

EPA believes that in some instances phosphorus levels in soils are so high, or site-specific conditions (e.g., highly erodible soils) are such that any application of manure, litter, or other process wastewaters would be inconsistent with appropriate agricultural utilization of nutrients and would lead to excessive levels of nutrients and other pollutants in runoff. EPA expects that these factors will be taken into account as State permitting authorities develop appropriate technical standards for the land application of manure by CAFOs.

The trace metals present in animal wastes, when applied to fields at either nitrogen- or phosphorus-based rates, are made available to plants in sufficient quantities that they provide many of the micronutrients necessary for proper plant growth. Excessively high levels of these trace metals, however, can inhibit plant growth. By limiting manure applications to the nitrogen- or phosphorus-based rate, CAFOs will also be limiting the rate at which metals are applied to fields and thus reduce the potential for applying excessive amounts of the trace metals.

Nitrogen-based application rates are generally based on the following factors: (1) The nitrogen requirement of the crop to be grown based on the operation's soil type and crop; and (2) realistic crop yields that reflect the yields obtained for the given field in prior years or, if not available, from yields obtained for the same crop at nearby farms or county records. Once the nitrogen requirement for the crop is established, the manure application rate is generally determined by subtracting any other sources of nitrogen available to the crop from the crop's nitrogen requirement. These other sources of nitrogen can include residual nitrogen in the soil from previous applications of organic nitrogen, nitrogen credits from previous crops of legumes and crop residues, or applications of commercial fertilizer, irrigation water, and biosolids.

Application rates are based on the nitrogen content in the manure and should also account for application methods, such as incorporation, and other site-specific practices. Phosphorus-based application rates generally take into account the phosphorus requirements of the crop, as well as the amount of phosphorus that will be removed from the field when the crop is harvested. EPA expects that State standards will generally provide CAFOs the flexibility to determine, separately for each field, whether manure is to be applied at the nitrogen- or the phosphorus-based application rate. Thus, EPA expects that as the ELG

requirements are implemented, some CAFOs will be able to apply manure at the nitrogen-based rate for all of their fields; some CAFOs will be limited to the phosphorus-based rate on all of their fields; and the remaining CAFOs will have some fields that are limited to the phosphorus-based rate and some fields where manure can be applied at the nitrogen-based rate. In making these field-specific determinations, CAFOs must use the method authorized by the permitting authority.

Today's rule specifies that manure, litter, or other process wastewaters are not to be applied within 100 feet of any down-gradient surface waters, open tile line intake structures, sinkholes, agricultural well heads, or other conduits to surface waters. As a compliance alternative to the 100-foot setback, the CAFO may elect to establish a 35-foot vegetated buffer where application of manure, litter, and other process wastewaters are not applied; or may demonstrate to the permitting authority that a setback or vegetated buffer is unnecessary or may be reduced because implementation of alternative conservation practices or site-specific conditions will provide pollutant reductions equivalent to or better than the reductions that would be achieved by the 100-foot setback.

A setback is an area where manure, litter, or other process wastewaters are not applied, but crops may continue to be grown. The transport of nutrients and other pollutants in manure to surface waters and the rate at which transport occurs is dependent on the land use, geography, topography, climate, amount and method of manure application, and the nature and density of vegetation in the area. The setback achieves pollutant reductions by increasing the distance pollutants from the land application of manure, litter, or other process wastewaters have to travel to reach surface waters. The setback requirements established by this rule will minimize the potential runoff of pathogens, hormones such as estrogen, and metals and reduce the nutrient and sediment runoff.

Because a setback may not be the most cost-effective practice to control runoff in all cases, this rule includes a compliance alternative that allows the CAFO to establish a 35-foot vegetated buffer in lieu of the 100-foot setback. A vegetated buffer is a permanent strip of dense perennial vegetation, where no crops are grown, that slows runoff, increases water infiltration, absorbs nutrients, and traps pollutants bound to sediment. The vegetated buffer is more effective (on a per-foot of width basis) than the setback at reducing pollutant

runoff, therefore the compliance alternative allows the buffer width to be smaller than the setback. Both approaches are expected to achieve comparable pollutant reductions. (EPA decided not to require all fields receiving manure, litter, or other process wastewaters to have a vegetated buffer because that would unnecessarily require CAFOs to take that portion of the cropland out of production.)

The setback requirements included in today's rule contain an additional compliance alternative that allows the CAFO to implement alternative conservation practices that will provide pollutant reductions equivalent to or better than the 100-foot setback. In some cases, the CAFO may be able to demonstrate to the permitting authority that no setback is necessary based on site-specific conditions, such as when the surface water is located up-gradient from the area of manure application.

Manure must be sampled at least once per year and analyzed for its nutrient content, including nitrogen and phosphorus. EPA believes that annual sampling of manure is the minimum frequency to provide the necessary nutrient content on which to establish the appropriate application rate. The nutrient composition of manure varies widely among farms because of differences in animal species and management, and manure storage and handling practices. The only method available for determining the actual nutrient content of manure for a particular operation is laboratory analysis. If the CAFO applies its manure more frequently than once per year, it may choose to sample the manure more frequently. Sampling the manure as close to the time of application as practical provides the CAFO with a better measure of the nitrogen content of the manure. Generally, nitrogen content decreases through volatilization during manure storage when the manure is exposed to air. All CAFOs must collect and analyze soil samples for phosphorus at least once every 5 years from all fields under their control that receive manure. Soil tests are an important tool to determine the crop phosphorus needs and to determine the optimum application rate. Crop rotation cycles vary, and State programs require soil sampling at varying frequencies that in many cases are tied to the soil type. EPA requires soil sampling at least once every 5 years to correspond with the permit cycle for CAFOs, although States may require more frequent sampling. Without manure and soil analyses, CAFOs might apply more commercial fertilizer than is needed or spread too much manure on their fields. Either