Integrated Approach for a Comprehensive Nutrient Management Plan at Pahrump Dairy, Nevada

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Pahrump Dairy is located in Pahrump, Nevada, approximately 45 miles northwest of Las Vegas. Pahrump Dairy opened in 1988 and operates continuously with 2,300 milking cows and 600 dry cows/calves on-site. Pahrump Dairy operates under a State of Nevada approved Ground Water Discharge Permit which requires a Comprehensive Nutrient Management Plan (CNMP). The CNMP includes: land application of blended wastewater for on-site crop production, calculation of nitrogen loading rates, ground-water-quality monitoring, soil chemistry and crop yield monitoring, and prevention of ponding and runoff. Pahrump Dairy generates 99,040 gallons of wastewater per day, which is blended with ground water for irrigation of 196 acres of seasonally rotated cropland. Averaged over the year, the nitrogen uptake rate of the crops (sordan and wheat) exceeds the nitrogen application rate [59,285 pounds per year (lbs/yr)]. Depth to water in four monitoring wells completed into the alluvial aquifer ranges from 35 to 50 feet, and ground-water quality (nitrate, chloride, total dissolved solids) has been monitored since 1995. Nitrate concentrations exceeding 7 milligrams per liter (mg/L) have been reported, and Pahrump Dairy installed a solids separator in March 1999 to prevent recurrence. Removal of wet manure by the separator should result in decreasing nitrate concentrations in ground water and should eliminate the potential for excess nitrogen loading. This integrated approach to nutrient management and monitoring can be adapted to regions with shallow alluvial aquifers and highly transmissive unconfined aquifers such as portions of the Ogallala aquifer of the Great Plains.

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