

Wyoming Nutrient Management Plan Technical Standards

This technical standards document provides design criteria for nutrient management planning. This design criteria defines the necessary elements for development of a nutrient management plan (NMP) which conforms with the National Pollution Discharge Elimination System (NPDES) and Effluent Limitation Guidelines (ELG) 40 CFR sections 122 and 412 respectively and WYDEQ Water Quality Rules and Regulations, Chapter 2, while maintaining management flexibility in meeting these standards. Conformance with USDA-NRCS, National Conservation Practice Standard 590 meets all requirements of this guidance. www.nrcs.usda.gov/technical/ECS/nutrient/590.pdf Existing swine operations must meet the requirements of their WTDEQ Water Quality Rules and Regulations, Chapter 3 permits. New swine operations shall refer to WYDEQ Water Quality Rules and Regulations, Chapter 20.

Applicability: This Technical Standard applies to Concentrated Animal Feeding Operations and Animal Feeding Operations designated Concentrated Animal Feeding Operations by the Agency Director as defined in the WYDEQ Water Quality Rules and Regulations, Chapter 2.

Various technical references are cited within the technical standards. The appropriate application of these technical design methods implies achievement of expected environmental protection. Other methods may be utilized subject to the approval of the Water Quality Division (WQD).

TECHNICAL STANDARDS

Operation Identification: Shall include the operator name, address, and phone number, and the name, address, and phone number of the person preparing the NMP.

Operation Description: Shall include an aerial photo or map identifying surface waters, field identification (field #, name, or legal description), production areas (acres) and land application areas (acres). Production areas are defined as that part of an animal feeding operation that includes the animal confinement area, manure storage area, raw materials storage area, and the waste containment area. Land application area means all areas that may receive application of manure and process waste water during the term of the management plan. Contract land application areas shall be identified as such and life of lease provided. Operators may apply manure and process wastewater to property owned and operated by others. These lands shall be included in the nutrient plan.

Animal Numbers: Provide number of animals by species and production/age class (cattle excluding mature dairy or veal, veal, mature dairy, chickens, turkeys, ducks, horses, sheep or lambs, bison).

Manure Production: Manure production shall be determined for each species and production/age class. Manure production shall be determined by Manure Management Planner (www.agry.purdue.edu/mmp/), Spatial Nutrient Management Planner (www.cares.missouri.edu/snmp/), NRCS-WY Agronomy Technical Note #14 (solid systems)

<http://www.nrcs.usda.gov/technical/efotg/>, NRCS-WY Conservation Practice Standard #313 (Liquid Systems) <ftp://ftp-fc.sc.egov.usda.gov/NHQ/practice-standards/standards/313.pdf>, or NRCS National Engineering Handbook - Agriculture Waste Management Field Handbook <http://www.info.usda.gov/CED/ftp/CED/neh651-ch1-11.pdf> Total manure production for the operation shall be calculated.

Manure Sampling and Analysis: Manure/process wastewater shall be sampled and analyzed annually and results of analysis utilized to determine appropriate application rates.

Manure sampling shall be conducted following Colorado State University -Cooperative Extension Service CNMP Workbook <http://www.colostate.edu/Depts/SoilCrop/extension/Soils/cnmp/> or NRCS-WY Agronomy Tech. Note #13 <http://www.nrcs.usda.gov/technical/efotg/>. The number of grab samples necessary to provide representative nutrient content values is based on storage and handling methods. Recommended sample numbers are: Agitated liquid slurries, under barn storage, tanks, or earthen basins = 1, liquid slurries (not agitated) = 3, lagoon liquids w/solid separation = 1, stored stack solids = 3 or more, scrape and haul =1.

Manure analysis shall be conducted by an accredited laboratory for total N, phosphorus, and potassium at minimum.

Operators may allow others to remove manure from the operation. The operator shall maintain a record of the recipient that received manure, estimated tonnage removed, and date of pickup. These records must be maintained for five (5) years. The operator shall provide the most current manure nutrient analysis to the recipient.

New facilities may utilize the following table or other valid values for initial calculation of nutrient content for each manure type.

Table 1: National averages of nitrogen (N), phosphorus (P₂O₅), and potassium (K₂O) values of manures based on a dry weight and a wet weight basis.*

Source	% Dry Weight				% Wet Weight		
	Dry Matter	Total N	Total P ₂ O ₅	Total K ₂ O	Total N	Total P ₂ O ₅	Total K ₂ O
Dairy	15-25	0.6-2.1	0.7-1.1	2.4-3.6	0.1-0.5	0.1-0.3	0.4-0.9
Feedlot	20-40	1.0-2.5	0.9-1.6	2.4-3.6	0.2-1.0	0.2-0.6	0.5-1.4
Horse	16-25	1.7-3.0	0.7-1.2	1.2-2.2	0.3-0.8	0.1-0.3	0.2-0.6
Poultry	20-30	2.0-4.5	4.5-5.0	1.2-2.4	0.4-1.4	0.9-1.5	0.2-0.7
Sheep	25-35	3.0-4.0	1.2-1.6	3.0-4.0	0.8-1.4	0.3-0.6	0.8-1.4
Swine	20-30	3.0-4.0	0.4-0.6	0.5-1.0	0.6-1.2	0.1-0.2	0.1-0.3

*To determine actual amounts of nutrients, however, it is necessary to have the manure tested. **Source:** Knott's Handbook for Vegetable Growers. 1997. John Wiley & Sons, Inc.⁴

Crop Production: Identify anticipated crop sequence, acreages, and realistic yield goals.

Nutrient Requirements: Nutrient requirements shall be calculated using University of Wyoming –

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Cooperative Extension Service bulletin #1045 <http://www.uwyo.edu/CES/PUBS/MP7R-03.pdf> or historic crop yield and nutrient uptake data.

Nutrient Budget: The nutrient budget shall include crop nutrient requirements minus nutrient credits. Nutrient credits include legume nitrogen, residual soil nutrients, nutrients from commercial fertilizer application, irrigation water nitrate nitrogen, and other nutrient sources. Plant available nitrogen from manure may be calculated utilizing NRCS – WY Agronomy Tech. Note #14 <http://www.nrcs.usda.gov/technical/efotg/>. Assessment of each land application area for phosphorus transport to surface water potential utilizing the NRCS – WY Agronomy Tech. Note #15 <http://www.nrcs.usda.gov/technical/efotg/> (phosphorus index) shall be conducted. The following restrictions shall apply based on the results of the Phosphorus index:

Phosphorus based manure and process wastewater application rates shall apply where the phosphorus transport risk is high.

No application of manure or process wastewater shall be made to a land application area with a phosphorus transport risk rating of very high.

Manure Application: Manure and process wastewater shall be applied with properly calibrated equipment. Application equipment shall be calibrated following Colorado State university-Cooperative Extension Service Bulletin #1.223 (<http://www.ext.colostate.edu/pubs/livestk/01223.html>) for liquid manure application or #0.561 <http://www.ext.colostate.edu/pubs/crops/00561.html> for solid manure. Manure and process wastewater shall be applied uniformly and at rates identified in the nutrient budget. Application equipment shall be inspected for leaks and proper function annually prior to first application of manure or process wastewater.

Land to be utilized for application of manure or process wastewater shall have a slope of less than six (6) percent. Minimize runoff potential by incorporating manure or process waste water as soon as possible after application unless the application site is permanently vegetated or is no-till cropped. Surface broadcast, injection, or incorporation of liquid manure or process wastewater shall not be applied to frozen or snow covered ground. If application to frozen or snow covered ground is absolutely necessary, the operator shall notify the WQD of any deviation from the NMP.

Set Backs: Manure and process wastewater shall not be applied closer than one hundred (100) feet to any down gradient surface waters, open tile line intake structures, sinkholes, agricultural wellheads, or other conduits to surface waters;

A thirty five (35) foot setback where application is prohibited may be adopted if this area is designated as a permanently vegetated buffer;

Alternative setback distances can be approved by the WQD where conservation practices or site conditions provide verifiable pollutant reductions that meet or exceed those provided by the minimum setbacks defined above. Irrigation wells may qualify for this provision upon completion of a groundwater vulnerability determination.

Operator Identification

- ___ operator Information
- ___ planner information

Operation Description

- ___ production area
- ___ land application area
- ___ field identification
- ___ surface water identification

Animal Waste Calculations

- ___ animal numbers
- ___ total manure production calculations
- ___ manure nutrient content calculations

Land Application Area

- ___ identification of planned crops
- ___ expected yield and basis of yield
- ___ Phosphorus index worksheet
- ___ acres receiving waste identified
- ___ nutrient budget
- ___ set back alternative demonstration

Manure Application Plan

- ___ application equipment calibration log
- ___ application equipment inspection log

___ application dates and amounts record sheet

Helpful references:

NRCS Nutrient Management Technical Practice standard 590, <http://www.nrcs.usda.gov/technical/ECS/nutrient/590>.

NRCS Nutrient Management Technical Resources, <http://www.nrcs.usda.gov/technical/nutrient.html>

NRCS Field Office Technical Guide, <http://www.nrcs.usda.gov/technical/efotg/>

Cooperative Extension Service Agents and Specialists, <http://www.reusda.gov/hrd/statedir.htm>

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