CHAPTER 7: AVOIDING COMMON DEFICIENCIES

Historically, the majority of discharges from CAFOs occur from manure handling systems and during the land application of manure. In most cases, the discharge did not occur during a rainfall event. In many cases, the discharge could have been avoided through better planning, management, and operation of the CAFO. Even though proper operation and maintenance is a standard permit condition, it is often helpful to simply be aware of the types of deficiencies that may ultimately lead to a discharge. This chapter focuses on the more common deficiencies that may lead to permit violations, pollutant discharges, or both, and provides some tools CAFOs may use to avoid such deficiencies.

Disclaimer: The purpose of this chapter is to give examples of practices that could lead to a CAFO being out of compliance with its permit requirements. These examples are not intended to comprehensively describe the CAFO regulatory requirements and the full set of practices that are necessary for a CAFO to remain in compliance. For more information, visit the Agriculture Compliance Assistance Center website at http://www.epa.gov/agriculture/.

A. Proactive Management

Norton et. al. (1996) developed a dual approach of developing management plans and conducting farm inspections for addressing key aspects of pollution risk management: proactive management and reactive management. Proactive management involves identifying the potential for any discharge, assessing what can be done to minimize the risk of discharge, and then taking steps to ensure the potential discharge does not occur. In contrast, reactive management deals with the actions necessary to respond to a discharge and then implementing measures to prevent an incident from reoccurring. Many state spill response plan requirements and the Environmental Management System guidelines for ISO14000 certification (ASQ,1996) require addressing incidents such that they do not recur.

Example: Permit Violations in North Carolina

A review of permit violations on concentrated animal feeding operations in North Carolina found that two hundred eighty-five (285) discharges occurred between 1996 and 2000. Forty-two percent (42%) of discharges from swine facilities were related to the land application of lagoon effluent and thirty-nine percent (39%) were from the manure handling systems. Lagoon liquid levels were observed to be exceeding the lagoon's 25-year, 24-hour storm storage level at over 80% of all visits.

Source: Sheffield, 2002.

Resources are available to help a CAFO to determine an accurate environmental profile for their operation. For example, the National Livestock Producers Association (NLPA) and Environmental Management Solutions, LLC, formed a clearinghouse for the On-Farm Assessment and Environmental Review (OFAER) program. The OFAER Program provides a free, confidential assessment of animal production facilities and is available to the producer through NLPA. The program helps give producers an edge regarding the public's perception of their operation and offers cost savings by taking advantage of a third party's animal production and environmental stewardship knowledge. The OFAER program can help all operations learn what strengths and challenges face the operation, as well as offer helpful recommendations concerning these issues. For more information see http://www.nlpa.org/html/ofaer_program.shtml or contact America's Clean Water Foundation at http://www.acwf.org/projects/ofaer.html for more information on the assessment program and to download the OFAER environmental assistance program's *Form A: Producer Checklist*.

CAFOs may request compliance assistance from EPA's Agriculture Compliance Assistance Center. For more information see http://www.epa.gov/agriculture/.

CAFOs may also contact the state agriculture and environmental agencies for other resources.

B. Common Deficiencies

1. Inadequacy of Storage Capacity

The minimum storage period for livestock and poultry manures is not specifically defined by the CAFO regulations. The NRCS recommends that manure storage facilities have a minimum of 6 months of storage capacity. As discussed in Chapter 2 of this document, a case-by-case evaluation of the appropriateness of the storage period specified in a NMP based on the proposed nutrient utilization strategy is necessary for a balanced assessment of other acceptable storage periods. See Chapter 2 for more information on adequate storage.

2. Infrequent Dewatering of Storage Structures

A well-designed manure storage facility must also be well managed to prevent the development of environmental concerns. Management decisions relative to startup and loading (especially anaerobic lagoons), manure removal, monitoring of structure integrity and other issues, and maintenance of appearance and aesthetics play critical roles in a well-managed storage facilities. Probably the single most important requirement in operating and maintaining a manure storage facility is to ensure that the facility does not overflow or discharge. Discharges from manure storage facilities may violate permit requirements and other state or local regulations; result in large fines or penalties; and, at the very least, represent a potential environmental hazard. Manure removal from storage according to the storage period selected is the most critical activity in preventing discharge. Many discharge problems have occurred because producers were unable to manage the activities necessary to remove manure from storage in a timely manner.

3. Pumpdown Practices

Lagoon effluent and holding pond water is usually removed by pumping equipment similar to irrigation equipment. Hand carry, solid set, stationary big gun, traveling gun, drag-hose systems, and center pivot equipment have all been used to land apply liquids. Experience has shown that unplanned discharges and spills sometimes occur with pumping activities. Sources of such unplanned discharges include burst or ruptured piping, leaking joints, operation of loading pumps past the full point of hauling equipment, and other factors. Hence, pumping activities should be closely monitored, especially in the “startup” phase, to ensure that no spills or discharges occur. Continuous pumping systems such as drag-hose or irrigation systems can be equipped with automatic shut-off devices (which usually sense pressure) to minimize the risk of discharge in the event of pipe failure. In some situations lagoon liquid may be applied through permanent irrigation systems that are used to apply water for crop production. For this type of system backflow/anti-siphon devices should be installed to preclude the chance of contamination of the fresh water supply. All process wastewater pumped out must be accounted for in the overall nutrient balance calculated in the CAFO’s NMP.

4. Lagoon Agitation

Lagoons may or may not be agitated. When they are not agitated, considerable nutrient buildup in the bottom sludge will occur. Agitation is a critical operation in maintaining available storage in liquid manure systems. Some facilities have designed storage structures equipped with pumps to allow wastewater application without additional agitation. Failure to properly agitate will likely result in a continuing buildup of settled solids that are not removed. The result is less and less available storage capacity as time goes by.

Agitation of manure resuspends settled solids and ensures that most or all of the manure will flow to the inlet of the pump or removal device. Additionally, agitation homogenizes the manure mixture and provides a more consistent nutrient analysis as the manure is being land applied. Agitation of manure storage facilities releases gases that may increase odor levels and present a health hazard. Consideration should be given to weather and wind conditions, time of

day, and day of the week to minimize the possibility of odor conflicts while agitating. Some CAFOs may be subject to local or state requirements for agitation.

5. Representative Manure Samples

It is inappropriate to sample the more dilute liquid from the top of storage facility, and then agitate the solids during land application activities. If a storage facility will be agitated just prior to or during land application, manure samples for nutrient analysis, in order to be considered representative, should be obtained after the facility is well agitated. In most cases, the results of such an analysis will not be available before land-applying the manure. In these cases, analysis results from the most recent pumping events can be used to anticipate the present analysis (and estimate the proper application rate). The present analysis, when available, can be used to calculate the nutrients actually applied. The CAFO must include this information in the records and address it in the NMP.

6. Animal Mortality Practices

NMPs developed as a condition of an NPDES permit must ensure proper management of typical and catastrophic animal mortalities, as described earlier in this document. It is important for the CAFO also to identify and review any applicable State and local regulations concerning animal mortalities. In many cases, state or local laws and ordinances may prohibit the use of specific animal mortality practices. The plan must comply with any state or local requirements. These regulations can often be found at the State Department of Agriculture of the State Health Department. The permit authority, as well, should take note of any such State or local requirements prior to reviewing a NMP as part of a permit application review or conducting an inspection.

Potential issues concerning compliance with the requirements for handling animal mortality include the following:

- Underestimating the number of mortalities;
- Inappropriate technology selection based on type and number of animals;
- Incorrect sizing of storage and treatment facilities;
- Failure to address catastrophic mortality; and
- Failure to identify or meet state and local requirements.

7. Chemical Handling

CAFOs must ensure that chemicals and other contaminants handled on-site are not disposed of in any manure, litter, process wastewater, or storm water storage or treatment system unless specifically designed to treat such chemicals and other contaminants (40 CFR 122.42(e)(1)). Examples include pesticides, hazardous and toxic chemicals, and petroleum products/by-products. This standard does not impose any new use restrictions that do not already exist. Many chemicals will disrupt the biological treatment processes that may be a part of a CAFO's waste handling and storage system. Any chemicals that enter manure and wastewater storage structures could be discharged to surface water during land application of the manure and wastewater or during spills or other accidental releases.

In general, poor housekeeping is an indicator of improper storage and handling of chemicals and an increased potential for contamination of manure and wastewater structures. The CAFO's NMP should identify where chemicals are stored, where any mixing and loading are conducted, how empty containers and waste materials are disposed of, and what practices are employed to prevent chemicals from inappropriately entering the manure and wastewater storage structures.

In addition, livestock operations may be subject to section 311 of the CWA, which addresses pollution from oil and hazardous substance releases. The regulations established by EPA to implement this portion of the CWA have two sets of requirements — the Spill Prevention

Control and Countermeasures (SPCC) plan rule, and the Facility Response Plan (FRP) rule. Only a very limited number of livestock operations are expected to meet the requirements for having to prepare an SPCC plan and even fewer would need to prepare an FRP. In those cases where the SPCC requirements do apply to a CAFO, it may be appropriate to address these requirements in concert with the chemical handling minimum standard in the NMP. Additional information on the SPCC program can be obtained at EPA's web site at www.epa.gov/oilspill

8. Emergency Action Plans

Behind most manure spills and discharges is a chain of events that leads up to an unsafe act, improper judgment, unsafe conditions, or a combination of factors. Preventing or properly responding to discharges on a farm is everyone's concern. Communication among the farm owner, supervisors, and employees generates ideas and awareness that leads to accident prevention and quick response if a spill does occur. Education programs, response plans, and regular inspections of manure management and application systems are essential links in maintaining a safe, accident-free operation.

Emergency action plans are needed to minimize the environmental impact of manure spills, discharges, or mishaps. In several states, these plans are required to be developed and maintained on all livestock and poultry operations, especially those with liquid manure management systems. This plan would be implemented if manure or other wastes from an operation are leaking, overflowing, or running off the site. Rather than waiting until the manure or wastewater reaches a stream or leaves the property, act preemptively to ensure that this mishap does not happen.

The Emergency Action Plan should be available to all employees, because accidents, leaks, and breaks could happen at any time. The plan should follow this format:

- Eliminate the source;
- Contain the spill, if possible;
- Assess the extent of the spill and note any obvious damage;
- Contact the appropriate agencies; and
- Clean up the spill and make repairs.

In addition, the CAFO may be required to have a closure plan for their manure storage structures or impoundments. See Section 4.2 of the *Permit Guidance* for more information.