NUTRIENT MANAGEMENT

Operations and Maintenance Plan For Liquid Manure

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This **Operation and Maintenance Plan** is intended to be used with liquid manure. Liquid manure is defined as manure having less than 20% solid content.

Background: Ohio policy states that CNMPs are not required for the following "lower risk" circumstances: Livestock operations with liquid manure handling and storage that meet all of the following criteria:

- There is no settling basin with a constructed vegetated treatment area.
- Existing storage is structurally sound with no signs of off site pollution or will be replaced with a new system.
- There are less than 10,000 cubic feet (75,000 gallons) of liquid manure collected annually,
- There is at least one acre available for manure application for every 5,000 gallons of manure collected.
- The farm headquarters and the land that will have manure applied are under a conservation management system.
- There is a current soil test on all fields that will receive manure.
- There are no fields receiving manure with soil tests above 150 ppm (300 lbs/ac).

In these cases this Operations and Maintenance Plan will serve in place of a CNMP.

General Description of Operation:

(Describe Location, Type and Number of Livestock, Acres of Cropland / Pasture Land, Crop Rotation, Tillage System)

Manure Storage and Handling:

(Describe how manure will be collected, stored, and transferred.)

Manure Application:

(Describe the type of application equipment and specify the form, source, amount, timing, and method of nutrient application.)

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A conservation plan map and setback map of non-application areas must be developed

The following setbacks will be observed when applying manure:

Type of Sensitive - Setback Area	Setbacks Based on Methods of Manure Application		
	Surface Application	Winter Application Frozen or Snow Covered Soils 7/	Surface Incorporation W/I 24 Hours OR Direct Injection
Residences / Private Wells down slope from the application area.	100 ft.	200 ft.	100 ft.
- Sinkholes	300 ft.		100 ft.
- Pond or Lake	- 35ft. Vegetative Barrier 1/, with the remaining 100 ft. setback in non-vegetative Setback 2/	- 35ft. Vegetative Barrier 1/, with the remaining 200 ft. setback in non-vegetative Setback 2/	- 35ft. Vegetative Barrier 1/
- Streams - Ditches - Surface Inlets	- 35ft. Vegetative Barrier 1/, OR - 100 ft. setback in non-vegetative Setback, OR - 35 ft. in non-vegetative setback 3/	200 ft.	None
Grassed Waterway	35 ft.	200 ft.	None
Field Surface Drains	35 ft.	200 ft.	None
Public Wells	300 ft.	300 ft.	100 ft.
Developed Springs	300 ft. upslope	300 ft. upslope	300 ft. upslope
Public Surface Drinking Water In-take	300 ft.	300 ft.	300 ft.

1. Must have a current soil test on all land receiving manure to develop this plan.
2. Soil tests will be taken every 3 years and manure will be analyzed annually. These results will guide manure application.
3. For liquid wastes, the application rate is to be adjusted to the most limiting factor to avoid ponding, surface runoff, subsurface drainage (tile) discharge, the nutrient needs of the field as recommended by the Tri-State Fertility Guide, or the nitrogen or phosphorus risks for the field. The total application is not to exceed the field capacity of the upper 8 inches of soil. See **Table 1**
4. Prior to manure application on fields with subsurface tile, use an AERWAY (or similar tool) that can disrupt/close (using horizontal fracturing) the preferential flow paths (worm holes, cracks, root channels) in the soil, or till the surface of the soil 3-5 inches deep to a condition that will absorb the liquid wastes.
5. If fields have a history of liquid manure entering the subsurface drainage system, block the drainage outlets .
6. Manure will be utilized in a manner that minimizes the opportunity for contamination of surface and ground water .
7. Manure will not be land-applied on soils that are frequently flooded as defined by the National Cooperative Soil Survey, during the period when flooding is expected unless incorporated immediately.
8. Manure will not be applied to frozen or snow covered soil.
9. Weather forecasts will be monitored. Don't apply prior to an imminent rainfall likely to generate runoff.
10. Records of manure application will be kept a minimum of five (5) years.
11. Manure will not be applied to cropland over 15% slope or to pasture/hayland over 20% slope unless <u>one</u> of the following precautions is taken:
    A) Immediate incorporation or injection with operations done on the contour, UNLESS the field has 80% ground cover (residue and/or canopy) .
    B) Applications are timed during periods of lower runoff and/or rainfall (Late May to Mid-October) .
    C) Apply low rates through split applications (separated by rainfall events). Apply less than 5000 gal/ac .
    D) The field is established and managed in contour strips with alternate strips in grass or legume.
12. When appropriate, reduce nitrogen volatilization losses by direct injection or incorporation within 24 hours.
13. See practice standard Nutrient Management (590) for more information.

Producer's Signature	Date

Table 1. Available Water Capacity (AWC) Practical Soil Moisture Interpretations for Various Soils Textures and Conditions to Determine Liquid Waste Volume Applications not to exceed AWC.

This table shall be used to determine the AWC at the time of application and the liquid volume in acre-inches that can be applied not to exceed the AWC. To determine the AWC in the upper 24 inches use a soil probe or similar device to evaluate the soil to a depth of 24 inches. To evaluate the upper 8 inches only the upper 8 inches of soil needs to be evaluated.

Available Moisture in the Soil	Sands and Loamy Sands	Sandy Loam and Fine Sandy Loam	Very Fine Sandy Loam, Loam, Silt Loam, Silty Clay Loam	Sandy Clay, Silty Clay, Clay, Fine and Very Fine Textured Soils
0 % Soil Moisture Soil Depth Amount to Reach AWC	Dry, loose and single-grained; flows through fingers. 0-8" 1" 0-24 " 2.6"	Dry and loose; flows through fingers. 0-8" 1" 0-24 " 2.6"	Powdery dry; in some places slightly crusted but breaks down easily into powder. 0-8" 1.5" 0-24 " 3.5"	Hard, baked and cracked; has loose crumbs on surface in some places. 0-8" 1" 0-24 " 2.6"
50% or Less Soil Moisture Soil Depth Amount to Reach AWC	Appears to be dry; does not form a ball under pressure. [b] 0-8" .75" 0-24 " 2.0"	Appears to be dry; does not form a ball under pressure. [b] 0-8" .75" 0-24 " 2.6"	Somewhat crumbly but holds together under pressure. 0-8" 1.1" 0-24 " 2.6"	Somewhat pliable; balls under pressure [b]. 0-8" .75" 0-24 " 2.0"
50 to 75 % Soil Moisture Soil Depth Amount to Reach AWC	Appears to be dry; does not form a ball under pressure. [b] 0-8" .5" 0-24 " 1.3"	Balls under pressure but seldom holds together. 0-8" .5" 0-24 " 1.3"	Forms a ball under pressure; somewhat plastic; slicks slightly under pressure. 0-8" .75" 0-24 " 1.8"	Forms a ball; ribbons out between thumb and forefinger. 0-8" .5" 0-24 " 1.3"
75% to Field Capacity Soil Depth Amount to Reach AWC	Sticks together slightly; may form a weak ball under pressure. 0-8" .25" 0-24 " .6"	Forms a weak ball that breaks easily, does not stick. 0-8" .25" 0-24 " .6"	Forms ball; very pliable; slicks readily if relatively high in clay. 0-8" .4" 0-24 " .9"	Ribbons out between fingers easily; has a slick feeling. 0-8" .25" 0-24 " .6"
100% Field Capacity	On squeezing, no free water appears on soil, but wet outline of ball on hand.	On squeezing, no free water appears on soil, but wet outline of ball on hand.	On squeezing, no free water appears on soil, but wet outline of ball on hand.	On squeezing, no free water appears on soil, but wet outline of ball on hand.
Above Field Capacity	Free water appears when soil is bounced in hand.	Free water is released with kneading.	Free water can be squeezed out.	Puddles: free water forms on surface