

## **E. Plan Summary of Decisions**

### **1. Summary**

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# Comprehensive Nutrient Management Plan

## Summary of Plan

### Cottonwood Springs Dairy

Decisionmaker: Mr. Phil Troost

Facility Address: 491 W. Funk Road, Lake Arthur, NM 88253

Phone: Business: (505) 365-2741

Date: November 2009

#### **General**

The Comprehensive Nutrient Management System for Cottonwood Springs Dairy was planned and designed with the involvement of Mr. Phil Troost. The plan is based on decisions and choices made by him. The system is planned to manage waste generated by the dairy in a manner that prevents or minimizes degradation of soil, water, air, plant, and animal resources and protects public health and safety. It is also planned to preclude discharge of pollutants to surface water from a 25-year, 24-hour storm event, to minimize ground water contamination, and to recycle the waste produced through soil and crops to the fullest extent possible. The land application of rates of green water and manure solids are not based on 125% of N uptake. The rates are based on agronomic rate using the fertilizer recommendations from NMSU.

This plan addresses production, collection, transfer, storage, and utilization functions of a CNMP. This system meets a Resource Management System level of conservation for the land included in the plan. The operation and maintenance, and safety requirements for the system presented in this plan are organized by these functions.

#### **System description**

The CNMP was planned to accommodate manure and effluent for at least 60 days of permitted storage from a herd of 3,400 dairy cows (milking) plus additional replacements (dry cows, heifers and calves), and to contain runoff from a 25-year, 24-hour storm event.

The dairy is unpaved, within the exception of concrete feed alleys and bunks. Manure within the corrals are cleaned on an ongoing basis and transported off site. The effluent will be pumped from the lagoon(s) to 380 acres land application fields.

The facility plans to utilize four existing monitoring wells MW#1, MW#2, MW#3, and MW#4. The monitoring wells will be used to evaluate any ground water contamination. These wells will be monitored quarterly, for total Kjeldal nitrogen (TKN), nitrates as nitrogen (NO<sub>3</sub>-N), chloride (Cl), and total dissolved solids (TDS). The results will be reported to NMED Ground Water Quality Bureau within 45 days of the testing.

## **Decision maker's responsibilities**

Mr. Troost is responsible for the proper installation, operation, and maintenance of the waste management system. The lining system is being designed by Quality Control Engineering of Roswell, NM. This CNMP was written by Reddy Ganta, senior Agronomist with Glorieta Geoscience, Inc. and Linda Scheffe, Water Quality Specialist with the Natural Resources Conservation Service. There is an Environmental Quality Incentives Program plan and contract in place to assist in application of specific practices in the plan. Nutrient management must be revised annually as a minimum.

Mr. Troost is also responsible for obtaining a groundwater discharge permit from the New Mexico Environment Department, and a surface water discharge permit (NPDES) from the Environmental Protection Agency, and all other necessary permits to operate the system. The system must be operated and maintained in accordance with these permits and other laws and regulations that pertain to its operation including any local and state governmental agencies. All personnel must be trained and informed of the safety and the operation and maintenance requirements for the system.

A record will be kept of hours of operation for system equipment that is routinely maintained on a time used basis.

## **Component installation schedule**

See the attached Conservation Plan for the schedule of practice applications.

## **Production function requirements**

Process generated greenwater is generated through washdown of the cows prior to entering the milking parlor. Greenwater from the milking parlor flows via underground pipelines to a concrete sump located southeast end of the milking parlor. From the sump, greenwater is pumped via underground pipelines to a mechanical solids screen separator. The separated liquids are stored in a two chambered synthetically lined greenwater lagoon. Further separation of solids occurs in cell A (settling chamber) and greenwater devoid of solids overflows through an overflow pipe into cell B (main storage chamber). The new lagoon Cell C constructed recently is also used for additional green water storage.

## **Collection function requirements**

Dairy process water collected in the sump is pumped through a screen solids separator. Separated liquids flow from the separator to the existing lagoon.

The stormwater runoff from the south corrals flows into a drainage channel from where it is diverted into runoff pond located southeast of the corrals. The runoff from the north and east corrals is contained in a stormwater catchment located southeast corner of the facility. Storm water collected in the storm water pond will be pumped out and either transferred to the lagoon or land applied within fourteen (14) days.

## **Treatment function requirements**

Manure solids are separated from dairy process water by a screen solids separator and the separated liquids are blended with fresh water in the lagoon. The blend is land applied to cropland.

## **Storage function requirements**

The existing green water lagoon Cell B has storage capacity of 12.36 ac-ft plus two (2) feet freeboard. The green water lagoon Cell C has a storage capacity of 32.98 ac-ft. The total green water storage capacity at Cottonwood Sprigs Dairy is 45.34 ac-ft with 2 feet of freeboard. The required 60-day storage capacity at 140,000 GPD is 33.4 ac-ft.

The storage capacity of the runoff pond is 28.5 ac-ft and the storage capacity of the runoff catchment is approximately 282 ac-ft. The required 25 year 24 hour storm event runoff storage capacity from the production area is 28.1 ac-ft.

The ponds shall be inspected weekly and after unusual storm events. The embankments will be inspected for leaks, slope failures, erosion, and excessive settlement. Excavated slopes will be inspected for slope failures and erosion. Repairs shall be made promptly. Weeds will be controlled on the banks of the ponds because roots may damage the liner and plant residue (dry parts of Kochia and Russian thistle) will blow into the ponds and cause maintenance problems.

## **Transfer function requirements**

The transfer function applies to movement and transport of the waste throughout the system. Manure solids from the corrals will be either land applied on site (if allowed given soil test results and green water application volumes) or transferred off site upon collection. Manure solids separated from green water by the screen solids separator will be stored temporarily on a concrete pad located beneath the solids separator and then applied to cropland on-site or transported off site.

Storm water collected in the storm water runoff pond will be transferred to the lagoon or land applied with a portable trailer-mounted pump or evaporated.

## **Utilization function requirements**

The utilization function is that part of the system that recycles reusable waste products. Green water will be land applied to a total of 380 acres of cropland (Fields 1, 2, 3, 4, 5, 6, and 7). Manure will be transported off site.

The nutrient in the applied green water must not exceed the agronomic requirements for the yield goals of the cropland. The actual rates applied will be based on the nutrient

content of the waste and soil testing. See included job sheets for nutrient management recommendations.

Specific data dealing with the waste utilization component of this plan is included in the following conservation plan.

### **Contingency Plan**

In the event that monitoring indicates groundwater standards are violated during the term of Cottonwood Springs Dairy's Discharge Permit, upon closure of the facility or during post-closure monitoring, Cottonwood Springs Dairy shall collect a confirmatory sample from the monitoring wells within 15 days to verify the initial sampling results. Within 30 days of confirmation of ground water contamination, Cottonwood Springs Dairy shall submit a corrective action plan to NMED, which includes a site investigation to define the source, nature and extent of contamination; a proposed abatement option; and a schedule for its implementation. The site investigation and abatement option shall be consistent with the requirements and provisions of Sections 20.6.2.4101, 4103, 4106, 4107, and 4112 NMAC. The abatement plan shall be implemented within 30 days of NMED approval.

In the event of a spill or release that is not prescribed under their Discharge Permit, Cottonwood Springs Dairy shall initiate the notifications and corrective actions as required in Section 20.6.2.1203 NMAC. Cottonwood Springs Dairy shall take immediate corrective action to contain and remove or mitigate the damage caused by the discharge. Within 24 hours after discovery of the discharge, Cottonwood Springs Dairy shall verbally notify NMED and provide the information required by Section 20.6.2.1203.A(1) NMAC. Within 7 days of discovering the discharge, Cottonwood Springs Dairy shall submit a written report to NMED verifying the oral notification and providing any additional information or changes. Cottonwood Springs Dairy shall submit a corrective action report within 15 days after discovery of the discharge.

If NMED or Cottonwood Springs Dairy identifies any other failures of the discharge plan or system not specifically noted below, NMED might require Cottonwood Springs Dairy to develop for NMED approval contingency plans and schedules to cope with the failures.

NMED reserves the right to require Discharge Permit modification in the event NMED determines that the requirements of Section 20.6.2 NMAC are being or may be violated, or the standards of Section 20.6.2.3103 NMAC are being or may be violated. This may include a determination by NMED that operational practices approved under Cottonwood Springs Dairy's Discharge Permit are not protective of ground and surface water quality, and that a modification is necessary to protect water quality and/or abate water pollution. Modification may include, but is not limited to, lining/relining lagoons, expanding land application areas, changing waste management practices, expanding monitoring requirements, and/or implementing abatement of water pollution.

In the event of a spill, pipeline break, pump failure or other system failure at this facility effluent shall be contained, pumped and/or transferred to the concrete-lined sump,

lagoon(s) and/or land application area as necessary. Failed components shall be repaired or replaced as soon as possible and no later than 48 hours from the time of failure.

If NMED determines, upon review of analytical results from surface and sub-surface soil sampling, that nitrogen may be migrating vertically, Cottonwood Springs Dairy shall, within 30 days of notification, submit for NMED approval a corrective action plan to reduce nitrogen concentration in soil. The plan shall include source control measures, such as a reduction in the amount of effluent or solids applied to the land, expansion of the land application area, and/or changes in crop rotation. Also, Cottonwood Springs Dairy shall implement deep soil and plant material sampling.

## **Public Protection**

This CNMP Plan for Cottonwood Springs Dairy can be put into operation and managed as the plan states; and at the same time the public will be assured of water quality protection. This plan is the result of a coordinated resource conservation planning effort of the landowner, the USDA Natural Resources Conservation Service, the New Mexico Environment Department, and the Central Valley Soil and Water Conservation District.

## **Monitor Plan**

Cottonwood Springs Dairy plans to utilize monitoring wells MW1, MW2, MW3, and MW4, to evaluate any ground water contamination. These wells will be monitored quarterly for total Kjeldal nitrogen (TKN), nitrates as nitrogen (NO<sub>3</sub>-N), chloride (Cl), and total dissolved solids (TDS). The results will be reported to NMED Ground Water Section within 45 days of the testing.

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## **Closure Plan**

If Cottonwood Springs Dairy ceases to operate or terminates its discharge permit, Cottonwood Springs Dairy will:

- 1) Remove all manure from the corrals and apply it to the designated land application area or transfer it offsite for proper disposal.
- 2) Empty lagoons of all effluent and manure solids.
- 3) Perforate or remove the lagoon liner(s) and re-grade the lagoons with clean fill to blend with surface topography and prevent ponding.
- 4) Continue ground water monitoring as described in their Discharge Permit for two years after closure to confirm the absence of ground water contamination. If monitoring results show that the ground water standards in Section 20.6.2.3103 NMAC are being exceeded, Cottonwood Springs Dairy shall implement the contingency plan describe previously in this section.
- 5) Following notification from NMED that post-closure monitoring may cease; Cottonwood Springs Dairy shall plug and abandon the monitoring wells in accordance with NMED Guidelines for Monitoring Well Construction and Abandonment.
- 6) When all post-closure requirements have been met, Cottonwood Springs Dairy may request to terminate the Discharge Permit.

**Decision maker acknowledgement**

I certify that this plan accurately represents my decisions for installation, operation, maintenance, and safety for my CNMP.

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Phil Troost, Cottonwood Springs Dairy

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Date

Prepared by: \_\_\_\_\_  
Reddy Ganta, Glorieta Geoscience, Inc.