-Nov-07	###		
1310		370	unknown	###				###				###	12-Mar-08	31-May-01	31-May-08	###		
1335		400	unknown	###				###				###	2-Apr-02	2-Nov-01	2-Nov-08	###		

### Nitrate Contamination at Dairy Facilities

DP#	ww management practices	Actual most shallow DtW (ft)	GW Flow Direction Determination	column	Compliance of GW Standards			column	MW Inspections (Cameraed)			column	Permit			column	Upgradient Grou	
					Exceeds MCL?	Exceeds MCL? (200-21 compliance?)	Do current DTW/C levels exceed MCL?		MW Inspected (cameraed)	Are those cameraed properly done?	Do they match well logs?		Last Inspection	Permit Issuance Date	Permit Expiration Date		Upgradient MW?	Type of Well
1338		370	unknown	###				###				###	12-Mar-08	31-May-01	31-May-08	###		
1352		320	unknown	###				###				###	12-Mar-08	2-Jul-02	2-Jul-09	###		
1364		300	unknown	###				###				###	N/A	9-May-02	9-May-09	###		
1460		250	unknown	###				###				###	1-Mar-04			###		
1496		260	unknown	###				###				###	20-Jan-05	30-Jun-05	20-Jun-12	###		
1557		385	unknown	###				###				###	N/A	29-Mar-07	seven years from the issuance date or five years from the date discharge commences	###		
1567		280	unknown	###				###				###	N/A	29-Mar-07	seven years from the issuance date or five years from the date discharge commences	###		
1330		70	unknown	###				###				###	14-Mar-08	28-Mar-01	28-Mar-08	###		
1276		335	unknown	###				###				###	10-Mar-09	18-Feb-00	18-Feb-07	###		
1348		350	unknown	###				###				###	12-Mar-08	24-Sep-01	24-Sep-08	###		
1361		400	unknown	###				###				###	12-Mar-08	27-Dec-01	27-Dec-08	###		
1415		320	unknown	###				###				###	12-Mar-08	25-Feb-04	25-Feb-11	###		
1317		63 - 135	unknown	###				###				###	N/A	14-May-01	14-May-08	###		
1376		70	unknown	###				###				###	N/A	18-Feb-04	18-Feb-11	###		
1373		110	unknown	###				###				###	17-Jun-08	1-Mar-02	1-Mar-09	###		
1394		110	unknown	###				###				###	18-Sep-02	31-Dec-02	31-Dec-09	###		

### Nitrate Contamination at Dairy Facilities

DP#	ww management practices	Actual most shallow DtW (ft)	GW Flow Direction Determination	Exceedance of GW Standards			MW Inspections (Cameraed)			Last Inspection	Permit Issuance Date	Permit Expiration Date	Upgradient Grou	
				colur	Does last cameraed MW log match current log?	Do current TDS / O <sub>2</sub> levels exceed 500?	colur	MW Cameraed?	Are those cameraed properly done?				Do they match well logs?	colur
1601		112	unknown	###			###				seven years from the issuance date or five years from the date discharge commences	###		
1309		245	unknown	###			###			1-Aug-01	26-Feb-01	26-Feb-08	###	
1316		255	unknown	###			###			14-Mar-08	15-Feb-01	15-Feb-08	###	
1372		70	unknown	###			###			N/A	20-Feb-02	20-Feb-09	###	
1384		170	unknown	###			###			N/A	9-May-02	9-May-09	###	
1447		155	unknown	###			###			N/A	3-Jun-04	3-Jun-11	###	
1476		220	unknown	###			###			N/A	5-Jan-06	5-Jan-13	###	
1483		115	unknown	###			###			17-Jun-08	8-Mar-05	8-Feb-12	###	
1485		110	unknown	###			###			17-Jun-08	15-Sep-05	15-Sep-12	###	
1486		110	unknown	###			###			17-Jun-08	15-Sep-05	15-Sep-12	###	
1487		110	unknown	###			###			17-Jun-08	15-Sep-05	15-Sep-12	###	
1530		125	unknown	###			###			17-Jun-08	7-Nov-05	7-Nov-12	###	
1593		110	unknown	###			###			N/A	29-Mar-07	seven years from the issuance date or five years from the date discharge commences	###	
1349		60	unknown	###			###			N/A	11-Oct-01	11-Oct-08	###	
1507		147	unknown	###			###			N/A	16-Jun-05	16-Jun-12	###	
1587				###			###						###	

### Nitrate Contamination at Dairy Facilities

DP#	ww management practices	Actual most shallow D <sub>1</sub> W (ft)	GW Flow Direction Determination	Exceedance of GW Standards			MW Inspections (Camrad)			Last Inspection	Permit Issuance Date	Permit Expiration Date	Upgradient Group	
				Ever had treatment (P2-N) installed?	Do current TDS / Cl levels exceed 500?	colu	MW's inspected (count)?	Are these clustered property toasts?	Do they match well logs?				colu	Upgradient MW?
1641		32 - 57	good	###			###			###	24-Oct-07	Decision pending Public Hearing outcome	###	
1196	evaporation lagoon only			###	No		###			###			###	No
440		5	good	440			440	no		440	30-Mar-01	1-Jan-98 1-Jan-03	440	
860		140	unknown	860	No	No	860	No		860	24-Mar-03	28-Oct-92 28-Oct-97	860	No
741		60	good	741			741	No		741	21-Apr-04	20-Apr-02 20-Apr-07	741	
1397				###			###			###			###	
547		20	unknown	547			547			547	5-Dec-95	7-Nov-94 7-Nov-99	547	
801				801			801			801			801	
802				802			802			802			802	
1082				###			###			###			###	
1365				###			###			###	1-May-03		###	
184	storage lagoon & land apply	15	good	184	No		184	no		184	22-Apr-08	18-Oct-98 8-Oct-03	184	no
183	evaporation lagoon only			183	Unknown		183			183			183	no
124				124			124			124			124	
655				655			655			655			655	No
260				260			260			260			260	
684				684	Yes	Yes	684			684			684	
775				775			775			775	7-Mar-91	12-Mar-96	775	
1002				###			###			###	16-Mar-95	16-Mar-02	###	
1339				###			###			###	never issued		###	
834				834			834			834			834	

### Nitrate Contamination at Dairy Facilities

DP#	ww management practices	Actual most shallow DtW (ft)	GW Flow Direction Determination	Exceedance of GW Standards			MW Inspections (Conducted)			Last Inspection	Permit Issuance Date	Permit Expiration Date	Upgradient Group				
				colu	Are land practices being followed?	Do current TDS / Cl levels exceed state?	colu	Are MWs inspected (conducted)?	Are those cameras used properly const.?				Do they match well logs?	colu	Upgradient MW?	Type of Well	
503	direct land apply	110	unknown	503			503	No			503	28-Feb-06	15-Jun-01	15-Jun-06	503	Yes	supply well
217				217			217				217				217		
623		90	unknown	623			623	No			623	15-Jun-04	13-Feb-03	13-Feb-08	623		
1261				###			###				###				###		
1293				###			###	no			###		28-Sep-00	28-Sep-07	###		
1319	storage lagoon & land apply	170	unknown	###			###				###	13-Mar-08	5-Dec-00	5-Dec-07	###		
1565				###			###				###				###		
437		15 - 50	good	437	Yes	Yes	437	No			437	30-Mar-01	16-Nov-01	16-Nov-06	437		
1005				###			###				###		18-Jan-01	18-Jan-08	###		
648				648			648				648	19-Mar-97	15-May-90	15-May-95	648		
1414		16 - 20	unknown	###			###				###	31-Jul-08			###		
789				789			789				789				789		
1604				###			###				###				###		
1448				###			###				###				###		
515		100	unknown	515			515				515	1-Apr-92	24-Jun-88	24-Jun-93	515		
656				656			656				656		14-Mar-90	14-Mar-97	656		
795				795			795				795				795		
998				998			998				998				998		

## Nitrate Contamination at Dairy Facilities

Ground Water Quality			Wastewater Storage Lagoons											
DP#	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	column y	Current Lagoon Practices										Nitrate Trend Toward Exceed?
				Lagoon System	Number of Lagoons	Lagoon Contains	Storage or Evap?	Current Liner Type	Previous Liner Type(s)	Lagoon MW(s)	MW(s) down-gradient of lagoon(s)?		If multiple lagoons, which caused exceedance	
1233	≤ 10	≤ 10	###	single lagoon system	1	combo ww/sw	Total Evap	Synthetic	Clay	Yes	1 MW; covers one lagoon	No		No
568			568	multi-lagoon; multi-liner types	2	ww only	Total Evap	Separate clay & syn	Clay	Yes	1 MW; covers one lagoon	Yes	clay-lined	
585	11 - 30	11 - 30	585	multi-lagoon; single liner type	2	ww only	Total Evap	Synthetic	Clay	Yes	multiple MWs; covers multiple lagoons	Yes	all	
1195	11 - 30	11 - 30	###	single lagoon system	2	ww only	Total Evap	Synthetic	Clay	Yes	1 MW; covers all lagoons	Yes		
1203	≤ 10	≤ 10	###		0									
689	≤ 10	≤ 10	689	single lagoon system	1	ww only	Storage	Synthetic	Clay	Yes	1 MW; covers one lagoon	No		No
1439			###	single lagoon system	1	ww only	Storage	Synthetic		Yes	1 MW; covers one lagoon	No		No
480	≤ 10	≤ 10	480	multi-lagoon; single liner type	2	ww only	Storage	Manure	Manure	Yes	multiple MWs; covers multiple lagoons	Yes	manure-lined	
533	≤ 10	≤ 10	533	single lagoon system	1	ww only	Storage	Clay		Yes	1 MW; covers one lagoon	Yes		
606	≤ 10	≤ 10	606	single lagoon system	1	ww only	Storage	Clay		Yes	1 MW; covers one lagoon	Yes		
633			633	single lagoon system	1	ww only	storage	manure		yes	1 MW; covers one lagoon	Yes		
677	≤ 10	≤ 10	677	multi-lagoon; single liner type	4	ww only	Storage	Synthetic	Clay	Yes		Yes		
727	≤ 10	≤ 10	727	single lagoon system	1	ww only	Storage	Synthetic	Clay	Yes	1 MW; covers all lagoons	No		No
738	11 - 30	11 - 30	738	single lagoon system	1	ww only	Storage	Clay		Yes	1 MW; covers one lagoon	Yes		
742			742	single lagoon system	1	ww only	Storage	Synthetic	Clay	No		no MWs		

## Nitrate Contamination at Dairy Facilities

Ground Water Quality			Wastewater Storage Lagoons												
DP#	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	column y	Current Lagoon Practices											
				Lagoon System	Number of Lagoons	Lagoon Contains	Storage or Evap?	Current Liner Type	Previous Liner Type(s)	Lagoon MW(s)	MW(s) down-gradient of lagoon(s)?	Nitrate Exceeds State	If multiple lagoons, which caused exceedance	Nitrate Trend Toward Exceed?	
952	≤ 10	11 - 30	952	single lagoon system	1	ww only	Storage	Clay			Yes	1 MW; covers one lagoon	Yes		
1003	≤ 10	≤ 10	###	multi-lagoon; single liner type	3	ww only	Storage	Synthetic	Clay	Yes		1 MW; covers all lagoons	Yes	synthetically lined	
1131	≤ 10	11 - 30	###	multi-lagoon; single liner type	1	ww only	Storage	Synthetic	Clay	No				clay-lined	
717	≤ 10	≤ 10	717	single lagoon system	1	ww only	Storage		Clay	Yes		1 MW; covers one lagoon	Yes	undetermined	
776	≤ 10	≤ 10	776	multi-lagoon; multi-liner types	2	combo ww/sw	Storage	Separate clay & syn			Yes	multiple MWs; covers multiple lagoons	Yes	clay-lined	No
1141	≤ 10	≤ 10	###	single lagoon system	1	ww only	storage	clay		yes			No		Yes
162	31 - 50	31 - 50	162	single lagoon system	1	combo ww/sw	Storage	Synthetic	Clay	Yes		1 MW; covers one lagoon	Yes		Yes
163	11 - 30	51 - 100	163	multi-lagoon; single liner type	2	combo ww/sw	Storage	Synthetic	Clay	No				clay-lined	
164	11 - 30	11 - 30	164	multi-lagoon; single liner type	2	combo ww/sw	Storage	Synthetic	Clay	Yes		multiple MWs; covers multiple lagoons	Yes		
207	51 - 100	> 100	207	single lagoon system	1	ww only	Storage	Synthetic	Clay	Yes		1 MW; covers one lagoon	Yes	clay-lined	
227	31 - 50	51 - 100	227	single lagoon system	1	ww only	Storage	Synthetic	Clay	No					
343	11 - 30	31 - 50	343	multi-lagoon; single liner type	2	ww only	Storage	Synthetic	Manure	No			Unknown		
554	≤ 10	11 - 30	554	multi-lagoon; single liner type	2	ww only	Storage	Synthetic	Clay	Yes		1 MW; covers all lagoons	Yes	clay-lined	
635	≤ 10	11 - 30	635	single lagoon system	1	ww only	Storage	Synthetic	Clay	Yes		1 MW; covers one lagoon	No		No
646	≤ 10	≤ 10	646	single lagoon system	1	ww only	Storage	Synthetic	Clay	Yes		1 MW; covers one lagoon	No		No

## Nitrate Contamination at Dairy Facilities

Ground Water Quality			Wastewater Storage Lagoons											
DP#	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	column y	Current Lagoon Practices										
				Lagoon System	Number of Lagoons	Lagoon Contains	Storage or Evap?	Current Liner Type	Previous Liner Type(s)	Lagoon MW(s)	MW(s) down-gradient of lagoon(s)?	Nitrate Exceedance	If multiple lagoons, which caused exceedance	Nitrate Trend Toward Exceed?
707	11 - 30	11 - 30	707	single lagoon system	1	ww only	Storage	Synthetic	Clay	Yes	1 MW; covers all lagoons	Yes		
718	11 - 30	11 - 30	718	single lagoon system	1	ww only	Storage	Separate clay & syn	Clay	Yes	1 MW; covers all lagoons	Yes		
764	≤ 10	11 - 30	764	single lagoon system	1	ww only	Storage	Synthetic	Clay	Yes	1 MW; covers one lagoon	Yes		
791	11 - 30	31 - 50	791	multi-lagoon; single liner type	3	ww only	storage	Synthetic	Manure	Yes	1 MW; cover some but not all lagoons	Yes		
797	≤ 10	≤ 10	797	single lagoon system	1	ww only	Storage	Synthetic	Clay	No		no MWs		
804			804	single lagoon system	1	ww only	Storage	Clay		Yes	1 MW; covers all lagoons	Yes		
904	≤ 10	11 - 30	904	single lagoon system	1	ww only	Storage	Synthetic	Clay	Yes	1 MW; covers one lagoon	No		No
1200	11 - 30	11 - 30	###	single lagoon system	1	ww only	Storage	Clay	Clay	Yes	1 MW; covers all lagoons	Yes	clay-lined	
674			674	single lagoon system	1	ww only	Storage	Synthetic	Clay	No				
703	≤ 10	≤ 10	703	multi-lagoon; single liner type	2	ww only	Storage	Clay		Yes	1 MW; covers all lagoons	No		No
851			851	single lagoon system	1	ww only	Storage	Clay		Yes	1 MW; covers one lagoon	No		No
878			878	single lagoon system	1	ww only	storage	clay		Yes	1 MW; covers all lagoons	no		no
934			934	multi-lagoon; single liner type	2	combo ww/sw	Storage	Clay	Clay	Yes	1 MW; cover some but not all lagoons	No	clay-lined	
956	≤ 10	≤ 10	956	single lagoon system	1	ww only	storage	clay		No		no MWs		

## Nitrate Contamination at Dairy Facilities

Ground Water Quality			Wastewater Storage Lagoons											
DP#	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	column y	Current Lagoon Practices										
				Lagoon System	Number of Lagoons	Lagoon Contains	Storage or Evap?	Current Liner Type	Previous Liner Type(s)	Lagoon MW(s)	MW(s) down-gradient of lagoon(s)?	If multiple lagoons, which caused exceedance	Nitrate Trend Toward Exceed?	
1022	≤ 10	≤ 10	###	multi-lagoon; single liner type	3	combo ww/sw	Storage	Clay			No		no MWs	
1026	≤ 10	≤ 10	###	single lagoon system	1	ww only	storage	clay			no		no MWs	
1111	≤ 10	≤ 10	###	single lagoon system	1	combo ww/sw	storage	clay			yes	1 MW; covers one lagoon	no	no
1197	≤ 10	≤ 10	###	multi-lagoon; single liner type	4	combo ww/sw	storage	clay			yes	1 MW; cover some but not all lagoons	no	no
1288	≤ 10	≤ 10	###	single lagoon system	1	ww only	storage	clay			yes		no	yes
1413	≤ 10	≤ 10	###	multi-lagoon; single liner type	2	combo ww/sw	Storage	Clay			Yes	1 MW; cover some but not all lagoons	No	No
1455	≤ 10	≤ 10	###	multi-lagoon; single liner type	2	combo ww/sw	Storage	Synthetic			Yes	1 MW; cover some but not all lagoons	No	No
1475	≤ 10	≤ 10	###	single lagoon system	1	ww only	Storage	Synthetic			Yes	1 MW; covers all lagoons	No	No
1553			###	single lagoon system	1	combo ww/sw	Storage	Synthetic			Yes	1 MW; covers all lagoons		
1001	≤ 10	≤ 10	###	single lagoon system	1	ww only	Storage	Clay	Clay		Yes	1 MW; covers one lagoon	No	No
1423			###	single lagoon system	1	combo ww/sw	Storage	Synthetic			Yes	1 MW; covers one lagoon	No	Yes
1321			###	single lagoon system	1	ww only	Storage	Clay			Yes		No	No
1346	≤ 10	≤ 10	###	single lagoon system	1	combo ww/sw	Storage	Clay			Yes	1 MW; covers all lagoons	No	No
1091			###		0									
1163	≤ 10	≤ 10	###	multi-lagoon; single liner type	2	combo ww/sw	Storage	clay			no		no MWs	
1379	≤ 10	≤ 10	###	multi-lagoon; single liner type	2	combo ww/sw	Storage	Synthetic			No		Unknown	
1578			###	multi-lagoon; single liner type	2	combo ww/sw	Storage	Synthetic			No		no MWs	
706	≤ 10	≤ 10	706	single lagoon system	1	ww only	Storage	Clay			Yes	1 MW; covers one lagoon	No	No

### Nitrate Contamination at Dairy Facilities

Ground Water Quality			Wastewater Storage Lagoons												
DP#	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	column y	Current Lagoon Practices											
				Lagoon System	Number of Lagoons	Lagoon Contains	Storage or Evap?	Current Liner Type	Previous Liner Type(s)	Lagoon MW(s)	MW(s) down-gradient of lagoon(s)?	Nitrate Exceedance	If multiple lagoons, which caused exceedance	Nitrate Trend Toward Exceed?	
1136	≤ 10	11 - 30	###	multi-lagoon; single liner type	2	combo ww/sw	storage	clay			yes	1 MW; covers all lagoons	yes	all	
1199	≤ 10	≤ 10	###	single lagoon system	1	ww only	Storage	Synthetic	Clay	Yes		1 MW; covers one lagoon	Yes	clay-lined	
1277	≤ 10	≤ 10	###	multi-lagoon; single liner type	1	combo ww/sw	Storage	Clay	Clay	Yes		1 MW; cover some but not all lagoons	Yes	clay-lined	
932	≤ 10	≤ 10	932	single lagoon system	1	ww only	Storage	Clay		Yes		1 MW; covers all lagoons	Yes	clay-lined	
967			967	multi-lagoon; single liner type	3	combo ww/sw	storage	clay			Yes		MW-dry		
1265	≤ 10	≤ 10	###	multi-lagoon; single liner type	2	ww only	Total Evap	Synthetic			yes		No		No
342			342	multi-lagoon; single liner type	3	ww only	Storage	Clay			Yes	1 MW; cover some but not all lagoons	No		No
692	≤ 10	< 10	692	single lagoon system	1	ww only	Total Evap	Synthetic	Manure	Yes		multiple MWs; covers multiple lagoons	Yes		
170	≤ 10	≤ 10	170	multi-lagoon; single liner type	3	ww only	Total Evap	Synthetic	Clay	Yes		multiple MWs; covers multiple lagoons	Yes		
1350	11 - 30	11 - 30	###	multi-lagoon; single liner type	2	ww only	storage	Synthetic			yes		Yes		
42			42	multi-lagoon; single liner type	2	ww only	Total Evap	Synthetic	Synthetic	Yes		1 MW; covers one lagoon	No		No
70	11 - 30	11 - 30	70	single lagoon system	1	ww only	Storage	Synthetic	Clay	Yes		1 MW; covers one lagoon	Yes	undetermined	
126	11 - 30	11 - 30	126	multi-lagoon; single liner type	2	ww only	Storage	Synthetic	Clay	Yes		1 MW; covers all lagoons	Yes	undetermined	
167	11 - 30	51 - 100	167	single lagoon system	1	ww only	Storage	Synthetic	Clay	Yes		1 MW; covers one lagoon	No		No
177	31 - 50	51 - 100	177	multi-lagoon; multi-liner types	2	ww only	Storage	Clay	Manure	Yes		multiple MWs; covers multiple lagoons	Yes	undetermined	
340	11 - 30	51 - 100	340	single lagoon system	1	combo ww/sw	Storage	Synthetic	Clay	No					

## Nitrate Contamination at Dairy Facilities

Ground Water Quality			Wastewater Storage Lagoons											
DP#	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	column y	Current Lagoon Practices										
				Lagoon System	Number of Lagoons	Lagoon Contains	Storage or Evap?	Current Liner Type	Previous Liner Type(s)	Lagoon MW(s)	MW(s) down-gradient of lagoon(s)?	If multiple lagoons, which caused exceedance	Nitrate Trend Toward Exceed?	
624	≤ 10	11 - 30	624	multi-lagoon; multi-liner types	1	ww only	Storage	Clay	Manure	Yes		Yes		
833	11 - 30	31 - 50	833	multi-lagoon; single liner type	2	ww only	Storage	Synthetic	Clay	Yes	multiple MWs; covers multiple lagoons	Yes		
1208	≤ 10	≤ 10	###	single lagoon system	1	ww only	Storage	Synthetic	Clay	Yes	1 MW; covers all lagoons	No		No
257	11 - 30	11 - 30	257	single lagoon system	1	ww only	Storage	Synthetic	Manure	Yes	1 MW; covers one lagoon	Yes		
683	> 100	> 100	683	multi-lagoon; single liner type	4	ww only	Storage	Clay	Manure	Yes	1 MW; cover some but not all lagoons	Yes	clay-lined	
765		≤ 10	765	single lagoon system	1	ww only	storage	manure		yes	1 MW; covers one lagoon	yes		
796	≤ 10	≤ 10	796	multi-lagoon; single liner type	2	ww only	Storage	Clay	Clay	Yes	multiple MWs; covers multiple lagoons	Yes	clay-lined	Yes
921	11 - 30	11 - 30	921	multi-lagoon; single liner type	1	combo ww/sw	Storage	Synthetic	Clay	Yes	1 MW; cover some but not all lagoons	Yes	clay-lined	
734	31 - 50	31 - 50	734	multi-lagoon; single liner type	2	ww only	storage	Synthetic		no				
913	11 - 30	51 - 100	913	single lagoon system	1	ww only	Storage	Clay		Yes	1 MW; covers one lagoon	Yes		
461	≤ 10	≤ 10	461	single lagoon system	1	ww only	Storage	Synthetic	Concrete	Yes	1 MW; covers one lagoon	No		No
988			988	single lagoon system	1	ww only	Storage	Concrete		Yes	1 MW; covers one lagoon	No		No
1168	≤ 10	≤ 10	###	multi-lagoon; single liner type	3	ww only	Storage	Clay		Yes	1 MW; cover some but not all lagoons	No		No
1302	11 - 30	11 - 30	###	multi-lagoon; single liner type	2	ww only	storage	clay		yes		no		no
1323			###	single lagoon system	1	ww only	Storage	Synthetic		No				

### Nitrate Contamination at Dairy Facilities

Ground Water Quality			Wastewater Storage Lagoons											
DP#	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	column y	Current Lagoon Practices										
				Lagoon System	Number of Lagoons	Lagoon Contains	Storage or Evap?	Current Liner Type	Previous Liner Type(s)	Lagoon MW(s)	MW(s) down-gradient of lagoon(s)?	Nitrate Exceedance	If multiple lagoons, which caused exceedance	Nitrate Trend Toward Exceed?
259	≤ 10	≤ 10	259	multi-lagoon; multi-liner types	2	ww only	Storage	Separate clay & syn	Manure	Yes	1 MW; covers all lagoons	Yes	manure-lined	
762	≤ 10	≤ 10	762	multi-lagoon; multi-liner types	2	combo ww/sw	Storage	Separate clay & syn		Yes	1 MW; covers one lagoon	Yes	clay-lined	
909	≤ 10	≤ 10	909	multi-lagoon; single liner type	1	ww only	Storage	Clay	Clay	Yes	1 MW; covers one lagoon	Yes	undetermined	
1025			###	multi-lagoon; single liner type	2	ww only	Storage	Clay	Clay	Yes	1 MW; covers one lagoon	Yes	clay-lined	
1135	≤ 10	≤ 10	###	multi-lagoon; single liner type	3	ww only	Storage	Synthetic	Clay	Yes	1 MW; cover some but not all lagoons	Yes	clay-lined	
1559	≤ 10	≤ 10	###	multi-lagoon; single liner type	2	ww only	Storage	Synthetic		Yes	1 MW; cover some but not all lagoons	No		Yes
1331	11 - 30	31 - 50	###	single lagoon system	1	ww only	Storage	Synthetic		yes	1 MW; covers one lagoon	no		no
1391	≤ 10	≤ 10	###	single lagoon system	1	ww only	Storage	Synthetic		yes	1 MW; covers one lagoon	yes		
1257	≤ 10	≤ 10	###		0					No				
1332	≤ 10	≤ 10	###	multi-lagoon; single liner type	2	combo ww/sw	Storage	Synthetic		Yes	1 MW; cover some but not all lagoons	No		No
514	≤ 10	11 - 30	514	single lagoon system	1	ww only	Total Evap	Synthetic		No				
880	≤ 10	≤ 10	880	multi-lagoon; single liner type	3	combo ww/sw	Total Evap	Synthetic		Yes	multiple MWs; covers multiple lagoons	No		No
926	≤ 10	≤ 10	926	single lagoon system	1	ww only	storage	Manure		No		no MWs		
963	≤ 10	11 - 30	963	single lagoon system	2	ww only	Storage	Synthetic	Clay	Yes	1 MW; covers all lagoons	No		
1251	≤ 10	31 - 50	###	single lagoon system	1	ww only	storage	Synthetic		yes	1 MW; covers one lagoon	no		no

## Nitrate Contamination at Dairy Facilities

Ground Water Quality			Wastewater Storage Lagoons												
DP#	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	column y	Current Lagoon Practices											
				Lagoon System	Number of Lagoons	Lagoon Contains	Storage or Evap?	Current Liner Type	Previous Liner Type(s)	Lagoon MW(s)	MW(s) down-gradient of lagoon(s)?	Nitrate Exceedance	If multiple lagoons, which caused exceedance	Nitrate Trend Toward Exceed?	
1315	≤ 10	11 - 30	###	single lagoon system	1	combo ww/sw	Storage	Synthetic			Yes	1 MW; covers one lagoon	No		Yes
1517			###	single lagoon system	1	combo ww/sw	Storage	Synthetic			Yes	1 MW; covers all lagoons			
1531			###	single lagoon system	1	ww only	Storage	Synthetic			Yes	1 MW; covers all lagoons			
1320	≤ 10	≤ 10	###	multi-lagoon; single liner type	2	combo ww/sw	storage	Synthetic			yes	1 MW; covers all lagoons	no		no
390			390		0						No		Unknown		
1246	≤ 10	≤ 10	###	multi-lagoon; single liner type	2	combo ww/sw	storage	clay			yes	1 MW; covers one lagoon	yes	all	
384			384	single lagoon system	1	ww only	Storage	Clay	Manure	Yes	Yes	1 MW; covers one lagoon	Yes		
537			537	single lagoon system	1	combo ww/sw	Storage	Clay	Manure	Yes	Yes	1 MW; covers one lagoon	Yes		
595	≤ 10	≤ 10	595	multi-lagoon; single liner type	3	ww only	Storage	Clay		Yes	Yes	1 MW; covers all lagoons	Yes		
666	11 - 30	11 - 30	666	multi-lagoon; multi-liner types	2	ww only	Total Evap	Separate clay & syn	Clay	Yes	Yes	multiple MWs; covers multiple lagoons	Yes	clay-lined	
667			667	single lagoon system	1	combo ww/sw	Storage	Clay	Clay	Yes	Yes	1 MW; covers one lagoon	No		Yes
737	≤ 10	≤ 10	737	single lagoon system	1	ww only	Storage	Clay		Yes	Yes	1 MW; covers all lagoons	Yes		
753	≤ 10	≤ 10	753	single lagoon system	1	ww only	Storage	Synthetic			Yes	1 MW; covers one lagoon	No		No
826	11 - 30	11 - 30	826	single lagoon system	1	ww only	Total Evap	Synthetic			Yes	1 MW; covers one lagoon	Yes		
898	≤ 10	≤ 10	898	multi-lagoon; single liner type	2	combo ww/sw	Storage	Synthetic	Clay	Yes	Yes	multiple MWs; covers multiple lagoons	Yes	clay-lined	
987	≤ 10	31 - 50	987	single lagoon system	3	combo ww/sw	Storage	Synthetic	Clay	Yes	Yes	1 MW; covers one lagoon	Yes		
1154			###	multi-lagoon; single liner type	2	ww only	Storage	Clay			Yes	1 MW; cover some but not all lagoons	Yes	clay-lined	

## Nitrate Contamination at Dairy Facilities

Ground Water Quality			Wastewater Storage Lagoons												
DP#	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	column y	Current Lagoon Practices											
				Lagoon System	Number of Lagoons	Lagoon Contains	Storage or Evap?	Current Liner Type	Previous Liner Type(s)	Lagoon MW(s)	MW(s) down-gradient of lagoon(s)?	Nitrate Exceeds 10 mg/L	If multiple lagoons, which caused exceedance	Nitrate Trend Toward Exceed?	
1245	≤ 10	≤ 10	###	multi-lagoon; single liner type	4	combo ww/sw	storage	clay			yes	1 MW; cover some but not all lagoons	no		no
1250	11 - 30	11 - 30	###	single lagoon system	1	ww only	Storage	Synthetic			Yes	1 MW; covers all lagoons	No	undetermined	Yes
1286	≤ 10	≤ 10	###	single lagoon system	1	ww only	storage	Synthetic			yes		yes		
1287	≤ 10	11 - 30	###	single lagoon system	1	ww only	Storage	Clay			Yes	1 MW; covers one lagoon	Yes		
1299	≤ 10	≤ 10	###	single lagoon system	1	ww only	Storage	Clay	Clay		Yes	1 MW; covers all lagoons	Yes	clay-lined	
1312	≤ 10	≤ 10	###	multi-lagoon; single liner type	1	ww only	Storage	Clay	Clay		Yes	1 MW; cover some but not all lagoons	No	clay-lined	Yes
1377	≤ 10	≤ 10	###	single lagoon system	1	combo ww/sw	Storage	Synthetic			Yes	1 MW; covers one lagoon	No		No
1313			###	multi-lagoon; single liner type	2	combo ww/sw	Storage	Synthetic	Clay		Yes	1 MW; covers all lagoons	Yes	clay-lined	
380	≤ 10	≤ 10	380	multi-lagoon; single liner type	3	ww only	Total Evap	Clay	Manure		yes	multiple MWs; covers multiple lagoons	no		no
546			546	multi-lagoon; single liner type	3	ww only	Storage	Synthetic	clay		yes	1 MW; covers one lagoon	no		yes
1477	≤ 10	≤ 10	###	single lagoon system	1	combo ww/sw	Total Evap	Synthetic			Yes	1 MW; covers one lagoon	No		No
563			563	multi-lagoon; single liner type	2	ww only	Total Evap	Clay			Yes	1 MW; covers all lagoons	No		No
772			772	multi-lagoon; single liner type	2	ww only	Total Evap	Clay			Yes	1 MW; covers one lagoon	No		No
865	≤ 10	≤ 10	865	multi-lagoon; single liner type	2	combo ww/sw	Total Evap	Synthetic	clay		yes	multiple MWs; covers multiple lagoons	No		No
1194	≤ 10	≤ 10	###	single lagoon system	1	ww only	Storage	Synthetic			Yes	1 MW; covers one lagoon	No		No
1294	≤ 10	≤ 10	###	multi-lagoon; single liner type	2	combo ww/sw	Total Evap	Synthetic			yes		no		no

## Nitrate Contamination at Dairy Facilities

Ground Water Quality			Wastewater Storage Lagoons												
DP#	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	column y	Current Lagoon Practices									Nitrate Exceedance	If multiple lagoons, which caused exceedance	Nitrate Trend Toward Exceed?
				Lagoon System	Number of Lagoons	Lagoon Contains	Storage or Evap?	Current Liner Type	Previous Liner Type(s)	Lagoon MW(s)	MW(s) down-gradient of lagoon(s)?				
1032	≤ 10	≤ 10	###	multi-lagoon; multi-liner types	2	ww only	Total Evap	Separate clay & syn	Manure	Yes	1 MW; covers one lagoon	Yes	manure-lined		
190	≤ 10	≤ 10	190	multi-lagoon; single liner type	3	ww only	Total Evap	Synthetic	Clay	Yes	1 MW; covers one lagoon	No		No	
290	≤ 10	≤ 10	290	single lagoon system	1	ww only	Total Evap	Synthetic		Yes	1 MW; covers one lagoon	Yes	undetermined		
1004	≤ 10	≤ 10	###	single lagoon system	1	ww only	storage	Synthetic		Yes	1 MW; covers one lagoon	No		Yes	
1034	≤ 10	≤ 10	###	multi-lagoon; single liner type	2	ww only	Storage	Synthetic		Yes	multiple MWs; covers multiple lagoons	No		No	
115	≤ 10	≤ 10	115	multi-lagoon; single liner type	2	ww only	Total Evap	Synthetic	Clay	Yes	1 MW; covers all lagoons	No		No	
1181	≤ 10	≤ 10	###	single lagoon system	1	ww only	storage	Synthetic	manure	yes	1 MW; covers one lagoon	Yes			
1176	≤ 10	≤ 10	###	single lagoon system	1	ww only	Storage	Synthetic	Concrete	Yes	1 MW; covers one lagoon	Yes			
1153			###	single lagoon system	2	ww only	Total Evap	Manure		No					
408			408		0										
638			638	multi-lagoon; single liner type	2	ww only	Storage			No					
613			613		0										
84			84		4	combo ww/sw	Storage	Manure		No					
743			743												
821			821	single lagoon system	2	ww only	Storage	Clay		No					
905			905												
953			953												
307			307		1	combo ww/sw	storage	Manure							
159			159												
740			740												
744			744												
770			770												

## Nitrate Contamination at Dairy Facilities

Ground Water Quality			Wastewater Storage Lagoons													
DP#	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	column y	Current Lagoon Practices												
				Lagoon System	Number of Lagoons	Lagoon Contains	Storage or Evap?	Current Liner Type	Previous Liner Type(s)	Lagoon MW(s)	MW(s) down-gradient of lagoon(s)?	Unknown	If multiple lagoons, which caused exceedance	Nitrate Trend Toward Exceed?		
889			889													
1268	≤ 10	≤ 10	###	single lagoon system	1	ww only	Storage	Synthetic			Yes	1 MW; covers one lagoon	No			No
1211			###	single lagoon system	1	ww only	Storage	Manure			Yes	1 MW; covers one lagoon	No			Yes
888			888		0						No					
951			951	multi-lagoon; single liner type	2	ww only	Storage	Clay			Yes	1 MW; cover some but not all lagoons	Yes	clay-lined		
1066			###													
235			235		1	combo ww/sw	storage	manure			yes		No			
1239			###													
252			252		1	ww only	Storage	Concrete			No					
123		≤ 10	123	single lagoon system	1	combo ww/sw	Total Evap	Manure			No		Unknown			
347			347													
1207	≤ 10	51 - 100	###	multi-lagoon; single liner type	2	combo ww/sw	Total Evap	Clay			Yes	multiple MWs; covers multiple lagoons	No			No
893		51 - 100	893	multi-lagoon; single liner type	2	ww only	storage	clay			yes	multiple MWs; covers multiple lagoons	yes	clay-lined		
936			936		1	ww only	Storage	Synthetic	Manure		Yes		No			No
197			197													
208	≤ 10	≤ 10	208	single lagoon system	1	combo ww/sw	Storage	Synthetic	Clay		No		No			
228	31 - 50	51 - 100	228	multi-lagoon; multi-liner types	2	combo ww/sw	Storage	Separate clay & syn			yes	1 MW; covers one lagoon	no			no
487	≤ 10	11 - 30	487	multi-lagoon; single liner type	3	ww only	Storage	Synthetic	Manure		Yes	multiple MWs; covers multiple lagoons	Yes	manure-lined		
74	≤ 10	≤ 10	74	multi-lagoon; single liner type	2	combo ww/sw	Storage	Synthetic	Clay		Yes	multiple MWs; covers multiple lagoons	Yes	undetermined		

## Nitrate Contamination at Dairy Facilities

Ground Water Quality			Wastewater Storage Lagoons											
DP#	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	column y	Current Lagoon Practices										
				Lagoon System	Number of Lagoons	Lagoon Contains	Storage or Evap?	Current Liner Type	Previous Liner Type(s)	Lagoon MW(s)	MW(s) down-gradient of lagoon(s)?	Yes	If multiple lagoons, which caused exceedance	Nitrate Trend Toward Exceed?
86	≤ 10	11 - 30	86	multi-lagoon; single liner type	3	combo ww/sw	Storage	Synthetic	Clay	Yes	multiple MWs; covers multiple lagoons	Yes	clay-lined	
923	≤ 10	≤ 10	923	single lagoon system	1	ww only	Storage	Clay		Yes	1 MW; covers one lagoon	No		Yes
699	≤ 10	≤ 10	699	multi-lagoon; single liner type	2	ww only	Storage	Clay	Manure	Yes	multiple MWs; covers multiple lagoons	Yes	undetermined	
911	≤ 10	11 - 30	911		0									
1067			###	single lagoon system	1	combo ww/sw	Total Evap	Synthetic		Yes	1 MW; covers one lagoon	No		No
299			299	single lagoon system	1	combo ww/sw	Storage	Synthetic		Yes	1 MW; covers one lagoon	No		No
346	11 - 30	11 - 30	346	single lagoon system	1	ww only	Storage	Clay		Yes	1 MW; covers one lagoon	Yes		
1157	≤ 10	≤ 10	###	multi-lagoon; multi-liner types	2	combo ww/sw	Storage	Separate clay & syn	Clay	Yes	multiple MWs; covers multiple lagoons	Yes	clay-lined	
195			195	multi-lagoon; single liner type	2	ww only	Total Evap	Clay		Yes	1 MW; covers all lagoons	No	clay-lined	No
1061	≤ 10	11 - 30	###	single lagoon system	1	combo ww/sw	Total Evap	Synthetic	Clay	Yes	1 MW; covers one lagoon	No		No
885			885	multi-lagoon; single liner type	2	combo ww/sw	Total Evap	Manure		Yes	1 MW; covers all lagoons	No		No
1360			###											
1418			###											
1374			###											
1290			###											
1292			###											
1310			###											
1335			###											

## Nitrate Contamination at Dairy Facilities

nd Water Quality			Wastewater Storage Lagoons													
DP#	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	column y	Current Lagoon Practices												
				Lagoon System	Number of Lagoons	Lagoon Contains	Storage or Evap?	Current Liner Type	Previous Liner Type(s)	Lagoon MW(s)	MW(s) down-gradient of lagoon(s)?	Nitrate Exceedance	If multiple lagoons, which caused exceedance	Nitrate Trend Toward Exceed?		
1338			###													
1352			###													
1364			###													
1460			###													
1496			###													
1557			###													
1567			###													
1330			###													
1276			###													
1348			###													
1361			###													
1415			###													
1317			###													
1376			###													
1373			###													
1394			###													

## Nitrate Contamination at Dairy Facilities

Ground Water Quality			Wastewater Storage Lagoons											
DP#	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	column y	Current Lagoon Practices									If multiple lagoons, which caused exceedance	Nitrate Trend Toward Exceed?
				Lagoon System	Number of Lagoons	Lagoon Contains	Storage or Evap?	Current Liner Type	Previous Liner Type(s)	Lagoon MW(s)	MW(s) down-gradient of lagoon(s)?	When		
1601			###											
1309			###											
1316			###											
1372			###											
1384			###											
1447			###											
1476			###											
1483			###											
1485			###											
1486			###											
1487			###											
1530			###											
1593			###											
1349			###											
1507			###											
1587			###											

## Nitrate Contamination at Dairy Facilities

Ground Water Quality			Wastewater Storage Lagoons												
DP#	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	column y	Current Lagoon Practices								Nitrate Exceedance	If multiple lagoons, which caused exceedance	Nitrate Trend Toward Exceed?	
				Lagoon System	Number of Lagoons	Lagoon Contains	Storage or Evap?	Current Liner Type	Previous Liner Type(s)	Lagoon MW(s)	MW(s) down-gradient of lagoon(s)?				
1641			###												
1196			###		0										
440			440												
860			860		0						No				
741			741		1	ww only	Storage	Manure			Yes	Yes			
1397			###												
547			547		0										
801			801												
802			802												
1082			###												
1365			###												
184			184												
183			183												
124			124												
655			655												
260			260												
684			684												
775			775												
1002			###												
1339			###												
834			834												

### Nitrate Contamination at Dairy Facilities

Ground Water Quality			Wastewater Storage Lagoons											
DP#	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	column y	Current Lagoon Practices									If multiple lagoons, which caused exceedance	Nitrate Trend Toward Exceed?
				Lagoon System	Number of Lagoons	Lagoon Contains	Storage or Evap?	Current Liner Type	Previous Liner Type(s)	Lagoon MW(s)	MW(s) down-gradient of lagoon(s)?			
503	≤ 10	≤ 10	503		0									
217			217											
623			623		0									
1261			###											
1293			###											
1319			###											
1565			###											
437			437		1	ww only	Storage	Synthetic	Manure	Yes		Yes		
1005			###											
648			648		1	ww only	Storage	Manure						
1414			###											
789			789											
1604			###											
1448			###											
515			515											
656			656											
795			795											
998			998											

## Nitrate Contamination at Dairy Facilities

Historical Lagoon Practices										Current Stormwater Practices					
DP#	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	Number of Old Lagoons	Liner Type	Status	MW(s) down-gradient of old lagoon(s)?	Resulted in Nitrate Exceedence?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	columnar	Current SW Management	Number of Impoundments	Liner?	Current Liner Type	MW(s)?
1233	≤ 10	31 - 50	1	Clay	closure incomplete	yes; sampling continues	no	≤ 10	31 - 50	###	combo lagoon(s)	0			
568	11 - 30	11 - 30	2	Clay	closed	yes; sampling continues	Yes	11 - 30	11 - 30	568	sw impoundment (s)	1	No	Unlined	No
585	> 100	> 100								585	sw impoundment (s)	1	no	Unlined	no
1195	31 - 50	31 - 50	2	Clay	needs closure	yes; sampling continues	Yes	11 - 30	31 - 50	###	sw impoundment (s)	2	No	Unlined	Yes
1203			1	Clay	closure incomplete	yes; sampling continues	yes	≤ 10	11 - 30	###	sw impoundment (s)	1	Yes	Clay	No
689	≤ 10	≤ 10								689	sw impoundment (s)	1	No	Unlined	Yes
1439	≤ 10	≤ 10								###	sw impoundment (s)	1	No	Unlined	No
480	11 - 30	31 - 50	0							480	sw impoundment (s)	1	No	Unlined	Yes
533	11 - 30	11 - 30								533	sw impoundment (s)	2	No	Unlined	No
606	51 - 100	51 - 100								606	sw impoundment (s)	1	No	Unlined	Yes
633	11 - 30	11 - 30								633	sw impoundment (s)	1	No	Unlined	Yes
677	51 - 100	> 100	2	Manure	closed	yes; sampling continues	Yes	11 - 30	31 - 50	677	sw impoundment (s)	3	No	Manure	Yes
727	≤ 10	≤ 10	2	Clay	needs closure	yes; sampling continues	unknown	≤ 10	≤ 10	727	sw impoundment (s)	1	No	Manure	No
738	31 - 50	31 - 50								738	sw impoundment (s)	1	No	Unlined	Yes
742			1	Clay	closure incomplete	yes; sampling continues	yes	31 - 50	51 - 100	742	sw impoundment (s)	1	No	Unlined	Yes

### Nitrate Contamination at Dairy Facilities

Historical Lagoon Practices										Current Stormwater Practices					
DP#	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	Number of Old Lagoons	Liner Type	Status	MW(s) down-gradient of old lagoon(s)?	Resulted in Nitrate Exceedence?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	column ar	Current SW Management	Number of Impoundments	Liner?	Current Liner Type	MW(s)?
952	51 - 100	51 - 100								952	sw impoundment (s)	1	No	Unlined	Yes
1003	11 - 30	11 - 30	2	Clay	closed	yes; sampling continues	Yes	11 - 30	11 - 30	###	sw impoundment (s)	1	No		Yes
1131			1	Clay	needs closure	yes; sampling continues	Yes	11 - 30	11 - 30	###	sw impoundment (s)	2	No	Unlined	Yes
717	11 - 30	11 - 30	1	Clay		yes; sampling continues	Yes	11 - 30	11 - 30	717	sw impoundment (s)	3	No		No
776	≤ 10	31 - 50								776	combo lagoon(s)	2	Yes	Separate syn & manure	Yes
1141	≤ 10	11 - 30								###	sw impoundment (s)	1	no	Unlined	yes
162	11 - 30	11 - 30	3	multiple; see comments	closed	plugged & abandoned	Yes	n/a	51 - 100	162	combo lagoon(s)	0			
163			1	Clay	closed	no; never installed				163	combo lagoon(s)	0			
164	31 - 50	31 - 50	1	Clay	closed	yes; sampling continues	yes	31 - 50	31 - 50	164	sw impoundment (s)	1	Yes	Synthetic	No
207	11 - 30	11 - 30	1	Clay	closed					207	sw impoundment (s)	2	No	Unlined	No
227			1	Clay	needs closure	yes; sampling continues	Yes	51 - 100	51 - 100	227	sw impoundment (s)	3	No	Unlined	No
343			2	Manure	closure incomplete	yes; sampling continues	Yes	51 - 100	51 - 100	343	sw impoundment (s)	2	No		Yes
554	11 - 30	51 - 100	1	Clay	closed	yes; sampling continues	yes	11 - 30	51 - 100	554	sw impoundment (s)	1	No	Manure	No
635	≤ 10	≤ 10	1	Manure	closed	yes; not sampling	Yes	no current data	11 - 30	635	sw impoundment (s)	1	No	Unlined	Yes
646	≤ 10	≤ 10	1	Manure	closed	yes; sampling continues	no	≤ 10	11 - 30	646	sw impoundment (s)	1	No	Unlined	No

### Nitrate Contamination at Dairy Facilities

Historical Lagoon Practices										Current Stormwater Practices					
DP#	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	Number of Old Lagoons	Liner Type	Status	MW(s) down-gradient of old lagoon(s)?	Resulted in Nitrate Exceedence?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	column ar	Current SW Management	Number of Impoundments	Liner?	Current Liner Type	MW(s)?
707	11 - 30	11 - 30	1	Clay	needs closure	yes; sampling continues	Yes	11 - 30	11 - 30	707	sw impoundment (s)	1	No	Unlined	No
718	11 - 30	11 - 30	2	Clay	needs closure	yes; sampling continues	yes	11 - 30	11 - 30	718	sw impoundment (s)	2	No	Unlined	Yes
764	51 - 100	51 - 100	1	Clay	closed	yes; not sampling	Yes	no current data	31 - 50	764	sw impoundment (s)	1	No	Unlined	No
791	31 - 50	51 - 100								791	sw impoundment (s)	1	no	Unlined	yes
797										797	sw impoundment (s)	3	No	Manure	Yes
804	11 - 30	11 - 30								804	sw impoundment (s)	1	No	Clay	Yes
904	≤ 10	≤ 10	1	Clay	closure incomplete	yes; sampling continues	Yes	11 - 30	31 - 50	904	sw impoundment (s)	1	No	Manure	Yes
1200	11 - 30	11 - 30	0							###	sw impoundment (s)	1	No		No
674										674	sw impoundment (s)	1	No	Unlined	No
703	≤ 10	≤ 10								703	sw impoundment (s)	1	Yes	Clay	No
851	≤ 10	≤ 10	0							851	sw impoundment (s)	1	No	Unlined	Yes
878	≤ 10	≤ 10								878	sw impoundment (s)	1	no	Unlined	no
934	≤ 10	11 - 30								934	combo lagoon(s)	1	No	Unlined	No
956										956	sw impoundment (s)	1	no		yes

### Nitrate Contamination at Dairy Facilities

Historical Lagoon Practices										Current Stormwater Practices					
DP#	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	Number of Old Lagoons	Liner Type	Status	MW(s) down-gradient of old lagoon(s)?	Resulted in Nitrate Exceedence?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	columnar	Current SW Management	Number of Impoundments	Liner?	Current Liner Type	MW(s)?
1022			Unknown							###	combo lagoon(s)	See Lagoons			
1026										###	sw impoundment (s)	1	yes	Clay	yes
1111	≤ 10	≤ 10								###	combo lagoon(s)				
1197	≤ 10	≤ 10								###	combo lagoon(s)				
1288	≤ 10	11 - 30								###	sw impoundment (s)	1	Yes	Clay	yes
1413	≤ 10	≤ 10								###	combo lagoon(s)	2	Yes	Clay	Yes
1455	≤ 10	≤ 10	0							###	combo lagoon(s)	0			
1475	≤ 10	≤ 10								###	sw impoundment (s)	2	Yes	Synthetic	No
1553										###	combo lagoon(s)	1	Yes	Synthetic	Yes
1001	≤ 10	≤ 10								###	sw impoundment (s)	2	No	Manure	No
1423	≤ 10	≤ 10	0							###	combo lagoon(s)	0			
1321	≤ 10	≤ 10	0							###	sw impoundment (s)	1	Yes	Clay	Yes
1346	≤ 10	≤ 10								###	combo lagoon(s)	1	Yes	Clay	Yes
1091			0							###	not contained	0			
1163										###	sw impoundment (s)	1	no	Unlined	no
1379			0			no; never required	Unknown			###	combo lagoon(s)	2	Yes	Synthetic	No
<b>1578</b>										###	combo lagoon(s)				
706	≤ 10	≤ 10	1	Unlined	closed	yes; sampling continues	Yes	11 - 30	31 - 50	706	sw impoundment (s)	1	No	Unlined	No

### Nitrate Contamination at Dairy Facilities

Historical Lagoon Practices										Current Stormwater Practices					
DP#	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	Number of Old Lagoons	Liner Type	Status	MW(s) down-gradient of old lagoon(s)?	Resulted in Nitrate Exceedence?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	columnar	Current SW Management	Number of Impoundments	Liner?	Current Liner Type	MW(s)?
1136	11 - 30	31 - 50								###	combo lagoon(s)				
1199	31 - 50	31 - 50	1	Clay	closed	yes; sampling continues	Yes	31 - 50	31 - 50	###	sw impoundment (s)	3	Yes	Clay	No
1277	11 - 30	11 - 30								###	combo lagoon(s)	0			
932	11 - 30	11 - 30	0							932	sw impoundment (s)	1	No		No
967										967	combo lagoon(s)	1	no		no
1265	≤ 10	≤ 10								###	sw impoundment (s)	1	yes	clay	Yes
342	≤ 10	≤ 10	4	manure	closed		Unknown			342	sw impoundment (s)	multiple/ unknown	no	Unlined	no
692	51 - 100	51 - 100	2	Manure	closed	yes; sampling continues	Yes	51 - 100	51 - 100	692	combo lagoon(s)	2	Yes	Synthetic	Yes
170	11 - 30	11 - 30	2	manure	closed	yes; sampling continues	Yes	11 - 30	> 100	170	sw impoundment (s)	1	No	Unlined	no
1350	11 - 30	11 - 30								###	sw impoundment (s)	1	no		no
42	≤ 10	≤ 10								42	sw impoundment (s)	1	Yes	Synthetic	Yes
70	31 - 50	31 - 50	1	Clay	closed	unknown				70	sw impoundment (s)	2	Yes	Synthetic	No
126	11 - 30	11 - 30	1	Clay	closed	unknown				126	sw impoundment (s)	2	No	Separate clay & manure	Yes
167	≤ 10	≤ 10	2	manure	closed		Yes	11 - 30	11 - 30	167	sw impoundment (s)	1	No	Clay	Yes
177	11 - 30	31 - 50	Unk.							177	sw impoundment (s)	3	Yes	Separate syn & manure	Yes
340			1	clay	closed	yes; sampling continues	Yes	11 - 30	11 - 30	340	combo lagoon(s)	1	Yes	Synthetic	No

### Nitrate Contamination at Dairy Facilities

Historical Lagoon Practices										Current Stormwater Practices					
DP#	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	Number of Old Lagoons	Liner Type	Status	MW(s) down-gradient of old lagoon(s)?	Resulted in Nitrate Exceedence?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	columnar	Current SW Management	Number of Impoundments	Liner?	Current Liner Type	MW(s)?
624	31 - 50	51 - 100								624	sw impoundment (s)	1	Yes	Clay	Yes
833	11 - 30	11 - 30	1	Clay	closed	yes; sampling continues	yes	11 - 30	11 - 30	833	combo lagoon(s)	3	Yes	Synthetic	Yes
1208	≤ 10	51 - 100	2	Clay	needs closure	yes; sampling continues	Yes	31 - 50	51 - 100	###	sw impoundment (s)	1	No		Yes
257	> 100	> 100	1	Manure	closed	yes; sampling continues	Yes	> 100	> 100	257	sw impoundment (s)	2	Yes	Separate clay & syn	Yes
683	31 - 50	51 - 100	0							683	sw impoundment (s)	1	No		No
765	31 - 50	31 - 50	0							765	sw impoundment (s)	1	no	Unlined	yes
796	≤ 10	11 - 30								796	sw impoundment (s)	1	Yes	Clay	Yes
921	31 - 50	31 - 50	1	Clay	closure in-progress	yes; sampling continues	yes	31 - 50	31 - 50	921	combo lagoon(s)	See Lagoons			
734			0							734	sw impoundment (s)	1	no	Unlined	yes
913	11 - 30	11 - 30								913	sw impoundment (s)	3	No	Unlined	Yes
461			1	Clay	closed		Unknown			461	sw impoundment (s)	2	No	Unlined	Yes
988	≤ 10	≤ 10								988	sw impoundment (s)	1	No	Manure	No
1168	≤ 10	≤ 10								###	sw impoundment (s)	2	No	Unlined	No
1302	≤ 10	≤ 10								###	sw impoundment (s)	1	no	Unlined	no
1323										###	sw impoundment (s)	1	No	Unlined	No

### Nitrate Contamination at Dairy Facilities

Historical Lagoon Practices										Current Stormwater Practices					
DP#	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	Number of Old Lagoons	Liner Type	Status	MW(s) down-gradient of old lagoon(s)?	Resulted in Nitrate Exceedence?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	column	Current SW Management	Number of Impoundments	Liner?	Current Liner Type	MW(s)?
259	51 - 100	51 - 100	1	Manure	closed	plugged & abandoned	Yes	11 - 30	11 - 30	259	sw impoundment (s)	2	No	Manure	no
762	11 - 30	51 - 100	0							762	combo lagoon(s)	0			
909	11 - 30	11 - 30	0							909	sw impoundment (s)	1	No		No
1025	31 - 50	31 - 50	0							###	sw impoundment (s)	1	No		No
1135	11 - 30	11 - 30	0							###	sw impoundment (s)	1	No		No
1559	≤ 10	≤ 10								###	sw impoundment (s)	2	No	Manure	No
1331										###	sw impoundment (s)	1	no	Unlined	no
1391	11 - 30	11 - 30	0							###	sw impoundment (s)	1	yes	clay	no
1257										###	not contained	0			
1332	≤ 10	≤ 10	0							###	combo lagoon(s)	0			
514										514	sw impoundment (s)	2	No	Unlined	No
880	≤ 10	≤ 10								880	combo lagoon(s)	1	Yes	Synthetic	Yes
926			0							926	sw impoundment (s)	1	No		No
963										963	sw impoundment (s)	1	No	Unlined	No
1251	≤ 10	31 - 50								###	sw impoundment (s)	2	no	Unlined	no

### Nitrate Contamination at Dairy Facilities

Historical Lagoon Practices										Current Stormwater Practices					
DP#	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	Number of Old Lagoons	Liner Type	Status	MW(s) down-gradient of old lagoon(s)?	Resulted in Nitrate Exceedence?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	columnar	Current SW Management	Number of Impoundments	Liner?	Current Liner Type	MW(s)?
1315	≤ 10	≤ 10								###	combo lagoon(s)	0			
1517										###	combo lagoon(s)	1	Yes	Synthetic	Yes
1531										###	sw impoundment (s)	1	No	Unlined	Yes
1320	≤ 10	≤ 10								###	sw impoundment (s)	1	no	Unlined	no
390										390	sw impoundment (s)	1	No	Manure	No
1246	11 - 30	11 - 30								###	combo lagoon(s)				
384	11 - 30	11 - 30	0							384	sw impoundment (s)	2	Yes	Clay	Yes
537	11 - 30	11 - 30	0							537	combo lagoon(s)	1	Yes	Clay	Yes
595	11 - 30	11 - 30	0							595	sw impoundment (s)	1	Yes	Clay	Yes
666	11 - 30	11 - 30								666	sw impoundment (s)	1	No	Unlined	No
667	≤ 10	11 - 30	1	Clay	closed	no; never required	Unknown			667	combo lagoon(s)	See Lagoons			
737	11 - 30	11 - 30								737	not contained sw	1	No	Unlined	No
753	≤ 10	≤ 10	2	Clay	closed	yes; sampling continues	Yes	≤ 10	11 - 30	753	impoundment	3	No		No
826	11 - 30	11 - 30								826	sw impoundment (s)	1	No	Unlined	No
898	11 - 30	51 - 100	1	Clay	closed	yes; not sampling	Yes	31 - 50	51 - 100	898	sw impoundment (s)	5	No	Unlined	No
987	11 - 30	31 - 50	2	Clay	closed	yes; sampling continues	yes	11 - 30	11 - 30	987	sw impoundment (s)	4	Yes	Separate syn & manure	Yes
1154	11 - 30	11 - 30	2	Clay	closed	no; never installed	Unknown			###	sw impoundment (s)	1	No		No

### Nitrate Contamination at Dairy Facilities

Historical Lagoon Practices										Current Stormwater Practices					
DP#	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	Number of Old Lagoons	Liner Type	Status	MW(s) down-gradient of old lagoon(s)?	Resulted in Nitrate Exceedence?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	columnar	Current SW Management	Number of Impoundments	Liner?	Current Liner Type	MW(s)?
1245	≤ 10	≤ 10								###	combo lagoon(s)				
1250	≤ 10	11 - 30	0							###	sw impoundment (s)	1	Yes	Clay	Yes
1286	11 - 30	11 - 30								###	sw impoundment (s)	1	No		Yes
1287	31 - 50	51 - 100								###	sw impoundment (s)	1	No	Unlined	No
1299	11 - 30	11 - 30								###	sw impoundment (s)	1	No	Manure	Yes
1312	≤ 10	≤ 10	0							###	sw impoundment (s)	1	No		Yes
1377	≤ 10	≤ 10								###	combo lagoon(s)	0			
1313	31 - 50	31 - 50	0							###	sw impoundment (s)	3	No		No
380	≤ 10	≤ 10	1	manure	closed		Unknown			380	sw impoundment (s)	3	no	Unlined	no
546	≤ 10	11 - 30								546	sw impoundment (s)	1	yes	Synthetic	yes
1477	≤ 10	≤ 10	0			no; never required	Unknown			###	combo lagoon(s)	1	Yes	Synthetic	Yes
563	≤ 10	≤ 10	0			no; never required	Unknown			563	sw impoundment (s)	2	No	Unlined	No
772	≤ 10	11 - 30	0							772		0			No
865	≤ 10	≤ 10								865	sw impoundment (s)	1	no	Unlined	yes
1194	≤ 10	≤ 10	1	Manure	closed	yes; not sampling	Unknown			###	sw impoundment (s)	3	No		No
1294	≤ 10	≤ 10								###	combo lagoon(s)				

### Nitrate Contamination at Dairy Facilities

Historical Lagoon Practices										Current Stormwater Practices					
DP#	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	Number of Old Lagoons	Liner Type	Status	MW(s) down-gradient of old lagoon(s)?	Resulted in Nitrate Exceedence?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	columnar	Current SW Management	Number of Impoundments	Liner?	Current Liner Type	MW(s)?
1032	11 - 30	31 - 50	2	Manure	closed	yes; sampling continues	Yes	11 - 30	31 - 50	###	sw impoundment (s)	1	No	Unlined	No
190	≤ 10	≤ 10	2	Clay	closure in-progress	yes; sampling continues	Yes	31 - 50	31 - 50	190		1	No	Clay	No
290	11 - 30	11 - 30								290	sw impoundment (s)	2	No	Manure	Yes
1004	≤ 10	≤ 10	0							###	sw impoundment (s)	1	No		Yes
1034	≤ 10	≤ 10								###	not contained	0			No
115	≤ 10	≤ 10	1	Manure	closure incomplete	yes; sampling continues	No	≤ 10	≤ 10	115	sw impoundment (s)	2	Yes	Synthetic	No
1181	51 - 100	> 100								###	bermed field(s)	0			
1176	11 - 30	11 - 30	1	Concrete	closed	yes; not sampling	No	≤ 10	≤ 10	###	sw impoundment (s)	1	No		No
1153										###		0			
408			0							408					
638										638					
613										613		1	no		no
84										84					
743										743					
821										821		0			
905										905					
953										953					
307										307					
159										159					
740										740					
744										744					
770										770					

### Nitrate Contamination at Dairy Facilities

Historical Lagoon Practices										Current Stormwater Practices					
DP#	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	Number of Old Lagoons	Liner Type	Status	MW(s) down-gradient of old lagoon(s)?	Resulted in Nitrate Exceedence?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	column ar	Current SW Management	Number of Impoundments	Liner?	Current Liner Type	MW(s)?
889										889		3	no		no
1268	≤ 10	≤ 10	0							###	bermed field(s)	0			
1211	≤ 10	≤ 10	0							###	not contained				No
888										888	sw impoundment (s)	1	No	Unlined	No
951	≤ 10	31 - 50								951	sw impoundment (s)	1	No	Unlined	No
1066										###					
235										235					
1239			0*		needs closure		Unknown			###					
252										252					
123			0			no; never required	Unknown			123	combo lagoon(s)	1	Yes	Manure	No
347										347					
1207	≤ 10	< 10	2	Manure	closed	yes; sampling continues	No	≤ 10	≤ 10	###	not contained	0			Yes
893	> 100	> 100								893	not contained	0			
936										936					
197										197					
208			1	Clay	closure incomplete	yes; sampling continues	no	≤ 10	≤ 10	208	sw impoundment (s)	2	Yes	Separate clay & manure	Yes
228	≤ 10	≤ 10	1	manure	needs closure	yes; sampling continues	Yes	11 - 30	> 100	228	sw impoundment (s)	1	no	Unlined	no
487	31 - 50	51 - 100	2	Manure	closed	yes; sampling continues	Yes	51 - 100	51 - 100	487	sw impoundment (s)	1	No		Yes
74	31 - 50	51 - 100	1	Clay	closed	unknown				74	sw impoundment (s)	2	Yes	Synthetic	Yes

### Nitrate Contamination at Dairy Facilities

Historical Lagoon Practices										Current Stormwater Prac					
DP#	Current NO <sub>3</sub> - N conc (mg/L)	Highest NO <sub>3</sub> - N reported (mg/L)	Number of Old Lagoons	Liner Type	Status	MW(s) down- gradient of old lagoon(s)?	Resulted in Nitrate Exceedence?	Current NO <sub>3</sub> - N conc (mg/L)	Highest NO <sub>3</sub> - N reported (mg/L)	column ar	Current SW Management	Number of Impound- ments	Liner?	Current Liner Type	MW(s)?
86	31 - 50	31 - 50	1	Clay	closed	unknown				86	combo lagoon(s)	1	Yes	Synthetic	Yes
923	≤ 10	≤ 10	1	Clay	needs closure	yes; sampling continues	no	≤ 10	≤ 10	923	sw impoundment (s)	3	No		No
699	11 - 30	51 - 100	1	Manure	needs closure	yes; not sampling	Yes	no current data	31 - 50	699	sw impoundment (s)	1	No	Unlined	No
911			0							911	sw impoundment (s)	1	No		No
1067	≤ 10	≤ 10								###	sw impoundment (s)	1	Yes	Clay	No
299	≤ 10	11 - 30	4	Unlined	closed	yes; sampling continues	Yes	11 - 30	> 100	299	combo lagoon(s)	0			
346	11 - 30	11 - 30								346	sw impoundment (s)	1	No	Unlined	No
1157	11 - 30	11 - 30	0							###	sw impoundment (s)	1	Yes	Clay	No
195	≤ 10	11 - 30	0			no; never required	Unknown			195	sw impoundment (s)	2	No	Unlined	No
1061	≤ 10	≤ 10	0							###					
885	≤ 10	≤ 10	0			no; never required	Unknown			885	combo lagoon(s)	2	Yes	Manure	Yes
1360										###					
1418										###					
1374										###					
1290										###					
1292										###					
1310										###					
1335										###					

### Nitrate Contamination at Dairy Facilities

Historical Lagoon Practices										Current Stormwater Practices					
DP#	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	Number of Old Lagoons	Liner Type	Status	MW(s) down-gradient of old lagoon(s)?	Resulted in Nitrate Exceedence?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	columnar	Current SW Management	Number of Impoundments	Liner?	Current Liner Type	MW(s)?
1338										###					
1352										###					
1364										###					
1460										###					
1496										###					
1557										###					
1567										###					
1330										###					
1276										###					
1348										###					
1361										###					
1415										###					
1317										###					
1376										###					
1373										###					
1394										###					

### Nitrate Contamination at Dairy Facilities

Historical Lagoon Practices										Current Stormwater Prac					
DP#	Current NO <sub>3</sub> - N conc (mg/L)	Highest NO <sub>3</sub> - N reported (mg/L)	Number of Old Lagoons	Liner Type	Status	MW(s) down- gradient of old lagoon(s)?	Resulted in Nitrate Exceedence?	Current NO <sub>3</sub> - N conc (mg/L)	Highest NO <sub>3</sub> - N reported (mg/L)	colu mn ar	Current SW Manage-ment	Number of Impound- ments	Liner?	Current Liner Type	MW(s)?
1601										###					
1309										###					
1316										###					
1372										###					
1384										###					
1447										###					
1476										###					
1483										###					
1485										###					
1486										###					
1487										###					
1530										###					
1593										###					
1349										###					
1507										###					
1587										###					

### Nitrate Contamination at Dairy Facilities

Historical Lagoon Practices										Current Stormwater Practices					
DP#	Current NO <sub>3</sub> - N conc (mg/L)	Highest NO <sub>3</sub> - N reported (mg/L)	Number of Old Lagoons	Liner Type	Status	MW(s) down- gradient of old lagoon(s)?	Resulted in Nitrate Exceedence?	Current NO <sub>3</sub> - N conc (mg/L)	Highest NO <sub>3</sub> - N reported (mg/L)	column ar	Current SW Manage-ment	Number of Impound- ments	Liner?	Current Liner Type	MW(s)?
1641										###					
1196			2	Unlined	closed	plugged & abandoned	No	no current data	≤ 10	###					
440										440					
860			0							860	0				No
741	> 100	> 100								741	1	No			No
1397										###					
547										547	0				
801										801					
802										802					
1082										###					
1365										###					
184			3	manure	closed	yes: not sampling	No	no current data	≤ 10	184					
183			2	Manure	closure in- progress	unknown				183	sw impoundment (s)	1	No	Unlined	No
124										124					
655										655					
260										260					
684										684					
775										775					
1002										###					
1339										###					
834										834					

### Nitrate Contamination at Dairy Facilities

Historical Lagoon Practices										Current Stormwater Practices					
DP#	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	Number of Old Lagoons	Liner Type	Status	MW(s) down-gradient of old lagoon(s)?	Resulted in Nitrate Exceedence?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	column ar	Current SW Management	Number of Impoundments	Liner?	Current Liner Type	MW(s)?
503			1	Clay	closed	yes; not sampling	No	≤ 10	≤ 10	503	sw impoundment (s)	1	Yes	Clay	Yes
217										217					
623										623	0				
1261										###					
1293										###					
1319										###					
1565										###					
437	11 - 30	> 100	2	Manure	closed		Yes			437					
1005										###					
648										648					
1414										###					
789										789					
1604										###					
1448										###					
515										515					
656										656					
795										795					
998										998					

### Nitrate Contamination at Dairy Facilities

Stormwater Runoff Management												Current		
DP#	Nitrate Trend Toward Exceed?	Current NO <sub>3</sub> - N conc (mg/L)	Highest NO <sub>3</sub> - N reported (mg/L)	Past SW management	Number of old SW impoundments	status	MW(s) down-gradient of old SW ponds?	Resulted in Nitrate Exceedence?	Current NO <sub>3</sub> - N conc (mg/L)	Highest NO <sub>3</sub> - N reported (mg/L)	colu	Land apply WW?	Current WW Application Method	MW(s)?
1233				same as current							###	No		
568	no MWs			same as current			no; never required	Unknown	n/a		568	No		
585	Unknown			same as current							585	no		
1195	Yes	11 - 30	11 - 30	same as current							###	No		
1203	no MWs			same as current	0						###	No		
689	No	No	≤ 10	≤ 10	same as current						689	Yes	center pivot sprinkler	Yes
1439				same as current							###	Yes	center pivot sprinkler	No
480	No	Yes	≤ 10	≤ 10	same as current	0					480	Yes	flood	No
533				same as current							533	No		
606	No	No	≤ 10	≤ 10	same as current						606	Yes	multiple methods	Yes
633	Yes		11 - 30	11 - 30	same as current						633	yes	multiple methods	yes
677	Yes		11 - 30	11 - 30							677	Yes	multiple methods	Yes
727				same as current			no; never required				727	Yes	flood	Yes
738	No	No	≤ 10	≤ 10	same as current						738	No		
742	No	Yes	≤ 10	≤ 10	same as current						742	Yes	underslung with pivot	Yes

### Nitrate Contamination at Dairy Facilities

Stormwater Runoff Management												Current		
DP#	Nitrate Trend Toward Exceed?	Current NO <sub>3</sub> - N conc (mg/L)	Highest NO <sub>3</sub> - N reported (mg/L)	Past SW management	Number of old SW impoundments	status	MW(s) down-gradient of old SW ponds?	Resulted in Nitrate Exceedence?	Current NO <sub>3</sub> - N conc (mg/L)	Highest NO <sub>3</sub> - N reported (mg/L)	Land apply WW?	Current WW Application Method	MW(s)?	
952	Yes	31 - 50	31 - 50	same as current							952	Yes	multiple methods	Yes
1003	Yes	11 - 30	11 - 30	same as current	0						###	Yes	multiple methods	Yes
1131	Yes	11 - 30	11 - 30	same as current							###	Yes	center pivot sprinkler	Yes
717	no MWs					Unk.		Unknown			717	Yes	multiple methods	Yes
776	No	≤ 10	≤ 10	same as current							776	Yes	center pivot sprinkler	Yes
1141	yes	11 - 30	11 - 30	same as current							###	yes	multiple methods	yes
162				combo lagoon(s)	0						162	Yes	flood	Yes
163				same as current							163	Yes	center pivot sprinkler	Yes
164				same as current							164	Yes	center pivot sprinkler	Yes
207				same as current							207	Yes	center pivot sprinkler	Yes
227				same as current							227	Yes	center pivot sprinkler	Yes
343	Yes	> 100	51 - 100	combo lagoon(s)	2	closure incomplete	yes; sampling continues	Yes	31 - 50	51 - 100	343	Yes	multiple methods	Yes
554	no MWs			combo lagoon(s)					n/a		554	Yes	multiple methods	Yes
635	Yes	31 - 50	31 - 50	same as current							635	Yes	flood	Yes
646				same as current							646	Yes	multiple methods	Yes

### Nitrate Contamination at Dairy Facilities

Stormwater Runoff Management													Current		
Past Stormwater Practices					Past Stormwater Practices								Current		
DP#	Nitrate Trend Toward Exceed?	Current NO <sub>3</sub> - N conc (mg/L)	Highest NO <sub>3</sub> - N reported (mg/L)	Past SW management	Number of old SW impoundments	status	MW(s) down-gradient of old SW ponds?	Resulted in Nitrate Exceedence?	Current NO <sub>3</sub> - N conc (mg/L)	Highest NO <sub>3</sub> - N reported (mg/L)	colu	Land apply WW?	Current WW Application Method	MW(s)?	
707				same as current							707	Yes	center pivot sprinkler	Yes	
718	Yes	11 - 30	11 - 30	same as current							718	Yes	center pivot sprinkler	Yes	
764				same as current							764	Yes	center pivot sprinkler	Yes	
791	yes	31 - 50	31 - 50								791	yes	multiple methods	yes	
797	Yes	11 - 30	11 - 30								797	Yes	center pivot sprinkler	No	
804	No	No	≤ 10	same as current							804	Yes	flood	Yes	
904	Yes	11 - 30	11 - 30	same as current							904	Yes	multiple methods	Yes	
1200	no MWs				0						###	Yes	***	No	
674				same as current							674	Yes	center pivot sprinkler	Yes	
703				same as current			no; never required				703	Yes	center pivot sprinkler	Yes	
851	No	No	≤ 10	same as current	0						851	Yes	center pivot sprinkler	Yes	
878	no MWs			same as current							878	yes	center pivot sprinkler	yes	
934	no MWs			same as current							934	Yes	center pivot sprinkler	Yes	
956	no	no	≤ 10	same as current							956	yes	center pivot sprinkler	yes	

### Nitrate Contamination at Dairy Facilities

Stormwater Runoff Management													Current		
Past Stormwater Practices					Past Stormwater Practices								Current		
DP#		Nitrate Trend Toward Exceed?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	Past SW management	Number of old SW impoundments	status	MW(s) down-gradient of old SW ponds?	Resulted in Nitrate Exceedence?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	colu	Land apply WW?	Current WW Application Method	MW(s)?
1022	no MWs				****							###	Yes	center pivot sprinkler	No
1026	no	yes	≤ 10	≤ 10	same as current							###	yes	center pivot sprinkler	no
1111					same as current							###	yes	center pivot sprinkler	yes
1197					same as current							###	No	center pivot sprinkler	no
1288	no	yes	≤ 10	11 - 30	same as current							###	yes	underslung with pivot	yes
1413	No	No	≤ 10	≤ 10	same as current							###	Yes	center pivot sprinkler	Yes
1455					same as current	0						###	Yes	center pivot sprinkler	Yes
1475	no MWs				same as current							###	Yes	center pivot sprinkler	Yes
1553					same as current							###	Yes	center pivot sprinkler	Yes
1001	no MWs				same as current			no; never required	unknown	n/a		###	Yes	center pivot sprinkler	Yes
1423					same as current	0						###	Yes	center pivot sprinkler	Yes
1321	No	No	≤ 10	≤ 10	same as current	0						###	Yes	center pivot sprinkler	Yes
1346	No	No	≤ 10	≤ 10	same as current							###	Yes	center pivot sprinkler	Yes
1091					not contained	0						###	Yes	other	No
1163	no MWs											###	yes	center pivot sprinkler	No
1379	Unknown				same as current	0		no; never required	Unknown	no current data		###	Yes	multiple methods	No
<b>1578</b>												###			
706	no MWs				same as current							706	Yes	center pivot sprinkler	Yes

### Nitrate Contamination at Dairy Facilities

Stormwater Runoff Management Practices													Current		
DP#	Nitrate Trend Toward Exceed?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	Past SW management	Number of old SW impoundments	status	MW(s) down-gradient of old SW ponds?	Resulted in Nitrate Exceedence?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	color	Land apply WW?	Current WW Application Method	MW(s)?	
1136											###	yes	center pivot sprinkler	yes	
1199	no MWs			same as current			no; never required	unknown	n/a		###	Yes	center pivot sprinkler	No	
1277				same as current							###	Yes	center pivot sprinkler	Yes	
932	no MWs			same as current	0						932	Yes	multiple methods	Yes	
967	no MWs										967	yes	drip	no	
1265	No	No	≤ 10	≤ 10	same as current						###	no			
342	Unknown			same as current							342	yes	flood	no	
692	Yes	31 - 50	> 100	sw impoundment (s)	2	closed	no; never required	no			692	No			
170				same as current	0						170	no			
1350	no MWs										###	yes	flood	yes	
42	Yes	51 - 100	51 - 100								42	No			
70	no MWs			not contained							70	Yes	multiple methods	Yes	
126	Yes	11 - 30	11 - 30	same as current							126	Yes	center pivot sprinkler	Yes	
167	No	≤ 10	≤ 10	same as current	0						167	Yes	flood	yes	
177	Yes	31 - 50	51 - 100	sw impoundment (s)	2		yes; sampling continues	yes	31 - 50	51 - 100	177	Yes	flood	Yes	
340				sw impoundment (s)	1	closed	no; never installed				340	Yes	hand-set sprinkler	Yes	

### Nitrate Contamination at Dairy Facilities

Stormwater Runoff Management													Current		
DP#	Nitrate Trend Toward Exceed?	Current NO <sub>3</sub> - N conc (mg/L)	Highest NO <sub>3</sub> - N reported (mg/L)	Past SW management	Number of old SW impoundments	status	MW(s) down-gradient of old SW ponds?	Resulted in Nitrate Exceedence?	Current NO <sub>3</sub> - N conc (mg/L)	Highest NO <sub>3</sub> - N reported (mg/L)	colu	Land apply WW?	Current WW Application Method	MW(s)?	
624	Yes	11 - 30	51 - 100								624	Yes	flood	Yes	
833	Yes	51 - 100	51 - 100	same as current							833	Yes	multiple methods	Yes	
1208	No	≤ 10	≤ 10								###	Yes	flood	Yes	
257	No	≤ 10	≤ 10	same as current							257	Yes	flood	Yes	
683	no MWs			same as current							683	Yes	multiple methods	Yes	
765	Yes	11 - 30	11 - 30	same as current							765	yes	side-roll sprinkler	yes	
796	Yes	11 - 30	31 - 50	same as current							796	Yes	multiple methods	Yes	
921	Yes	31 - 50	31 - 50		0						921	Yes	multiple methods	Yes	
734	no	≤ 10	31 - 50	same as current							734	yes	multiple methods	yes	
913	Yes	51 - 100	51 - 100	same as current							913	Yes	multiple methods	Yes	
461	No	< 10	≤ 10	bermed field(s)		closure incomplete	no; never required				461	Yes	center pivot sprinkler	No	
988	no MWs			same as current							988	Yes	multiple methods	No	
1168	no MWs			same as current			no; never required				###	Yes	center pivot sprinkler	Yes	
1302				same as current							###	yes	center pivot sprinkler	yes	
1323				same as current							###	Yes	underslung with pivot	No	

### Nitrate Contamination at Dairy Facilities

Stormwater Runoff Management													Current		
Practices					Past Stormwater Practices							Current			
DP#		Nitrate Trend Toward Exceed?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	Past SW management	Number of old SW impoundments	status	MW(s) down-gradient of old SW ponds?	Resulted in Nitrate Exceedence?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	color	Land apply WW?	Current WW Application Method	MW(s)?
259					same as current							259	Yes	center pivot sprinkler	Yes
762					same as current	0						762	Yes	center pivot sprinkler	Yes
909					bermed field(s)	0		no; never required				909	Yes	center pivot sprinkler	Yes
1025	no MWs				same as current	0						###	Yes	multiple methods	Yes
1135	no MWs				same as current	0						###	Yes	center pivot sprinkler	Yes
1559	no MWs				same as current							###	Yes	center pivot sprinkler	Yes
1331					same as current							###	yes	multiple methods	yes
1391	no MWs				same as current	0						###	yes	hand-set sprinkler	yes
1257					same as current							###	Yes	other	Yes
1332					same as current	0						###	Yes	center pivot sprinkler	Yes
514					same as current							514	No		Yes
880	No	No	≤ 10	≤ 10	same as current							880	No		
926	no MWs				same as current	0						926	Yes	underslung with pivot	Yes
963					same as current							963	Yes	center pivot sprinkler	Yes
1251					same as current							###	yes	center pivot sprinkler	yes

### Nitrate Contamination at Dairy Facilities

Stormwater Runoff Management Practices													Current WW Application Methods		
DP#	Nitrate Trend Toward Exceed?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	Past SW management	Number of old SW impoundments	status	MW(s) down-gradient of old SW ponds?	Resulted in Nitrate Exceedence?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	column	Land apply WW?	Current WW Application Method	MW(s)?	
1315				same as current							###	Yes	center pivot sprinkler	Yes	
1517				same as current							###	Yes	center pivot sprinkler	Yes	
1531				same as current							###	Yes	center pivot sprinkler	Yes	
1320				same as current							###	yes	center pivot sprinkler	yes	
390	no MWs			same as current			no; never required	Unknown			390	Yes	other	No	
1246				same as current							###	yes	center pivot sprinkler	yes	
384	no	yes	≤ 10	≤ 10	bermed field(s)	0					384	Yes	underslung with pivot	Yes	
537	Yes		11 - 30	11 - 30	same as current	0					537	Yes	multiple methods	No	
595	Yes		51 - 100	51 - 100	not contained	0					595	Yes	center pivot sprinkler	Yes	
666					same as current						666	Yes	center pivot sprinkler	Yes	
667					not contained			no; never installed			667	Yes	side-roll sprinkler	Yes	
737					same as current						737	Yes	center pivot sprinkler	Yes	
753	no MWs				not contained	0					753	Yes	center pivot sprinkler	Yes	
826					same as current						826	No			
898					same as current						898	Yes	center pivot sprinkler	No	
987	Yes		11 - 30	11 - 30	sw impoundment (s)	2	closure in-progress				987	Yes	underslung with pivot	No	
1154	no MWs				same as current	1 (combo)	closed	yes; sampling continues	Yes	11 - 30	11 - 30	###	Yes	center pivot sprinkler	No

### Nitrate Contamination at Dairy Facilities

Stormwater Runoff Management												Current			
DP#	Nitrate Trend Toward Exceed?	Current NO <sub>3</sub> - N conc (mg/L)	Highest NO <sub>3</sub> - N reported (mg/L)	Past Stormwater Practices								Land apply WW?	Current WW Application Method	MW(s)?	
				Past SW management	Number of old SW impoundments	status	MW(s) down-gradient of old SW ponds?	Resulted in Nitrate Exceedence?	Current NO <sub>3</sub> - N conc (mg/L)	Highest NO <sub>3</sub> - N reported (mg/L)					
1245				same as current								###	yes	center pivot sprinkler	yes
1250	No	Yes	≤ 10	11 - 30	same as current	0						###	Yes	center pivot sprinkler	Yes
1286	Yes		11 - 30	11 - 30	same as current							###	Yes	underslung with pivot	yes
1287					same as current							###	Yes	center pivot sprinkler	Yes
1299	Yes		11 - 30	11 - 30	same as current							###	Yes	center pivot sprinkler	Yes
1312	No	Yes	≤ 10	≤ 10								###	Yes	center pivot sprinkler	Yes
1377					same as current							###	Yes	center pivot sprinkler	Yes
1313	no MWs				same as current	0						###	Yes	center pivot sprinkler	Yes
380	Unknown				same as current			no; never required				380	no		
546	no	no	≤ 10	11 - 30	sw impoundment (s)	same area as current		yes; sampling continues	Unknown	≤ 10	11 - 30	546	yes	flood	no
1477	No	No	≤ 10	≤ 10	same as current	0		no; never required	Unknown	no current data		###	No		No
563	Unknown				same as current	0		no; never required	Unknown	no current data		563	No		No
772						0						772	No		No
865	no	no	≤ 10	≤ 10	same as current							865	No		
1194					bermed field(s)	0						###	Yes	flood	Yes
1294					same as current							###	no		

### Nitrate Contamination at Dairy Facilities

Stormwater Runoff Management												Current		
Past Stormwater Practices					Past Stormwater Practices							Current		
DP#	Nitrate Trend Toward Exceed?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	Past SW management	Number of old SW impoundments	status	MW(s) down-gradient of old SW ponds?	Resulted in Nitrate Exceedence?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	column	Land apply WW?	Current WW Application Method	MW(s)?
1032	Unknown			same as current	0		no; never required	unknown	n/a		###	No		
190					1			yes	31 - 50	31 - 50	190	No		No
290	Yes	11 - 30	11 - 30	same as current							290	No		
1004	No	No	≤ 10	same as current	0						###	Yes	center pivot sprinkler	Yes
1034	no MWs			not contained							###	Yes	flood	Yes
115	no MWs			not contained							115	No		
1181				same as current							###	yes	flood	yes
1176				same as current	0		no; never required				###	Yes	other	Yes
1153											###	No		
408				sw impoundment (s)	1	closed	plugged & abandoned	No	no current data	≤ 10	408	No		
638											638	yes	flood	No
613											613	yes	side-roll sprinkler	yes
84											84	Yes	flood	No
743											743			
821											821			
905											905			
953											953			
307											307	yes	other	no
159											159			
740											740			
744											744			
770											770			

### Nitrate Contamination at Dairy Facilities

Stormwater Runoff Management Practices													Current		
DP#	Nitrate Trend Toward Exceed?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	Past SW management	Number of old SW impoundments	status	MW(s) down-gradient of old SW ponds?	Resulted in Nitrate Exceedence?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	Land apply WW?	Current WW Application Method	MW(s)?		
889											889				
1268				bermed field(s)	0						###	No		Yes	
1211				same as current	0						###	Yes	other	No	
888				same as current							888	Yes	other	No	
951				same as current							951	Yes	underslung with pivot	Yes	
1066											###				
235											235				
1239				not contained	0*	needs closure		Unknown			###				
252											252	Yes	flood	No	
123	Unknown			same as current	0	needs closure	no; never required	Unknown	no current data		123	No		No	
347											347				
1207	Unknown			combo lagoon(s)	2	closed	yes; sampling continues	No	≤ 10	≤ 10	###	No		No	
893				same as current							893	yes	flood	yes	
936											936				
197											197				
208	No	No	≤ 10	≤ 10	same as current						208	Yes	center pivot sprinkler	No	
228	Unknown				same as current			no; never required			228	yes	multiple methods	yes	
487	Yes	51 - 100	> 100		0						487	Yes	center pivot sprinkler	Yes	
74	Yes	31 - 50	51 - 100	not contained							74	Yes	flood	No	

### Nitrate Contamination at Dairy Facilities

Stormwater Runoff Management													Current		
DP#	Nitrate Trend Toward Exceed?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	Past SW manage-ment	Number of old SW impound-ments	status	MW(s) down- gradient of old SW ponds?	Resulted in Nitrate Exceedence?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	colu	Land apply WW?	Current WW Application Method	MW(s)?	
86	Yes	31 - 50	31 - 50	combo lagoon(s)							86	Yes	multiple methods	Yes	
923	no MWs			not contained	0						923	Yes	underslung with pivot	No	
699	no MWs			bermed field(s)	1	needs closure	no; never required	unknown	n/a		699	Yes	multiple methods	Yes	
911	no MWs			not contained	0						911	No			
1067				same as current							###	No			
299				sw impoundment (s)	1	closure incomplete	yes; sampling continues	Yes	11 - 30	11 - 30	299	Yes	multiple methods	No	
346				same as current							346	Yes	flood	No	
1157	no MWs			same as current	0						###	Yes	center pivot sprinkler	Yes	
195	Unknown			same as current	0	needs closure	no; never required	Unknown	no current data		195	No		No	
1061					0						###	No			
885	No	No	≤ 10	same as current	0	needs closure	no; never required	Unknown	no current data		885	No		No	
1360											###				
1418											###				
1374											###				
1290											###				
1292											###				
1310											###				
1335											###				

## Nitrate Contamination at Dairy Facilities

Stormwater Runoff Management					Past Stormwater Practices							Current			
DP#	Nitrate Trend Toward Exceed?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	Past SW management	Number of old SW impoundments	status	MW(s) down-gradient of old SW ponds?	Resulted in Nitrate Exceedence?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	color	Land apply WW?	Current WW Application Method	MW(s)?	
1338												###			
1352												###			
1364												###			
1460												###			
1496												###			
1557												###			
1567												###			
1330												###			
1276												###			
1348												###			
1361												###			
1415												###			
1317												###			
1376												###			
1373												###			
1394												###			

### Nitrate Contamination at Dairy Facilities

Stormwater Runoff Management													Current		
Facilities					Past Stormwater Practices								Current		
DP#	Nitrate Trend Toward Exceed?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	Past SW management	Number of old SW impoundments	status	MW(s) down-gradient of old SW ponds?	Resulted in Nitrate Exceedence?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	column	Land apply WW?	Current WW Application Method	MW(s)?	
1601											###				
1309											###				
1316											###				
1372											###				
1384											###				
1447											###				
1476											###				
1483											###				
1485											###				
1486											###				
1487											###				
1530											###				
1593											###				
1349											###				
1507											###				
1587											###				

### Nitrate Contamination at Dairy Facilities

Stormwater Runoff Management												Current		
Past Stormwater Practices												Current		
DP#	Nitrate Trend Toward Exceed?	Current NO <sub>3</sub> - N conc (mg/L)	Highest NO <sub>3</sub> - N reported (mg/L)	Past SW management	Number of old SW impoundments	status	MW(s) down-gradient of old SW ponds?	Resulted in Nitrate Exceedence?	Current NO <sub>3</sub> - N conc (mg/L)	Highest NO <sub>3</sub> - N reported (mg/L)	color	Land apply WW?	Current WW Application Method	MW(s)?
1641											###			
1196											###	No		
440											440			
860					0						860	No		
741											741	Yes	multiple methods	Yes
1397											###			
547											547	Yes	flood	Yes
801											801			
802											802			
1082											###			
1365											###			
184											184			
183					not contained		no; never required				183	no		
124											124			
655											655			
260											260			
684											684			
775											775			
1002											###			
1339											###			
834											834			

### Nitrate Contamination at Dairy Facilities

Stormwater Runoff Management												Current		
Past Stormwater Practices					Past Stormwater Practices							Current		
DP#	Nitrate Trend Toward Exceed?	Current NO <sub>3</sub> - N conc (mg/L)	Highest NO <sub>3</sub> - N reported (mg/L)	Past SW management	Number of old SW impoundments	status	MW(s) down-gradient of old SW ponds?	Resulted in Nitrate Exceedence?	Current NO <sub>3</sub> - N conc (mg/L)	Highest NO <sub>3</sub> - N reported (mg/L)	colu	Land apply WW?	Current WW Application Method	MW(s)?
503	No	≤ 10	≤ 10	combo lagoon(s)	0						503	Yes	other	No
217											217			
623											623	Yes	side-roll sprinkler	Yes
1261											###			
1293											###			
1319											###			
1565											###			
437											437	Yes	flood	Yes
1005											###			
648											648	yes	other	
1414											###			
789											789			
1604											###			
1448											###			
515											515			
656											656			
795											795			
998											998			

### Nitrate Contamination at Dairy Facilities

Current Land Application Area								Previously Used Land App Areas							
Current Land Application Practices					Historical Info. on Current Fields			Past Land App Practices							
DP#	Backflow Prevention Method		Nitrate Trend Toward Exceed?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	Previous WW Application Method	Did contamination result from past application method?	column	WW applied to Fields?	Status	MW(s) down-gradient of old fields?	Resulted in Nitrate Exceedence?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	column
1233								###							###
568						same as current	no MWs	568	No						568
585								585	yes	abandoned	no; never required	Unknown			585
1195						same as current	No	###							###
1203								###	No						###
689	unknown	No	No	≤ 10	≤ 10	flood	Yes	689	Yes	abandoned	yes; sampling continues	Yes	11 - 30	11 - 30	689
1439	unknown					same as current		###							###
480	unknown	Yes		11 - 30	11 - 30	same as current	Unknown	480	No						480
533								533							533
606	unknown	Yes		51 - 100	51 - 100	same as current	Unknown	606							606
633	airgap	yes		11 - 30	11 - 30	same as current		633							633
677	unknown	Yes		51 - 100	> 100	flood	Yes	677	Yes	Farming continues	yes; sampling continues	Yes	51 - 100	51 - 100	677
727	airgap	Yes		11 - 30	11 - 30	same as current	Yes	727	Yes	Farming continues		Yes	11 - 30	11 - 30	727
738								738							738
742	unknown	No	No	≤ 10	11 - 30	flood	Yes	742	Yes	abandoned	no; never required	unknown	n/a		742

### Nitrate Contamination at Dairy Facilities

Current Land Application Area								Previously Used Land App Areas							
Land Application Practices				Historical Info. on Current Fields				Past Land App Practices							
DP#	Backflow Prevention Method		Nitrate Trend Toward Exceed?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	Previous WW Application Method	Did contamination result from past application method?	column	WW applied to Fields?	Status	MW(s) down-gradient of old fields?	Resulted in Nitrate Exceedence?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	column
952	unknown	Yes		11 - 30	11 - 30	flood	Yes	952							952
1003	unknown	Yes		11 - 30	11 - 30	same as current	Unknown	###	Yes	Farming continues	yes; sampling continues	Unknown			###
1131	unknown	Yes		11 - 30	11 - 30	same as current	Yes	###	Yes	abandoned	no; never installed				###
717	unknown	Yes		11 - 30	11 - 30	flood	Unknown	717	Yes	Farming continues					717
776	unknown	Yes		11 - 30	11 - 30	flood	Yes	776							776
1141	unknown	yes		51 - 100	> 100			###							###
162	airgap	yes		11 - 30	31 - 50	same as current		162	No						162
163	unknown	Yes		31 - 50	51 - 100	flood	Yes	163							163
164	unknown	Yes		11 - 30	11 - 30	flood	Yes	164							164
207	unknown	Yes		51 - 100	51 - 100	same as current	Yes	207	Yes	abandoned	no; never required	unknown	no current data		207
227	unknown	Yes		51 - 100	51 - 100	flood	Yes	227							227
343	unknown	Yes		> 100	51 - 100	same as current	Unknown	343	Yes	Farming continues	yes; sampling continues	Yes	> 100	51 - 100	343
554	unknown	Yes		11 - 30	> 100	flood	Yes	554	Yes	Farming continues	yes; sampling continues	yes	11 - 30	> 100	554
635	unknown	No	No	≤ 10	≤ 10	center pivot sprinkler	No	635	Yes	Farming continues	yes; not sampling	Yes	≤ 10	11 - 30	635
646	unknown	Yes		11 - 30	11 - 30	same as current	Unknown	646							646

### Nitrate Contamination at Dairy Facilities

Current Land Application Area								Previously Used Land App Areas					
Land Application Practices						Historical Info. on Current Fields		Past Land App Practices					
DP#	Backflow Prevention Method		Nitrate Trend Toward Exceed?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	Previous WW Application Method	Did contamination result from past application method?	WW applied to Fields?	Status	MW(s) down-gradient of old fields?	Resulted in Nitrate Exceedence?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)
707	unknown	Yes		11 - 30	11 - 30								
718	unknown	Yes		51 - 100	51 - 100								
764	unknown	Yes		51 - 100	51 - 100	flood	Yes						
791	unknown	yes		> 100	> 100	flood	Yes						
797	unknown	no MWs											
804	unknown	No	Yes	≤ 10	≤ 10								
904	unknown	Yes		11 - 30	11 - 30	flood	Yes	Yes	Farming continues		yes	11 - 30	11 - 30
1200	unknown	Yes		11 - 30	11 - 30		Unknown	###					###
674	unknown					other	Unknown	674	Yes	abandoned	no; never installed	Unknown	
703	unknown	No	No	≤ 10	≤ 10	same as current	No	703			No	no current data	≤ 10
851	unknown	No	No	≤ 10	≤ 10	same as current		851	No				
878	airgap	no	no	≤ 10	≤ 10	same as current		878					
934	unknown	No	No	≤ 10	≤ 10	same as current	No	934	Yes	Farming continues	yes; sampling continues	no	≤ 10
956	unknown	No	No	≤ 10	≤ 10	same as current		956					

### Nitrate Contamination at Dairy Facilities

Current Land Application Area								Previously Used Land App Areas							
Land Application Practices				Historical Info. on Current Fields				Past Land App Practices							
DP#	Backflow Prevention Method		Nitrate Trend Toward Exceed?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	Previous WW Application Method	Did contamination result from past application method?	color	WW applied to Fields?	Status	MW(s) down-gradient of old fields?	Resulted in Nitrate Exceedence?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	color
1022	chemigation valve	no MWs				flood	Unknown	###	Yes	Farming continues					###
1026	other	no MWs				same as current		###							###
1111	chemigation valve	no	no	≤ 10	≤ 10	same as current		###							###
1197	double check valve	No	No	≤ 10	≤ 10	same as current		###							###
1288	airgap	No	No	≤ 10	11 - 30	same as current		###							###
1413	unknown	No	No	≤ 10	≤ 10	same as current	No	###	Yes	Farming continues	yes; sampling continues	No	≤ 10	≤ 10	###
1455	airgap	No	No	≤ 10	≤ 10	same as current		###	No						###
1475	unknown	No	No	≤ 10	≤ 10	same as current	no MWs	###				Unknown	n/a		###
1553	unknown					same as current		###							###
1001	unknown	No	No	≤ 10	≤ 10	same as current	No	###							###
1423	unknown	No	No	≤ 10	≤ 10	same as current		###	No						###
1321	unknown	No	No	≤ 10	≤ 10			###	No						###
1346	unknown	No	No	≤ 10	≤ 10	same as current	No	###							###
1091	airgap	no MWs				same as current	Unknown	###	No						###
1163	unknown	no MWs						###							###
1379	unknown	Unknown				same as current	Unknown	###	Yes	Farming continues	no; never installed	Unknown			###
1578								###							###
706	other	Yes		11 - 30	11 - 30	same as current	no MWs	706	Yes	Farming continues	yes; sampling continues	yes	11 - 30	11 - 30	706

## Nitrate Contamination at Dairy Facilities

Current Land Application Area								Previously Used Land App Areas							
Current Land Application Practices				Historical Info. on Current Fields				Past Land App Practices							
DP#	Backflow Prevention Method		Nitrate Trend Toward Exceed?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	Previous WW Application Method	Did contamination result from past application method?	colu	WW applied to Fields?	Status	MW(s) down-gradient of old fields?	Resulted in Nitrate Exceedence?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	colu
1136	airgap	no	no	≤ 10	≤ 10			###							###
1199	unknown	no MWs				flood	no MWs	###	Yes	Farming continues	no; never required	unknown	n/a		###
1277	other	No	Yes	≤ 10	≤ 10	same as current	No	###	Yes	Farming continues	yes; sampling continues	No	≤ 10	≤ 10	###
932	airgap	No	Yes	≤ 10	≤ 10	same as current	Unknown	932	Yes	Farming continues	yes; sampling continues	No			932
967		no MWs				flood	Unknown	967							967
1265								###	yes	Farming continues	no; never required	Unknown			###
342	unknown					flood	Unknown	342	Yes	Farming continues		Unknown			342
692						flood	Yes	692	Yes	abandoned	yes; sampling continues	Yes	31 - 50	51 - 100	692
170						flood	yes	170	Yes	abandoned	yes; sampling continues	Yes	51 - 100	> 100	170
1350		yes		11 - 30	11 - 30	same as current		###							###
42	none					flood	Yes	42	Yes	Farming continues					42
70	unknown	Yes		31 - 50	31 - 50	same as current	Unknown	70							70
126	unknown	Yes		11 - 30	11 - 30	flood	Yes	126							126
167	airgap	No	No	≤ 10	51 - 100	same as current	Unknown	167							167
177	unknown	Yes		51 - 100	51 - 100	same as current	Yes	177	Yes	Farming continues	yes; sampling continues	yes	51 - 100	51 - 100	177
340	unknown	Yes		11 - 30	31 - 50	same as current	Yes	340							340

### Nitrate Contamination at Dairy Facilities

Current Land Application Area								Previously Used Land App Areas							
Land Application Practices				Historical Info. on Current Fields				Past Land App Practices							
DP#	Backflow Prevention Method		Nitrate Trend Toward Exceed?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	Previous WW Application Method	Did contamination result from past application method?	DP#	WW applied to Fields?	Status	MW(s) down-gradient of old fields?	Resulted in Nitrate Exceedence?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	DP#
624	airgap	Yes		11 - 30	51 - 100	same as current	Yes	624							624
833	unknown	Yes		11 - 30	31 - 50			833							833
1208	airgap	No	No	≤ 10	≤ 10	same as current		###	Yes	Farming continues	yes; sampling continues	No	≤ 10	≤ 10	###
257	airgap	No	No	≤ 10	≤ 10	same as current	Unknown	257							257
683	unknown	Yes		> 100	> 100			683	Yes	Farming continues	yes; sampling continues	Yes	11 - 30	11 - 30	683
765	unknown	yes		> 100	> 100	flood	Unknown	765							765
796	airgap	Yes		11 - 30	11 - 30	same as current	Yes	796	Yes	Farming continues	no; never required				796
921	unknown	Yes		11 - 30	11 - 30	same as current	Unknown	921	Yes	Farming continues	unknown	Unknown			921
734	unknown	no	yes	≤ 10	11 - 30	multiple methods	Unknown	734							734
913	unknown							913							913
461	unknown	no MWs				same as current	Unknown	461	Yes	Farming continues					461
988	unknown	no MWs				other		988	Yes	Farming continues	yes; not sampling	Yes	no current data	11 - 30	988
1168	unknown	MW-inaccessible	No	≤ 10	≤ 10	same as current	MW(s)-unable to sample	###							###
1302	unknown	no	no	≤ 10	≤ 10	same as current		###							###
1323	unknown					same as current	No	###							###

### Nitrate Contamination at Dairy Facilities

Current Land Application Area								Previously Used Land App Areas							
Current Land Application Practices						Historical Info. on Current Fields		Past Land App Practices							
DP#	Backflow Prevention Method		Nitrate Trend Toward Exceed?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	Previous WW Application Method	Did contamination result from past application method?	DP#	WW applied to Fields?	Status	MW(s) down-gradient of old fields?	Resulted in Nitrate Exceedence?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	DP#
259	unknown	No	No	≤ 10	≤ 10	flood	Yes	259	Yes	abandoned	plugged & abandoned	Yes	no current data	11 - 30	259
762	chemigation valve	No	No	≤ 10	≤ 10	same as current		762	Yes	Farming continues	no; never required	Unknown			762
909	unknown	No	No	≤ 10	≤ 10	same as current		909	Yes	Farming continues					909
1025	unknown	No	No					###	Yes	Farming continues	yes; sampling continues	Yes	31 - 50	31 - 50	###
1135	airgap	No	No	≤ 10	≤ 10	same as current		###	No						###
1559	unknown	Yes		11 - 30	11 - 30	same as current	No	###							###
1331	unknown	yes		31 - 50	31 - 50	same as current		###							###
1391	unknown	no	no	≤ 10	≤ 10	same as current		###	No						###
1257	none	No	No	≤ 10	≤ 10	same as current	No	###							###
1332	airgap	No	No	≤ 10	11 - 30	same as current		###	No						###
514		No	No	≤ 10	≤ 10	other	Yes	514	Yes	abandoned	yes; sampling continues	Unknown	≤ 10	≤ 10	514
880								880	Yes	abandoned	no; never required				880
926	airgap	No	Yes	≤ 10	≤ 10	center pivot sprinkler	Unknown	926	No						926
963	unknown	No				same as current		963							963
1251	unknown	no	no	≤ 10	≤ 10	same as current		###							###

### Nitrate Contamination at Dairy Facilities

Current Land Application Area								Previously Used Land App Areas							
Current Land Application Practices						Historical Info. on Current Fields		Past Land App Practices							
DP#	Backflow Prevention Method		Nitrate Trend Toward Exceed?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	Previous WW Application Method	Did contamination result from past application method?	colu	WW applied to Fields?	Status	MW(s) down-gradient of old fields?	Resulted in Nitrate Exceedence?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	colu
1315	unknown	No	No	≤ 10	≤ 10	same as current	Unknown	###	Yes	Farming continues	yes; sampling continues	No	≤ 10	≤ 10	###
1517	unknown					same as current		###							###
1531	unknown					same as current		###							###
1320	other	no	no	≤ 10	≤ 10	same as current		###							###
390	unknown	Unknown				same as current	Unknown	390	Yes	Farming continues	no; never required	unknown	n/a		390
1246	chemigation valve	no	yes	≤ 10	11 - 30	same as current		###							###
384	other	No	Yes	≤ 10	≤ 10	multiple methods	Unknown	384							384
537	unknown					same as current		537	Yes	Farming continues					537
595	airgap	No	Yes	≤ 10	≤ 10	flood	Unknown	595	Yes		no; never required	unknown			595
666	unknown	Yes		11 - 30	11 - 30	same as current	Unknown	666							666
667	none	Yes		11 - 30	11 - 30	same as current	No	667	Yes	Farming continues	no; never installed				667
737	unknown	No	No			multiple methods	Unknown	737							737
753	airgap	No	Yes	≤ 10	≤ 10	flood	Unknown	753	Yes	abandoned	no; never required	Unknown			753
826						flood	Unknown	826	Yes	abandoned	yes; sampling continues	Yes	11 - 30	11 - 30	826
898	unknown					same as current	Unknown	898	Yes	Farming continues	yes; sampling continues	Yes	11 - 30	31 - 50	898
987	unknown					same as current	Unknown	987							987
1154	airgap					flood	Unknown	###							###

### Nitrate Contamination at Dairy Facilities

Current Land Application Area								Previously Used Land App Areas						
Current Land Application Practices					Historical Info. on Current Fields			Past Land App Practices						
DP#	Backflow Prevention Method		Nitrate Trend Toward Exceed?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	Previous WW Application Method	Did contamination result from past application method?	WW applied to Fields?	Status	MW(s) down-gradient of old fields?	Resulted in Nitrate Exceedence?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	
1245	unknown	Yes		11 - 30	11 - 30	same as current		###						###
1250	unknown	Yes		11 - 30	11 - 30	same as current		###	Yes	Farming continues	no; never required			###
1286	airgap	yes		31 - 50	31 - 50	same as current		###						###
1287	none	Yes		11 - 30	11 - 30	other	Unknown	###						###
1299	airgap	Yes		11 - 30	11 - 30	same as current	Yes	###	Yes	Farming continues	yes; sampling continues	Yes	11 - 30	11 - 30
1312		Yes		11 - 30	11 - 30	same as current	Unknown	###						###
1377	unknown	Yes		11 - 30	11 - 30	same as current		###						###
1313	airgap	Yes		11 - 30	11 - 30	same as current		###	Yes	abandoned	yes; not sampling	No	≤ 10	≤ 10
380								380	yes	abandoned		Unknown		380
546	airgap					same as current		546						546
1477		Unknown				same as current	Unknown	###	No		no; never required	Unknown		###
563		Unknown				same as current		563	No		no; never required	Unknown		563
772								772	No					772
865								865	Yes	Farming continues		Unknown		865
1194	unknown	No	No	≤ 10	≤ 10	same as current		###						###
1294								###	Yes	Farming continues	yes; sampling continues	No	≤ 10	≤ 10

### Nitrate Contamination at Dairy Facilities

Current Land Application Area								Previously Used Land App Areas							
Current Land Application Practices				Historical Info. on Current Fields				Past Land App Practices							
DP#	Backflow Prevention Method		Nitrate Trend Toward Exceed?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	Previous WW Application Method	Did contamination result from past application method?	colu	WW applied to Fields?	Status	MW(s) down-gradient of old fields?	Resulted in Nitrate Exceedence?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	colu
1032						same as current	No	###	No						###
190								190	No						190
290								290	Yes	abandoned		Yes			290
1004	airgap	No	No	≤ 10	≤ 10	same as current		###	No						###
1034	airgap	No	No	≤ 10	≤ 10	same as current	No	###	Yes	Farming continues	yes; sampling continues	Yes	≤ 10	11 - 30	###
115								115	No						115
1181	airgap	no	no	≤ 10	11 - 30	same as current		###							###
1176		Yes		11 - 30	11 - 30	same as current	No	###							###
1153								###							###
408								408	Yes	Farming continues	no; never required	Unknown	n/a		408
638								638							638
613		no						613							613
84	airgap							84							84
743								743							743
821						hand-set sprinkler		821							821
905								905							905
953								953							953
307								307							307
159								159							159
740								740							740
744								744							744
770								770							770

### Nitrate Contamination at Dairy Facilities

Current Land Application Area								Previously Used Land App Areas							
Current Land Application Practices					Historical Info. on Current Fields			Past Land App Practices							
DP#	Backflow Prevention Method		Nitrate Trend Toward Exceed?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	Previous WW Application Method	Did contamination result from past application method?	colu	WW applied to Fields?	Status	MW(s) down-gradient of old fields?	Resulted in Nitrate Exceedence?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	colu
889								889	yes						889
1268		No	No	≤ 10	≤ 10			###	No						###
1211	unknown					same as current		###	Yes						###
888	unknown					same as current		888							888
951	unknown	Yes		11 - 30	51 - 100	same as current	Yes	951							951
1066								###							###
235								235							235
1239						flood	Unknown	###	Yes	abandoned		Unknown			###
252	airgap							252							252
123		Unknown				same as current		123	No		no; never required	Unknown			123
347								347							347
1207		Unknown				flood	Unknown	###	Yes	abandoned	no; never required	Unknown			###
893	airgap	no				same as current		893							893
936								936							936
197								197							197
208	unknown					flood	Unknown	208	Yes	abandoned	no; never installed	Unknown			208
228	unknown	yes		51 - 100	> 100	multiple methods	Yes	228	Yes	Farming continues	yes; sampling continues	yes	51 - 100	> 100	228
487	unknown	No	Yes	≤ 10	≤ 10	flood	Unknown	487	Yes	abandoned	no; never required	Unknown			487
74	unknown					same as current	Unknown	74	Yes	abandoned	no; never required	Unknown			74

### Nitrate Contamination at Dairy Facilities

Current Land Application Area								Previously Used Land App Areas							
Current Land Application Practices				Historical Info. on Current Fields				Past Land App Practices							
DP#	Backflow Prevention Method		Nitrate Trend Toward Exceed?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	Previous WW Application Method	Did contamination result from past application method?	color	WW applied to Fields?	Status	MW(s) down-gradient of old fields?	Resulted in Nitrate Exceedence?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	color
86	unknown	Yes		31 - 50	31 - 50	same as current	Unknown	86							86
923	airgap	no MWs				same as current		923	Yes	Farming continues	no; never required	Unknown			923
699	airgap	Yes		11 - 30	11 - 30	center pivot sprinkler	Unknown	699	Yes	Farming continues	no; never required	Yes	n/a		699
911						multiple methods	Yes	911	Yes	abandoned	yes; sampling continues	Yes	≤ 10	11 - 30	911
1067						center pivot sprinkler	Yes	###	Yes	abandoned	yes; sampling continues	Yes	≤ 10	11 - 30	###
299	airgap	no MWs				multiple methods	Unknown	299	Yes	Farming continues	yes; sampling continues	Yes	11 - 30	11 - 30	299
346	unknown					flood	Unknown	346							346
1157	airgap	No	Yes	≤ 10	≤ 10	same as current		###	No						###
195		Unknown				same as current		195	No		no; never required	Unknown			195
1061						flood	No	###	Yes	abandoned	yes; sampling continues	No	≤ 10	≤ 10	###
885		Unknown				flood	Unknown	885	Yes	abandoned	no; never required	Unknown			885
1360								###							###
1418								###							###
1374								###							###
1290								###							###
1292								###							###
1310								###							###
1335								###							###

### Nitrate Contamination at Dairy Facilities

Current Land Application Area								Previously Used Land App Areas							
Past Land Application Practices				Historical Info. on Current Fields				Past Land App Practices							
DP#	Backflow Prevention Method		Nitrate Trend Toward Exceed?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	Previous WW Application Method	Did contamination result from past application method?	column	WW applied to Fields?	Status	MW(s) down-gradient of old fields?	Resulted in Nitrate Exceedence?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	column
1338								###							###
1352								###							###
1364								###							###
1460								###							###
1496								###							###
1557								###							###
1567								###							###
1330								###							###
1276								###							###
1348								###							###
1361								###							###
1415								###							###
1317								###							###
1376								###							###
1373								###							###
1394								###							###

### Nitrate Contamination at Dairy Facilities

Current Land Application Area								Previously Used Land App Areas					
Current Land Application Practices				Historical Info. on Current Fields				Past Land App Practices					
DP#	Backflow Prevention Method		Nitrate Trend Toward Exceed?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	Previous WW Application Method	Did contamination result from past application method?	WW applied to Fields?	Status	MW(s) down-gradient of old fields?	Resulted in Nitrate Exceedence?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)
1601								###					###
1309								###					###
1316								###					###
1372								###					###
1384								###					###
1447								###					###
1476								###					###
1483								###					###
1485								###					###
1486								###					###
1487								###					###
1530								###					###
1593								###					###
1349								###					###
1507								###					###
1587								###					###

### Nitrate Contamination at Dairy Facilities

Current Land Application Area								Previously Used Land App Areas						
Current Land Application Practices				Historical Info. on Current Fields				Past Land App Practices						
DP#	Backflow Prevention Method		Nitrate Trend Toward Exceed?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	Previous WW Application Method	Did contamination result from past application method?	WW applied to Fields?	Status	MW(s) down-gradient of old fields?	Resulted in Nitrate Exceedence?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	
1641								###					###	
1196								###	No				###	
440								440					440	
860						flood	No	860	Yes	abandoned	No		860	
741	unknown	Yes		> 100	> 100			741					741	
1397								###					###	
547	airgap	No	Yes					547					547	
801								801					801	
802								802					802	
1082								###					###	
1365								###					###	
184								184	Yes	Farming continues	yes; not sampling	No	no current data	≤ 10
183								183	No				183	
124								124					124	
655								655					655	
260								260					260	
684								684					684	
775								775					775	
1002								###					###	
1339								###					###	
834								834					834	

### Nitrate Contamination at Dairy Facilities

Current Land Application Area								Previously Used Land App Areas							
Current Land Application Practices				Historical Info. on Current Fields				Past Land App Practices							
DP#	Backflow Prevention Method		Nitrate Trend Toward Exceed?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	Previous WW Application Method	Did contamination result from past application method?	colu	WW applied to Fields?	Status	MW(s) down-gradient of old fields?	Resulted in Nitrate Exceedence?	Current NO <sub>3</sub> -N conc (mg/L)	Highest NO <sub>3</sub> -N reported (mg/L)	colu
503	airgap							503	Yes	abandoned	no; never required	Unknown			503
217								217							217
623	unknown	No	Yes					623							623
1261								###							###
1293								###							###
1319								###							###
1565								###							###
437	airgap	No	No	≤ 10	≤ 10			437							437
1005								###							###
648								648							648
1414								###							###
789								789							789
1604								###							###
1448								###							###
515								515							515
656								656							656
795								795							795
998								998							998

## Nitrate Contamination at Dairy Facilities

Abatement			
DP#	Is Facility in Abatement?	Date Abatement Req. Letter Sent	Current Stage of Abatement
1233	No		
568	No		
585	yes	28-Jun-06	Stage 1
1195	No		
1203	No		
689	No		
1439	No		
480	No		
533	No		
606	Yes	5-May-08	Stage 1
633	no		
677	Yes	2004?	Stage 1
727	No		
738	No		
742	No		

## Nitrate Contamination at Dairy Facilities

Abatement			
DP#	Is Facility in Abatement?	Date Abatement Req. Letter Sent	Current Stage of Abatement
952	No		
1003	No		
1131	Yes	25-Sep-08	Stage 1
717	No		
776	No		
1141	Yes		Stage 1
162	yes	24-Sep-08	Stage 1
163	Yes	13-Aug-08	Stage 1
164	Yes	13-Aug-08	Stage 1
207	No		
227	Yes	5-May-08	Stage 1
343	Yes	2008	Stage 1
554	No		
635	No		
646	No		

## Nitrate Contamination at Dairy Facilities

Abatement			
DP#	Is Facility in Abatement?	Date Abatement Req. Letter Sent	Current Stage of Abatement
707	No		
718	No		
764	Yes	13-Aug-08	Stage 1
791	no		
797	No		
804			
904	Yes	10/2008 ?	Stage 1
1200	No		
674	No		
703	No		
851	No		
878	No		
934	No		
956	no		

Nitrate Contamination at Dairy Facilities

Abatement			
DP#	Is Facility in Abatement?	Date Abatement Req. Letter Sent	Current Stage of Abatement
1022	No		
1026	no		
1111	no		
1197	no		
1288	no		
1413	No		
1455	No		
1475	No		
1553	No		
1001	No		
1423	No		
1321	No		
1346	No		
1091	No		
1163	no		
1379	No		
<b>1578</b>			
706	No		

## Nitrate Contamination at Dairy Facilities

Abatement			
DP#	Is Facility in Abatement?	Date Abatement Req. Letter Sent	Current Stage of Abatement
1136	no		
1199	No		
1277	No		
932	No		
967	no		
1265	no		
342	No		
692	Yes	7-Apr-06	Stage 1
170	Yes	3-Sep-02	Stage 1
1350	no		
42	Yes	2006?	Stage 1
70	Yes	7-Apr-06	Stage 1
126	Yes	7-Apr-06	Stage 1
167	Yes	7-Apr-06	Stage 1
177	Yes	yes	Stage 1
340	Yes	7-Apr-06	Stage 1

Nitrate Contamination at Dairy Facilities

Abatement			
DP#	Is Facility in Abatement?	Date Abatement Req. Letter Sent	Current Stage of Abatement
624	Yes	yes	Stage 1
833	Yes	7-Apr-06	Stage 1
1208	Yes	7-Apr-06	Stage 1
257	Yes	7-Apr-06	Stage 1
683	Yes	2008	Stage 1
765	yes	1-Jul-05	Stage 1
796	No		
921	No		
<b>734</b>	<b>no</b>		
913	No		
461	No		
988	No		
1168	No		
1302	no		
1323	No		

Nitrate Contamination at Dairy Facilities

Abatement			
DP#	Is Facility in Abatement?	Date Abatement Req. Letter Sent	Current Stage of Abatement
259	Yes		Stage 1
762	Yes		Stage 1
909	No		
1025	No		
1135	No		
1559	No		
1331			
1391	no		
1257	No		
1332	No		
514	No		
880	No		
926	No		
963	No		
<b>1251</b>	<b>no</b>		

### Nitrate Contamination at Dairy Facilities

Abatement			
DP#	Is Facility in Abatement?	Date Abatement Req. Letter Sent	Current Stage of Abatement
1315	No		
1517	No		
1531	No		
1320	no		
390	No		
1246	no		
384	No		
537	No		
595	No		
666	No		
667	No		
737	No		
753	No		
826	No		
898	No		
987	No		
1154	No		

Nitrate Contamination at Dairy Facilities

Abatement			
DP#	Is Facility in Abatement?	Date Abatement Req. Letter Sent	Current Stage of Abatement
1245	no		
1250	No		
1286	no		
1287	No		
1299	No		
1312	No		
1377	No		
1313	No		
380	no		
546	no		
1477	No		
563	No		
772	No		
865	No		
1194	No		
1294	no		

Nitrate Contamination at Dairy Facilities

Abatement			
DP#	Is Facility in Abatement?	Date Abatement Req. Letter Sent	Current Stage of Abatement
1032	No		
190	No		
290	No		
1004	No		
1034	No		
115	No		
1181	no		
1176	No		
1153			
408	No		
638	No		
613	No		
84			
743			
821			
905			
953			
307			
159			
740			
744			
770			

## Nitrate Contamination at Dairy Facilities

Abatement			
DP#	Is Facility in Abatement?	Date Abatement Req. Letter Sent	Current Stage of Abatement
889	no		
1268	No		
1211	No		
888	No		
951	No		
1066			
235			
1239	No		
252			
123	No		
347			
1207	No		
893	no		
936			
197			
208	No		
228	Yes		Stage 1
487	Yes	2008	Stage 1
74	Yes	7-Apr-06	Stage 1

## Nitrate Contamination at Dairy Facilities

Abatement			
DP#	Is Facility in Abatement?	Date Abatement Req. Letter Sent	Current Stage of Abatement
86	Yes	7-Apr-06	Stage 1
923	No		
699	No		
911	No		
1067	No		
299	No		
346	No		
1157	No		
195	No		
1061	No		
885	No		
1360			
1418			
1374			
1290			
1292			
1310			
1335			

Nitrate Contamination at Dairy Facilities

Abatement			
DP#	Is Facility in Abatement?	Date Abatement Req. Letter Sent	Current Stage of Abatement
1338			
1352			
1364			
1460	No		
1496			
1557			
1567			
1330			
1276	No		
1348			
1361			
1415			
1317			
1376			
1373			
1394			

Nitrate Contamination at Dairy Facilities

Abatement			
DP#	Is Facility in Abatement?	Date Abatement Req. Letter Sent	Current Stage of Abatement
1601			
1309			
1316			
1372			
1384			
1447			
1476			
1483			
1485			
1486			
1487			
1530			
1593			
1349			
1507			
1587			

## Nitrate Contamination at Dairy Facilities

Abatement			
DP#	Is Facility in Abatement?	Date Abatement Req. Letter Sent	Current Stage of Abatement
1641			
1196	No		
440			
860	No		
741	Yes	7-Jun-04	Stage 2
1397			
547			
801			
802			
1082			
1365			
184			
183			
124			
655			
260			
684			
775			
1002			
1339	No		
834			



**STATE OF NEW MEXICO  
BEFORE THE WATER QUALITY CONTROL COMMISSION**

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In the Matter of: )  
)  
)  
PROPOSED AMENDMENT ) No.: WQCC 09-13(R)  
TO 20.60.2 NMAC (Dairy Rules) )  
)  
)  

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**Testimony of Elanor Starmer**

I am the Western Region Director of Food & Water Watch, a non-profit consumer advocacy organization working to protect the safety and sustainability of our essential food and water resources. Food & Water Watch has a national network of 200,000 individuals and organizations that receive our advocacy updates and take action on our shared policy priorities.

I joined Food & Water Watch in August of 2008. In this position, I have led the organization's work on dairy and groundwater regulation in California's Central Valley and am a stakeholder in the Central Valley Regional Water Quality Control Board's process to develop regulations for groundwater monitoring and reporting by dairies. I have testified a number of times before the Central Valley Water Board and the California State Senate on issues related to dairy operations and the public health impacts of contaminants associated with dairy waste discharge. Prior to joining Food & Water Watch, I consulted with organizations in several Midwestern states and Washington, DC on livestock policy and the public health impacts of concentrated animal production. Previously, I was a researcher on livestock policy and economics at the Global Development and Environment Institute at Tufts University. During this time, I served as a peer reviewer for the Pew Commission on Industrial Farm Animal Production. I have an M.A. in development economics from the Fletcher School of Law and Diplomacy and an M.S. in agricultural science and policy from the Friedman School of Nutrition Science and Policy, both at Tufts University. I obtained my B.A. in public policy from Brown University.

My testimony will focus on the constituents of concern included in the draft language for groundwater, wastewater and stormwater sampling and reporting programs. A significant and growing body of literature demonstrates that dairy waste contains a number of constituents that can reach both surface and groundwater, particularly in areas with shallow depth-to-groundwater, which make that water unsuitable for domestic or other use.

As described in more detail below, the proposed amendment to 20.6.2 NMAC under consideration should require the monitoring of additional waste-related constituents of concern in ground and stormwater runoff. It should also leave open the possibility of requiring additional monitoring in the future or in specific cases, as may be specified in a discharge permit. These

changes will make the amendment more protective of public health, a critical issue in a state where 90 percent of the population relies on groundwater as a drinking water source (Groundwater Protection Council 2007). Proposed language is included in Coalition Exhibit 2.

### **1. Background - Potential for groundwater contamination under New Mexico dairies**

Dairy waste has been found to contain high concentrations of a variety of contaminants – including nitrogen, minerals, pathogens, antibiotics, and hormones – that may be harmful to human health and compromise water quality (Brown, Vence and Associates [BVA] 2003, 16). Research on specific contaminants will be summarized below. Confined animal operations have multiple sites from which pollutants can migrate to ground or surface water, including the corral areas, dry manure storage areas, greenwater impoundments, waste lagoons or ponds, and the land areas where wastewater and manure are applied to crops (ibid).

Dairy cows generate significant quantities of waste; according to estimates by the U.S. Government Accountability Office (GAO), a dairy housing 700 cows produces nearly 18,000 tons of manure per year (GAO 2008, 18). By those calculations, New Mexico’s roughly 340,000 cows generate an estimated 8.7 million tons of waste per year. The clustering of dairies in certain regions – as is the case in New Mexico’s “dairy belt” – exacerbates water quality impacts because regionally, more nutrients are produced in manure than can be taken up by available cropland. As a result, the potential for leaching and runoff in many dairy regions is high (GAO 2008, 20).

Although the fate and transport of dairy waste contaminants in soil are determined by complex processes, the literature has identified shallow groundwater conditions – defined by the U.S. Geological Survey as depths of 200 feet or less (BVA 2003, 16) – as “perhaps the most important factor affecting groundwater vulnerability” to contamination from animal waste (BVA 2004, 13) because “infiltrating wastewater or waste constituents have a short travel distance to the groundwater and a shorter soil column to attenuate waste concentrations” (BVA 2003, 16). The U.S. Environmental Protection Agency (U.S. EPA) has firmly established that shallow groundwater can become contaminated with manure pollutants from water traveling through the soil to groundwater (68 Fed. Reg. 2003, 7238).

Shallow groundwater is a particular concern in New Mexico. According to information provided by the NMED on dairies currently subject to discharge permitting, nearly 30 percent of all permitted dairies have a depth-to-groundwater of 50 feet or less, some as shallow as 5 feet. Socorro County dairies average a depth-to-groundwater of 78 feet; Lea County dairies average 77 feet; Chaves County dairies average 64 feet; Dona Ana County dairies average 52 feet; and Valencia County dairies average 31 feet (author’s calculations based on NMED 2009). Exacerbating the risk, alluvial materials in the dairy belt have been found to be generally permeable and allow the movement of contaminants, at times rapidly, from the surface to the underlying aquifer (Arnold and Meister 1999).

Because the contamination of shallow groundwater with constituents from dairy waste is a significant concern, and because many of the constituents present in dairy waste have been found

to be harmful to human health, it is imperative that dairy ground and stormwater monitoring programs assess the presence of key contaminants, as detailed below.

## **2. Sampling and reporting for new and existing groundwater monitoring wells, wastewater and stormwater discharge**

### **a. Total coliforms and Escherichia coli**

Total coliforms are used as a preliminary indicator of the microbial quality of drinking water. Although not pathogenic themselves, their presence in water often indicates the presence of fecal pathogens (54 Fed. Reg. 1989, 27547). *Escherichia coli* (*E. coli*) is a type of fecal coliform bacteria commonly found in animal intestines and waste. The presence of *E. coli* in water is a strong indication of sewage or animal waste contamination (U.S. EPA 2006a). The presence of *E. coli* in water may therefore indicate the presence of other pathogenic organisms associated with livestock waste, including *E. coli* 0157:H7. *E. coli* is generally the fecal indicator organism tested for by public water systems when samples have tested positive for total coliforms (71 Fed. Reg. 2006, 65584).

On fields where animal wastewater and/or manure have been applied, these indicator organisms and related pathogenic bacteria can be biologically active for three months or longer (Filip et al. 1988, Guan and Holley 2003, Holley et al. 2006, Ibekwe et al. 2007, Harter 2009). Studies in the U.S. and abroad have found that pathogens from animal waste lagoons and land application areas are capable of reaching and contaminating groundwater (McMurry et al. 1998, Campagnolo et al. 1998, Cho et al. 2000, Ogden et al. 2001, Artz et al. 2004, Bergamaschi et al. 2008, Sermenov et al. 2009). According to the U.S. EPA's Final Ground Water Rule (GWR):

Viral and bacterial pathogens associated with fecal contamination can reach groundwater via pathways in the subsurface and near surface. First, fecal contamination from, for example, improper storage or management of manure [or] runoff from land-applied manure... can reach the ground water source by traveling—sometimes great distances—through the subsurface. (71 Fed. Reg. 2006, 65581)

Once pathogens reach groundwater, they can persist for periods ranging from less than a day to several weeks or months, depending on the organism (Harter undated, Bergamaschi et al. 2008). Near dairies and other animal operations, researchers find that shallow groundwater can have high pathogen loads independent of survival times because of frequent loading at the land surface (Harter undated).

### ***Human health impacts of pathogen contamination***

Testing for generic families of bacteria that indicate the presence of fecal contamination, such as total coliform and *E. coli*, is especially important because animal manure contains a variety of pathogenic organisms that are harmful to humans. Six of the 150 human pathogens found in animal manure are responsible for 90% of human food- and water-borne diseases:

*Campylobacter*, *Salmonella*, *Listeria*, *E. coli* 0157:H7, *Cryptosporidium*, and *Giardia* (BVA 2003, 22).

According to the GWR:

Waterborne disease attributable to viral and bacterial pathogens is a significant public health problem. EPA's Science Advisory Board cited drinking water contamination, particularly contamination by pathogenic microorganisms, as one of the most important environmental risks.... The CDC reports significant numbers of recent waterborne disease outbreaks and cases of illness associated with ground waters. (71 Fed. Reg. 2006, 65581)

Between 1991 and 2000, groundwater-based drinking water systems were associated with 68 disease outbreaks that affected nearly 11,000 people. These account for over half of all waterborne disease outbreaks in the U.S. during that time (ibid). The GWR continues:

The outbreak data illustrate that the major deficiency in GWSs [groundwater systems] was source water contamination. Contaminated source water was the cause of 79 percent of the outbreaks in GWSs.... In addition, the number of identified and reported outbreaks in the CDC database is believed to substantially understate the actual incidence of waterborne disease outbreaks and cases of illness. (71 Fed. Reg. 2006, 65583)

The GWR finds that “Fecal contamination of drinking water is a primary cause of waterborne disease” (71 Fed. Reg. 2006, 65583). In its 2003 final rule on Confined Animal Feeding Operations (CAFOs), the U.S. EPA notes that:

In addition, studies have found that nearly 20% of rural water wells are contaminated with enteric pathogens such as fecal coliform and fecal streptococcus, common indicators of enteric pathogens, at ratios which suggest the source of contamination may be animal waste. (68 Fed. Reg. 2003, 7242)

The agency further notes that “An important feature relating to the potential for disease transmission for [pathogenic] organisms is the relatively low infectious dose in humans” (68 Fed. Reg. 2003, 7236). In other words, even a limited presence of pathogenic bacteria in water may be of great concern when humans rely upon the water as a drinking water source. The growing presence of antibiotic-resistant bacteria that has been linked to the use of antibiotics by livestock operations furthers the human health risk (Smith et al. 2002).

Because animal waste has been found to be a significant contributor to the contamination of ground and surface water with pathogenic bacteria, and because only a low infectious dose of this bacteria is required to cause harm to human health, it is critical to monitor groundwater and stormwater runoff for the presence of pathogen indicator organisms. This is especially necessary to protect households and communities that depend on domestic supply wells that may be untreated or poorly treated.

### ***Regulatory context***

Testing for total coliform and *E. coli* as indicators of waste contamination is a well-established practice. The U.S. EPA specifies a Maximum Contaminant Level (MCL) for total coliforms, fecal coliforms, and *E. coli* in public drinking water systems under the Safe Drinking Water Act (SDWA). Under the Total Coliform Rule (TCR), public water systems must monitor for total coliform and, if the sample tests positive, for fecal coliform or *E. coli*. They must also, at a minimum, disinfect water to protect against bacterial contamination. The largest public water systems must test at least 480 samples per month (U.S. EPA 2006a).

Under the GWR, public water systems that utilize groundwater must follow the TCR and treat drinking water to address microbial contamination if it is identified (U.S. EPA 2006b). Starting in December 2009, New Mexico came into compliance with the GWR.

The state of Illinois implements a program more stringent than the TCR for its community water systems. The state requires testing for both total coliform and *E. coli* bacteria concurrently. The Illinois EPA determined that triggered monitoring – waiting for a total coliform-positive test before testing for *E. coli* – missed 76% of well detections for *E. coli* (Illinois EPA, 2009). A federal advisory committee formed in 2007 has developed an agreement in principle to revise the TCR such that both total coliform and *E. coli* would be monitored (U.S. EPA 2008).

In its dairy waste discharge permit, California's Central Valley Regional Water Quality Control Board requires the monitoring of stormwater and tailwater discharge for total and fecal coliform (CVRWQCB 2005, MRP 5-6).

### **b. Ammonia-nitrogen**

Manure nitrogen occurs in several forms, including ammonium, ammonia and nitrate. All three produce adverse environmental impacts when transported in excess quantities to the environment (U.S. EPA 1998, 10). In dry weight measure (mg/kg), ammonia-N is present in much higher concentrations in solid manure from dairy cattle than in that of beef cattle or swine (Link and Inman 2003).

Ammonia-N may adsorb to clayey soils, but adsorption may be significantly less under certain conditions. For example, frequent loading of manure at the surface, sandy soils, soils with low moisture content, or shallow groundwater conditions can lead to the leaching of ammonia-N to groundwater (Libra and Quade 1998, Wang and Alva 2000, DeLoughery and Link 2002, Dontsova et al. 2005). Ammonia-N has been found in groundwater underlying dairies in New Mexico at mean levels that exceed the drinking water standard (Arnold and Meister 1999).

Elevated levels of ammonia-N have also been found in surface waters downstream of dairy and other livestock operations (Gammon 1995). Interaction between ground and surface waters has been shown to allow contamination from groundwater to reach nearby surface waters. For example, testimony during the hearing on New Mexico's ParaSol Dairy proposed near the floodplain of Percha Creek found direct communication between the groundwater under the proposed lagoons and the arroyo. The groundwater expert offering testimony estimated that the time of travel for contaminants would be on the order of days to weeks.

When present in ground or surface water, ammonia-N presents a threat to water quality. According to the EPA's CAFO rule,

Ammonia is of environmental concern because it is toxic to aquatic life and it exerts a direct BOD on the receiving water, thereby reducing dissolved oxygen levels and the ability of a water body to support aquatic life. Excessive amounts of ammonia can lead to eutrophication, or nutrient overenrichment, of surface waters. (68 Fed. Reg. 2003, 7236)

Ammonia also presents a threat in ground and surface water due to its potential to convert to nitrates, the health and environmental effects of which are well documented (see, for example, U.S. EPA 1998, 12-14). According to the Nebraska Department of Environmental Quality,

When ammonia begins traveling in natural groundwater flow away from the LWCF [Livestock Waste Control Facility], it begins to mix with more oxygen-rich water with an increase in biological activity. It is then converted on a nearly one -to-one ratio to nitrate... This may occur very close to the LWCF (shown by high nitrate levels in downgradient monitoring wells) or several hundred feet further downgradient. Nitrate in drinking water is a health concern to babies and pregnant women, and has even been shown to be harmful to very young farm animals (Link and Inman, 2003).

Appreciable concentrations of ammonia in groundwater indicate new livestock pollution that has not yet converted to nitrate-N, and may not convert until it travels downgradient from the monitoring well (Arnold and Meister 1999). Testing for ammonia-N is especially important in areas with high background nitrate-N levels from historic pollution because it allows operations to assess livestock waste contamination without background interference. For this reason, monitoring for ammonia-N can return data on the potential health and environmental impacts of livestock waste pollution that simply monitoring for nitrate-N cannot.

### ***Regulatory context***

Several major dairy states, including Wisconsin, California, Pennsylvania, and Nebraska, require groundwater monitoring by dairies to include ammonia-nitrogen in addition to total Kjeldahl and nitrate-N (DeLoughery and Link 2002, CVRWQCB 2005, Stevenson 2010, Adams 2010).

### **c. Phosphorus**

Phosphorus is excreted in dairy waste at rates estimated to range 0.07 lbs to 0.22 lbs/animal/day; unlike nitrogen, phosphorus is not volatilized (BVA 2003, 20). Livestock waste has been found to contribute more to local phosphorus yield than does commercial fertilizer use (68 Fed. Reg. 2003, 7238). Livestock manure applied at agronomic rates based on crop nitrogen uptake potential may result in excessive applications of phosphorus, leading to the buildup of phosphorus in the soil (University of California 2005, 50). Phosphorus compounds in manure are water-soluble; the result is the transfer of phosphorus in runoff, sometimes at levels that are

hazardous to living organisms (U.S. EPA 1998, 15, University of California 2005, 50, Ribaud, Gollehon et al. 2006).

Phosphorus in runoff is a risk to surface waters (BVA 2003, 20). According to the U.S. EPA's 2003 CAFO rule:

Phosphorus is of concern in surface waters because it is a nutrient that can lead to eutrophication and the resulting adverse impacts—fish kills, reduced biodiversity, objectionable tastes and odors, increased drinking water treatment costs, and growth of toxic organisms. At concentrations greater than 1.0 mg/l, phosphorus can interfere with the coagulation process in drinking water treatment plants thus reducing treatment efficiency. Phosphorus is of particular concern in fresh waters, where plant growth is typically limited by phosphorus levels... Thus, both nitrogen and phosphorus loads can contribute to eutrophication. (68 Fed. Reg. 2003, 7236)

Although most commonly found in surface waters, phosphorus can also migrate to groundwater under certain conditions. A study published by the Minnesota Pollution Control Agency tested groundwater near feedlots by installing between 8 and 24 wells on each operation and testing for a number of contaminants. The study authors note,

Phosphorus in ground water is a concern when ground water discharges to surface water and phosphorus concentrations cause excess algae growth in surface water. We defined excess phosphorus as the amount of phosphorus loading attributable to the manure storage area at a feedlot (MPCA 2001, 3).

The MPCA found excess phosphorus in groundwater monitoring wells 50 feet downgradient from the manure storage areas on all of the operations tested, even those with lined lagoons. In one case, excess phosphorus was found more than 250 feet from the manure storage area (ibid).

#### ***Regulatory context***

Under U.S. EPA rules governing CAFOs that discharge to navigable U.S. surface waters, operations that qualify for inclusion under the rule must develop a nutrient management plan that includes compliance with surface water effluent limitation guidelines described in the National Pollutant Discharge Elimination System (NPDES) permit. Effluent limitation guidelines establish limits on the discharge of pollutants, including phosphorus. The rules require CAFO operators to submit a technical analysis of pollutants discharged, including site-specific pollutant data on phosphorus and other nutrients (68 Fed. Reg. 2003,7272).

Under its dairy waste discharge permit, California's Central Valley Regional Water Quality Control Board requires the monitoring of process wastewater, plant tissue, soil, subsurface (tile) drainage systems, stormwater discharges, and tailwater discharges for phosphorus (CVRWQCB 2005, MRP-5-6 and 19).

#### **d. Other minerals**

Animal manure contains dissolved mineral salts – cations and anions – that can contribute to salinity or otherwise degrade soil and water quality. The major cations present in manure include sodium, calcium, magnesium, and potassium. Major anions include chloride, sulfate, bicarbonate, carbonate and nitrate. (U.S. EPA 1998, 21, American Society of Agricultural Engineers 2000, 68 Fed. Reg. 2003, 7236).

According to the U.S. EPA:

In land-applied wastes, salinity is a concern because salts can accumulate in the soil and become toxic to plants, and can deteriorate soil quality by reducing permeability and contributing to poor tilth. Direct discharges and salt runoff to fresh surface waters contribute to salinization and can disrupt the balance of the ecosystem. Leaching salts can deteriorate groundwater quality, making it unsuitable for human consumption (U.S. EPA 1998, 21).

Studies have found an increase in major ions in soil underlying feedlots (see, for example, Dantzman et al. 1983). The major ions present in manure have also been found to reach and contaminate groundwater underlying dairies and other livestock operations (see, for example, Withers et al. 1998, EPA 1998, MPCA 2001, 68 Fed. Reg. 2003, Rodvang et al. 2004.)

Testing for major ions in ground and stormwater runoff can help determine dairy impacts on water quality. According to staff in the dairy program of California's Central Valley Regional Water Quality Control Board,

Several of the general mineral constituents are indicators of dairy activity (K, Na, Cl, P), and comparing these constituents in background and downgradient wells often provide an indication of what effect the dairy may have had on groundwater quality. The remaining major ions are useful as a check on the accuracy of the analyses when a cation/anion balance is performed. In addition, since there are significant differences in the concentrations of some of these ions in natural waters depending on their origin, a general minerals analysis provides a starting point from which to work (e.g., high HCO<sub>3</sub> in a water that would normally be a Ca,Na-SO<sub>4</sub> water may indicate inputs from organic sources). (Sholes 2010)

Conducting general water chemistry analyses are often more cost-effective than analyzing samples for individual cations or anions. The cation and anion concentrations derived from general water chemistry tests are commonly plotted on a trilinear diagram called a Piper diagram, which is a convenient way to visually compare the chemical quality of water from different sources (see, for example, USGS 2002).

Some or all of the major cations and anions are included in ground and stormwater testing programs for dairies in several states, including California, Nebraska and Texas (DeLoughery and Link 2002, CVRWQCB 2005, Fleet 2010).

### **3. Additional constituents of concern**

The current draft of the proposed amendment to 20.6.2 NMAC does not contain language allowing the Department to require monitoring of additional contaminants as may be determined in discharge permits. The absence of such language may limit the Department's ability to go beyond the contaminants listed in the text in order to address emerging and evolving pollution issues or issues specific to certain operations or conditions.

Given the direction of research at the federal and state levels into emerging contaminants associated with livestock waste, including heavy metals, antibiotics, and endocrine-disrupting chemicals (EDCs) such as hormones, and given variations in site-specific pollution impacts from dairy operations, the Department should allow for the possibility of requiring additional monitoring by making its authority to do so explicit in the text of the amendment. Recommended language is included in Coalition Exhibit 2.

### ***Case study: Hormones***

Hormones are naturally occurring in beef and dairy cows but are also used as supplements to increase productivity. Scientific literature indicates that animals excrete physiologically active steroidal hormones in their waste; the USDA's Agricultural Research Service has determined that "clearly, CAFOs provide elevated releases" of hormones to the environment (Rice 2007). Animal manure has been shown to contain estrogens, estradiol, progesterone, testosterone, and synthetic hormones (BVA 2003, 23).

In dairy waste lagoons, concentrations of hormones have been detected at levels as high as 650 ng/l (Kolodziej et al. 2004). While ongoing research continues to investigate specific transport routes for hormones from livestock waste to surface and groundwater (see, for example, U.S. EPA 2009), to date, several studies have found the presence of hormones in groundwater near dairy operations at levels ranging from under 1 nanograms per liter (see, for example, Watanabe et al. 2008) to higher levels (see, for example, Arnon et al. 2008), including studies by the Idaho Department of Agriculture that found estradiol in groundwater downgradient of dairies at levels as high as 2.8 micrograms per liter (Tesch and Owsley 2006). Studies have found that hormones from other sources, including human wastewater, are capable of reaching and contaminating groundwater (Wicks et al. 2004, Swartz et al. 2006).

In 2008, the GAO released a review of U.S. EPA programs governing CAFO air and water pollution. In its analysis of peer-reviewed studies documenting impacts to water, the Office discussed four studies of hormones from animal feeding operations that directly linked the presence of these pollutants in water to impacts on human health or the environment. Three of the studies linked feedlot runoff to adverse effects in the reproductive systems of aquatic life; the fourth linked hormone-contaminated feedlot effluent to reproductive malformations in lab rats and human cells (GAO 2008, 24).

Human exposure to hormones in the environment has been linked to health problems, including reproductive and metabolic abnormalities (Osman and Wallinga 2009). For example, the International Agency for Research on Cancer classifies estrogen as a Group 1 human carcinogen (IARC 2007). A major consensus meeting in 2008 outlined the growing body of scientific literature that human exposure to hormones and other EDCs can disrupt normal hormone

function and alter fetal programming and child development, increasing the risk of hormone-related cancer and other chronic diseases later in life (Grandjean et al. 2008).

In June 2009, the Endocrine Society released a scientific statement determining that hormones and other EDCs in the environment are “a significant concern to public health” (Diamanti-Kandarakis et al. 2009). In November 2009, the American Medical Association adopted a resolution calling for new policies to decrease the public’s exposure to EDCs because of their human health effects (Endocrine Society 2009). That same month, the American Public Health Association adopted a resolution calling on the Food and Drug Administration to ban the use of hormone growth promoters in beef and dairy cattle production, based on evidence that cattle operations release hormones into the environment and that human exposure to hormones in the environment interferes with hormone function (APHA 2009).

In summary, existing literature suggests that animal manure, including dairy waste, contains natural and synthetic hormones that are capable of reaching and contaminating ground and surface water. Human exposure to hormones in the environment has been linked to serious health problems, including reproductive and metabolic abnormalities.

### ***Regulatory context***

A 1996 amendment to the Safe Drinking Water Act recognized some of the risks associated with EDCs and authorized the U.S. EPA to consider EDCs in drinking water (42 USC § 300j-17). The EPA is now in the process of developing an Endocrine Disruptor Screening Program.

In its 2008 review of U.S. EPA CAFO programs, the GAO found that:

...numerous studies completed since 2002 have provided additional information on the direct and indirect impacts of discharges from animal feeding operations on human health and the environment, and many more studies have been completed that have measured the amounts of pollutants being discharged (GAO 2008, 30-31).

The GAO criticized the U.S. EPA for lacking the data necessary to assess how widespread these impacts are. It noted that the agency has taken a number of steps to gather this information, including the inclusion of a long-term research goal as part of the EPA’s Multi-Year Plan for Endocrine Disruptors (FY 2007-2013) to “characterize the magnitude and extent of the impact of management strategies on the fate and effect of hormones” in livestock production (GAO 2008, 31).

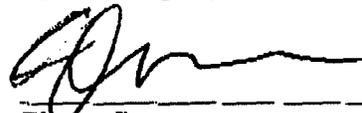
Municipal governments in states including California, Illinois, Nevada, Maine, Massachusetts, Virginia, Colorado, Wisconsin, Texas and Pennsylvania – including major cities such as Chicago, Milwaukee and Las Vegas – test drinking water for the presence of EDCs. Such testing demonstrates that these contaminants are a public health concern. It is reasonable to assume that programs to monitor discharges from facilities that contribute to this pollution are on the regulatory horizon.

As the body of scientific literature grows on the contribution of livestock operations to ground and surface water contamination with EDCs and other contaminants, monitoring specific or all operations for the constituents may become necessary in order to protect water quality and public

health in the state. Policymaking at the state or federal level may indeed require it. NMED should not limit its own ability to request monitoring for additional contaminants beyond the list contained in the text of the amendment to 20.6.2 NMAC. Doing so will make it difficult for the department to adjust to the scientific and regulatory communities' changing understanding of dairy operations' contribution to ground and surface water contamination.

### **Conclusion**

As described above, the proposed amendment to 20.6.2 NMAC under consideration should require the monitoring of additional waste-related constituents of concern in groundwater, wastewater and stormwater runoff in order to more fully assess the impact of dairy waste pollution on water quality. It should also leave open the possibility of requiring additional monitoring in the future or in specific cases, as may be specified in a discharge permit. Doing so is critical to public health, particularly that of the 90 percent of New Mexico's population that relies on groundwater as a drinking water source. Proposed language for these portions of the amendment are included in Coalition Exhibit 2.



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Eleanor Starmer

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**STATE OF NEW MEXICO  
WATER QUALITY CONTROL COMMISSION**

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**IN THE MATTER OF THE PROPOSED AMENDMENT  
TO 20.6.2 NMAC (DAIRY REGULATIONS)**

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)      **WQCC 09-13 (R)**

**TESTIMONY OF BRIAN SHIELDS**

I am the Executive Director of Amigos Bravos, Inc., a New Mexico non-profit river conservation organization. I have served as a founding member of the Board of Directors from 1988-1990, as Projects Director from 1991-1996, and as Executive Director since 1996. Established in 1988, Amigos Bravos is an award-winning, nationally recognized river conservation organization with offices in Taos and Albuquerque, a staff of seven, and over 1,600 supporters. Rooted in both science and the law, and inspired by the traditional values and wisdom of New Mexico's diverse communities, Amigos Bravos is guided by social justice principles and dedicated to preserving and restoring the ecological and cultural integrity of New Mexico's rivers and watersheds. Amigos Bravos has played a leading role in reducing water contamination emanating from the Chevron Mining Inc molybdenum mine in Questa, preserving the Valle Vidal, holding Los Alamos National Laboratory accountable for its toxic legacy, restoring the Red River, reforming mining practices, and bringing river otters back to New Mexico.

In response to severe impacts to New Mexico's limited water resources, and the lack of comprehensive mining reform at the federal level, mining activists, including Amigos Bravos, worked for passage of the 1993 New Mexico Mining Act. The Act contains strict requirements regarding the location of new mines and a strong mandate for the reclamation of existing and new mines that includes establishing financial assurance to cover closure and cleanup costs. Since the passage of the New Mexico Mining Act of 1993, I have been involved in numerous regulatory proceedings regarding the development of closure plans and corresponding financial assurance requirements at the Chevron Mining, Inc. molybdenum mine in Questa, NM. Starting in 2007, I have represented Amigos Bravos' interests in a successful national lawsuit that mandates EPA to develop financial assurance regulations for all producers and handlers of hazardous waste.

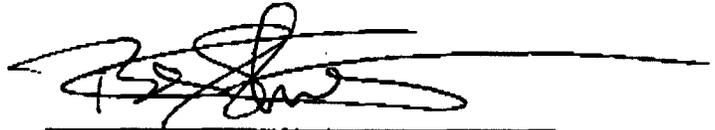
**20.6.2.3206 Application Requirements for New Discharge Permits.** The New Mexico Environment Department's Revised Petition for Regulatory Change does not contain language relating to financial assurance. An astonishing sixty-one percent (61%) of active New Mexico dairies are currently not in compliance with groundwater standards for nitrates (Coalition Exhibit 4). Given the extremely high rate of groundwater contamination and permit non-compliance among New Mexico dairy facilities, I strongly believe that the proposed regulations must require financial assurance from all dairy facilities operating in the State. The rationale for financial assurance is to ensure that entities that discharge pollutants will be able to clean up any environmental contamination regardless of whether their business fails; this minimizes the cost to local, state, and federal governments to have to intervene and do cleanup, helps ensure that

any cleanup is done sooner, and protects the tax payer from having to subsidize the industry's cleanup costs. Financial assurance also creates a greater incentive to safely locate, manage, and dispose of waste. Dairy facilities impact human health, property, and local environments by the release of pollutants. The US-EPA has recognized that financial assurances are intended to address pollution from toxic and hazardous substances, and EPA specifically states that "[h]aving the financial wherewithal to perform closure and/or cleanup is critical to protecting human health and the environment from toxic and hazardous waste and substances that are polluting the land, air, and water. The financial responsibility requirements achieve this protection by: (1) promoting the proper handling of hazardous and toxic, waste and substances, (2) ensuring that funds will be available to address contamination; (3) preventing the shifting of cleanup costs from the responsible party to the tax payer or other parties; and (4) making facilities and land available to the public for reuse." EPA, *Compliance and Enforcement National Priority: Financial Responsibility Under Environmental Laws 2* (2005).

In New Mexico, financial assurance is a requirement of the New Mexico Mining Act (Coalition Exhibit 5). The State of Oklahoma requires financial assurance for dairy facilities (*Oklahoma Concentrated Animal Feeding Operations Act*, "§ 20-55. Evidence of Financial Ability to Run an Animal Feeding Operation with a Liquid Animal Waste Management System" Coalition Exhibit 6 ). During the New Mexico dairy stakeholder meetings in the Fall of 2009, in which Amigos Bravos participated, the Groundwater Quality Bureau (GWQB) provided what they called an "Exceptions Concept" (20.6.2.XXXX; Coalition Exhibit 7). Representatives from the dairy industry were seeking grounds for exceptions and the GWQB responded with the "Exceptions Concept" document; the largest section of which deals with Financial Assurance (proposed 20.6.2.XXXX.a(6)). I support the language regarding Financial Assurance contained in the Exceptions Concept, but for all the reasons listed above, I believe that financial assurance must apply to all dairy facilities as an integral component of the permit, not just as a condition in the case of an exception to the regulations. Therefore, we are adding an additional section, **S. Financial Assurance**, to 20.6.2.3206. My recommendation for Financial Assurance also applies to section **20.6.2.3207 Application Requirements for Discharge Permit Renewal or Modification**, where I propose an additional subsection: **Q. Financial Assurance**. My recommended changes are included in Coalition Exhibit 2.

**Closure Plan.** Closure Plans for facilities that produce, handle, and dispose of animal waste and chemicals that can contaminant water supplies are an essential component of an operations plan. Without a closure plan, the operator and the regulating agency are unable to adequately determine and predict environmental impacts that could lead to unintended post-operations consequences. Moreover, comprehensive closure plans are an important tool to help operators determine the most protective and cost-effective waste management practices in order to avoid potential long-term cleanup costs and environmental impacts. For instance, if a closeout plan had been required prior to open pit mining at the Molycorp (now Chevron Mining) molybdenum mine in Questa – where EPA is now estimating an eight-hundred million dollar cleanup cost – it is highly unlikely that the waste rock piles would have been placed in such proximity to the Red River. I believe that the New Mexico Environment Department's Revised Petition for Regulatory Change must require site-specific closure plans for all dairies as a part of the permit application and approval process. In the proposed regulatory change, NMED includes language on closure requirements in **20.6.2.3230 Closure Requirements for All Dairy Facilities** (p79 of

the proposed regulations). There are also two "reserved" sections for dairy facilities with land application areas (20.6.2.3231) and dairy facilities discharging to an evaporative wastewater disposal system (20.6.2.3232). However, nowhere in the proposed regulation does NMED require the submittal and approval of a closure plan. Given the extremely high rate of groundwater contamination and permit non-compliance among New Mexico dairy facilities, I believe that all dairy facilities must submit a closure and post-closure plan at the time of original permit or, in the case of existing dairy facilities, at the time of permit renewal or modification, as is required under the Mining Act. Approved closure plans are the basis for determining financial assurance and for protecting public health and the environment. My recommended changes are included in Coalition Exhibit 2.



Brian Shields

**New Mexico Mining Act  
Financial Assurance Provisions**

<http://www.nmcpr.state.nm.us/nmac/parts/title19/19.010.0012.htm>

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TITLE 19 NATURAL RESOURCES AND WILDLIFE  
CHAPTER 10 NON-COAL MINING  
PART 12 FINANCIAL ASSURANCE REQUIREMENTS

19.10.12.1 ISSUING AGENCY: New Mexico Mining Commission.  
[19.10.12.1 NMAC - N, 05-15-2001]

19.10.12.2 SCOPE: All persons subject to the New Mexico Mining Act NMSA 1978, Section 69-36-1 et. seq.  
[19.10.12.2 NMAC - N, 05-15-2001]

19.10.12.3 STATUTORY AUTHORITY: NMSA 1978, Section 69-36-1 et. seq.  
[19.10.12.3 NMAC - N, 05-15-2001]

19.10.12.4 DURATION: Permanent.  
[19.10.12.4 NMAC - N, 05-15-2001]

19.10.12.5 EFFECTIVE DATE: February 15, 1996, unless a later date is cited at the end of a section.

A. All references to the Mining Act Parts 1-13 in any other rule shall be understood as a reference to 19.10 NMAC.

B. The amendment and replacement of the Mining Act Parts 1-13 shall not affect any administrative or judicial enforcement action pending on the effective date of this amendment nor the validity of any permit issued pursuant to the Mining Act Parts 1-13.  
[19.10.12.5 NMAC - N, 05-15-2001]

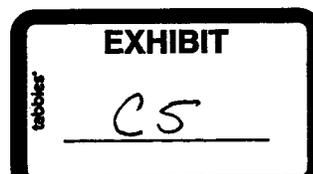
19.10.12.6 OBJECTIVE: The objective of Parts 1-14 of 19.10 NMAC is to establish regulations to implement the New Mexico Mining Act as directed in NMSA 69-36-7A. These regulations are designed to ensure proper reclamation through permitting for operations subject to the Mining Act, in accordance with provisions and standards outlined in the Mining Act.  
[19.10.12.6 NMAC - N, 05-15-2001]

19.10.12.7 DEFINITIONS: [RESERVED]  
[19.10.12.7 NMAC - N, 05-15-2001]  
[Definitions for this part can be found in 19.10.1.7 NMAC.]

19.10.12.8 - 19.10.12.1200 [RESERVED]  
[19.10.12.8 - 19.10.12.1200 NMAC - N, 05-15-2001]

19.10.12.1201 REQUIREMENT TO FILE FINANCIAL ASSURANCE:

A. Except for existing mining operations without new units, the applicant for a permit shall provide a financial assurance proposal to the director following the director's determination that the permit application is approvable, but prior to the permit issuance. An applicant's financial assurance proposal shall be based upon estimates for a third-party contractor to complete reclamation work. The permit shall not be issued until receipt of the approved financial assurance by the director.



B. The permittee of an existing mining operation shall provide a financial assurance proposal in an amount adequate to complete the proposed closeout plan as soon as practicable after the permittee receives notice from the director that the closeout plan is approvable. The permittee shall provide the approved financial assurance prior to the director's approval of the closeout plan.

C. Financial assurance shall be payable to the state of New Mexico and conditioned upon the performance of all the requirements of the act, 19.10 NMAC, the permit, and the reclamation plan or closeout plan.

D. Financial assurance proposals submitted by applicants or permittees may be required to be reviewed by a third party contractor as ordered by the director. All costs for such review shall be paid by the applicant or permittee.

[7-12-94, 2-15-96; 19.10.12.1201 NMAC - Rn, 19 NMAC 10.2.12.1201, 05-15-2001; A, 10-15-03; A, 04-30-09]

#### 19.10.12.1202 AREA TO BE COVERED BY FINANCIAL ASSURANCE:

A. The permittee or applicant shall file, with the approval of the director, financial assurance under one of the following schemes to cover the reclamation or closeout plan costs as determined in accordance with 19.10.12.1205 NMAC:

(1) financial assurance for the approved reclamation plan or closeout plan for the entire permit area; or

(2) financial assurance may be provided and approved to guarantee specific increments of reclamation within the permit area provided the sum of incremental financial assurance equals or exceeds the total amount required under 19.10.12.1205 NMAC and 19.10.12.1206 NMAC. The area to be reclaimed and the amount of financial assurance required for each increment shall be specified in detail, and the permittee shall comply with the following:

(a) An incremental financial assurance schedule and the financial assurance required for full reclamation of the first increment in the schedule shall be provided.

(b) Before mining, exploration or reclamation operations on succeeding increments are initiated and conducted within the permit area, the permittee shall file with the director additional financial assurance to cover such increments in accordance with 19.10.12 NMAC.

(c) The permittee or applicant shall identify the initial and successive areas or increments on a map submitted with the permit application and shall specify the financial assurance amount to be provided for each area or increment.

(d) Identified increments shall be of sufficient size and configuration to provide for efficient reclamation operations should reclamation by the director become necessary pursuant to 19.10.12.1211 NMAC.

B. A permittee or applicant shall not disturb any area prior to acceptance by the director of the required financial assurance.

[7-12-94, 2-15-96; 19.10.12.1202 NMAC - Rn, 19 NMAC 10.2.12.1202, 05-15-2001]

#### 19.10.12.1203 FORM OF FINANCIAL ASSURANCE:

A. The director may accept the following forms of financial assurance:

- (1) cash;
- (2) trusts;
- (3) surety bonds;
- (4) letters of credit;
- (5) collateral bonds;
- (6) third party guarantees;
- (7) insurance; or
- (8) a combination of any of the above.

B. The director shall not accept any type or variety of self-guarantee or self-insurance for the required financial assurance.

[7-12-94, 2-15-96; 19.10.12.1203 NMAC - Rn, 19 NMAC 10.2.12.1203, 05-15-2001; A, 10-15-03]

19.10.12.1204 PERIOD OF LIABILITY:

A. The permittee shall maintain the financial assurance in effect, except as reduced pursuant to 19.10.12 NMAC, until such time as the director releases the financial assurance pursuant to 19.10.12.1210 NMAC. For areas to be revegetated, the director shall retain the amount of financial assurance necessary for a third party to re-establish vegetation for a period of 12 years after the last year of augmented seeding, fertilizing, or irrigation, unless a post-mining land use is approved by the director that does not require revegetation. Interseeding to establish diversity shall not be considered augmented seeding. Interseeding may not be performed within the last three years of the liability period.

B. For new mining operations only, no part of the financial assurance necessary for a third party to re-establish vegetation shall be released so long as the lands to which the release would be applicable are contributing suspended solids above background levels to streamflow of intermittent or perennial streams.

C. Isolated and clearly defined portions of the disturbed area not qualifying for financial assurance release may be separated from the original area and assured separately with the approval of the director. Access to the separated areas for remedial work may be included in the area under extended liability if deemed necessary by the director.

D. For exploration permits, financial assurance may be released after the permittee has submitted a termination report that meets the requirements of 19.10.4.407 NMAC and the director has determined, after inspection, that the reclamation requirements of 19.10.3 NMAC and 19.10.4 NMAC, as applicable, and the permit have been satisfied.

[7-12-94, 2-15-96; 19.10.12.1204 NMAC - Rn, 19 NMAC 10.2.12.1204, 05-15-2001; A, 04-30-09]

19.10.12.1205 DETERMINATION OF FINANCIAL ASSURANCE AMOUNT:

A. The amount of the financial assurance shall be determined by the director and take into account, but not be limited to, the estimated cost submitted by the permittee or the applicant. This estimated cost should include at a minimum the following costs: contract administration; mobilization; demobilization; engineering redesign; profit and overhead; procurement costs; reclamation or closeout plan management; and contingencies. Credit for salvage value of building materials or abandoned equipment and supplies shall not be allowed. Equipment normally available to a third party contractor should be used in determining the estimated cost;

(1) reflect the probable difficulty of reclamation or closure, giving consideration to such factors as topography, geology, hydrology, revegetation potential and approved post-mining land use;

(2) depend on the requirements of the approved permit;

(3) not duplicate any federal or state financial requirements for the same area so long as those entities' financial assurance requirements are at least as stringent as this part; and

(4) not be less comprehensive than the federal requirements, if any.

B. The amount of the financial assurance shall be sufficient to assure the completion of the reclamation plan or closeout plan if the work has to be performed by the state of New Mexico or a contractor with the state in the event of forfeiture.

C. The director may accept a net present value calculation for the amount of financial assurance required pursuant to Subsections A and B of 19.10.12.1205 NMAC, if the scheduled completion date for the reclamation or closeout plan exceeds five years following closure, not including the 12 year period described in Subsection A of 19.10.12.1204 NMAC for re-establishing vegetation, and if the financial assurance will be provided in the form of cash or other allowable form of financial assurance to be converted into cash upon forfeiture. The director shall require an appropriate adjustment be made to the net present value calculation to exclude anticipated delays for converting financial assurance into cash.

(1) The net present value calculation shall be based upon projected inflation rates and projected rates of return over the term of the reclamation plan and shall be based upon publicly available

indices and data. The director shall determine whether a proposed net present value calculation is acceptable and complies with the requirements of Subsection B of 19.10.12.1205 NMAC. The director shall issue guidance on acceptable methods for calculating net present value within one year from the effective date of this rule.

(2) The director shall review any approved net present value calculation as needed, but at least once every five years, to take into consideration additional information regarding rates of return and inflation rates.

D. The amount of financial assurance for a minimal impact existing and new mining operations shall be as provided for in Subsection F of 19.10.3.303 NMAC and Subsection E of 19.10.3.304 NMAC, respectively.  
[7-12-94, 2-15-96; 19.10.12.1205 NMAC - Rn, 19 NMAC 10.2.12.1205, 05-15-2001; A, 10-15-03; A, 12-30-03]

#### 19.10.12.1206 ADJUSTMENT OF AMOUNT:

A. The amount of the financial assurance required and the terms of its acceptance shall be adjusted by the director from time-to-time as the area requiring financial assurance is increased or decreased or when the future reclamation or closeout costs change. The director may specify periodic times or set a schedule for re-evaluating and adjusting the financial assurance amount.

B. The director shall:

(1) notify the permittee, the surety, any person with a property interest in collateral who has requested notification under Subsection C, Paragraph 4 of 19.10.12.1208 NMAC and any person who has requested notification of actions concerning the mining operation, of any proposed adjustment to the financial assurance amount; and

(2) provide the permittee an opportunity for an informal conference on the adjustment.

C. Permittee may request reduction of the amount of the financial assurance upon submission of evidence to the director demonstrating that the permittee's methods of operation or other circumstances reduce the estimated cost for the state of New Mexico or its contractor to reclaim or complete the closeout plan for the area. Adjustments which involve undisturbed land or revision of the cost estimate for reclamation or closeout plan completion are not considered financial assurance release subject to procedures of 19.10.12.1210 NMAC.

D. In the event that the approved permit is revised or modified, the director shall review the financial assurance for adequacy, and if necessary, shall require adjustment of the financial assurance to conform to the permit as revised or modified.

[7-12-94, 2-15-96; 19.10.12.1206 NMAC - Rn, 19 NMAC 10.2.12.1206, 05-15-2001; A, 12-30-03]

#### 19.10.12.1207 GENERAL TERMS AND CONDITIONS OF FINANCIAL ASSURANCE:

A. The financial assurance shall be in an amount determined by the director as provided in 19.10.12.1205 NMAC.

B. The financial assurance shall be payable to the state of New Mexico.

C. The financial assurance shall be conditioned upon performance of all the requirements of the act, 19.10 NMAC, and the approved permit, including completion of the reclamation or closeout plan.

D. The duration of the financial assurance shall be for the time period provided in 19.10.12.1204 NMAC.

E. Failure of Financial Providers

(1) The financial assurance shall provide a mechanism for a bank or surety company or guarantor to give prompt notice to the director by certified mail and the permittee of any administrative or judicial action filed or initiated alleging the insolvency or bankruptcy of the surety company, the bank, or the permittee, or alleging any violations which would result in suspension or revocation of the surety or bank charter or license to do business.

(2) Upon the incapacity of a bank or surety company or guarantor by reason of bankruptcy, insolvency, suspension or revocation of charter or license or for any other reason, the permittee shall be

deemed to be without financial assurance coverage and shall promptly notify the director in writing. Upon notification, the director shall specify to the permittee in writing a reasonable period, not to exceed 90 days, to replace the financial assurance coverage. If adequate financial assurance is not provided by the end of the period allowed, the permittee shall cease mining and shall immediately begin to conduct reclamation or closeout measures in accordance with the reclamation or closeout plan. The director may, for good cause shown, grant up to two 30-day extensions. Mining operations shall not resume until the director has determined that an acceptable replacement financial assurance has been provided. [7-12-94, 2-15-96; 19.10.12.1207 NMAC - Rn, 19 NMAC 10.2.12.1207, 05-15-2001]

#### 19.10.12.1208 FINANCIAL ASSURANCE MECHANISMS:

##### A. Surety Bonds

(1) A surety bond shall be executed by the applicant or the permittee and a corporate surety licensed to do business in the state of New Mexico.

(2) Surety bonds shall be noncancellable during their terms, except that surety bond coverage for lands not disturbed may be cancelled with the prior written consent of the director. The director shall advise the surety, within 30 days after receipt of a notice to cancel bond, whether the bond may be cancelled on an undisturbed area.

(3) Surety bond terms shall be established for a minimum of five years. One hundred and twenty (120) days prior to the expiration of the term, the operator must provide the director with evidence that the current surety bond will be continued, another surety company is to provide a financial assurance, or another form of financial assurance will replace the surety bond. Upon receiving notification, the director shall respond to the permittee within 30 days, in writing, indicating whether or not the proposed form and amount of financial assurance will be acceptable. If adequate financial assurance is not provided 30 days prior to the expiration of the term of the original surety bond, the permittee shall cease operations and shall forfeit the existing surety bond. Mining operations shall not resume until the director has determined that an acceptable replacement financial assurance has been provided. If an acceptable financial assurance is provided within a time frame specified by the director, not to exceed 180 days, the forfeited funds, less any costs associated with the forfeiture, will be refunded to the surety company. If adequate financial assurance is not provided within the specified time frame, the director will authorize reclamation of the mining operation using the forfeited funds.

##### B. Letters of Credit

(1) The letter of credit must be issued by a bank organized or authorized to do business in the United States. The director may require an independent rating of the proposed bank and the cost of any such rating shall be paid by the applicant or permittee.

(2) Letters of credit shall be irrevocable during their terms. A letter of credit used as security in areas requiring continuous financial assurance coverage shall be forfeited and shall be collected by the state of New Mexico if not replaced by other suitable financial assurance or letter of credit at least 30 days before its expiration date.

(3) Mining operations shall not resume until the director has determined that an acceptable replacement financial assurance has been provided. If an acceptable financial assurance is provided within a time frame specified by the director, not to exceed 180 days, the payment amount, less any costs associated with the demand for payment, will be refunded to the bank. If financial assurance is not provided within the specified time frame, the director will authorize reclamation of the mining operation using the payment from the letter of credit.

(4) The letter of credit shall be payable to the state of New Mexico upon demand, in part or in full, upon receipt from the director of a notice of forfeiture issued in accordance with 19.10.12.1211 NMAC.

##### C. Collateral Bonds

###### (1) Valuation of Collateral

(a) If the nature of the collateral proposed to be given as security for financial assurance is subject to fluctuations in value over time, the director shall require that such collateral have a

fair market value at the time of permit approval in excess of the financial assurance amount by a reasonable margin. The amount of such margin shall reflect changes in value anticipated over a period of five years, including depreciation, appreciation, marketability and market fluctuation. In any event, the director shall require a margin for legal fees and costs of disposition of the collateral in the event of forfeiture.

(b) The annual report filed by the permittee must indicate the current market value of any collateral accepted by the director pursuant to this part.

(c) The financial assurance value of collateral may be evaluated at any time, but it shall be evaluated as part of permit renewal and, as necessary, its amount increased or decreased. In no case shall the value attributed to the collateral exceed its market value.

(2) Collateral bonds, except for cash accounts and real property, shall be subject to the following conditions:

(a) the director must have custody of collateral deposited by the applicant or permittee until authorized for release or replacement as provided in this part;

(b) the director shall value collateral at its current market value, not at face value;

(c) the director shall not accept as collateral shares of stock issued by the following: applicant or permittee; an entity that owns or controls the applicant or permittee; or an entity owned or controlled by the applicant or permittee;

(d) the director shall require that certificates of deposit be made payable to or assigned to the state of New Mexico, both in writing and upon the records of the bank issuing the certificates; if assigned, the director shall require the banks issuing these certificates to waive all rights of setoff or liens against those certificates prior to the director's acceptance;

(e) the director shall not accept an individual certificate of deposit in an amount in excess of one hundred thousand dollars (\$100,000) or the maximum insurable amount as determined by the federal deposit insurance corporation or the federal savings and loan insurance corporation.

(3) Real property provided as a collateral bond shall meet the following conditions:

(a) the real property must be located in the state of New Mexico. The real property cannot be within the permit or affected area of a mining operation;

(b) the permittee shall grant the state of New Mexico a first mortgage, first deed of trust, or perfected first-lien security interest in real property with a right to sell in accordance with state law or otherwise dispose of the property in the event of forfeiture under 19.10.12.1211 NMAC;

(c) for the director to evaluate the adequacy of the real property, the permittee must submit the following information for the real property, unless the director, for good cause, waives any of the requirements:

(i) a description of the property, which shall include a site improvement survey plat to verify legal descriptions of the property and to identify the existence of recorded easements;

(ii) the fair market value as determined by a current appraisal conducted by an independent qualified appraiser, previously approved by the director;

(iii) proof of ownership and title to the real property;

(iv) a current title binder which provides evidence of clear title containing no exceptions, or containing only exceptions acceptable to the director; and

(v) phase I environmental assessment.

(d) in the event the permittee pledges water rights, the permittee shall provide such additional information as may be required by the director to meet any additional conditions prescribed by him for accepting water rights as collateral.

(4) Persons with an interest in collateral provided as financial assurance who desire notification of actions affecting the collateral shall request the notification in writing to the director at the time collateral is offered.

D. Cash accounts shall be subject to the following conditions.

(1) The director may authorize the applicant or permittee to meet its financial assurance obligations through the establishment of a cash account in one or more federally-insured or equivalently protected accounts made payable upon demand to, or deposited directly with, the state of New Mexico.

(2) Any interest paid on a cash account must be retained in the account and applied to the account unless the director has approved the payment of interest to the permittee.

(3) Certificates of deposit may be substituted for a cash account with the approval of the director.

(4) The director shall not accept an individual cash account in an amount in excess of one hundred thousand dollars (\$100,000) or the maximum insurable amount as determined by the federal deposit insurance corporation or the federal savings and loan insurance corporation, unless the cash account has been deposited with the state of New Mexico.

E. Trusts shall be subject to the following conditions.

(1) The director may approve the use of a trust to hold and manage funds for the purpose of implementing reclamation as prescribed in the closeout plan. The trustee must be an entity which has the authority to act as a trustee and whose trust operations are regulated and examined by a federal or state agency and which has been approved by the director. The director must be notified of any change of trustee and any successor trustees must be approved by the director.

(2) The trust fund is also subject to the following conditions:

(a) the initial payment into the trust must be made by the date established by the director;

(b) the trust shall be funded in accordance with the terms of the permit;

(c) investments of the trust shall be reviewed and approved by the director and may include fixed income investments such as U.S. treasury obligations, state issued securities, time deposits and other investments of similar risk as approved by the director;

(d) income accrued on trust funds shall be retained in the trust, except as otherwise agreed by the director under the terms of an agreement governing the trust;

(e) the trustee may be compensated under terms defined by the director, upon approval of the director;

(f) the trust may be terminated by the permittee only if the permittee substitutes, with the approval of the director, alternate financial assurance as specified in this section or the permittee has completed reclamation in accordance with Subsection E of 19.10.12.1210 NMAC;

(g) a copy of the trust agreement, as well as quarterly and annual reports of the trustee on the trust fund balance shall be provided to the director upon request;

(h) any disbursement of funds from the trust shall be approved by the director in writing.

F. Insurance

(1) The insurer must be authorized to transact the business of insurance in the state of New Mexico and a licensed carrier or a registered carrier of surplus lines of insurance or reinsurance and authorized to transact business of insurance in the state of New Mexico, and have an AM BEST rating of not less than A- or the equivalent rating of other recognized rating companies.

(2) The insurance policy shall be issued for the amount equal to the closeout plan cost estimate as approved by the director or for a lesser amount if used in conjunction with other forms of financial assurance and approved by the director.

(3) The insurance policy shall guarantee that funds will be available for reclamation in accordance with the closeout plan and that the insurer will be responsible for paying out funds, up to an amount equal to the face amount of the policy, upon direction of the director. Actual payments by the insurer will not change the face amount, although the insurer's future liability may be reduced by the amount of the payments, during the policy period.

(4) The permittee must maintain the policy in full force and effect until the director approves termination or replacement of insurance with another form of financial assurance acceptable to the director.

G. Third party guarantee

(1) A third party guarantee is a written agreement from a guarantor, which provides that if the permittee fails to complete the performance requirements of the permit, including closure and reclamation, the guarantor shall do so or, upon forfeiture in accordance with 19.10.12.1211 NMAC, shall fund such account(s) as the director may instruct in the full amount of that portion of the financial assurance covered by the third party guarantee.

(a) A third party guarantee may not exceed seventy-five percent of the total amount of the financial assurance for a permit established pursuant to 19.10.1205 NMAC. Any permittee with a third party guarantee in place at the effective date of this subparagraph shall meet the limitation within one year after the effective date of this subparagraph.

(b) A third party guarantee may not include any type of self-guarantee or self-insurance. The director may investigate to determine whether a sham relationship exists between the guarantor and the permittee. The director may reject a third party guarantee as a form of self-guarantee if the director concludes that substantial evidence supports a finding that either the guarantor or the permittee exercises dominion and control over the other so pervasive as to render the one a mere instrumentality of the other.

(2) The permittee or applicant shall submit financial information as requested by the director unless doing so would place guarantor in violation of an applicable legal requirement.

(3) The third party guarantee shall be signed by an authorized representative, and legal counsel of the guarantor shall certify that the guarantor can legally engage in the guarantee and shall certify the amounts and names of beneficiaries of all other guarantees for which the guarantor is obligated.

(4) If the guarantor is a corporation, the authorization documentation will include a board of directors' resolution or shareholder's vote or similar verification and proof that the corporation can validly execute a guarantee under the laws of the state or country of its incorporation, and its bylaws and articles of incorporation.

(5) If the guarantor is a partnership, joint venture, syndicate, or other business entity, each party or an authorized representative for the party with the beneficial interest, direct or indirect, shall sign the agreement.

(6) The guarantor's financial statements shall be audited by an independent certified public accountant and the accountant's certification provided to the director. All costs and fees for such audit and certification shall be paid by the applicant or permittee. If the accountant gives an adverse opinion of the financial statements, the guarantor cannot qualify for the third party guarantee. The permittee shall also pay for any evaluation and analysis by an independent reviewer selected by the director to evaluate and analyze for the director any information regarding the guarantor provided to the director or requested by the director to evaluate the guarantor's financial ability to provide a guarantee.

(7) The guarantor as well as its successors and assignees agree to remain bound jointly and severally liable for all litigation costs incurred in any successful effort to enforce the third party guarantee against the guarantor.

(8) The guarantor must demonstrate financial soundness by meeting either alternative I or alternative II soundness tests.

(a) Alternative I financial soundness test:

(i) guarantor has a tangible net worth of at least ten million dollars (\$10,000,000);

(ii) guarantor's tangible net worth and working capital are each equal to or greater than six times the sum of the proposed financial assurance and all other guarantees for environmental permits issued in the U.S. for which the guarantor is obligated;

(iii) guarantor's assets located in the United States amount to at least ninety percent of its total assets or its total assets in the United States are at least six times the sum of the proposed financial assurance and all other guarantees for environmental permits issued in the U.S. for which the guarantor is obligated; and

(iv) guarantor meets at least two of the following three financial ratios: the ratio of total liabilities to net worth is less than 2:1; the ratio of the sum of net income plus depreciation, depletion, and amortization to total liabilities is greater than 0.1:1; the ratio of current assets to current liabilities is greater than 1.5:1.

(b) Alternative II financial soundness test:

(i) guarantor's most recently issued senior credit obligation are rated "BBB" or higher by standard and poor's corporation, or "Baa" or higher by moody's investors service, inc.;

(ii) the guarantor has a tangible net worth of at least ten million dollars (\$10,000,000) and is greater than six times the sum of the proposed financial assurance and all other guarantees for environmental permits issued in the U.S. for which the guarantor is obligated; and

(iii) guarantor's assets located in the United States amount to at least ninety percent of its total assets or its total assets in the United States are at least six times the sum of the proposed financial assurance and all other guarantees for environmental permits issued in the U.S. for which the guarantor is obligated.

(9) The director may require monitoring of the guarantor's financial condition by a contractor with the state during the time that a third party guarantee is used for financial assurance. The costs of such monitoring shall be paid by the permittee. The frequency of such monitoring shall be determined by the director.

(10) At any time that the guarantor's financial condition is such that the guarantor no longer qualifies pursuant to this part, the permittee shall be deemed without financial assurance coverage. The director shall specify to the permittee in writing a reasonable period, not to exceed 90 days, to replace the financial assurance coverage. If adequate financial assurance is not provided by the end of the period allowed, the permittee shall cease mining and shall immediately begin to conduct reclamation or closeout measures in accordance with the reclamation or closeout plan. The director may, for good cause shown, grant up to two 30-day extensions. Mining operations shall not resume until the director has determined that an acceptable replacement financial assurance has been provided.

[7-12-94, 2-15-96, 12-14-96, 6-30-98, 12-29-2000; 19.10.12.1208 NMAC - Rn, 19 NMAC 10.2.12.1208, 05-15-2001; A, 10-15-03; A, 12-30-03]

#### 19.10.12.1209 REPLACEMENT OF FINANCIAL ASSURANCE:

A. The director may allow a permittee to replace existing financial assurance with other approved financial assurance mechanisms that provide equivalent coverage.

B. The director shall not release existing financial assurance until the permittee has submitted, and the director has approved, acceptable replacement financial assurance. Replacement of financial assurance pursuant to 19.10.12.1209 NMAC shall not constitute a release of the financial assurance under 19.10.12.1210 NMAC.

[7-12-94, 2-15-96; 19.10.12.1209 NMAC - Rn, 19 NMAC 10.2.12.1209, 05-15-2001]

#### 19.10.12.1210 RELEASE OF FINANCIAL ASSURANCE:

A. Release Application

(1) The permittee may file an application with the director for the release of all or part of the financial assurance. The permittee may file only one release application per year for each permit.

(2) The application shall describe the reclamation or closeout measures completed and shall contain an estimate of the cost of reclamation that has not been completed.

(3) At the time the release application is filed with the director, the permittee shall submit proof that the notice of application has been provided in accordance with 19.10.9.902 NMAC and 19.10.9.903 NMAC. The notice shall be considered part of any release application and shall contain: the permittee's name; permit number and approval date; notification of the precise location of the real property affected; the number of acres; the type and amount of the financial assurance filed and the portion sought to be released; the type and appropriate dates of reclamation or closeout plan performed; a description of the results achieved as they relate to the permittee's approved reclamation or closeout plan;

and the name and address of the director, to whom written comments, objections, or requests for public hearings on the specific financial assurance release may be submitted pursuant to Subsection C of 19.10.12.1210 NMAC.

(4) The director shall promptly provide notice of receipt of the application for release of all or part of the financial assurance to the environment department, the office of the state engineer, the department of game and fish, the forestry division, the state historic preservation division, other agencies he deems appropriate, and if the operation is on state or federal land, to the appropriate state or federal land management agency.

B. Inspection by director. Upon receipt of the complete financial assurance release application, the director shall, within 30 days, or as soon thereafter as weather conditions permit, conduct an inspection and evaluation of the reclamation or closeout measures completed. The evaluation shall consider, among other factors, the degree of difficulty to complete any remaining reclamation. The surface owner or lessor of the real property, other state and federal agencies as listed in Subsection A, Paragraph 4 of 19.10.12.1210 NMAC above, and any other persons who have requested advance notice of the inspection shall be given notice of such inspection and may be present at the release inspection as may any other interested members of the public. The director may arrange with the permittee to allow access to the permit area, upon request by any person with an interest in the financial assurance release, for the purpose of gathering information relevant to the proceeding.

C. Public Hearing

(1) Within 30 days from the date of the inspection, a person with an interest that is or will be adversely affected by the proposed financial assurance release may file written objections to the proposed release with the director. If written objections are filed and a hearing is requested, the director shall inform all persons who have requested notice of hearings and persons who have filed written objections in regard to the application of the time and place of the hearing at least 30 days in advance of the public hearing. The hearing shall be held in the locality of the permit area proposed for release.

(2) The date, time and location of the public hearing shall be advertised by the director in a newspaper of general circulation in the locality of the permit area once a week for two consecutive weeks. All persons who have submitted a written request in advance to the director to receive notices of hearings shall be provided notice at least 30 days prior to the hearing. The hearing procedures of 19.10.9.905 NMAC shall be followed.

D. Within 45 days from the inspection, if no public hearing is held pursuant to Subsection C of 19.10.12.1210 NMAC, or, within 45 days after a public hearing has been held pursuant to Subsection C of 19.10.12.1210 NMAC, the director shall notify in writing the permittee, the surety or other persons with an interest in the collateral who have requested notification under 19.10.12.1208 NMAC and the persons who either filed objections in writing or participants in the hearing proceedings who supplied their addresses to the director, if any, of the decision whether to release all or part of the financial assurance.

E. The director may release all or part of the financial assurance for the entire permit area or incremental area if the director is satisfied that the reclamation or closeout plan or a phase of the reclamation or closeout plan covered by the financial assurance, or portion thereof, has been accomplished in accordance with the act, 19.10 NMAC, and the permit.

F. If the director denies the release application or portion thereof, the director shall notify the permittee, the surety, and any person with an interest in collateral as provided for in Subsection C, Paragraph 4 of 19.10.12.1208 NMAC, in writing, stating the reasons for disapproval and recommending corrective actions necessary to secure the release.

G. The director may approve an application for release of financial assurance for a minimal impact operation without public notice or hearing.

[7-12-94, 2-15-96; 19.10.12.1210 NMAC - Rn, 19 NMAC 10.2.12.1210, 05-15-2001; A, 12-30-03]

19.10.12.1211 FORFEITURE OF FINANCIAL ASSURANCE:

A. If a permittee refuses or is unable to conduct or complete the reclamation or closeout plan, if the terms of the permit are not met, or if the permittee defaults on the conditions under which the financial assurance was accepted, the director shall take the following action to forfeit all or part of the financial assurance for the permit area or an increment of the permit area:

(1) Send written notification by certified mail, return receipt requested, to the permittee and the surety, if any, informing them of the determination to forfeit all or part of the financial assurance, including the reasons for the forfeiture and the amount to be forfeited. The amount shall be based on the estimated total cost of achieving reclamation or closeout.

(2) Advise the permittee and surety, if applicable, of the conditions under which forfeiture may be avoided. Such conditions may include, but are not limited to:

(a) An agreement by the permittee or another party to perform reclamation or closeout operations in accordance with the conditions of the permit, the reclamation or closeout plan, the act and 19.10 NMAC and a demonstration that such a party has the ability to satisfy the conditions; or

(b) The director may allow a surety to complete the reclamation or closeout plan, or the portion of the reclamation or closeout plan applicable to the financial assurance phase or increment, if the surety can demonstrate an ability to complete the reclamation or closeout plan in accordance with the approved reclamation or closeout plan. Except where the director approves partial release authorized under 19.10.12.1210 NMAC, no surety liability shall be released until successful completion of all reclamation or closeout under the terms of the permit, including applicable liability periods of 19.10.12.1204 NMAC.

B. In the event forfeiture of the financial assurance is required by this part, the director shall:

(1) proceed to collect the forfeited amount as provided by applicable laws if actions to avoid forfeiture have not been taken; and

(2) use funds collected from the forfeiture to complete the reclamation or closeout, or portion thereof, on the disturbed area or increment to which financial assurance coverage applies.

C. Upon default of the conditions under which the financial assurance was accepted, the director may cause the forfeiture of any and all financial assurance to complete reclamation or closeout for which the financial assurance was provided. Unless specifically limited, as provided in 19.10.12.1202 NMAC, financial assurance liability shall extend to the entire disturbed area under conditions of forfeiture.

D. In the event the estimated amount forfeited is insufficient to pay for the full cost of reclamation or closeout, the permittee shall be liable for remaining costs. The director may complete, or authorize completion of, reclamation or closeout of the area in accordance with the permit terms and may recover from the permittee all reasonably incurred costs of reclamation or closeout and forfeiture in excess of the amount forfeited.

E. In the event the amount of financial assurance forfeited was more than the amount necessary to complete reclamation or closeout and all costs of forfeiture, the excess funds shall be returned by the director to the party from whom they were collected.

[7-12-94, 2-15-96; 19.10.12.1211 NMAC - Rn, 19 NMAC 10.2.12.1211, 05-15-2001]

History of 19.10.12 NMAC:

Pre-NMAC History: Material in this part was derived from that previously filed with the commission of public records - state records center and archives as:

Rule 12, Financial Assurance Requirements, filed 07-12-94.

History of Repealed Material: [Reserved]

Other History:

Rule 12, Financial Assurance Requirements, filed 07-12-94, renumbered and reformatted as Subpart 12 of 19 NMAC 10.2, New Mexico Mining Act Implementation, filed 01-31-96.

19 NMAC 10.2, Subpart 12, Financial Assurance Requirements, filed 01-31-96 was renumbered and reformatted to 19.10.12 NMAC, effective 05-15-2001.

**Title 2. Agriculture**  
**Chapter 1 - Agricultural Code**  
**Article 20 - Feeding Operations and Animal Unit Capacity**  
**Oklahoma Concentrated Animal Feeding Operations Act**

**§ 20-40. Short Title - Purpose**

A. Sections 28 through 50 of this act shall be known and may be cited as the "Oklahoma Concentrated Animal Feeding Operations Act."

B. The purpose of the Oklahoma Concentrated Animal Feeding Operations Act is to provide for environmentally responsible construction and expansion of animal feeding operations and to protect the safety, welfare and quality of life of persons who live in the vicinity of an animal feeding operation.

**§ 20-41. Definitions**

A. Concentrated animal feeding operations are point sources subject to the license program established pursuant to the provisions of the Oklahoma Concentrated Animal Feeding Operations Act.

B. As used in the Oklahoma Concentrated Animal Feeding Operations Act:

1. **"Affected property owner"** means a surface landowner within one (1) mile of the designated perimeter of an animal feeding operation;

2. **"Animal feeding operation"** means a lot or facility where the following conditions are met:

a. animals have been, are, or will be stabled or confined and fed or maintained for a total of ninety (90) consecutive days or more in any twelve-month period, and

b. crops, vegetation, forage growth or post-harvest residues are not sustained in the normal growing season over any portion of the lot or facility.

The term "animal feeding operation" shall not include a racetrack licensed by the Oklahoma Horse Racing Commission to hold pari-mutuel race meetings pursuant to the Oklahoma Horse Racing Act if the facility discharges to a publicly owned treatment works, or an aquatic animal production facility;

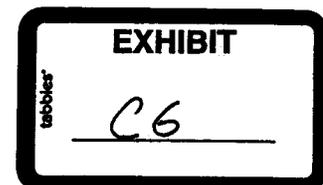
3. **"Animal unit"** means a unit of measurement for any animal feeding operation calculated by adding the following numbers: The number of slaughter and feeder cattle multiplied by one (1), plus the number of mature dairy cattle multiplied by one and four-tenths (1.4), plus the number of sheep multiplied by one-tenth (0.1), plus the number of horses multiplied by two (2);

4. **"Animal waste"** means animal excrement, animal carcasses, feed wastes, process wastewaters or any other waste associated with the confinement of animals from an animal feeding operation;

5. **"Animal Waste Management Plan" or "Nutrient Management Plan"** means a written plan that includes a combination of conservation and management practices designed to protect the natural resources of the state prepared by an owner or operator of an animal feeding operation as required by the Department pursuant to the provisions of Section 36 of this act;

6. **"Animal waste management system"** means a combination of structures and nonstructural practices serving an animal feeding operation that provides for the collection, treatment, disposal, distribution, storage and land application of animal waste;

7. **"Artificially constructed"** means constructed by humans;



8. **"Best Management Practices"** means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the state as established by the Oklahoma Department of Agriculture, Food, and Forestry pursuant to Section 36 of this act;

9. **"Board"** means the State Board of Agriculture;

10. **"Common ownership"** includes but is not limited to any corporation, partnership or individual where the same owner has power or authority to manage, direct, restrict, regulate or oversee the operation or has financial control of the facility;

11. **"Concentrated animal feeding operation"** means:

a. an animal feeding operation which meets the following criteria:

(1) more than the number of animals specified in any of the following categories are confined:

- (a) 1,000 slaughter and feeder cattle,
- (b) 700 mature dairy cattle, whether milk or dry cows,
- (c) 500 horses,
- (d) 10,000 sheep or lambs,
- (e) 55,000 turkeys,
- (f) 100,000 laying hens or broilers, if the facility has continuous overflow watering,
- (g) 30,000 laying hens or broilers, if the facility has a liquid manure system,
- (h) 5,000 ducks, or
- (i) 1,000 animal units, and

(2) pollutants are discharged into waters of the state.

Provided, no animal feeding operation pursuant to this subparagraph shall be construed to be a concentrated animal feeding operation if the animal feeding operation discharges only in the event of a twenty-five-year, twenty-four-hour storm event, or

b. an animal feeding operation which meets the following criteria:

(1) more than the number of animals specified in any of the following categories are confined:

- (a) 300 slaughter or feeder cattle,
- (b) 200 mature dairy cattle, whether milk or dry cows,
- (c) 150 horses,
- (d) 3,000 sheep or lambs,
- (e) 16,500 turkeys,
- (f) 30,000 laying hens or broilers, if the facility has continuous overflow watering,
- (g) 9,000 laying hens or broilers, if the facility has a liquid manure system,
- (h) 1,500 ducks, or
- (i) 300 animal units, and

(2) either one of the following conditions are met:

- (a) pollutants are discharged into waters of the state through an artificially constructed ditch, flushing system or other similar artificially constructed device, or
- (b) pollutants are discharged directly into navigable waters which originate outside of and pass over, across or through the facility or otherwise come into direct contact with the animals confined in the operation.

Provided, however, that no animal feeding operation pursuant to this subparagraph is a concentrated animal feeding operation if the animal feeding operation discharges only in the event of a twenty-five-year, twenty-four-hour storm event, or

c. the Board determines that the operation is a significant contributor of pollution to waters of the state pursuant to Section 32 of this act;

12. "**Department**" means the Oklahoma Department of Agriculture, Food, and Forestry;

13. "**Designated perimeter**" means the perimeter of any structure or combination of structures utilized to control animal waste until it can be disposed of in an authorized manner. The structures shall include but not be limited to pits, burial sites, barns or roof-covered structures housing animals, composters, waste storage sites, or retention structures or appurtenances or additions thereto;

14. "**Facility**" means any place, site or location or part thereof where animals are kept, handled, housed, or otherwise maintained and processed and includes but is not limited to buildings, lots, pens, and animal waste management systems;

15. "**Interested party**" means an affected property owner who validly requests an individual hearing, in accordance with the provisions of the Oklahoma Concentrated Animal Feeding Operations Act and rules promulgated pursuant thereto regarding the issuance of an animal feeding operation license and asserts rights to relief in respect to or arising out of the same license;

16. "**Land application**" means the spreading on, or incorporation of, animal waste into the soil mantle primarily for beneficial purposes;

17. "**Liquid animal waste management system**" means any animal waste management system which uses water as the primary carrier of the waste into a primary retention structure;

18. "**Nutrient-limited watershed**" means a watershed of a water body which is designated as "nutrient-limited" in the most recent Oklahoma Water Quality Standards;

19. "**Nutrient-vulnerable groundwater**" means groundwater which is designated "nutrient-vulnerable" in the most recent Oklahoma Water Quality Standards;

20. "**Occupied residence**" means a habitable structure designed and constructed for full-time occupancy in all weather conditions which:

a. is not readily mobile,

b. is connected to a public or permanent source of electricity and a permanent waste disposal system or public waste disposal system, and

c. is occupied as a residence;

21. "**Pollution Prevention Plan**" means a written plan to control the discharge of pollutants which has been prepared in accordance with industry-acceptable engineering and management practices by the owner or operator of an animal feeding operation as required pursuant to Section 35 of this act;

22. "**Process wastewater**" means any water utilized in the facility that comes into contact with any manure, litter, bedding, raw, intermediate, or final material or product used in or resulting from the production of animals and any products directly or indirectly used in the operation of a facility, such as spillage or overflow from animal watering systems; washing, cleaning, or flushing pens, barns, manure pits, direct contact, swimming, washing or spray cooling of animals; and dust control and any precipitation which comes into contact with animals or animal waste;

23. **"Retention structures"** includes but is not limited to all collection ditches, conduits and swales for the collection of runoff water and process wastewater, and basins, ponds and lagoons or other structures used to store animal wastes;

24. **"Waste facility"** means any structure or combination of structures utilized to control animal waste until it can be disposed of in an authorized manner. The structures shall include but not be limited to pits, burial sites, barns or roof-covered structures housing animals, composters, waste storage sites, or retention structures or appurtenances or additions thereto; and

25. **"Waters of the state"** means all streams, lakes, ponds, marshes, watercourses, waterways, wells, springs, irrigation systems, drainage systems, storm sewers and all other bodies or accumulations of water, surface and underground, natural or artificial, public or private, which are contained within, flow through or border upon this state or any portion thereof, and shall include under all circumstances the waters of the United States which are contained within the boundaries of, flow through or border upon this state or any portion thereof. Provided, waste treatment systems, including treatment ponds and lagoons, designed to meet federal and state requirements other than cooling ponds as defined in the Clean Water Act or rules promulgated pursuant thereto are not waters of the state.

#### **§20-42. Authority of State Board of Agriculture - Rules - Personnel**

The State Board of Agriculture is authorized to promulgate rules for the administration, implementation, and enforcement of the Oklahoma Concentrated Animal Feeding Operations Act. For the performance of its duties and responsibilities, the Board is authorized to employ such personnel and agents as may be required with the funds available.

#### **§ 20-43. Rule Advisory Committee**

A. The State Board of Agriculture shall appoint a rule advisory committee who, without compensation, shall act as advisors to the Board in the formulation of the rules promulgated pursuant to the Oklahoma Concentrated Animal Feeding Operations Act.

1. The committee shall consist of:
  - a. one member who shall represent the beef cattle producers,
  - b. one member who shall represent the dairy producers,
  - c. one member who shall represent the poultry producers,
  - d. one member who shall represent the field of hydrogeology,
  - e. one member who shall be a soil scientist,
  - f. one member designated by the Secretary of the Environment,
  - g. one member who shall be a professional engineer,
  - h. one member who shall represent the field of water quality science,
  - i. one member who shall represent the field of ecology, and
  - j. two members who shall represent the general public.
2. Of the initial members, four shall serve for one-year terms; four shall serve for two-year terms; and three shall serve for three-year terms. Thereafter, all members shall serve for three-year terms; provided, all members shall serve at the pleasure of the Board.
3. At the initial meeting of the rule advisory committee, the membership shall appoint a chair, vice-chair, and secretary from its membership and thereafter as determined by the committee.

B. Except for emergency rules, proposed rules shall be submitted to the rule advisory committee at the same time as the Department causes notice to be published in "The Oklahoma Register" pursuant to the Administrative Procedures Act. Comments of the rule advisory committee shall

be submitted to the members of the Board at least fifteen (15) days prior to any official action by the Board on the rules.

C. Proposed emergency rules shall be submitted by the Department to the rule advisory committee at least five (5) days prior to the rules being considered by the Board.

#### **§ 20-44. Licensure of Concentrated Animal Feeding Operations**

- A. 1. Any animal feeding operation meeting the criteria defining a concentrated animal feeding operation shall be required to obtain a license to operate pursuant to the Oklahoma Concentrated Animal Feeding Operations Act and rules promulgated pursuant thereto.
2. No animal feeding operation which voluntarily obtains a license pursuant to the Oklahoma Concentrated Animal Feeding Operations Act shall be considered to be a concentrated animal feeding operation unless the operation meets the definition of concentrated animal feeding operation.
3. Any animal feeding operation other than a concentrated animal feeding operation, regardless of the number of animals, shall only be required to be licensed pursuant to the provisions of the Oklahoma Concentrated Animal Feeding Operations Act and rules promulgated pursuant thereto if the State Board of Agriculture determines the operation to be a significant contributor of pollution to waters of the state pursuant to subsection C of this section.
- B. Two or more animal feeding operations under common ownership are considered, for the purposes of licensure, to be a single animal feeding operation if they adjoin each other or if they use a common area or system for the disposal of wastes.
- C. 1. The State Board of Agriculture may make a case-by-case designation of concentrated animal feeding operations pursuant to this section. Any animal feeding operation may be designated as a concentrated animal feeding operation if it is determined to be a significant contributor of pollution to the waters of the state. In making this designation, the Board shall consider the following factors:
- a. the size of the animal feeding operation and the amount of wastes reaching waters of the state,
  - b. the location of the animal feeding operation relative to waters of the state,
  - c. the means of conveyance of animal waste and wastewater into waters of the state,
  - d. the method of disposal for animal waste and process wastewater disposal,
  - e. the slope, vegetation, rainfall and other factors affecting the likelihood or frequency of discharge of animal wastes and process wastewaters into waters of the state, and
  - f. other such factors relative to the significance of the pollution problem sought to be regulated.
2. In no case shall an application for a license be required from an animal feeding operation pursuant to this subsection until there has been an on-site inspection of the operation and a determination by the Oklahoma Department of Agriculture, Food, and Forestry that the operation is a concentrated animal feeding operation. Should the Department determine that the operation is a concentrated animal feeding operation, the Department shall notify the operation of the determination and of an opportunity for the owner or operator of the facility to request an administrative hearing on the issue.
3. Process wastewater in the overflow may be discharged to navigable waters whenever rainfall events, either chronic or catastrophic, cause an overflow of process wastewater from a retention structure properly designed, constructed and operated to contain all process wastewaters plus the runoff from a twenty-five-year, twenty-four-hour rainfall event for the

location of the point source. There shall be no effluent limitations on discharges from a waste facility constructed, and properly maintained to contain the twenty-five-year, twenty-four-hour storm event; provided the proper design, construction, and operation of the retention structure shall include, but not be limited to, one (1) foot of free board.

D. No new concentrated animal feeding operation or expansion of a concentrated animal feeding operation requiring a license pursuant to the Oklahoma Concentrated Animal Feeding Operations Act shall be constructed or placed in operation unless final design plans, specifications and a Pollution Prevention Plan developed pursuant to Section 35 of this act have been approved by the Department.

**§ 20-45. Forms and Applications for Licenses - Availability - Contents - Renewals and Transfers - Penalties for Violations**

A. The State Board of Agriculture shall cause to be prepared and available, for any person desiring or required to apply for a license to operate a new or previously unlicensed animal feeding operation, the necessary forms and applications.

B. The application for a license to operate a new or previously unlicensed animal feeding operation shall contain, as a minimum, the following information:

1. Name and address of the owner and operator of the facility;
2. Name and address of the animal feeding operation;
3. Capacity in animal units, and number and type of animals housed or confined;
4. A diagram or map and legal description showing geographical location of the facility on which the perimeters of the facility are designated, location of waters of the state, including, but not limited to, drainage from the facility, animal waste storage facilities and land application sites owned or leased by the applicant;
5. A copy of the Pollution Prevention Plan containing an Animal Waste Management Plan, Best Management Practices, or such other plan authorized by the Oklahoma Concentrated Animal Feeding Operations Act and approved by the Department;
6. A copy of the written waiver by an adjacent property owner to the facility releasing specified setback requirements as provided by Section 44 of the Oklahoma Concentrated Animal Feeding Operations Act; and
7. Any other information deemed necessary by the Oklahoma Department of Agriculture, Food, and Forestry to administer the provisions of the Oklahoma Concentrated Animal Feeding Operations Act and rules promulgated pursuant thereto.

C. 1. An application for renewal of a license to operate an animal feeding operation shall be considered to be properly filed when the Department has received a completed renewal application and payment of fees from the applicant.

2. If the application for renewal is denied, written notification of the denial and an opportunity for an administrative hearing on the denial shall be given to the applicant by the Department. The notification shall set forth the reasons for the denial, steps necessary to meet the requirements for issuance of the renewal license and the opportunity for the applicant to request an administrative hearing.

D. For transfer of a license to a new owner or operator, the following conditions shall be met:

1. The new owner or operator shall submit to the Department a transfer application, attaching any change of conditions resulting from the transfer of ownership or operation;
2. After receipt of the information required, the Department shall review the information, and within sixty (60) days, issue approval or denial of the transfer. Transfer of a license shall be denied only if:

- a. the new owner or operator cannot comply with the requirements of transfer,
  - b. the Department finds a material or substantial change in conditions since the issuance of the original license to operate the animal feeding operation,
  - c. failure of the new owner or operator to meet any other conditions or requirements for compliance established by the Department pursuant to the Oklahoma Concentrated Animal Feeding Operations Act and rules promulgated pursuant thereto, or
  - d. the new owner or operator has failed to meet the requirements of Section 48 of the Oklahoma Concentrated Animal Feeding Operations Act; and
3. If a transfer is denied, written notification of the denial and an opportunity for an administrative hearing on the denial shall be given to the applicant for a transfer license by the Department. The notification shall set forth the reasons for the denial, steps necessary to meet the requirements for a transfer license, and the opportunity for the applicant to request an administrative hearing.
- E. Any suspension or revocation or nonrenewal of a license issued pursuant to the Oklahoma Concentrated Animal Feeding Operations Act by the Board shall be made in accordance with Section 48 of this act.
- F. In addition to other information required for issuance of a new or transfer license, an application for a new or transfer license for a concentrated animal feeding operation shall be under oath and shall contain the following information:
1. a. A statement of ownership.
    - (1) If the applicant is a firm or partnership, the name and address of each member thereof shall be included in the application.
    - (2) If the applicant is a corporation, the name and address of the corporation and the name and address of each officer and registered agent of the corporation shall be included in the application.
    - (3) If the applicant is a partnership or other legal entity, the name and address of each partner and stockholder with an ownership interest of ten percent (10%) or more shall be included in the statement.
  - b. The information contained in the statement of ownership shall be public information and shall be available upon request from the Board;
2. The name and address of the management, if the management is not the applicant and is acting as agent for the applicant;
3. a. An environmental history from the past three (3) years of any concentrated animal or swine feeding operation established and operated by the applicant or any other operation with common ownership in this state or any other state. The environmental history shall include but not be limited to all citations, administrative orders or penalties, civil injunctions or other civil actions, criminal actions, past, current and ongoing, taken by any person, agency or court relating to noncompliance with any environmental law, rule, agency order, or court action relating to the operation of an animal or swine feeding operation.
- b. A copy of all records relating to the environmental history required by this paragraph shall accompany the application.
- c. Noncompliance with a final agency order or final order or judgment of a court of record which has been set aside by a court on appeal of the final order or judgment shall not be considered a final order or judgment for the purposes of this subsection;

4. Environmental awards or citations received or pollution prevention or voluntary remediation efforts undertaken by the applicant; and
  5. Any other information or records required by the Department for purposes of implementing the Oklahoma Concentrated Animal Feeding Operations Act or rules promulgated pursuant thereto.
- G. 1. In addition to other penalties as may be imposed by law, any person who knowingly makes any false statement, representation, or certification in, omits material data from, or tampers with any application for a license, or notice relating to the determination of affected property owners, shall, upon conviction thereof, be guilty of a misdemeanor and may be subject to a fine of not more than Ten Thousand Dollars (\$10,000.00) for each such violation. In addition, the Department shall deny licensure to the applicant or may require submission of a new application.
2. The responsibility for ensuring that all affected property owners are notified pursuant to the provisions of this section shall be upon the applicant.

**§ 20-46. Notice and Hearing Requirements - Review of Application for New Operation**

- A. 1. Any person applying for a license for a new animal feeding operation shall comply with the notice and hearing requirements as specified by this section and rules promulgated by the State Board of Agriculture.
2. Notice requirements shall include notice to affected property owners by certified mail, return receipt requested pursuant to subsection C of this section and public notice pursuant to subsection D of this section.
- B. After submission of a completed application as provided by the Oklahoma Concentrated Animal Feeding Operations Act and rules promulgated pursuant thereto, the Oklahoma Department of Agriculture, Food, and Forestry shall have sixty (60) working days to review the application for a new operation for physical and technical suitability.
- C. 1. After review and after the applicant has submitted any additional required information to the Department, the Department shall require the applicant to notify all affected property owners of the proposed facility. Notice shall be sent by certified mail, return receipt requested. The notice shall identify that an application for a new animal feeding operation has been submitted to the Department, the location where the facility is to be located, that a hearing may be requested pursuant to this subsection, and the date the application will be available for public review beginning no earlier than the day following the certified mailing of all the required notices, and any other information required by the Department.
2. Each affected property owner requesting a hearing shall submit, in writing, the following information:
- a. the name and address of the interested party and proof of standing by showing that the interested party is an affected property owner,
  - b. a statement of specific allegations showing that the proposed facility operation may have a direct, substantial and immediate effect upon a legally protected interest of the interested party, and
  - c. the relief sought by the interested party.
3. If any of the affected property owners request an administrative hearing and all information listed in paragraph 2 of this subsection is found to be complete and adequate in the request for hearing, the scheduling conference for the hearing shall be held by the Department at a reasonable time within sixty (60) calendar days after the close of the public review period. Should the interested party have failed to provide any of the information listed

in paragraph 2 of this subsection, the interested party shall have thirty (30) calendar days with which to cure any deficiencies after notice by the Department of such failure and receipt thereof in writing by the interested party. All interested parties may be joined as parties to the hearing.

4. In addition to any other information deemed necessary by the Department, at the hearing the Department shall hear testimony and accept evidence pertaining to the physical and technical suitability of the proposed facility.

a. Prior to the hearing, and after a reasonable opportunity for discovery, the interested party shall identify with specificity the reasons why the applicant has failed to show that the application should be granted.

b. In a prehearing order, the Department shall identify the allegations that are relevant and applicable to the hearing.

c. At the hearing, the interested party shall be afforded a reasonable opportunity to present evidence and argument in support of the allegations identified in the prehearing order and the applicant shall be afforded a reasonable opportunity to present evidence and argument to controvert those allegations.

5. Any administrative hearing held pursuant to the provisions of this subsection shall comply with the Administrative Procedures Act and rules promulgated by the Board.

6. Establishment of property usage is the date the animal feeding operation application was made available for public review versus date of initial construction or placement of occupied residence and shall be given consideration when determining a contested matter between an applicant and an interested party on issues other than pollution of the waters of the state.

D. 1. In addition to the individual notice, the Department shall require the applicant to give public notice of the opportunity to comment on the granting of the license.

2. The public notice for a new operation shall be published as a legal notice prior to the date the application is available for public viewing, in at least one newspaper of general circulation in the county where the proposed facility is to be located.

3. The notice shall identify locations where the application shall be available for viewing. The locations shall include the office of the Department and a specific public location in the county where the proposed facility is to be located.

4. The application shall be available for public review during normal business hours. The copies of the application posted for public viewing shall be complete except for proprietary provisions otherwise protected by law and shall remain posted during normal business hours for at least twenty (20) working days after notice is published.

5. The Department, as necessary, may hold public meetings at a location convenient to the population center nearest the proposed facility to address public comments on the proposed facility.

E. Prior to the issuance of any license for an animal feeding operation, the Department shall require the applicant to submit:

1. Documentation certifying notice has been issued to all affected property owners. A map of all affected property owners and the corresponding mailing list shall be submitted with each application; and

2. Proof of publication notice of a new application for an animal feeding operation license.

#### **§ 20-47. Pollution Prevention Plan**

A. An animal feeding operation licensed pursuant to the provisions of the Oklahoma Concentrated Animal Feeding Operations Act shall develop a Pollution Prevention Plan or may

substitute equivalent measures contained in a site-specific Animal Waste Management Plan prepared pursuant to Section 36 of this act. Design and construction criteria developed by the United States Department of Agriculture Natural Resources Conservation Service, may be substituted for the documentation of design capacity and construction requirements.

B. 1. The Pollution Prevention Plan shall be signed by the owner or as otherwise authorized by the Oklahoma Department of Agriculture, Food, and Forestry and a copy shall be retained on site.

2. The animal feeding operation shall amend the Pollution Prevention Plan and obtain approval of the Department prior to any change in design, construction, operation or maintenance which has significant effect on the potential for the discharge of pollutants to the waters of the state.

C. If, after reviewing the Pollution Prevention Plan, the Department determines that the Plan does not meet one or more of the minimum requirements, the animal feeding operation shall make and implement appropriate changes to the Plan as required by the Department pursuant to the Oklahoma Concentrated Animal Feeding Operations Act and rules promulgated pursuant thereto.

D. The Pollution Prevention Plan shall provide and require presite approval by Departmental personnel prior to construction. During construction, the Department shall monitor the construction process as deemed necessary by the Department in an attempt to verify the construction of the facility is done according to plans and acceptable engineering standards to reduce or eliminate the potential of pollution.

E. In addition to other requirements specified by this section, the Pollution Prevention Plan shall include but not be limited to:

1. A description of potential sources, activities and materials which may reasonably be expected to or could potentially add pollutants to runoff from the facility;

2. A map, indicating an outline of the drainage area of the facility, and each existing structural control measure designed to reduce pollutants in wastewater and precipitation runoff in all surface waters of the state;

3. A spill contingency plan for potential pollutants;

4. All existing sampling data of groundwater, nitrate and coliform bacteria levels, soil tests from land application sites and animal waste nutrient sampling;

5. A description of management controls appropriate for the facility. The management controls shall include, but not be limited to:

a. the location and a description of existing structural and nonstructural controls,

b. documentation of retention structure capacity and the assumptions and calculations used in determining the appropriate volume capacity, and

c. a description of the design standards for the retention facility embankments;

6. A description of the design standards for any retention facilities;

7. Training requirements for employees;

8. Documentation relating to any hydrologic connection between the contained wastewater and waters of the state which complies with Section 37 of this act; and

9. Requirements that all irrigation systems into which any animal waste will be injected shall be equipped as specified by Section 38 of this act.

F. The following records shall be maintained at the site as long as the facility is in operation:

1. Water level in the retention structure;

2. Daily precipitation records from on-site rain gauge;

3. Incident reports such as spills and other discharges;
4. Inspection and maintenance reports;
5. Findings from annual inspections of the entire facility;
6. Log of preventive maintenance and employee training that was completed;
7. Log of removal of animal waste sold or given to other persons for disposal;
8. Other specific information deemed necessary by the Department to implement the provisions of the Oklahoma Concentrated Animal Feeding Operations Act and rules promulgated pursuant thereto;
9. Copy of general permit issued by the United States Environmental Protection Agency if applicable, a copy of the completed Pollution Prevention Plan, and other specific records deemed necessary by the Department to implement the provisions of the Oklahoma Concentrated Animal Feeding Operations Act and rules promulgated pursuant thereto; and
10. The notarized statement signed by the applicant accepting full responsibility for properly closing all waste retention structures pursuant to subsection H of this section.

G. Any analyses required by the provisions of the Oklahoma Concentrated Animal Feeding Operations Act or rules promulgated pursuant thereto shall be performed by a qualified independent testing laboratory certified by the Oklahoma Department of Environmental Quality and approved by the Department.

H. The applicant shall sign a notarized statement accepting full responsibility for properly closing all waste retention structures if the facility ceases to function or is ordered to close by action of the Department. When a license is transferred, the new owner or lessee shall submit a signed notarized statement accepting full responsibility for properly closing all waste retention structures if the facility ceases to function or is ordered to close by action of the Department.

#### **§ 20-48. Best Management Practices**

A. Animal feeding operations licensed pursuant to the provisions of the Oklahoma Concentrated Animal Feeding Operations Act shall utilize Best Management Practices, or may substitute for best management practice equivalent measures contained in a site-specific Animal Waste Management Plan meeting the conditions and requirements established by subsection C of this section and by rules promulgated by the Board pursuant to the Oklahoma Concentrated Animal Feeding Operations Act.

B. The criteria for Best Management Practices shall be promulgated by rule by the Board, based upon existing physical and economic conditions, opportunities and constraints and shall include, but not be limited to, the following:

1. There shall be no discharge of process wastewater to waters of the state except in accordance with the provisions of the Oklahoma Concentrated Animal Feeding Operations Act;
2. Animal waste shall be isolated from outside surface drainage by ditches, dikes, berms, terraces or other such structures except for a twenty-five-year, twenty-four-hour rainfall event;
3. No waters of the state shall come into direct contact with the animals confined on the animal feeding operation;
4. Animal waste handling, treatment, management and removal shall:
  - a. not create an environmental or a public health hazard,
  - b. not result in the contamination of public or private drinking water supplies,
  - c. conform with Oklahoma Water Quality Standards,

- d. not violate any state or federal laws relating to endangered or threatened species of plant, fish or wildlife or to migratory birds,
  - e. conform to such other handling, treatment and management and removal requirements deemed necessary by the Oklahoma Department of Agriculture, Food, and Forestry to implement the Oklahoma Concentrated Animal Feeding Operations Act and rules promulgated pursuant thereto, and
  - f. ensure that watersheds and groundwater are adequately protected;
5. If, for any reason, there is a discharge other than a spill of less than one hundred (100) gallons, the licensee is required to make immediate notification to the Department. The report of the discharge shall include:
- a. a description and cause of the discharge, including a description of the flow path to the receiving water body,
  - b. an estimation of the flow rate and volume discharged,
  - c. the period of discharge, including exact dates and times, and if not already corrected, the anticipated time the discharge is expected to continue,
  - d. steps taken to reduce, eliminate and prevent recurrence of the discharge, and
  - e. test results for fecal coliform bacteria, five-day biochemical oxygen demand (BOD5), total suspended solids (TSS), ammonia nitrogen, total Kjeldahl nitrogen (TKN), any pesticides which the operator has reason to believe could be in the discharge, or other parameters as required by the Department which the Department has reason to believe could be in the discharge;
6. Notwithstanding the provisions of paragraph 5 of this subsection, any spill that leaves the property owned or controlled by the licensee shall be reported to the Department regardless of total number of gallons spilled; and
7. The Department shall maintain records of all discharges and shall separately maintain records of all spills.
- C. The Animal Waste Management Plan shall include at a minimum:
1. Animal waste removal procedures;
  2. Records of inspections of retention structures, including, but not limited to, specific measurement of wastewater level;
  3. All calculations in determining land application rates, acreage and crops for the land application rate of both solid and liquid animal wastes on land owned or controlled by the licensee;
  4. Requirements including that:
    - a. (1) land application of animal waste shall not exceed the nitrogen uptake of the crop coverage or planned crop planting with any land application of wastewater or manure. Where local water quality is threatened by phosphorous, in no case shall the applicant or licensee exceed the application rates in the most current Natural Resources Conservation Service publication titled Waste Utilization Standard, and  
(2) timing and rate of applications shall be in response to crop needs, expected precipitation and soil conditions,
    - b. land application practices shall be managed so as to reduce or minimize:
      - (1) the discharge of process water or animal waste to waters of the state,
      - (2) contamination of waters of the state, and
      - (3) odor,

c. facilities including waste retention structures, waste storage sites, ponds, pipes, ditches, pumps, and diversion and irrigation equipment shall be maintained to ensure ability to fully comply with the terms of the Oklahoma Concentrated Animal Feeding Operations Act, and

d. adequate equipment and land application area shall be available for removal of such waste and wastewater as required to maintain the proper operating volume of the retention structure; and

5. Such other information deemed necessary by the Department to administer the provisions of the Oklahoma Concentrated Animal Feeding Operations Act and rules promulgated pursuant thereto.

D. Records shall be maintained of all animal wastes applied on land owned or controlled by the licensee, and sold or given to other persons for disposal.

E. Soils in areas in which animal waste is applied shall be analyzed, annually, for phosphates, nitrates and soil pH prior to the first application of the animal waste in the calendar year. A copy of the results of the analysis shall be submitted to the Department upon request by the Department. Such analysis shall be retained by the animal feeding operation as long as the facility is in operation.

F. Every animal feeding operation licensed pursuant to the provisions of Oklahoma Concentrated Animal Feeding Operations Act shall develop a plan approved by the Department for the disposal of carcasses associated with normal mortality.

1. Dead animals shall be disposed of in accordance with a carcass disposal plan developed by the applicant or licensee and approved by the Department.

2. The plan shall include provisions for the disposal of carcasses associated with normal mortality, with emergency disposal when a major disease outbreak or other emergency results in deaths significantly higher than normal mortality rates and other provisions which will provide for a decrease in the possibility of the spread of disease and prevent the contamination of waters of the state. The plan shall comply with rules promulgated by the Department.

**§ 20-49. Renumbered as 2 O.S. § 20-23 by Laws 2005, HB 1467, c. 292, § 25, emerg. eff. July 1, 2005**

**§ 20-50. Wastewater Retention Structures**

A. Any hydrologic connection between wastewater and waters of the state outside that authorized by the provisions of the Oklahoma Concentrated Animal Feeding Operations Act shall constitute a discharge to waters of the state.

B. Site-specific conditions shall be considered in the design and construction of liners. Liners for retention structures shall be designed and constructed in accordance with the provisions of this section and generally accepted engineering practices established by rules of the Board or as required by the federal Environmental Protection Agency. Liners for lagoons owned or operated by an animal feeding operation with less than one thousand (1,000) animal units may be designed and constructed pursuant to Technical Note 716 of the United States Department of Agriculture Natural Resources Conservation Service or its current equivalent so long as the facility is designed by the United States Department of Agriculture Natural Resources Conservation Service.

- C. 1. When a liner is installed to prevent hydrologic connection, the licensee or the owner shall maintain the liner to inhibit infiltration of wastewaters. Documentation of liner maintenance shall be maintained at the facility.
- 2. An environmental, agricultural, or other approved professional engineer licensed pursuant to Section 475.12 of Title 59 of the Oklahoma Statutes shall conduct a site evaluation every five (5) years on the retention structure of every concentrated animal feeding operation with such a structure to ensure liner integrity. If the owner or operator suspects that a retention structure is leaking, the owner or operator shall report suspected leakage to the Department.
- D. All substances entering the retention structures shall be composed entirely of wastewaters from the proper operation and maintenance of an animal feeding operation and the runoff from the animal feeding operation area. The disposal of any materials, other than substances associated with proper operation and maintenance of the facility into the containment structures, including but not limited to human waste, is prohibited.
- E. Documentation, sampling data, and any other records required by this section shall be maintained on site for as long as the facility is in operation. Samples collected during the first year of the retention structure may be considered the baseline data and shall be retained on site as long as the facility is in operation. Baseline data for the facility shall be determined based on the best information available.

**§ 20-51. Irrigation Systems - Antipollution Requirements - Inspections - Responsibilities**

- A. All irrigation systems into which any animal waste will be injected shall be equipped with one or both of the following systems:
  - 1. An antipollution system, approved by the State Board of Agriculture, capable of preventing the backflow of animal waste into the groundwater. The system shall include a safety check valve with a removable inspection port, anti-syphon vent, and low-pressure escape drain. An interlock device shall be installed on pumps that pump the animal waste so that if a fresh water irrigation pump shuts down, the pump that pumps the animal waste will also immediately shut down, preventing the chance of leakage past the check valve; or
  - 2. A system which provides for a complete and total disconnection between the flow of fresh water and the flow of animal waste. The system shall be capable of a manual disconnection between fresh water and the animal waste.
- B. The Oklahoma Department of Agriculture, Food, and Forestry shall make annual on-site inspections examining the operative status of the check valves and interlock devices.
- C. The operator of the irrigation system shall be responsible to ensure:
  - 1. That the valves and interlock devices remain operative between annual inspections by the Oklahoma Department of Agriculture, Food, and Forestry; or
  - 2. Complete disconnection from fresh water when introducing animal waste into the system.

**§ 20-52. Authority of Board - Investigation of Complaints - Promulgation of Standard Precautions**

- A. The State Board of Agriculture or its authorized agents are empowered to enter upon the premises of any animal feeding operation for the purpose of investigating complaints as to the operation or to determine whether there are any violations of the Oklahoma Concentrated Animal Feeding Operations Act. The Department shall make at least one unannounced inspection per year of every animal feeding operation licensed pursuant to the Oklahoma Concentrated Animal Feeding Operations Act.

- B. 1. The Board shall promulgate standard precautions for the prevention of the transmission of communicable diseases to humans and animals to be used by employees of the Department of Agriculture, Food, and Forestry when inspecting animal feeding operations pursuant to their official duties specified by the Oklahoma Concentrated Animal Feeding Operations Act and rules promulgated pursuant thereto.
- 2. Except for emergency situations or when enforcement of the provisions of the Oklahoma Concentrated Animal Feeding Operations Act requires the use of the standard precautions as promulgated by the Board pursuant to paragraph 1 of this subsection, Department employees shall observe the health standards and sanitary requirements of the facility.
- C. The Board shall maintain necessary records and undertake such studies, investigations and surveys for the proper administration of the Oklahoma Concentrated Animal Feeding Operations Act.

**§ 20-53. Unlawful to Operate Concentrated Animal Feeding Operation Without License - Jurisdiction of the Department of Environmental Quality**

- A. 1. It shall be unlawful for any person to operate a concentrated animal feeding operation without first obtaining a license from the State Board of Agriculture.
- 2. The owner or operator of an animal feeding operation not classified as a concentrated animal feeding operation may apply for a license if the owner or operator elects to come under the provisions of the Oklahoma Concentrated Animal Feeding Operations Act and the rules of the State Board of Agriculture.
- B. 1. The Department of Environmental Quality shall have environmental jurisdiction over:
  - a. commercial manufacturers of fertilizers, grain and feed products, and chemicals, and over manufacturing of food and kindred products, tobacco, paper, lumber, wood, textile mill and other agricultural products,
  - b. slaughterhouses, but not including feedlots at these facilities, and
  - c. aquaculture and fish hatcheries, including, but not limited to, discharges of pollutants and storm water to waters of the state, surface impoundments and land application of wastes and sludge, and other pollution originating at these facilities.
- 2. Facilities storing grain, feed, seed, fertilizer, and agricultural chemicals that are required by federal National Pollutant Discharge Elimination System regulations to obtain a permit for storm water discharges shall only be subject to the jurisdiction of the Department of Environmental Quality with respect to storm water discharges.

**§ 20-54. Licenses - Expiration - Renewal - Fees**

- A. Licenses shall expire on June 30 of each year and may be renewed upon payment of the license fee set forth in this section and continued compliance with the provisions of the Oklahoma Concentrated Animal Feeding Operations Act and the rules of the Board.
- B. The fees for an animal feeding operations license and annual renewal shall be:
  - 1. Fifteen Dollars (\$15.00) for facilities with a capacity of less than two hundred fifty (250) animal units;
  - 2. Thirty-seven Dollars and fifty cents (\$37.50) for facilities with a capacity of two hundred fifty (250) to five hundred (500) animal units;
  - 3. Seventy-five Dollars (\$75.00) for facilities with a capacity of five hundred one (501) to three thousand (3,000) animal units;
  - 4. One Hundred Fifty Dollars (\$150.00) for facilities with a capacity of three thousand one (3,001) to ten thousand (10,000) animal units; or

5. Two Hundred Twenty-five Dollars (\$225.00) for facilities with a capacity of more than ten thousand (10,000) animal units.
- C. All fees received by the Board for licensure of animal feeding operations pursuant to this section shall be deposited in the State Department of Agriculture Revolving Fund.

**§ 20-55. Evidence of Financial Ability to Run an Animal Feeding Operation with a Liquid Animal Waste Management System**

- A. Any person who is licensed to operate an animal feeding operation with a liquid animal waste management system within this state shall furnish to the Oklahoma Department of Agriculture, Food, and Forestry evidence of financial ability to comply with the requirements for closure of retention structures and other waste facilities as established pursuant to the provisions of this section and rules promulgated by the State Board of Agriculture.
- B.
  1. To establish evidence of financial ability the Department shall require:
    - a. Category A surety which shall include a financial statement listing assets and liabilities and including a general release that the information may be verified with banks and other financial institutions. The financial statement shall be confidential and shall not be opened to public inspection. The statement shall prove a net worth of not less than:
      - (1) Ten Thousand Dollars (\$10,000.00) for any animal feeding operation licensed pursuant to the Oklahoma Concentrated Animal Feeding Operations Act having a capacity of more than three hundred (300) animal units but having one thousand (1,000) animal units or less,
      - (2) Twenty-five Thousand Dollars (\$25,000.00) for any animal feeding operation licensed pursuant to the Oklahoma Concentrated Animal Feeding Operations Act having a capacity of more than one thousand (1,000) animal units but less than two thousand (2,000) animal units, or
      - (3) Fifty Thousand Dollars (\$50,000.00) for any animal feeding operation licensed pursuant to the Oklahoma Concentrated Animal Feeding Operations Act having a capacity of more than two thousand (2,000) animal units, or
    - b. Category B surety which shall include an irrevocable commercial letter of credit, cash, a cashier's check, a Certificate of Deposit, Bank Joint Custody Receipt, other negotiable instrument or a blanket surety bond. Except as provided in paragraph 2 of this subsection, amount of such letter of credit, cash, check, certificate, bond, receipt or other negotiable instrument shall be in the amount of Twenty-five Thousand Dollars (\$25,000.00). The Department is authorized to determine the amount of Category B surety based upon the past performance of the owner or operator regarding compliance with the laws of this state, and any rules promulgated pursuant thereto. Any instrument shall constitute an unconditional promise to pay and be in a form negotiable by the Department.
  2. The Department upon certification by any animal feeding operation subject to Category B surety that its liability statewide is less than the twenty-five-thousand-dollar standard specified in this section may allow the owner or operator to provide Category B type surety in an amount less than the required Twenty-five Thousand Dollars (\$25,000.00), but at least sufficient to cover the estimated cost of all closure and removal operations currently the responsibility of that owner or operator.
- C.
  1. Any animal feeding operation licensed pursuant to the provisions of the Oklahoma Concentrated Animal Feeding Operations Act which does not have any outstanding contempt citations or fines may post Category A surety.

2. Any animal feeding operation licensed pursuant to the provisions of the Oklahoma Concentrated Animal Feeding Operations Act which does not have outstanding fines or contempt citations shall be required to post Category B surety. Animal feeding operations which have posted Category B surety and have operated under this type surety and have no outstanding fines at the end of three (3) years may post Category A surety.
- D. For good cause shown concerning pollution by the animal feeding operations posting either Category A or B surety, the Department, after notice and hearing, may require the filing of additional Category B surety in an amount greater than Twenty-five Thousand Dollars (\$25,000.00) but not to exceed Five Dollars (\$5.00) times the number of animal units for the facility being licensed.
- E.
  1. If the Department, after notice and an opportunity for hearing, determines that the animal feeding operation licensed pursuant to the provisions of the Oklahoma Concentrated Animal Feeding Operations Act has neglected, failed, or refused to close any surface impoundment, or remove or cause to be removed any equipment, or has abandoned the facility, then the animal feeding operation shall be deemed to have forfeited the letter of credit or negotiable instrument required by this section or shall pay to this state, for deposit in the State Treasury, a sum equal to the cost of closure of any surface impoundment or removal of equipment.
  2. The Department may cause the remedial work to be done, issuing a warrant in payment of the cost thereof drawn against the monies accruing in the State Treasury from the forfeiture or payment.
  3. The Department shall also recover any costs arising from litigation to enforce this provision. Provided, before an animal feeding operation is required to forfeit or pay any monies to the state pursuant to this section, the Department shall notify the animal feeding operation at the last-known address of the determination of neglect, failure or refusal to close any surface impoundment or remove equipment and the animal feeding operation shall have ten (10) days from the date of notification within which to commence remedial operations. Failure to commence remedial operations shall result in forfeiture or payment as provided in this subsection.
- F. If title to an animal feeding operation is transferred, the transferee shall furnish the evidence of financial ability to close surface impoundments required by the provisions of this section prior to the transfer.

**§ 20-56. Other Requirements for Animal Feeding Operations - Presumptions Created by Compliance**

- A. In addition to any other requirement of the Oklahoma Concentrated Animal Feeding Operations Act, animal feeding operations owners and operators who are granted an animal feeding operations license shall:
  1. Provide adequate veterinarian services for detection, control, and elimination of livestock diseases;
  2. Have available for use at all necessary times mechanical means of scraping, cleaning, and grading feed yards premises; and
  3. Provide weather resistant aprons adjacent to all permanently affixed feed bunks, water tanks, and feeding devices.
- B.
  1. Any animal feeding operation licensed pursuant to the Oklahoma Concentrated Animal Feeding Operations Act, operated in compliance with those standards, and in compliance with the rules promulgated by the Board, shall be deemed to be prima facie evidence that a

nuisance does not exist; provided, no animal feeding operation shall be located or operated in violation of any zoning regulations.

2. Any animal feeding operation licensed pursuant to the Oklahoma Concentrated Animal Feeding Operations Act, operated in compliance with those standards, and in compliance with rules promulgated by the Board, that is located on land more than three (3) miles outside the incorporated limits of any municipality and which is not located within one (1) mile of ten or more occupied residences shall not be deemed a nuisance unless it is shown by a preponderance of the evidence that the operation endangers the health or safety of others.

**§ 20-57. Distance of Liquid Animal Waste and Animal Feeding Operations from Residences, Drinking Water Wells, Parks, and Other Facilities and Areas**

A. Except as authorized by this subsection, no liquid animal waste shall be land applied within five hundred (500) feet of the nearest corner of an occupied residence not owned or leased by the owner of the animal feeding operation.

B. Except as provided by Section 45 of this act, no concentrated animal feeding operation shall be established after September 1, 1997, which is within one (1) mile of ten or more residences that are occupied residences at the time of the establishment of the concentrated animal feeding operation.

C. The proscription contained in subsections A and B of this section shall not apply if the applicable property owner executes a written waiver with the owner or operator of the animal feeding operation, under the terms and conditions that the parties negotiate. The written waiver becomes effective upon recording of the waiver in the offices of the recorder of deeds in the county where the property is located. The filed waiver shall preclude enforcement of the setback requirements contained in subsections A and B of this section. A change in ownership of the applicable property or change in the ownership of the property on which the animal feeding operation is located shall not affect the validity of the waiver.

D. No liquid animal waste shall be land applied within three hundred (300) feet of an existing public or private drinking water well.

E. Except as provided by Section 45 of this act, no concentrated animal feeding operation shall be established after September 1, 1997, which is located:

1. Within three (3) miles of a state park or resort;
2. On land within three (3) miles of the incorporated limits of any municipality;
3. Within three (3) miles of the high water mark of a surface public water supply if the concentrated animal feeding operation is located within the drainage basin for the public water supply.

F. All distances between occupied residences and animal feeding operations shall be measured from the closest corner of the walls of the occupied residence to the closest point of the nearest waste facility, as determined by the Oklahoma Department of Agriculture, Food, and Forestry. The property boundary line of the real property is not used unless it coincides with the closest point of the waste facility or occupied residence.

**§ 20-58. Setback Requirements -- Applicability to Certain Existing Operations**

Animal feeding operations, other than a concentrated animal feeding operation, not licensed pursuant to the provisions of the Oklahoma Feed Yards Act in operation on the effective date of this act shall not be subject to any setback requirements not in effect on the date of past construction.

**§ 20-59. Applications for Permits for Construction of Concentrated Animal Feeding Operation Within One Mile Upstream of Pensacola Project Boundary**

The Oklahoma Department of Agriculture, Food, and Forestry shall not accept or approve any pending applications requesting permits for construction of any concentrated animal feeding operation to be located within one (1) mile upstream of the Pensacola Project boundary as described in the records of the Grand River Dam Authority and the Federal Emergency Management Agency. Any operation authorized or permitted prior to April 17, 2002, shall not be affected by the provisions of this section.

**§ 20-60. Temporary Exception to Animal Unit Capacity Limitation**

- A. A concentrated animal feeding operation may exceed its animal unit capacity if:
1. A diseased or potentially diseased animal exists at the operation; or
  2. A diseased or potentially diseased animal is in the next destination for the production line for the operation; and
  3. The owner of the concentrated animal feeding operation has reasonable cause to believe an animal has or may have any disease causing:
    - a. a public health emergency,
    - b. a substantial and imminent economic hardship to the owner, or
    - c. a substantial and imminent threat to the animal population of the state, or
  4. The State Board of Agriculture issues an order establishing temporary restrictions, a quarantine, or a quarantine zone restricting the movement of persons, livestock, machinery, and personal property out of a concentrated animal feeding operation.
- B. In no case shall an animal unit capacity be exceeded for more than five (5) days following a confirmatory test indicating that either the animal is diseased or is not diseased. A confirmatory test shall be performed within twenty (20) days of discovery that a diseased or potentially diseased animal exists at the operation.
- C. The owner of a concentrated animal feeding operation shall provide written notification to the Oklahoma Department of Agriculture, Food, and Forestry upon discovery of a diseased or potentially diseased animal pursuant to subsection A of this section that may result in the animal unit capacity being exceeded.
- D. The notice shall:
1. Identify the concentrated animal feeding operation that may exceed its animal unit capacity; and
  2. Include an estimate of the number of animals exceeding the animal unit capacity at the concentrated animal feeding operation.

**§ 20-61. Violation Points System - Powers and Actions Available to the Board for Violations**

- A. 1. The Board is authorized and directed to promulgate a violation points system for violating the Oklahoma Concentrated Animal Feeding Operations Act which provides greater punishment for violations which are intentional and for violations which pose a greater threat to the environment.
2. The State Board of Agriculture shall have the power to suspend, revoke or not renew the license of any animal feeding operation based on the point system after a hearing, and after an administrative determination that the animal feeding operation has violated or has failed to comply with any of the provisions of the Oklahoma Concentrated Animal Feeding Operations Act, or any rule promulgated pursuant thereto.

3. The Board shall have the power and duty to reinstate any such suspended or revoked licenses, or renew the licenses, upon a satisfactory and acceptable showing and assurance that the animal feeding operation conducted animal feeding operations in conformity with, and in compliance with, the provisions of the Oklahoma Concentrated Animal Feeding Operations Act and rules promulgated pursuant thereto, and that such conformity and compliance will be continuous.
- B. In order to protect the public health and safety and the environment of this state, the Board, pursuant to the Oklahoma Concentrated Animal Feeding Operations Act, may deny issuance of a license or transfer of a license to establish and operate an animal feeding operation on and after September 1, 1997, to any person or other legal entity which:
  1. Is not in substantial compliance with a final agency order or any final order or judgment of a court of record secured by any state or federal agency relating to animal feeding operations; or
  2. Has evidenced a reckless disregard for the protection of the public and the environment as demonstrated by a history of noncompliance with environmental laws and rules resulting in endangerment of human health or the environment.
- C. Any action taken in regard to the denial, suspension or revocation of a license shall be in conformity with the rules of the Board governing Administrative Procedures and the Administrative Procedures Act.

**§ 20-62\* Violations of Act or Rules - Punishment, Fines, and Other Penalties - Court Actions and Relief**

- A. Any person violating the provisions of the Oklahoma Concentrated Animal Feeding Operations Act or any rule of the Board promulgated pursuant thereto shall, upon conviction, be deemed guilty of a misdemeanor and upon conviction thereof may be punished by a fine not exceeding Two Hundred Dollars (\$200.00).
- B. Any owner or operator who fails to take such action as may be reasonable and necessary to avoid pollution of any stream, lake, river or creek, except as otherwise provided by law, or who violates any rule of the Board adopted to prevent water pollution from animal feeding operations pursuant to this act shall, upon conviction, be deemed guilty of a misdemeanor, and upon conviction thereof may be punished by a fine of Five Hundred Dollars (\$500.00) to Ten Thousand Dollars (\$10,000.00) for each violation, by imprisonment in the county jail for not more than six (6) months for each violation, or by the assessment of a civil penalty up to Ten Thousand Dollars (\$10,000.00) for each violation or by any of such fine, imprisonment, and civil penalty.
- C.
  1. In addition to the criminal and civil penalties specified by this section, the Oklahoma Department of Agriculture, Food, and Forestry may:
    - a. assess an administrative penalty of not more than Ten Thousand Dollars (\$10,000.00) per day of noncompliance, or
    - b. bring an action for injunctive relief granted by a district court.
  2. A district court may grant injunctive relief to prevent a violation of, or to compel compliance with, any of the provisions of the Oklahoma Concentrated Animal Feeding Operations Act or any rule promulgated thereunder or order, license or permit issued pursuant to the Oklahoma Concentrated Animal Feeding Operations Act.
  3. Nothing in this section shall preclude the Department from seeking penalties in district court in the maximum amount allowed by law. The assessment of penalties in an administrative enforcement proceeding shall not prevent the subsequent assessment by a

court of the maximum civil or criminal penalties for violations of the Oklahoma Concentrated Animal Feeding Operations Act.

D. Any person assessed an administrative or civil penalty may be required to pay, in addition to such penalty amount and interest thereon, attorney fees and costs associated with the collection of such penalties.

E. The Attorney General or the district attorney of the appropriate district court of Oklahoma may bring an action in a court of competent jurisdiction for the prosecution of a violation by any person of a provision of the Oklahoma Concentrated Animal Feeding Operations Act or any rule promulgated thereunder, or order, license or permit issued pursuant thereto.

F. 1. Any action for injunctive relief to redress or restrain a violation by any person of the Oklahoma Concentrated Animal Feeding Operations Act or for any rule promulgated thereunder, or order, license, or permit issued pursuant thereto or recovery of any administrative or civil penalty assessed pursuant to the Oklahoma Concentrated Animal Feeding Operations Act may be brought by:

- a. the district attorney of the appropriate district court of the State of Oklahoma,
- b. the Attorney General on behalf of the State of Oklahoma, or
- c. the Department on behalf of the State of Oklahoma.

2. The court shall have jurisdiction to determine said action, and to grant the necessary or appropriate relief, including but not limited to mandatory or prohibitive injunctive relief, interim equitable relief, and punitive damages.

3. It shall be the duty of the Attorney General and district attorney, if requested by the Commissioner of Agriculture, to bring such actions.

G. Except as otherwise provided by law, administrative and civil penalties shall be paid into the Department of Agriculture Revolving Fund.

H. In determining the amount of a civil penalty or administrative penalty, the court or the Department, as the case may be, shall consider such factors as the nature, circumstances and gravity of the violation or violations, the economic benefit, if any, resulting to the defendant from the violation, the history of such violations, any good-faith efforts to comply with the applicable requirements, the economic impact of the penalty on the defendant, the defendant's degree of culpability, and such other matters as justice may require.

I. For the purposes of this section, each day upon which a violation is committed or is permitted to continue shall be deemed a separate offense.

J. In addition to other penalties as may be imposed by law, any person who knowingly makes any false statement, representation or certification in any water pollution form, notice or report, or who knowingly renders inaccurate any monitoring device or method required to be maintained by any water pollution rules promulgated by the Board shall, upon conviction, be guilty of a misdemeanor and may be subject to a fine of not more than Five Thousand Dollars (\$5,000.00) for each violation.

#### **§ 20-63. Poultry-Laying Operations - Complaints of Violations - Emergencies**

A. Due to the inherently unique nature of poultry-laying operations, and the increased propensity for vector propagation at such facilities, poultry-laying operations licensed pursuant to the Oklahoma Concentrated Animal Feeding Operations Act, shall be conducted only in a manner as prescribed by the State Department of Agriculture by rule promulgated pursuant to this section and the Oklahoma Concentrated Animal Feeding Operations Act.

B. If three valid complaints are received by the Department against a poultry-laying operation, licensed pursuant to the Oklahoma Concentrated Animal Feeding Operations Act, within a

period of sixty (60) days, the Oklahoma Department of Agriculture, Food, and Forestry, upon inspection and verification of the complaint, shall declare that an emergency exists.

C. Whenever the Department finds that an emergency exists requiring immediate action to protect the public health or welfare or the environment pursuant to this subsection, the Department may without notice or hearing issue an order, effective upon issuance, reciting the existence of such an emergency and requiring that such action be taken as deemed necessary to meet the emergency. Any person to whom such an order is directed shall comply therewith immediately but may request an administrative enforcement hearing thereon within fifteen (15) days after the order is served. The hearing shall be held by the Department within ten (10) days after receipt of the request. On the basis of the hearing record, the Department shall sustain or modify such order.

D. If, at the hearing, it is determined that the operator is in violation of the provisions of this section and rules promulgated pursuant thereto, in addition to other administrative penalties authorized by law, the Department may order that the operator be prohibited from land applying waste for one hundred sixty (160) days after determination that the facility is in violation.

E. Any party aggrieved by a final order may petition the Department for rehearing, reopening or reconsideration within ten (10) days from the date of the entry of the final order. Any party aggrieved by a final order, including the Attorney General on behalf of the state, may, pursuant to the Administrative Procedures Act, petition for a judicial review thereof.

F. The provisions of this section may be enforced pursuant to the provisions of Section 49 of this act.

**§ 20-64. Enactment as Part of Agricultural Code - Codification**

The Oklahoma Concentrated Animal Feeding Operations Act shall be enacted as a part of the Agricultural Code and shall be codified accordingly

1 **20.6.2.XXXX EXCEPTIONS TO REQUIREMENTS:**

2 **A.** An applicant may apply to the department for an exception to the requirements of Section  
3 20.6.2.3211 NMAC or Subsection B of 20.6.2.3212 provided that the applicant seeking an exception satisfies the  
4 following requirements.

5 (1) Demonstration of Equivalent of Better Protection : An applicant seeking an exception shall  
6 demonstrate that the proposed exception shall provide equivalent or better protection than provided by the  
7 requirement from which an exception is sought and meets the approval requirements of Section 20.6.2.3109 NMAC.  
8 If approved by the department, the exception shall be incorporated into the conditions of the discharge permit.

9 (2) Additional Public Notice:

10 (a) Notwithstanding the requirement for public notice specified in Subsection B or C of  
11 20.6.2.3108 NMAC, within 30 days of the department deeming an application for discharge permit, discharge  
12 permit renewal or discharge permit modification administratively complete, the applicant shall provide notice to the  
13 general public in the locale of the proposed discharge in a form provided by the department by each of the methods  
14 listed below:

15 (i) for each 640 contiguous acres or less of a discharge site, prominently posting a  
16 synopsis of the public notice at least 2 feet by 3 feet in size, in English and in Spanish, at a place conspicuous to the  
17 public, approved by the department, at or near the proposed facility for 30 days; one additional notice, in a form  
18 approved by and may be provided by the department, shall be posted at a place located off the discharge site, at a  
19 place conspicuous to the public and approved by the department; the department may require a second posting  
20 location for more than 640 contiguous acres or when the discharge site is not located on contiguous properties;

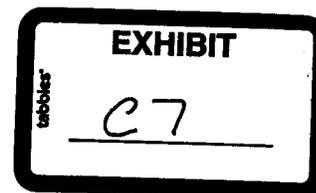
21 (ii) providing written notice of the discharge by mail, to owners of record of all properties  
22 within a 1 mile distance from the boundary of the property where the discharge site is located; if there are no  
23 properties other than properties owned by the discharger within a one mile distance from the boundary of property  
24 where the discharge site is located, the applicant shall provide notice to owners of record of the next nearest adjacent  
25 properties not owned by the discharger;

26 (iii) providing notice by certified mail, return receipt requested, to the owner of the  
27 discharge site if the applicant is not the owner; and

28 (iv) publishing a synopsis of the notice in English and in Spanish, in a display ad at least  
29 four inches by six inches not in the classified or legal advertisements section, in a newspaper of general circulation  
30 in the location of the proposed discharge for a duration of two consecutive publications.

31 (v) publishing a synopsis of the notice in English and in Spanish, in the classified or legal  
32 advertisements section in a newspaper of general circulation in the location of the proposed discharge. The  
33 publication shall run concurrently with the publication of the display ad required above.

34 (b) The notice and synopsis provided in subparagraph (a) above shall include the information  
35 listed in Subsection F of 20.6.2.3108 NMAC and shall indicate that the applicant is seeking an exemption from the  
36 requirements of the regulations and shall specify the specific subsections for which an exemption is sought.



1 (3) Compliance with Ground Water Monitoring Requirements: An applicant seeking an exception for  
2 an existing facility shall demonstrate that the facility is in compliance with the monitoring requirements of Section  
3 20.6.2.3218 NMAC. The department shall not grant an exception for any existing facility that is not in compliance  
4 with Section 20.6.2.3218 NMAC.

5 (4) Compliance with Water Quality Standards: An applicant seeking an exception for an existing  
6 facility shall demonstrate that the operation of the facility has not caused the standards of Section 20.6.2.3103  
7 NMAC to be exceeded in ground water at any place of withdrawal for present or future use, or the Water Quality  
8 Standards for Interstate and Intrastate Streams in New Mexico to be violated. The department shall not grant an  
9 exception for any facility that has caused the standards of Section 20.6.2.3103 NMAC to be exceeded in ground  
10 water at any place of withdrawal for present or future use, or the Water Quality Standards for Interstate and  
11 Intrastate Streams in New Mexico to be violated.

12 (5) Permit Application Exception Review Fee: In addition to the permit fee specified in Subsection  
13 20.6.2.3204 NMAC, an applicant seeking an exception shall remit with the application a nonrefundable permit  
14 application exception review fee of \$10,000.

15 (6) Financial Assurance: An applicant seeking an exception shall provide financial assurance in an  
16 amount necessary to close the facility in accordance with the closure requirements of Section 20.6.2.3225 NMAC.  
17 The calculation of financial assurance shall be the amount required for the work to be performed by a third party  
18 contractor. The applicant shall obtain cost estimates from at least three third party contractors to perform the work  
19 required to close the facility pursuant to Section 20.6.2.3225 NMAC. The amount of financial assurance shall at a  
20 minimum be equal to the average cost of the estimates provided by the third party contractors. Financial assurance  
21 shall be in place upon date the department issues the discharge permit. Evidence of the financial assurance shall be  
22 submitted to the department within 30 days of the date the department issues the permit.

23 (a) Terms of financial assurance: The financial assurance shall be payable to the state of New  
24 Mexico and conditioned upon the facility's proper operation, closure and post-closure monitoring in compliance  
25 with state of New Mexico statutes, these rules and the discharge permit conditions. The applicant shall notify the  
26 department of a material change affecting the financial assurance within 30 days of discovery of such change.

27 (b) Forfeiture of financial assurance: The department shall give the facility 20 days notice and  
28 an opportunity for a hearing prior to forfeiting financial assurance.

29 (c) Forms of financial assurance: The department may accept the following forms of financial  
30 assurance.

31 (i) Surety bonds: A surety bond shall be executed by the applicant and by a corporate  
32 surety licensed to do business in the state, and shall be non-cancelable.

33 (ii) Letters of credit: A letter of credit shall be issued by a bank organized or authorized  
34 to do commercial banking business in the United States, shall be irrevocable for a term of not less than five years  
35 and shall provide for automatic renewal for successive, like terms upon expiration, unless the issuer has notified the  
36 department in writing of non-renewal at least 90 days before its expiration date. The letter of credit shall be payable

1 to the state of New Mexico in part or in full upon receipt from the director or the director's authorized representative  
2 of demand for payment accompanied by a notice of forfeiture.

3 (iii) Cash accounts: An applicant may provide financial assurance in the form of a  
4 federally insured or equivalently protected cash account or accounts in a financial institution, provided that the  
5 facility and the financial institution shall execute as to each such account a collateral assignment of the account to  
6 the department, which shall provide that only the division may authorize withdrawals from the account. In the event  
7 the facility is unable to or refuses to operate, close or monitor post-closure according to these rules or the conditions  
8 of its discharge permit, the department may, at any time and from time to time, direct payment of all or part of the  
9 balance of such account (excluding interest accrued on the account) to itself or its designee for the facility's closure.

10 (d) Replacement of financial assurance.

11 (i) The department may allow an operator to replace existing forms of financial assurance  
12 with other forms of financial assurance that provide equivalent coverage.

13 (ii) The department shall not release existing financial assurance until the facility has  
14 submitted, and the division has approved, an acceptable replacement.

15 (e) Review of adequacy of financial assurance: The department may at any time not less than  
16 five years after initial acceptance of financial assurance for a facility, or whenever the operator applies for a  
17 modification of the facility's permit, initiate a review of such financial assurance's adequacy. Additionally,  
18 whenever the department determines that a facility has not achieved the closure standards specified in Section  
19 20.6.2.3225 NMAC, the department may review the adequacy of the financial assurance, without regard to the date  
20 of its last review. Upon determination, after notice to the operator and an opportunity for a hearing, that the  
21 financial assurance is not adequate to cover the reasonable and probable cost of a facility's closure and post closure  
22 monitoring, the department may require the operator to furnish additional financial assurance sufficient to cover  
23 such reasonable and probable cost.

24 **B.** The department may not approve an exception to any other sections or subsections of these  
25 regulations.

26 **C.** The commission shall review and approve any exception to the requirements of Section  
27 20.6.2.3211 NMAC or Subsection B of 20.6.2.3212 granted by the department as follows:

28 (1) The commission shall review the record compiled before the department, including the transcript  
29 of any public hearing held on the application or draft permit and shall allow any party to submit arguments.

30 (2) The commission may designate a hearing officer to review the record and the arguments of the  
31 parties and recommend a decision to the commission.

32 (3) The commission shall consider and weigh only the evidence contained in the record before the  
33 department and the recommended decision of the hearing officer, if any, and shall not be bound by the factual  
34 findings or legal conclusions of the department.

35 (4) Based upon the review of the evidence, the arguments of the parties and the recommendation of  
36 the hearing officer, the commission shall sustain, modify or reverse the action of the department.

1 (5) The commission shall enter ultimate findings of fact and conclusions of law and keep a record of  
2 the review.  
3

**STATE OF NEW MEXICO  
WATER QUALITY CONTROL COMMISSION**

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**IN THE MATTER OF THE PROPOSED AMENDMENT  
TO 20.6.2 NMAC (DAIRY REGULATIONS)**

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**WQCC 09-13 (R)**

**TESTIMONY OF RACHEL CONN**

I am the Clean Water Circuit Rider for Amigos Bravos, a non-profit river conservation organization dedicated to protecting the ecological and cultural richness of the Rio Grande and other wild rivers in New Mexico. I have a BA in Environmental Biology from Colorado College and have worked for the past 11 years in the environmental field. I worked for the Massachusetts Department of Environmental Protection as a consultant assessing the data management needs of the various bureaus in the department. I also worked for a non-profit in Colorado assessing and addressing water quality problems associated with gold mining. For the past seven years I have worked for Amigos Bravos on water quality issues. I am a Clean Water Act trainer and in this capacity give trainings around the state on water quality standards, TMDLs, and other Clean Water Act topics. As Clean Water Circuit Rider I review and comment on both groundwater and NPDES permits in New Mexico. In addition I provide trainings and assistance to others on how to comment on discharge permits, TMDLs, and other policy matters relating to water quality in New Mexico. I serve as the Vice Chair of the Clean Water Network, a national organization dedicated to protecting the health, safety and quality of our nation's waters.

**Facility Location Map - Public Notice:** I am providing testimony on the need to provide a copy of the facility location map during the public notification process to property owners within 1 mile of the proposed discharge. While working in my capacity as the Clean Water Circuit Rider for Amigos Bravos I have reviewed and commented on many draft water quality permits and assisted others in reviewing and commenting on draft permits. Having a copy of a map that outlines the key features of the landscape in relation to the proposed discharge would greatly increase the ability of the public to participate meaningfully in the process. Often times it is hard to understand the potential impact of a proposed discharge unless the public can picture exactly where the discharge will be located. Knowing where the facility that is proposing to discharge is located in relation to key features on the landscape such as watercourses, public drinking water wells, irrigation systems, etc. will help the public identify how the proposed discharge will impact them personally. For example, having a contoured map would help an individual identify if the proposed discharge is located near a watercourse that then passes by their property or by a favorite fishing spot. From my experience in working with the public, and in my own experience in reviewing proposed discharges, providing the public with a copy of a facility location map during the public notice process would greatly increase public understanding of and participation in the permitting process.

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Rachel Conn