

Wyoming Nutrient Management Plan Technical Standards



This technical standards document provides format and content criteria for nutrient management plan development. This criterion defines the necessary elements for development of a nutrient management plan (NMP) which conforms to 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.

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).

NARRATIVE APPROACH

The Wyoming Department of Environmental Quality requires NMPs to express rates of application as a narrative rate of application that results in the amount, in tons or gallons, of manure, litter, and process wastewater to be land applied, according to the following specifications:

1. The terms include maximum amounts of nitrogen and phosphorus derived from all sources of nutrients, for each crop identified in the nutrient management plan, in chemical forms determined to be acceptable, in pounds per acre, for each field, and certain factors necessary to determine such amounts.
2. At a minimum, the NMP must include: the outcome of the field-specific assessment of the potential for nitrogen and phosphorus transport from each field; the potential crops to be planted in each field or any other uses such as pasture or fallow fields; the realistic yield goal for each crop or use identified for each field; and the nitrogen and phosphorus recommendations from sources specified in this document for each crop or use identified for each field. In addition, the NMP must include the methodology by which the nutrient management plan accounts for the following factors when calculating the amounts of manure, litter, and process wastewater to be land applied: Results of soil tests conducted in accordance with protocols identified in the nutrient management plan; credits for all nitrogen in the field that will be plant available; the amount of nitrogen and phosphorus in the manure, litter, and process wastewater to be applied; consideration of multi-year phosphorus application; accounting for all other additions of plant available nitrogen and phosphorus to the field; the form and source of manure, litter, and process wastewater; the timing and method of land application; and volatilization of nitrogen and mineralization of organic nitrogen.

CAFOs must calculate maximum amounts of manure, litter, and process wastewater to be land applied at least once each year using the methodology required in this document before land applying manure, litter, and process wastewater and must rely on the following data:

1. A field-specific determination of soil levels of nitrogen and phosphorus, including, for nitrogen, a concurrent determination of nitrogen that will be plant available consistent with the methodology required, the results of the most recent soil test conducted in accordance with soil testing requirements; and

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2. The results of most recent representative manure, litter, and process wastewater tests for nitrogen and phosphorus taken within 12 months of the date of land application, in order to determine the amount of nitrogen and phosphorus in the manure, litter, and process wastewater to be applied.

TECHNICAL STANDARDS

Operation Identification:

Shall include the date of plan preparation, operator name, address, and phone number, operation legal description (Township, Range, and Section), Hydrologic Unit Code (HUC), and the name, address, and phone number of the person preparing the NMP.

Operation Description:

Shall include an aerial photo or map which shall identify the following features; Planning unit boundaries, surface waters, field boundaries, field ID (field #, name, or legal description), field area (acres), production area boundaries, production area ID, production area (acres) environmentally sensitive areas, manure containment areas, feed storage areas, mortality storage or disposal areas, arrows showing prevailing surface drainage of all land application and production areas (topographical lines are acceptable).

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 (use maximum capacity and any anticipated expansion during the life of the permit).

Manure Production:

Manure production shall be determined for each species and production/age class. Total manure production for the operation shall be calculated.

<http://www.wy.nrcs.usda.gov/technical/wycnmp/sec4.html#>

<http://www.wy.nrcs.usda.gov/technical/Agromony/nutrient.html>

Manure and Wastewater Handling and Containment:

Identify practices for collection, containment, and treatment of production area runoff and waste. Collection and containment capacity to meet 25/24 storm requirement must be certified by engineer or technician. State designed containment capacity (in days). Identify procedures to maintain/restore wastewater containment capacity. Identify clean water diversion structures. Identify operation and maintenance practices. Lagoon level monitoring device is required.

Include all inputs used in the open manure containment structure design including actual climate data for the previous 30 years consisting of historical average monthly precipitation and evaporation values, the number and types of animals, anticipated animal sizes or weights, any added water and bedding, any other process wastewater, and the size and condition of outside areas exposed to rainfall and contributing runoff to the open

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manure storage structure.

Provide the design of the open manure containment structure as determined by the most recent version of the National Resource Conservation Service's Animal Waste Management (AWM) software. CAFOs may use equivalent design software or procedures as approved by the Director.

Manure Sampling and Analysis:

Manure/process wastewater shall be sampled and analyzed annually and results of analysis utilized to determine appropriate application rates. Manure analysis shall be conducted by a Manure Analysis Proficiency (MAP) certified laboratory <http://www2.mda.state.mn.us/webapp/lis/maplabs.jsp>

Manure sampling shall be conducted following Colorado State University - Cooperative Extension Service CNMP Workbook: <http://www.extsoilcrop.colostate.edu/Soils/cnmp/index.html>, or North Dakota State University bulletin AE 1259: <http://www.ag.ndsu.edu/pubs/h2oqual/watnut/ae1259.pdf>

Manure analysis shall be conducted by an accredited laboratory for moisture content, total nitrogen, phosphorus, and potassium, ash, and organic matter. Ammonia should also be included for liquid manures.

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.

Soil Sampling and Analysis:

Soil sampling shall be conducted prior to the growing season on each field that will receive land application of manure. Soil sampling shall be consistent with the University of Wyoming soil test worksheet. <http://uwadmnweb.uwyo.edu/soilFert/Pubs/Soil%20Sample%20worksheet.pdf>

Soil analysis shall be conducted for nitrogen, phosphorus and potassium. Soil analysis shall be conducted by a Proficiency Assessment program (PAP) certified soils laboratory. <http://www.naptprogram.org/pap/>

Crop Production:

Identify any crops that may be grown within the life of the CNMP and actual or county average yields for each crop. Identify any acreage that may receive manure application during the life of the CNMP. Acreage description should be consistent with land application section of operation description.

Nutrient Requirements:

Nutrient requirements shall be calculated using University of Wyoming – Cooperative Extension Service bulletin #1045 <http://uwadmnweb.uwyo.edu/soilFert/> or http://efotg.nrcs.usda.gov/references/public/WY/Agronomy_Tech_Note_No_12_5.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 with Manure Management Planner <http://www.agry.purdue.edu/mmp/> or by using the following nutrient availability factors. (N based: use 0.4 for solids, 0.3 for liquids or slurries, and 0.2 for composted material; P based use 1.0). An assessment utilizing the phosphorus index shall be conducted for each land application area to determine

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the potential for phosphorus transport to surface water. An assessment utilizing the Colorado Nitrogen Leaching Index Risk Assessment shall be conducted for each land application area to determine the potential for nitrogen transport to ground water. The following restrictions shall apply based on the results of the Phosphorus index:

1. Phosphorus based manure and process wastewater application rates shall apply where the phosphorus transport risk is high.
2. No application of manure or process wastewater shall be made to a land application area with a phosphorus transport risk rating of very high or a soil analysis phosphorus value of 154 ppm or higher.
3. Nitrogen applications shall follow the Risk Interpretations guidelines of the Nitrogen Leaching Index.

Manure Application: Manure and process wastewater shall be applied with properly calibrated equipment. Application equipment shall be calibrated following:

<http://www.ces.purdue.edu/extmedia/ID/ID-309.pdf>

<http://www.ext.colostate.edu/pubs/livestk/01223.html> (liquid manure application)

<http://www.ext.colostate.edu/pubs/crops/00561.html> (solid manure)

Manure and process wastewater shall be applied uniformly and at rates identified in the nutrient budget. The timing and method of application of nutrients on each field to minimize nitrogen and phosphorus movement to surface waters shall be identified. 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. 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 prior to any application.

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.

Mortality Management:

Dead animals shall be handled in a manner that will not cause environmental problems. Generally accepted methods of handling dead animals include composting, rendering, land filling, burial in a site and at a depth that will not create a water quality problem or health risk. Natural disposal is legal when animals are deposited at least 1/2 mile from any dwelling and at least 1/4 mile from surface water. Natural disposal may not be suitable where numerous carcasses must be disposed of. Scavengers should be able to clean up disposed carcasses in a timely manner.