BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:

CONCENTRATED ANIMAL FEEDING OPERATIONS (CAFOS): PROPOSED AMENDMENTS TO 35 ILL. ADM. CODE 501, 502 AND 504	))))	R 2012-023

NOTICE OF ELECTRONIC FILING

To: **Attached Service List**

PLEASE TAKE NOTICE that on October 16, 2012, I electronically filed with the Clerk of the Pollution Control Board of the State of Illinois: **PRE-FILED TESTIMONY OF ARNOLD LEDER, PRE-FILED TESTIMONY OF STACY JAMES, PH.D.** and **PRE-FILED TESTIMONY OF DR. KENDALL THU** on behalf of Prairie Rivers Network, Illinois Citizens for Clean Air and Water, Natural Resources Defense Council and Environmental Law & Policy Center (collectively, "Environmental Groups") copies of which are attached hereto and herewith served upon you.

Respectfully Submitted,

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PRE-FILED TESTIMONY OF ARNOLD LEDER

My name is Arnold Leder. I worked for the USEPA Region 5 water enforcement program from 1974 until 2006, and am now retired. During the last ten years of my employment at USEPA, I worked as the Concentrated Animal Feeding Operation (CAFO) enforcement program manager. In that capacity, I participated in national workgroups helping to develop updated USEPA CAFO regulations and guidance. I assisted in developing and implementing CAFO inspection programs and participated in most Region 5 CAFO inspections. I was also responsible for initiating federal enforcement when violations were found. This process included the preparation of administrative orders and the technical components of referrals to the U.S. Department of Justice for civil prosecution. Independently from my job at USEPA, I raised from 30-100 hogs at a time for a period of about five years and was an Illinois certified livestock manager.

I am offering testimony on behalf of the Environmental Groups (Prairie Rivers Network, Environmental Law and Policy Center, Illinois Citizens for Clean Air and Water, and Natural Resources Defense Council). Today I will address several parts of the proposed rule, including water quality risks posed by livestock operations, siting setbacks from surface waters, surface application of livestock waste on frozen, ice-covered, and snow-covered ground, technical standards and nutrient management plan requirements for unpermitted CAFOs, and comprehensive inventories of all large CAFOs.

Restrictions on land application of waste are necessary

Waste discharges from land application fields are a particularly significant problem. We frequently did federal inspections during precipitation events or during winter thaws when discharges were likely to occur. Even if the field appears flat, preferential flow paths develop and the waste can leave the field. Sometimes discharges occur because of bad waste application practices; in one instance, a Michigan dairy was land-applying waste near a stream and half the waste from the manure spreader was going on land and half was going into the stream. In another case, an Indiana livestock operation was using spray irrigation to apply waste and the spray area included creeks and other waterways on the field.

Over-application of waste in amounts far in excess of crop needs and university recommendations also occurs. At a large dairy in Michigan, I found a field tile with a two-foot geyser spewing manure, and the resulting puddle flowed about ten feet to a creek. The reason this happened is because the farmer was injecting waste at a sufficient rate to surcharge the field tiles. In another case, a dairy operator went to apply waste to a field he had been given permission to use for application, but found that field had already received waste from another operator. Given he had no other place to put the waste, he went ahead and applied on the field, and subsequently there was a discharge during a rainfall. Another reason for over-application is waste applicators don't always calibrate their equipment; it was not uncommon for me to question applicators and find that they had not calibrated their equipment nor did they always realize calibration was important. Without calibrating, applicators may have no idea how much waste they are applying, and may over apply. But as we found in Michigan and Ohio, there can be instances where waste is applied in moderate amounts during dry weather and discharges still occur because of cracks and wormholes in the soil. These cracks can be a conduit to tiles which drain into surface waters. Discharges can also occur because of equipment failure. In some instances, waste is applied via pumps and long canvas draglines that can be more than a mile long; there have been instances of pump failure and burst pipes. Sometimes this equipment is left unattended, and the problem may not be found for hours. In the meantime, waste pools in the fields and may enter surface waters.

Land-applied waste can also contaminate groundwater. If waste is applied on fields with sensitive geology such as sinkholes or other karst features, there is a risk of some of that waste contaminating groundwater. There have also been cases where waste applied to fields has run off the field and contaminated groundwater supplies. While working at USEPA, we received several calls from people who resided next to livestock operations and claimed that their wells had been polluted due to land application of waste. Just days before I retired, we were investigating a case in Illinois where a public school's well had become contaminated by *E. coli* bacteria and at least one person fell sick. The well was located near a dairy but I am uncertain of the outcome of the investigation.

In summary, waste applied to fields can reach water via dry weather discharges (typically due to over-application or application too close to a waterway or conduit to a waterway), as runoff during storms or snowmelt, and via field drain tiles. Therefore, it is essential for the regulations to require that there be adequate land application setbacks from streams, wells, and water conveyances, appropriate application rates, and that the soil not contain cracks before application if the field is tiled. Tile outlets should also be monitored to ensure waste is not getting into the tiles; tile outlets can be plugged as a best management practice.

Surface application of livestock waste on frozen, ice-covered, and snow-covered ground

In my observation, land application on frozen, ice-covered, and snow-covered ground often occurs because CAFO operators lack adequate waste storage. While strategies for land application of waste vary from operator to operator, typically the waste is land applied to cropland in the fall and/or spring. Therefore, many operators need at least 6 months of waste storage to avoid running out of waste storage capacity in-between land application windows. I

have been told by some operators that during wet years at least a one-year storage capacity is necessary. However, many of the older facilities do not have this much capacity, and subsequently can have waste management problems, including the need to land-apply waste when the ground is frozen, snow-covered, or ice-covered.

When waste is applied to frozen ground, the soil cannot effectively absorb it. And when the waste is not absorbed to the soil, most of the nutrient value will be lost because the waste will leave the field during precipitation events and snowmelt. In particular in Illinois, most of the fields used for waste application are corn and soybean fields, but these crops are harvested before winter and the fields usually have no living cover in winter except weeds. Therefore, there is little if any vegetation taking up nutrients during Illinois winters, rendering waste more susceptible to be lost via runoff. These risks are reflected in the USEPA Region 5 Winter Spreading Technical Guidance (the Region 5 Guidance, attached as Attachment 1), which states that "winter is the least desirable time for land application." (p. L-1).

Accordingly, the risk of land-applied waste entering surface waters increases when waste is surface-applied to frozen, ice-covered and snow-covered ground. Waste sitting on top of snow will move down gradient with the snow when it melts. Waste sitting on top of ice or frozen ground – relatively impermeable surfaces – can move off the field more easily than if it were incorporated into the soil. Winter application sites can frequently discharge manure even on relatively flat fields when there is a thaw or rain event. For example, a dairy in Michigan land-applied on a field that was essentially flat and very close to a stream; as soon as the weather warmed and the ground thawed, the surface-applied waste ran off into a stream.

Because of these risks, CAFOs should be required to have at least six months of storage and there should be strict restrictions on surface-application of waste during winter. The Region 5 Guidance strongly prefers prohibiting winter application of livestock wastes where there is a reasonable risk of runoff. (Attach. 1, p. L-2). Winter application to frozen, snow-covered or ice-covered fields should not be allowed when there is reasonable risk of runoff to waters of the state

Winter surface application should be very stringently regulated and only allowed if incorporation and injection are not possible. Application by incorporation or injection is less environmentally risky because the waste is not just sitting on top of the ground, unprotected from the elements. In order to surface apply waste in winter, livestock operators should have to prove they have taken responsible steps to create adequate waste storage capacity to get through the winter, including land-applying the waste or transferring it to other locations or recipients or depopulating facilities to reduce the amount of waste being generated. Operators should have to cover or otherwise protect their waste storage structures from precipitation and clean stormwater runoff, to reduce the amount of waste that needs to be stored. The amount of waste applied to fields during winter should represent the minimum amount necessary to free up enough storage to get through the winter without a production area discharge. By minimizing the amount applied, the livestock operator will also be minimizing the risk of surface water discharges. Any surface application should be pre-approved by the Agency because there is a risk of discharge. By requiring Agency notification shortly before application, the Agency can ensure that weather conditions are conducive to application and the appropriate fields will be used, and the Agency can go inspect the application if they feel it is important to do so.

Restricting and reducing the frequency of winter application can greatly benefit stream quality. For example, there was a dairy in Michigan that as part of a consent decree increased the waste storage capacity, captured polluted runoff, protected manure stacks from stormwater, and made other improvements that resulted in no need for winter application. Within a year of completing these improvements, the State removed the receiving water from the impaired waters list.

Production area siting setbacks from surface waters

Livestock operations can store millions of gallons of livestock waste in on-site storage facilities. These facilities include subterranean concrete pits, above-ground storage tanks, waste-holding ponds, and lagoons. Waste may also be stored in manure stacks. These structures are not leak-proof or spill-proof, and are not always protected from precipitation or runoff. Discharges can also occur when precipitation comes into contact with raw materials (such as silage) in the production area.

There are a number of ways that waste from production areas may contaminate nearby surface waters. In some instances, livestock operators have discharged waste from the production area to surface waters via man-made conveyances such as ditches or tile drains. Many medium-sized livestock facilities needed permits because they discharged through a man-made conveyance.

In addition, there have been a number of cases in which waste storage structures were not properly operated and maintained, and the waste overflowed and eventually reached nearby streams or lakes. These overflows can occur both during storm events and during dry weather. Poor stormwater management is a common problem and can result in polluted discharges when clean storm water is not adequately diverted. There are also situations where solid waste is piled up in locations not protected from rainfall and overland runoff; runoff from these manure stacks can contain high concentrations of waste. Polluted runoff from unprotected, open feedlots is another problem. Diverting clean stormwater away from the production area is important, to minimize the chance of production areas discharging polluted stormwater.

Waste from production areas may also contaminate groundwater; storage structures (including cement pits and ponds) can develop cracks, allowing waste to seep into the surrounding groundwater. Wells located close to production areas are also at risk of contamination from polluted runoff, as are wells near land application sites.

I have experienced numerous occasions where production areas were discharging. In Michigan in January 2004, we conducted inspections at the production areas of five livestock facilities (1 turkey, 1 beef, 3 dairy) and found discharges at four of the five. The reason the 5th operation wasn't discharging was because the dairy operator had diked the production area and was capturing his runoff to correct the problem before the runoff left the facility. In another situation at a beef feedlot, the operator was feeding turkey manure to the animals, but the turkey manure pile was unprotected from stormwater and so polluted runoff from the pile was draining into a waterway.

There are also instances where waste is accidentally discharged because of an equipment failure. For example, in one case a man at a Michigan dairy was pumping out a waste settlement pit with a pump and then left the area while the pumping occurred; in that time the hose burst and the wastewater discharged onto the land for hours.

There have also been instances where production areas have been flooded by nearby creeks. For example, in Ohio there were facilities that were completely underwater because they were in the floodplain and there was a significant storm.

Based on my enforcement experience, I have concluded that states should be more judicious in their livestock operation siting requirements. In particular, production areas should be set back and isolated from surface waters and should not be located in floodplains. The further away from surface waters, the better, because there is less of a chance of discharge.

By requiring CAFOs to be sufficiently set back from surface waters, Illinois can decrease the likelihood of waste from production areas discharging into surface waters. Having adequate setbacks will allow more room for CAFO operators to dam up waste that escapes the production area before it discharges. Having adequate land and vegetated buffers between the production area and surface waters will also allow some of the spilled waste to infiltrate into the ground or otherwise be stopped or soaked up before reaching the water.

Technical standards and nutrient management plan requirements for unpermitted large CAFOs

It can be very confusing for the regulated community to have several sets of practices. I have found that livestock operators do not always know what the regulations are, so it would be even more complicated if different facilities were held to different standards. If agencies require permitted facilities to follow different practices than unpermitted facilities, this creates inconsistency and confusion. Good management practices should apply across the board, not just to operations subject to NPDES permits.

In the case of large CAFOs, the operations with permits are essentially the same as those without permits. In fact, all of the facilities I inspected that had water pollution problems were unpermitted facilities. Large CAFOs, regardless of permitting status, produce large quantities of waste that must be managed responsibly. The larger operations generate millions of gallons of waste annually. Likewise, both unpermitted and permitted CAFOs have tile drainage and get cracks in their fields, and have to deal with snow and rain and streams and slope and various other variables.

In order for unpermitted large CAFOs to qualify for the agricultural stormwater exemption when land-applying waste, waste must be applied using practices that ensure appropriate agricultural utilization of the nutrients. The USEPA, in its preamble to the 2008 federal CAFO rule (Attachment 2, p. 70435), states that CAFOs that land apply using practices based on standards other than the technical standards established by the Director would have to demonstrate that such practices ensure appropriate agricultural utilization of the nutrients. USEPA goes on to say that the technical standards established by the Director provide an objective basis for

determining whether stormwater discharges are exempt from NPDES permit requirements. For the sake of clarity and consistency, all large CAFOs should have to follow the same technical standards. In particular, unpermitted large CAFOs should have to follow the same technical standards for land application of waste as is required of the permitted CAFOs.

For the same reasons as cited above, both unpermitted and permitted large CAFOs should have to develop and follow a nutrient management plan (NMP). These plans are considered a best management practice and everyone should have one. In fact, the Unified National AFO Strategy, developed by the United States Department of Agriculture and USEPA, states that to minimize the public health and water quality impacts from AFOs, AFO owners and operations should implement comprehensive nutrient management plans (Attachment 3, Executive Summary Section 3.0).

There are advantages to livestock operations for having a NMP. For example, developing a plan will force livestock operators to evaluate their whole operation and decide on where and when the waste should and should not be applied in order to prevent discharges. The plan is a reference document available to employees who will be managing and land-applying waste. The plan will include maps showing setbacks from waterways, wells, homes, and other sensitive features that waste should not be applied next to. A plan will also involve taking soil and manure samples to determine appropriate land application rates. The recordkeeping involved will help demonstrate that applicators are applying at appropriate agronomic rates; these records can be used to defend a livestock operator should there be a future discharge. Many people who follow NMPs find that they can cut back on their application rates and still get a high crop yield. Nutrient management plans also require operators to operate and maintain their waste storage structures properly. For example, operators should be on a set schedule for checking for leaks and remaining waste storage capacity. The good practices in NMPs promote better stewardship and reduce the chance of accidents and discharges.

To provide a specific example of why NMPs are important, there was a case in Ohio where a livestock lagoon was filling up and the owner had left for two weeks to attend a wedding. The lagoon wound up discharging while the owner was away and the discharge drained into a stream which was a surface water drinking supply for a downstream community. The facility subsequently constructed additional storage as part of a NMP and began monitoring levels in the storage structures and maintaining those structures. Subsequently, this operation did not discharge again.

Comprehensive inventories of all large CAFOs

During my time at USEPA, I observed that many livestock operations thought they weren't discharging when they were. All of the facilities where we inspected and found problems were unpermitted facilities. I also found that many state inspectors did not recognize when a CAFO was discharging or when an NPDES permit was required. Most state programs were reactive instead of proactive. If there was a fish kill, there was an investigation, but otherwise there was little effort to ensure that best management practices were in place to prevent unauthorized discharges from the production and land application areas. Consequently, many livestock

operations were discharging without NPDES permits and were not receiving technical advice on how to properly manage livestock waste.

One of the biggest problems with state and federal CAFO programs is that they don't know where the CAFOs are. They don't know who needs a NPDES permit and who doesn't discharge. This makes it difficult for the state agencies to operate functional CAFO regulatory programs. In order for agencies to carry out the objectives of (and determine compliance with) the Clean Water Act, they need information about all existing CAFOs. When I was at USEPA and CAFOs became a priority, we visited Region 5 states that were not carrying out their NPDES program responsibilities. We found that states did not have complete inventories of CAFOs, so the states could not evaluate whether CAFOs were discharging and in need of a permit. Illinois, Indiana, Ohio, and Michigan all eventually faced possible de-delegation because they were not issuing permits to discharging CAFOs and did not know where CAFOs were and who was discharging.

The current system of CAFOs doing self-determinations of whether they need a permit or not is not working. Most permits issued in Illinois are not in response to an application, but to a discharge. Therefore, the Agency should be able to prevent some discharges by developing a comprehensive inventory of all CAFOs that allows the Agency to determine likelihood of discharge and compliance with the Clean Water Act. Certain minimum information about the production and land application areas must be included in the inventory for it to be useful. For example, in order for the Agency to determine whether production area discharges are likely, the inventory must contain information such as the number and type of livestock, annual waste production amount, and the available waste storage capacity. The fourteen items of information listed in the U.S. EPA's settlement agreement with Waterkeeper, Sierra Club, and Natural Resources Defense Council should all be included in a state inventory of CAFOs (Attachment 4, p. 2-3).

By developing a comprehensive inventory of CAFOs, the Agency will be strengthening efforts to identify dischargers and bring them into compliance. This should result in fewer federal and citizen suits against illegally discharging CAFOs, saving many people (including livestock operators) a lot of time and money.

A comprehensive CAFO inventory will also help the Agency figure out causes of fish kills and pollution discharges. For example, if there is a fish kill but the Agency has incomplete information on the pollution sources in the watershed, it will be a more cumbersome process to figure out the culprit. With a GIS-based database, Agency field inspectors could quickly pull up a map of the watershed with all the pollution sources plotted, and base their initial investigation on the sources found. Without such a database, inspectors will have to drive around looking for likely pollution sources, check aerial photographs, and ask residents or other government staff where to look.

The Agency should require CAFOs to submit the required information for an inventory, instead of seeking the information on its own by various means. The Agency's existing inventory is incomplete, and some of the information may be out-of-date. An Agency effort to collect the information on its own without surveying the CAFOs will likely result in time-consuming, piecemeal, inaccurate, and incomplete data collection. If the Agency requires livestock operators

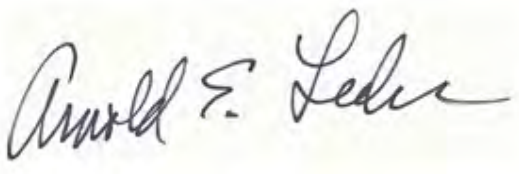
to submit information about their operations, the data-gathering will be far more resource-efficient and the inventory will be more complete and accurate. The information needed for a good inventory is quite basic and should already be known to the livestock operators, and thus their time investment in submitting information to the Agency should be relatively minimal.

Conclusion

Livestock operations pose considerable risks to water quality. Poor production area management, bad land application techniques, and inadequate waste storage capacity are frequent causes of livestock waste discharging into waters of the state. This rulemaking provides the State of Illinois with an important opportunity to reduce water pollution from CAFOs by adopting strong regulations that apply to all CAFOs. Simultaneous with the need for good technical standards is the need for a comprehensive inventory of CAFOs so that their locations and discharge potential are known.

Dated: October 16, 2012

Respectfully submitted,



Arnold Leder

Attachment 1:

The USEPA Region 5 Winter Spreading Technical Guidance

APPENDIX L - WINTER SPREADING TECHNICAL GUIDANCE

Interim Final

Technical Guidance
for the
Application of CAFO Manure on Land in the Winter

Water Division
Region 5
United States Environmental Protection Agency

Introduction[1]

Many owners or operators of concentrated animal feeding operations (CAFOs) utilize their manure, litter, and process wastewater (hereinafter "manure") as a source of nutrients for the growth of crops or forage or to improve the tilth of soil. Others dispose of manure on land. The longer manure remains in the soil before plants take the nutrients up the more likely those nutrients will be lost through volitization, denitrification, leaching to subsurface drainage tile lines or ground water, and runoff to surface water. To utilize the greatest fraction of the nutrients in manure, late spring and early summer are the best times for land application. Some CAFO owners or operators apply manure on land in the late fall or winter because crops are not growing, labor is available and, when it is frozen, the soil is able to handle the weight of manure hauling equipment without excessive compaction. Application in the late fall or winter also enables the owner or operator to avoid the cost of the structures that would be needed to store manure through the winter months. From the dual perspectives of nutrient utilization and pollution prevention, however, winter is the least desirable time for land application. Appendix 1 contains an excerpt from the United States Environmental Protection Agency (EPA) (2002) summarizing the literature on the risk that land application in the winter poses to water quality. *See* page 19.

Under regulations that EPA promulgated in 2003, agencies that are authorized to issue National Pollutant Discharge Elimination System permits (hereinafter "states") need to have technical standards for nutrient management which address, among other factors, the times at which CAFOs may apply manure on land (*see* Title 40 of the Code of Federal Regulations, section 123.36). Technical standards are to achieve realistic crop or forage production goals while minimizing movement of nitrogen and phosphorus to waters of the United States. They will form the basis for the nutrient management plans that CAFO owners and operators will implement under 40 CFR sections 122.42 and 412.4.

EPA recognizes certain times during which there may be an increased likelihood that runoff from CAFO land application areas may reach waters of the United States. The times include, among others, when the soil is frozen or covered with ice or snow. Frozen soil will occur in areas where snow or other ground cover is shallow and where prolonged periods of subfreezing air temperatures prevail (United States Army Corps of Engineers 1998). The January normal daily minimum air temperature in EPA Region 5 ranges from minus eight degrees Fahrenheit in the northwest to 22 degrees Fahrenheit in the south. Thus, all areas in the Region are subject to air temperatures that can cause soil to freeze. For the months of December through March, the mean precipitation in the Region ranges from three inches of water in the northwest to 14.6 inches of water in the south. The mean snowfall in these months ranges

[1] In accordance with the United States Environmental Protection Agency (2000), Region 5 asked three professional engineers to review a February 2004 draft of this document. The peer review record includes responses to the comments that these individuals provided pursuant to the request.

from 13 inches in the south to 108 inches in the coastal north. The above normals notwithstanding, the only reliable way to predict temperature and precipitation prior to any winter is through statistical analysis of historical data for the location of interest.

To assure effective implementation of the regulations, EPA (2003) has expressed its strong preference that states prohibit the discharge of manure from land application. That is unless the discharge is an agricultural storm water discharge (i.e., a precipitation-related discharge from land where manure was applied in accordance with a nutrient management plan). EPA has also expressed its strong preference for the way in which states should address the timing of land application in their technical standards. With regard to the winter months, EPA strongly prefers that technical standards either prohibit surface application on snow, ice, and frozen soil or include specific protocols that CAFO owners or operators, nutrient management planners, and inspectors will use to conclude whether or not application to a frozen or snow- or ice-covered field or a portion thereof poses a reasonable risk of runoff. Where there is a reasonable risk, EPA strongly prefers that technical standards prohibit application on the field or the pertinent portion thereof during times when the risk exists or may arise.

Technical Guidance

The purpose of this paper is to present technical guidance to which EPA Region 5 will refer as we work together with those states that plan to allow CAFO owners or operators to apply manure on land in the winter where a crop will not be grown in that season or nutrients need not be applied in the winter to grow the crop. For this purpose, Region 5 assumes that the risk of runoff will be minimized if a state requires injection or timely incorporation of manure in the winter, provided that the CAFO owner or operator adheres to the setback requirements in 40 CFR section 412.4(c)(5). Further, we assume that the risk of runoff will be minimized if waters of the United States, sinkholes, open tile line intake structures, and other conduits to waters of the United States are upslope from the land on which manure would be surface applied. Thus, the balance of this technical guidance is intended to provide a basis for the Region to evaluate the adequacy of preliminary technical standards that would allow surface application without timely incorporation where waters of the United States, sinkholes, open tile line intake structures, or other conduits to waters of the United States are downslope from the land on which the manure would be applied[2].

Potential Discharges that are not Precipitation-related

When liquid manure is applied on frozen soil in the absence of snow cover, Region 5 has concluded that the manure will run off and potentially discharge if it is applied in excess of the pertinent rate specified in Table 1a or 1b below[3]. *See* Appendix 2 on page 21 for an example that shows how the Region came to this conclusion. In as much as the discharge of manure is not an agricultural storm water discharge when it is not related to precipitation, technical standards need to prohibit the application of liquid manure on frozen soil, in excess of the rates provided in the following tables, when the soil is not covered with snow.

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[2] For the purpose of this technical guidance, "other conduits to waters of the United States" means any area wherein water is or may be conveyed to waters of the United States via channelized flow.

[3] Region 5 developed the tables for the corn and soybean crops commonly grown in the Region. On request, the Region can supply tables for other land uses and land cover and treatment practices.

Liquid Manure Maximum Rates of Application onto Frozen Soil

Table 1a
Harvested Crops were Row Crops Planted in Straight Rows
Land in Good Hydrologic Condition

Hydrologic Soil Group[4]	Maximum Rate of Application (gallons per acre)
A	3,000
B	1,600
C	1,100
D	1,100

Liquid Manure Maximum Rates of Application onto Frozen Soil

Table 1b
Harvested Crops were Close-seeded Legumes Planted in Straight Rows
Land in Good Hydrologic Condition

Hydrologic Soil Group	Maximum Rate of Application (gallons per acre)
A	4,100
B	2,200
C	1,100
D	1,100

Discharges that are Precipitation-related

When manure is applied on land in the winter, Region 5 assumes that nutrients and manure pollutants will dissolve or become suspended in any precipitation which comes into contact with the manure. This assumption is consistent with the findings reported in Appendix 1 and Table 4. The technical guidance that follows is intended to provide a basis for the Region to evaluate the adequacy of preliminary technical standards as such standards affect the movement of nutrients and manure pollutants in precipitation runoff during the winter or early spring. Six substantive steps are presented below. The first three involve the formulation of state policy for nutrient management. As contemplated in ***Step 1***, the policy should include a standard for the concentration or mass of biochemical oxygen demand in precipitation-related discharges. Nutrients, including ammonia and nitrite, contribute to this demand. The final three involve engineering analysis to determine whether the BOD standard will be met.

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[4] *See* Appendix A in the United States Department of Agriculture, Soil Conservation Service, (1986) for information on the Hydrologic Soil Group within which a given soil is classified. The appendix may be viewed at http://www.wcc.nrcs.usda.gov/hydro/hydro-tools-models-tr55.html.

Step 1: In collaboration with the Region, the state establishes a standard for the concentration or mass of BOD that will be permitted in precipitation-related discharges from land on which manure has been surface applied in the winter.

Step 2: ***A.*** The state establishes preliminary technical standards for the setback[5] and the type, form, and maximum quantity of manure that could be surface applied on land in the winter. Standards for the setback should be expressed in terms of distance and slope. The minimum distance is that required under 40 CFR section 412.4(c)(5). As required to use Equations 2 or 3, below, standards for the setback should also be expressed in terms of the land cover and treatment practice and the crop residue rate (in the case of Equation 2) or the Hydrologic Soil Group (in the case of Equation 3). *See* Tables 2 and 3 on pages 10 and 13 for information on various residue rates and land cover and treatment practices.

B. If the standard established in ***Step 1*** is expressed as a mass, the state establishes additional preliminary technical standards for the land cover and treatment practice and Hydrologic Soil Group applicable to land that is upslope from the setback.

Step 3: So the Region can perform the engineering analysis, the state establishes appropriate design conditions for the land use, form of precipitation (rain or ripe snow), depth of precipitation, and the temperature and moisture content of soil. At a minimum, the design condition for the moisture content of soil should be antecedent moisture condition III (i.e., saturated soil) (Wright 2004, Linsley, *et al.*, 1982). States should carefully review climate data to determine whether the design temperature of soil should be 0 °C or less. In no case should the design temperature of soil exceed 3 °C.

Step 4: The Region calculates the percent removal of BOD that will occur in the setback given the design conditions and preliminary technical standards. Calculating the percent removal is a two-step process as shown in ***A.*** and ***B.*** below.

A. Calculate the amount of time it takes water to travel or "concentrate" (T_c) across the setback distance. Two equations are provided below as options for calculating T_c. In general, use Equation 1 (USDA, Natural Resources Conservation Service, 2002a) when the design condition consists of rain on frozen soil or rain on ripe snow or when the preliminary technical standards specify a residue rate equal to or greater than 20 percent. Use Equation 3 (USDA, NRCS, 1993) when the design condition consists of ripe snow, the preliminary technical standards do not specify a residue rate, or the rate is less than 20 percent.

Eq. 1

$$T_c\,(hr) = T_{t\,(overland)} + T_{t\,(shallow\ concentrated)}$$

where

$$T_{t\,(overland)} = \frac{0.007 \cdot (N \cdot L)^{0.8}}{(P^{0.5}) \cdot (s^{0.4})} \qquad \text{Eq. 2}$$

[5] The term "setback" is defined in 40 CFR section 412.4 to mean a specified distance from surface waters (i.e., waters of the United States) or potential conduits to surface waters where manure may not be land applied.

N = Manning's roughness coefficient for overland flow. *See* Table 2 on page 10 to select a coefficient that is appropriate in light of the preliminary technical standards.

L = overland flow portion of the setback distance (maximum of 100 feet) (ft).

P = precipitation design depth (in).

s = preliminary technical standard for the slope over the distance L (ft/ft).

$T_{t\ (shallow\ concentrated)}$ applies to the shallow concentrated flow portion of the setback distance. In other words, it applies to the portion that is between points (a) and (b) as described below.

Point (a): 100 feet downslope from the furthest downslope point at which manure would be applied under the preliminary technical standards.
Point (b): the nearest waters of the United States, sinkhole, open tile line intake structure, or other conduit to waters of the United States.

$T_{t\ (shallow\ concentrated)}$ is determined by multiplying the above distance times a velocity of runoff that is appropriate in light of the preliminary technical standards. *See* Figure 2 on page 12.

Eq. 3

$$T_c\ (hr) = \frac{5}{3} \cdot \frac{(L^{0.8}) \cdot (S+1)^{0.7}}{1900 \cdot (s^{0.5})}$$

where

L = preliminary technical standard for the setback distance (ft).

S = potential maximum retention after runoff begins

$$= \frac{1000}{CN} - 10$$

CN = runoff curve number. *See* Table 3 on page 13 to select a number that is appropriate in light of the design condition for the land use and the preliminary technical standards.

s = preliminary technical standard for the slope over the distance L (percent).

B. Calculate the percent removal of BOD in the setback. The equation for percent removal is as follows (modified from Martel, *et al.*, 1980):

Eq. 4

$$E = (1 - A \cdot e^{-(k_T) \cdot t}) \cdot 100$$

where

E	=	percent removal of BOD.
A	=	nonsettleable fraction of BOD in manure
	=	0.5 to 0.6 for animals other than mature dairy cows (Zhu 2003)
	=	0.9 for mature dairy cows (Wright 2004).
k_T	=	first-order reaction rate constant at the design temperature of soil (T) (°C)
	=	$k \cdot (\theta)^{T-20}$.
θ	=	1.135 (Schroepfer, *et al.,* 1964)
k	=	0.03/min[6].
t	=	detention time
	=	$T_c \cdot 60$.

Step 5: The Region multiplies the percent removal calculated in ***Step 4. B.*** times the initial concentration of BOD in runoff from land where manure has been surface applied (i.e., the concentration prior to treatment of the runoff by land in the setback). If state-specific data are not available, use the values from Table 4 as the basis for assumptions about the initial concentration (*see* page 16). Subtract from the initial concentration the product of the percent removal times the initial concentration. If the standard established in ***Step 1*** is expressed as a mass, proceed to ***Step 6***. If it is expressed as a concentration, compare the final concentration to the standard. If the final concentration is less than or equal to the standard, then the Region will conclude that there is no reasonable risk of runoff. The Region will neither object to nor disapprove the state's preliminary technical standards. However, for the analysis to hold, the technical standards need to require the CAFO owner or operator to verify that conditions in the setback at the beginning of any application are consistent with the values assigned to N or S. In other words, the standards need to prohibit surface application when ice reduces the surface roughness or occupies the surface storage in the setback. If the concentration is greater than the standard established in ***Step 1***, then the Region will conclude that there is a reasonable risk of runoff. Therefore, the final technical standards need to prohibit surface application of manure in the winter (or on frozen or snow-covered soil) or the state needs to otherwise strengthen the preliminary technical standards so there is no reasonable risk of runoff.

Step 6: If the standard is expressed as a mass, the Region calculates the mass of BOD that will run off the land given the design conditions for the land use, depth of precipitation, soil temperature, and soil moisture content as well as the preliminary technical standards for the Hydrologic Soil Group, land cover and treatment practice, and the type and maximum quantity of liquid manure. Calculating the mass is a three-step process as shown below.

A. Use the following equation (USDA, NRCS, 1993) to calculate the inches of runoff.

---

[6] The k value of 0.03 per minute is as reported by Martel, *et al.*, for treatment of municipal wastewater by the overland flow process. The Region assumes that Martel, *et al.*, reported the constant at 20 °C consistent with standard engineering practice.

Eq. 5

$$Q = \frac{(P - 0.2 \cdot S)^2}{(P + 0.8 \cdot S)}$$

where

Q = runoff (in).

P = precipitation design depth plus the depth of water that could be applied in the winter as liquid manure given the preliminary technical standards (in).

S is as defined for Equation 3 except that, if the design temperature of soil is 0 °C or less, substitute S_f for S where $S_f = (0.1 \cdot S)$ (Mitchell, *et al.*, (1997)).

B. Use the following equation to convert the runoff from inches to a volume per acre.

Eq. 6

$$Q\ (gal/ac) = Q(in) \cdot ft/12\ in \cdot 43{,}560\ ft^2/ac \cdot 7.48\ gal/ft^3$$

C. Calculate the mass of BOD in runoff by multiplying the volume of runoff times the final concentration of BOD calculated in ***Step 5.*** The equation is as follows:

Eq. 7

$$BOD\ (lb/ac) = BOD\ (mg/L) \cdot Q\ (gal/ac) \cdot 3.7854\ L/gal \cdot g/1000mg \cdot 0.0022\ lb/g$$

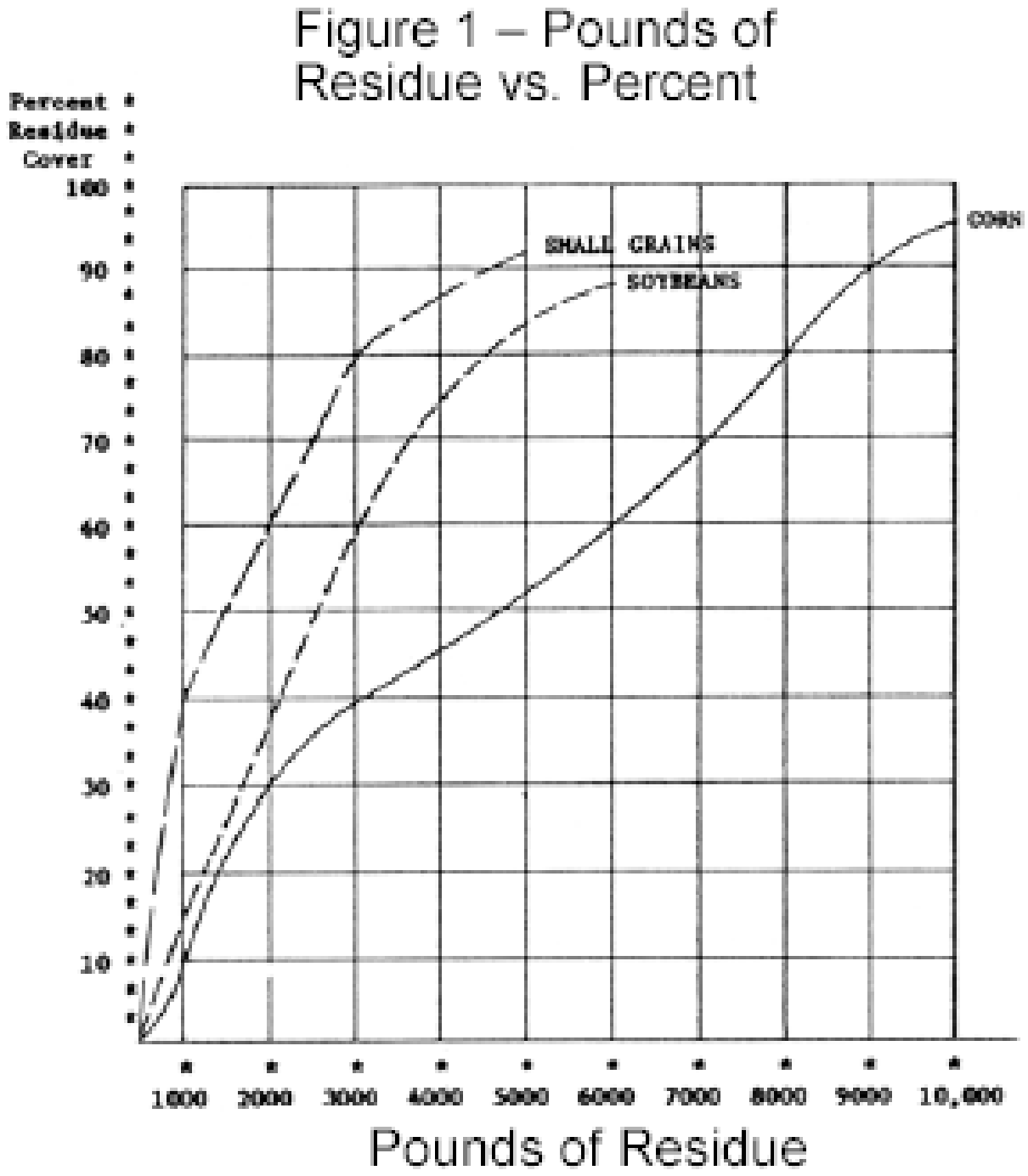
Compare the mass with the standard established in ***Step 1***. If the mass is less than or equal to the standard, then the Region will conclude that there is no reasonable risk of runoff. The Region will neither object to nor disapprove the preliminary technical standards. However, for the analysis to hold, the technical standards need to require the CAFO owner or operator to verify that conditions in the setback at the beginning of any application are consistent with the values assigned to N or S. In other words, the standards need to prohibit surface application when ice reduces the surface roughness or occupies the surface storage in the setback. If the mass is greater than the standard established in ***Step 1***, then the Region will conclude that there is a reasonable risk of runoff. Therefore, the final technical standards need to prohibit surface application of manure in the winter (or on frozen or snow-covered soil) or the state needs to otherwise strengthen the preliminary technical standards so there is no reasonable risk of runoff.

Table 2

Recommended Manning's Roughness Coefficients for Overland Flow
Engman (1986)

Cover or treatment	**Residue rate** (ton/acre)[7]	**Recommended coefficient**	**Range**
Bare clay-loam (eroded)		0.02	0.012 to 0.033
Fallow - no residue		0.05	0.006 to 0.16
Chisel plow	< 0.25	0.07	0.006 to 0.17
	0.25 to 1	0.18	0.07 to 0.34
	1 to 3	0.3	0.19 to 0.47
	> 3	0.4	0.34 to 0.46
Disk/harrow	< 0.25	0.08	0.008 to 0.41
	0.25 to 1	0.16	0.1 to 0.25
	1 to 3	0.25	0.14 to 0.53
	> 3	0.3	--
No till	< 0.25	0.04	0.03 to 0.07
	0.25 to 1	0.07	0.01 to 0.13
	1 to 3	0.3	0.16 to 0.47
Moldboard plow (fall)		0.06	0.02 to 0.1
Coulter		0.1	0.05 to 0.13
Range (natural)		0.13	0.02 to 0.32
Range (clipped)		0.1	0.02 to 0.24
Short grass prairie		0.15	0.1 to 0.2
Dense grass		0.24	0.17 to 0.3

[7] *See* Figure 1 to convert residue cover from a percent to a mass.



USDA, NRCS, (2002b).

Figure 2

Average Velocity of Shallow Concentrated Flow
USDA, NRCS, (1993)

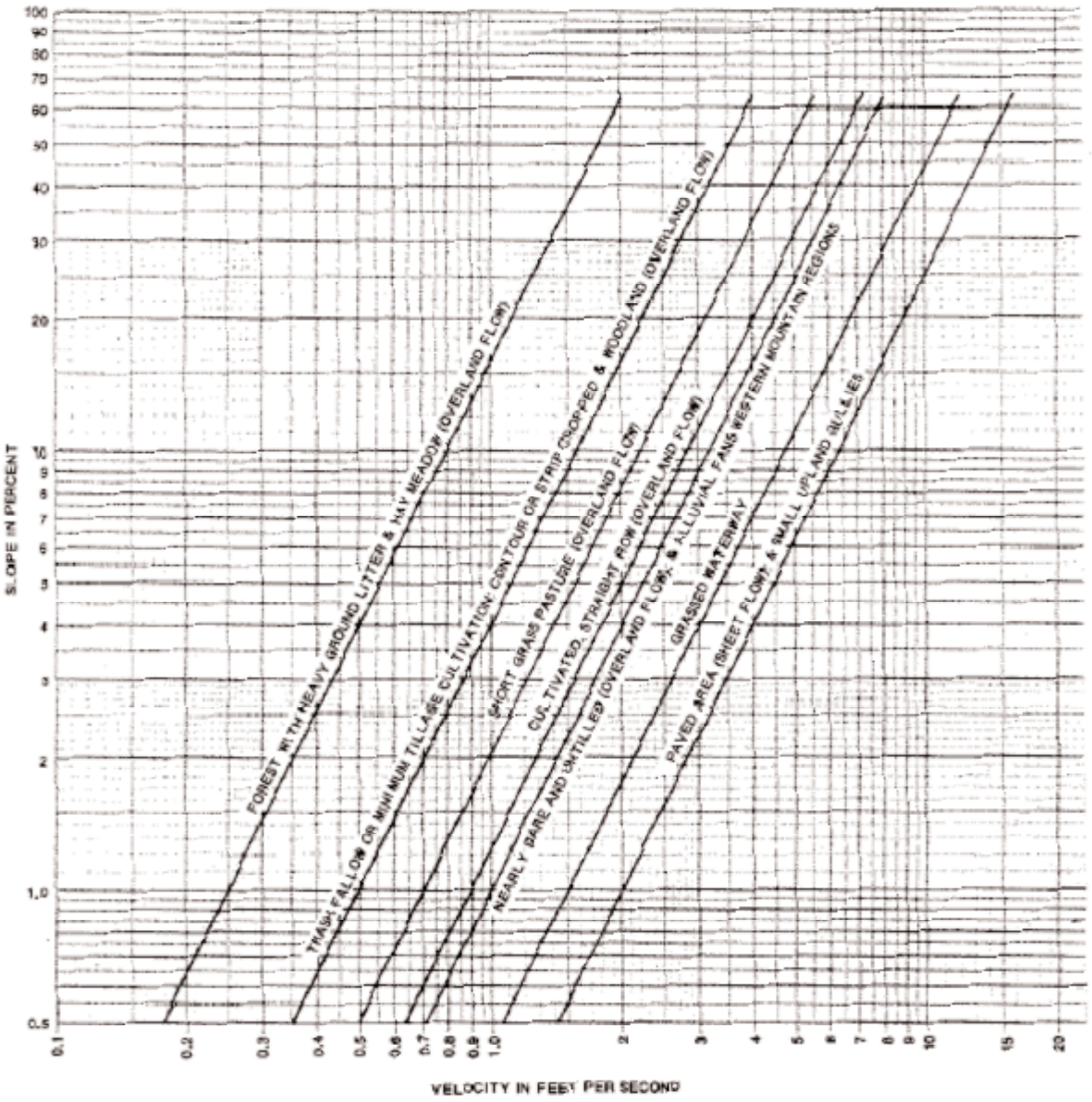


Table 3

Runoff Curve Numbers for Hydrologic Soil-Cover Complexes[8]
USDA, NRCS, (1993), USDA, SCS, (1986)

Land use	**Treatment or practice**	**Hydrologic condition**[9]	**Hydrologic Soil Group**			
			A	**B**	**C**	**D**
Fallow	Bare soil		89	94	97	98
	Crop residue cover	Poor	89	94	96	98
	"	Good	88	93	95	96
Row crops	Straight row	Poor	86	92	95	97
	"	Good	83	90	94	96
	Straight row and crop residue cover	Poor	86	91	95	96
	"	Good	81	88	92	94
	Contoured	Poor	85	91	93	95
	"	Good	82	88	92	94
	Contoured and crop residue	Poor	84	90	93	95
	"	Good	81	88	92	94
	Contoured and terraced	Poor	82	88	91	92
	"	Good	79	86	90	92

[8] The runoff curve numbers in Table 3 apply to saturated soil conditions (i.e., antecedent moisture condition III). *See* Appendix 3 on page 22 for runoff curve numbers applicable to average soil moisture conditions.

[9] According to USDA, SCS, (1986), hydrologic condition is based on a combination of factors, including (a) density and canopy of vegetative areas, (b) amount of year-round cover, (c) amount of grass or close-seeded legumes in rotations, (d) percent of residue cover on the land surface (good ≥ 20 percent), and (e) degree of surface roughness.

Land use	Treatment or practice	Hydrologic condition	Hydrologic Soil Group			
			A	B	C	D
	Contoured, terraced, and crop residue	Poor	82	87	91	92
	"	Good	78	85	89	91
Small grain	Straight row	Poor	82	89	93	95
	Contoured	Poor	80	88	92	94
	"	Good	78	87	92	93
	Contoured and crop residue	Poor	79	87	92	93
	"	Good	78	86	91	93
	Contoured and terraced	Poor	78	86	91	92
	"	Good	77	85	90	92
	Contoured, terraced, and crop residue	Poor	78	86	90	92
	"	Good	76	84	89	91
Close-seeded legumes[10] or rotation meadow	Straight row	Poor	82	89	94	96
	"	Good	76	86	92	94
	Contoured	Poor	81	88	93	94
	"	Good	74	84	90	93
Close-seeded legumes[11] or rotation meadow	Contoured and terraced	Poor	80	87	91	93

[10] Close-drilled or broadcast.

[11] Close-drilled or broadcast.

Land use	Treatment or practice	Hydrologic condition	Hydrologic Soil Group			
			A	B	C	D
	“	Good	70	83	89	91
Pasture or range		Poor	84	91	94	96
		Fair	69	84	91	93
		Good	59	78	88	91
	Contoured	Poor	67	83	92	95
	“	Fair	43	77	88	93
	“	Good	13	55	85	91
Meadow		Good	50	76	86	90

Table 4

Assumed Initial Concentration of BOD in Runoff from Land on which Manure or Process Wastewater has been Surface Applied

Type of Material	Initial Total BOD in Runoff (mg/L)
Broiler manure[12]	708
Cattle (other than mature dairy cow) manure	Reserved
Cattle open lot process wastewater	Reserved
Egg wash process wastewater	Reserved
Feed storage process wastewater	Reserved
Layer manure[13]	809
Mature dairy cow manure[14]	924
Swine manure[15]	204
Turkey manure	Reserved

[12] Daniel, *et al.*, (1995).

[13] Ibid.

[14] Thompson, *et al.*, (1979)

[15] Daniel, *et al.*, (1995).

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Appendix L-1

The following is an excerpt from EPA (2002):

> [C]onsiderable research has demonstrated that runoff from manure application on frozen or snow-covered ground has a high risk of water quality impact. Extremely high concentrations of nitrogen and phosphorus in runoff have been reported from plot studies of winter-applied manure: 23.5 to 1,086 milligrams (mg) of total kjeldahl nitrogen (TKN) per liter (L) and 1.6 to 15.4 mg/L of phosphorus (P) (Thompson, *et al.* 1979; Melvin and Lorimor 1996). In two Vermont field studies, Clausen (1990, 1991) reported 165 to 224 percent increases in total P concentrations, 246 to 1,480 percent increases in soluble P concentrations, 114 percent increases in TKN concentrations, and up to 576 percent increases in ammonia-nitrogen (NH_3-N) following winter application of dairy manure. Mass losses of up to 22 percent of applied nitrogen and up to 27 percent of applied P from winter-applied manure have been reported (Midgeley and Dunklee 1945; Hensler, *et al.*, 1970; Phillips, *et al.*, 1975; Converse, *et al.*, 1976; Klausner, *et al.,* 1976; Young and Mutchler 1976; Clausen 1990 and 1991; Melvin and Lorimor 1996). Much of this loss can occur in a single storm event (Klausner, *et al.,* 1976). Such losses may represent a significant portion of annual crop needs.
>
> On a watershed basis, runoff from winter-applied manure can be an important source of annual nutrient loadings to water bodies. In a Wisconsin lake, 25 percent of annual P load from animal waste sources was estimated to arise from winter spreading (Moore and Madison 1985). In New York, snowmelt runoff from winter-manured cropland contributed more P to Cannonsville Reservoir than did runoff from poorly managed barnyards (Brown, *et al.,* 1989). Clausen and Meals (1989) estimated that 40 percent of Vermont streams and lakes would experience significant water quality impairments from the addition of just two winter-spread fields in their watersheds.
>
> Winter application of manure can increase microorganism losses in runoff from agricultural land compared to applications in other seasons (Reddy, *et al.*, 1981). Cool temperatures enhance survival of fecal bacteria (Reddy *et al.*, 1981; Kibby, *et al.*, 1978). Although some researchers have reported that freezing conditions are lethal to fecal bacteria (Kibby, *et al.,* 1978; Stoddard, *et al.*, 1998), research results are conflicting. Kudva, *et al.*, (1998) found that *Escherichia coli* can survive more than 100 days in manure frozen at minus 20 degrees Celsius. Vansteelant (2000) observed that freeze/thaw of soil/slurry mix only reduced *E. coli* levels by about 90 percent. Studies have found that winter spreading of manure does not guarantee die-off of *Cryptosporidium* oocysts (Carrington and Ransome 1994; Fayer and Nerad 1996). Although several studies have reported little water quality impact from winter-spread manure (Klausner 1976; Young and Mutchler 1976; Young and Holt 1977), such findings typically result from fortuitous circumstances of weather, soil properties, and timing/position of manure in the snowpack. The spatial and temporal variability and unpredictability of such factors makes the possibility of ideal conditions both unlikely and impossible to predict.

Appendix L-2

Example Derivation of the Maximum Rates for Liquid Manure Application on Frozen Soil

Givens

According to USDA, NRCS, (1993), the following are givens:

Potential maximum retention after runoff begins (S) = $\frac{1000}{CN} - 10$

Runoff curve number (CN) = $\frac{1000}{S + 10}$

According to Mitchell, *et al.,* (1997), the following is a given for frozen soil:

$S_f = 0.1 \cdot S$

For CN in the range from zero to 100, Table 10.1 in USDA, NRCS, (1993), identifies the minimum depth of precipitation (P) at which the runoff curve begins under dry, average, and saturated antecedent soil moisture conditions. For example, for a CN of 91 and average antecedent soil moisture, the runoff curve begins when P equals 0.2 inches.

Example

Hydrologic Soil Group A.
Harvested crop was corn planted in straight rows.
The land is in good hydrologic condition.
The antecedent soil moisture is average.

$S_f = (1000/64 - 10) \cdot 0.1 = 0.56$

$CN_f = 1000/(0.56 + 10) = 94.7 \simeq 95$

According to Table 10.1 in USDA, NRCS (1993), for a CN of 95, 0.11 inches is the minimum depth of precipitation (or other liquid) at which the runoff curve begins. Converting this depth to a volume per acre,

$Q\ (gal/ac) = 0.11\ in \cdot ft/12\ in \cdot 43{,}560\ ft^2/ac \cdot 7.48\ gal/ft^3$

results in 2,987 gallons per acre as the maximum quantity of liquid that can be applied on frozen soils in Hydrologic Soil Group A while precluding runoff.

Appendix L-3

Runoff Curve Numbers for Antecedent Moisture Condition II

If the Curve Number for AMC III is ...	then the Curve Number for AMC II is ...
100	99
99	96
98	93
97	91
96	89
95	87
94	85
93	83
92	81
91	79
90	78
89	76
88	74
87	73
86	71
85	70
84	68
83	67
82	65
81	64
80	63
79	62

If the Curve Number for AMC III is ...	then the Curve Number for AMC II is ...
78	60
77	59
76	58
75	57
74	55
73	54
72	53
71	52
70	50
69	49
68	48
67	47
66	46
65	45
64	44
63	43
62	42
61	41

Attachment 2:

U.S. EPA preamble to the 2008 federal CAFO rule
(40 CFR Parts 9, 122, and 412)

Federal Register

Thursday,
November 20, 2008

Part II

Environmental Protection Agency

40 CFR Parts 9, 122, and 412
Revised National Pollutant Discharge Elimination System Permit Regulation and Effluent Limitations Guidelines for Concentrated Animal Feeding Operations in Response to the Waterkeeper Decision; Final Rule

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 9, 122, and 412

[EPA–HQ–OW–2005–0037; FRL–8738–9]

RIN 2040–AE80

Revised National Pollutant Discharge Elimination System Permit Regulation and Effluent Limitations Guidelines for Concentrated Animal Feeding Operations in Response to the Waterkeeper Decision

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: Under the Federal Water Pollution Control Act (Clean Water Act or CWA), EPA is revising the National Pollutant Discharge Elimination System (NPDES) permitting requirements and Effluent Limitations Guidelines and Standards (ELGs) for concentrated animal feeding operations (CAFOs) in response to the order issued by the U.S. Court of Appeals for the Second Circuit in *Waterkeeper Alliance et al.* v. *EPA*, 399 F.3d 486 (2d Cir. 2005). This final rule responds to the court order while furthering the statutory goal of restoring and maintaining the nation's water quality by ensuring that CAFOs properly manage manure generated by their operations.

This final rule revises several aspects of EPA's current regulations governing discharges from CAFOs. EPA is modifying the requirement to apply for a permit by specifying that an owner or operator of a CAFO that discharges or proposes to discharge must apply for an NPDES permit. The final rule also includes an option for an unpermitted CAFO to certify to the permitting authority that the CAFO does not discharge or propose to discharge. In addition, EPA is clarifying how the agricultural stormwater discharge exemption criteria are interpreted for unpermitted Large CAFOs. EPA is also requiring CAFOs seeking permit coverage to submit their nutrient management plans (NMPs) with their applications for individual permits or notices of intent to be authorized under general permits. Permitting authorities are required to review the NMPs and provide the public with an opportunity for meaningful public review and comment. Permitting authorities are also required to incorporate terms of NMPs as NPDES permit conditions. Additionally, this action removes the provision that allowed CAFOs to use a 100-year, 24-hour containment structure to fulfill the no discharge requirement for new source swine, poultry, and veal calf operations. Instead, this action authorizes permit writers, upon request by swine, poultry, and veal calf CAFOs that are new sources, to establish best management practice no discharge effluent limitations when the facility demonstrates that it has designed an open containment system that will comply with the no discharge requirements.

This final rule also responds to the court's remand orders regarding water quality-based effluent limitations (WQBELs) and pathogens. EPA is clarifying that WQBELs may be required in permits with respect to production area discharges and discharges from land application areas that are not exempt as agricultural stormwater. Finally, EPA is making the finding that the best conventional technology (BCT) limitations established in 2003 also apply to fecal coliform.

DATES: These final regulations are effective December 22, 2008. For judicial review purposes, this final rule is promulgated as of 1 p.m. Eastern Daylight Time, on December 4, 2008, as provided in 40 CFR 23.2.

ADDRESSES: The record for this rulemaking is available for inspection and copying at the Water Docket, located at the EPA Docket Center (EPA/DC), EPA West 1301 Constitution Ave., NW., Washington, DC 20004. The record is also available via EPA Dockets at *http://www.regulations.gov* under docket number OW–2005–0037. The rule and key supporting documents are also available electronically on the Internet at *http://www.epa.gov/npdes/caforule*.

FOR FURTHER INFORMATION CONTACT: For additional information contact Rebecca Roose, Water Permits Division, Office of Wastewater Management (4203M), Environmental Protection Agency, 1200 Pennsylvania Ave., NW., Washington, DC 20460, telephone number: (202) 564–0758, e-mail address: *roose.rebecca@epa.gov.* For additional information specific to New Source Performance Standards and BCT Limitations contact Paul Shriner, Engineering and Analysis Division, Office of Science and Technology (4303T), Environmental Protection Agency, 1200 Pennsylvania Ave., NW., Washington, DC 20460, telephone number: (202) 566–1076, e-mail address: *shriner.paul@epa.gov*.

SUPPLEMENTARY INFORMATION:

I. General Information

A. Does This Action Apply to Me?

This action applies to concentrated animal feeding operations (CAFOs) as specified in section 502(14) of the Clean Water Act (CWA), 33 U.S.C. 1362(14) and defined in the NPDES regulations at 40 CFR 122.23. Table 1.1 provides a list of standard industrial codes for operations potentially regulated under this revised rule. The rule also applies to States and Tribes with authorized NPDES Programs.

TABLE 1.1—OPERATIONS POTENTIALLY REGULATED BY THIS RULE

Category	Examples of regulated entities	North American Industry Classification System (NAICS)	Standard Industrial Classification (SIC)
Industry	Operators of animal production operations that meet the definition of a CAFO:		
	Beef cattle feedlots (including veal calves)	112112	0211
	Beef cattle ranching and farming	112111	0212
	Hogs	11221	0213
	Sheep and Goats	11241, 11242	0214
	General livestock except dairy and poultry	11299	0219
	Dairy farms	11212	0241
	Broilers, fryers, and roaster chickens	11232	0251
	Chicken eggs	11231	0252
	Turkey and turkey eggs	11233	0253
	Poultry hatcheries	11234	0254
	Poultry and eggs	11239	0259
	Ducks	11239	0259
	Horses and other equines	11292	0272

This table is not intended to be exhaustive, but rather provides a guide for readers regarding entities likely to be regulated by this action. This table lists the types of entities that EPA is now aware could potentially be regulated by this action. Other types of entities not listed in the table could also be regulated. To determine whether your facility is regulated under this rulemaking, you should carefully examine the applicability criteria in § 122.23. If you have questions regarding the applicability of this action to a particular entity, consult the person listed in the preceding **FOR FURTHER INFORMATION CONTACT** section.

B. How Can I Get Copies of This Document and Other Related Information?

1. *Docket.* EPA has established an official public docket for this action under Docket ID No. EPA–HQ–OW–2005–0037. The official public docket consists of the documents specifically referenced in this action, any public comments received, and other information related to this action. Although listed in the index, some information is not publicly available, *e.g.*, Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, will be publicly available only in hard copy. Publicly available docket materials are available either electronically in *www.regulations.gov* or in hard copy at the Water Docket in the EPA Docket Center, EPA West, 1301 Constitution Ave., NW., Washington, DC. The Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566–1744, and the telephone number for the Water Docket is (202) 566–2426.

2. *Electronic Access.* This **Federal Register** document and key supporting documents are also electronically available on the Internet at *http://www.epa.gov/npdes/agriculture*.

C. Under What Legal Authority Is This Final Rule Issued?

This final rule is issued under the authority of sections 101, 301, 304, 306, 308, 402, and 501 of the CWA. 33 U.S.C. 1251, 1311, 1314, 1316, 1317, 1318, 1342, and 1361.

D. What Is the Comment Response Document?

EPA received a large number of comments on the 2006 proposed rule (71 FR 37,744–87; June 20, 2006) and the 2008 supplemental proposal (73 FR 12,321–40; March 7, 2008). EPA evaluated all of the comments submitted and prepared a Comment Response Document containing both the comments received and the Agency's responses to those comments. The Comment Response Document complements and supplements this preamble by providing more detailed explanations of EPA's final action. The Comment Response Document is available in the Docket.

II. Background

A. The Clean Water Act

Congress enacted the Federal Water Pollution Control Act (1972), also known as the Clean Water Act (CWA), to ''restore and maintain the chemical, physical, and biological integrity of the nation's waters'' (CWA section 101(a)). Among the core provisions, the CWA establishes the NPDES permit program to authorize and regulate the discharge of pollutants from point sources to waters of the U.S. (CWA section 402). Section 502(14) of the CWA specifically includes CAFOs in the definition of the term ''point source.'' Section 502(12) defines the term ''discharge of a pollutant'' to mean ''*any* addition of any pollutant to navigable waters from any point source'' (emphasis added). EPA has issued comprehensive regulations that implement the NPDES program at 40 CFR part 122. The Act also provides for the development of technology-based and water quality-based effluent limitations that are imposed through NPDES permits to control the discharge of pollutants from point sources. CWA sections 301(a) and (b).

B. History of Actions To Address CAFOs Under the NPDES Permitting Program

EPA began regulating discharges of wastewater and manure from CAFOs in the 1970s. EPA initially issued national effluent limitations guidelines and standards for feedlots on February 14, 1974 (39 FR 5704), and NPDES CAFO regulations on March 18, 1976 (41 FR 11,458).

In February 2003, EPA issued revisions to these regulations that focused on the 5% of the nation's animal feeding operations (AFOs) that presented the highest risk of impairing water quality and public health (68 FR 7176–7274; February 12, 2003) (''the 2003 CAFO rule''). The 2003 CAFO rule required the owners or operators of all CAFOs[1] to seek coverage under an NPDES permit, unless they demonstrated no potential to discharge.

[1] The Clean Water Act regulates the conduct of persons, which includes the owners and operators of CAFOs, rather than the facilities or their discharges. To improve readability in this preamble, reference is made to ''CAFOs'' as well as ''owners'' and ''operators'' of CAFOs. No change in meaning is intended.

A number of CAFO industry organizations (American Farm Bureau Federation, National Pork Producers Council, National Chicken Council, and National Turkey Federation (NTF), although NTF later withdrew its petition) and several environmental groups (Waterkeeper Alliance, Natural Resources Defense Council, Sierra Club, and American Littoral Society) filed petitions for judicial review of certain aspects of the 2003 CAFO rule. This case was brought before the U.S. Court of Appeals for the Second Circuit. On February 28, 2005, the court ruled on these petitions and upheld most provisions of the 2003 rule but vacated and remanded others. *Waterkeeper Alliance, et al.* v. *EPA*, 399 F.3d 486 (2d Cir. 2005). The court's decision is described in detail below.

The revisions to the 2003 CAFO rule being published today relate directly to the changes required by the court's decision and continue to maintain the focus on regulating discharges from the universe of high-risk AFOs.

C. Ruling by the U.S. Court of Appeals for the Second Circuit

The Second Circuit's decision in *Waterkeeper* upheld certain challenged provisions of the 2003 rule and vacated or remanded others, as follows.

1. Issues Upheld by the Court

This section discusses provisions of the 2003 CAFO rule that were challenged by either industry or environmental petitioners, but were upheld by the *Waterkeeper* Court and therefore remain unchanged. EPA is not revising any of these provisions and did not solicit comment on them.

(a) Land Application Regulatory Framework and Interpretation of ''Agricultural Stormwater''

The *Waterkeeper* Court upheld EPA's authority to regulate, through NPDES permits, the discharge of manure, litter, or process wastewater that a CAFO applies to its land application area. The court rejected the industry petitioners' claim that land application runoff must be channelized before it can be considered to be a point source discharge subject to permitting. The court noted that the CWA expressly defines the term ''point source'' to include ''any * * * concentrated animal feeding operation * * * from which pollutants are or may be discharged,'' and found that the Act ''not only permits, but demands'' that land application discharges be construed as discharges ''from'' a CAFO. 399 F.3d at 510.

The *Waterkeeper* Court also upheld EPA's determination in the 2003 CAFO rule that precipitation-related discharges of manure, litter, or process wastewater from land application areas under the control of a CAFO qualify as ''agricultural stormwater'' only where the CAFO has applied the manure in accordance with nutrient management practices that ensure ''appropriate agricultural utilization'' of the manure, litter, or process wastewater nutrients. EPA's interpretation of the Act in this regard was reasonable, the court found, in light of Congressional intent in excluding agricultural stormwater from the meaning of the term ''point source'' and given the precedent set in an earlier Second Circuit case, *Concerned Area Residents for the Environment* v. *Southview Farm*, 34 F.3d 114 (2d Cir. 1994). 399 F.3d at 508–09.

(b) Effluent Guidelines

The court rejected the environmental organizations' claim that EPA, in developing best available technology effluent limitations guidelines, had failed to consider the single best performing CAFO and adopt limitations that reflected its performance. The court found that EPA had collected extensive data on the waste management systems at CAFOs and had considered approximately 11,000 public comments on the proposed CAFO rule. The court determined that EPA had either adopted as the basis for its limitations the best performing technology or declined to do so for permissible reasons. 399 F.3d at 513.

The court upheld EPA's decision in the 2003 rule relating to groundwater controls. In the 2003 rule, EPA stated that the Agency believed that requirements limiting the discharge of pollutants to surface water via groundwater that has a direct hydrologic connection to surface water should be addressed on a site-specific basis. The Agency also stated that nothing in the 2003 rule was to be construed to expand, diminish, or otherwise affect the jurisdiction of the CWA over discharges to surface water via groundwater that has a direct hydrologic connection to surface water. 399 F.3d at 514–15.

The court upheld the analytic methodologies that EPA used for determining whether the technology-based permit requirements for CAFOs set in the 2003 rule would be economically achievable by the industry as a whole. 399 F.3d at 515–18.

2. Issues Vacated by the Court

The following are the elements of the 2003 rule that the *Waterkeeper* Court found to be unlawful and therefore vacated.

(a) Duty To Apply

The CAFO industry organizations argued that EPA exceeded its statutory authority by requiring all CAFOs to either apply for NPDES permits or demonstrate that they have no potential to discharge. The court agreed with the CAFO industry petitioners on this issue and therefore vacated the ''duty to apply'' provision of the 2003 CAFO rule.

The court found that the duty to apply, based on the potential to discharge, was invalid because the CWA subjects only actual discharges to permitting requirements rather than potential discharges. The court acknowledged EPA's policy considerations for seeking to impose a duty to apply based on the potential to discharge but found that the Agency lacked statutory authority to do so. 399 F.3d at 505.

(b) Nutrient Management Plans (NMPs)

The court concluded that the 2003 CAFO rule impermissibly: (1) Empowered permitting authorities to issue permits without any meaningful review of a CAFO's NMP, (2) failed to require that the terms of the nutrient management plan be included as effluent limitations in the NPDES permit, and (3) violated the CWA's public participation requirements. The court agreed with the environmental petitioners on these three issues.

The court relied on provisions of the Act that authorize point source discharges only where NPDES permits ''ensure that every discharge of pollutants will comply with all applicable effluent limitations and standards,'' citing CWA sections 402(a)(1), (a)(2), and (b). Because the 2003 CAFO rule did not provide for permitting authority review of a CAFO's nutrient management plan before the permit was issued, the court found that the rule did not ensure that each CAFO's discharges comply with these CWA provisions. The court also found that the terms of the NMP themselves are ''effluent limitations'' as that term is defined in the Act and therefore must be made part of the permit and be enforceable as required under CWA sections 301 and 402. The court also held that as effluent limitations, those terms must be made available for public review. 399 F.3d at 499–502.

3. Issues Remanded by the Court

The *Waterkeeper* Court also remanded other aspects of the CAFO rule to EPA ''for further clarification and analysis.''

(a) Water Quality-Based Effluent Limits

The court agreed with EPA that agricultural stormwater is excluded from the meaning of the term ''point source'' and therefore is not subject to water quality-based effluent limitations in permits. However, the court directed EPA to ''clarify the statutory and evidentiary basis for failing to promulgate water quality-based effluent limitations for discharges other than agricultural stormwater discharges as that term is defined in 40 CFR 122.23(e),'' and to ''clarify whether States may develop water quality-based effluent limitations on their own.'' 399 F.3d at 524.

(b) New Source Performance Standards—100-Year Storm Standard

The 2003 CAFO rule set new source performance standards (NSPS) for swine, poultry, and veal calf CAFOs at no discharge. A CAFO in these categories could fulfill this requirement by showing that either (1) its production area was designed to contain all manure, litter, or process wastewater, and precipitation from a 100-year, 24-hour storm, or (2) it would comply with ''voluntary superior environmental performance standards'' based on innovative technologies, under which a discharge from the production area would be allowed if it was accompanied by an equivalent or greater reduction in the quantity of pollutants released to other media (*e.g.*, air emissions). The court found that EPA had neither justified in the record nor provided an adequate opportunity for public comment for either of these provisions. As a result, the court remanded these provisions to EPA to clarify, via a process that adequately involves the public, the statutory and evidentiary basis for them. 399 F.3d at 520–21.

(c) BCT Effluent Guidelines for Pathogens

The court held that the 2003 CAFO rule violated the CWA because EPA had not made an affirmative finding that the BCT-based Effluent Limitations Guidelines (ELGs), *i.e.*, the ''best conventional technology'' guidelines for conventional pollutants such as fecal coliform, do in fact represent BCT for pathogens. The court remanded this issue to EPA for such a finding. 399 F.3d at 519.

D. What Requirements Still Apply to CAFOs?

The *Waterkeeper* decision either upheld or did not address most provisions of the 2003 CAFO rule. This section describes certain key portions of the rule that were not challenged in *Waterkeeper*. These unchallenged provisions are addressed in this final rule only to provide background information and are not in any way reopened or affected by this rulemaking.

The definitions provided in 40 CFR 122.23(b) of the 2003 CAFO rule remain in effect and are unchanged. First, an operation must be defined as an animal feeding operation (AFO) before it can be defined as a concentrated animal feeding operation (CAFO). 40 CFR 122.23. The term ''animal feeding operation'' is defined by EPA regulation as a ''lot or facility'' where animals ''have been, are or will be stabled or confined and fed or maintained for a total of 45 days or more in any 12 month period and crops, vegetation, forage growth, or post harvest residues are not sustained in the normal growing season over any portion of the lot or facility.''

Whether an AFO is a CAFO depends primarily on the number of animals confined, which is also unchanged. Large CAFOs are AFOs that confine more than the threshold number of animals detailed in 40 CFR 122.23(b)(4). Medium CAFOs confine fewer animals than Large CAFOs and also: (1) Discharge pollutants into waters of the U.S. through a man-made ditch, flushing system, or other similar man-made device; or (2) discharge pollutants into waters of the U.S. which originate outside of and pass over, across, or through the facility or otherwise come into direct contact with the confined animals. 40 CFR 122.23(b)(6)(ii). The NPDES permitting authority also may, on a case-by-case basis, designate any medium or small AFO, as a CAFO after conducting an on-site inspection and finding that the facility ''is a significant contributor of pollutants to waters of the United States.'' 40 CFR 122.23(c). The permitting authority may not exercise its authority to designate a small AFO as a CAFO unless pollutants are discharged into waters of the U.S. through a man-made ditch, flushing system, or other similar man-made device, or are discharged into waters of the U.S. which originate outside of the facility and pass over, across, or through the facility or otherwise come into direct contact with the animals confined in the operation. 40 CFR 122.23(c)(3).

As previously described, the court upheld EPA's definition of ''agricultural stormwater discharge'' in relation to discharges from land application areas under the control of a CAFO in 40 CFR 122.23(e). Discharges of manure, litter, or process wastewater from land application areas under the control of a CAFO are discharges from the CAFO (i.e., point source discharges) unless they are agricultural stormwater discharges, which are exempt from permit requirements. Section 122.23(e) provides that precipitation-related discharges of manure, litter, or process wastewater from a CAFO's land application areas are agricultural stormwater discharges, provided that ''the manure, litter, or process wastewater has been applied in accordance with site-specific nutrient management practices that ensure appropriate agricultural utilization of the nutrients in the manure, litter, or process wastewater, as specified in § 122.42(e)(1)(vi)–(ix).''

The court ruling also did not affect the nutrient management planning requirements for permitted CAFOs established in the 2003 CAFO rule. All CAFOs that apply for permits must develop and implement an NMP that meets the requirements of 40 CFR 122.42(e) and, for Large CAFOs subject to 40 CFR part 412, subpart C or D, 40 CFR 412.4. The NMP identifies the necessary actions to ensure that runoff is eliminated or minimized through proper and effective manure, litter, or process wastewater management, including compliance with the ELGs as applicable. Permitted CAFOs must comply with all applicable recordkeeping and reporting requirements, including those specified in § 122.42(e).

The court ruling also did not affect the ELG requirements for Large CAFOs, with the exception of new source performance standards (NSPS) for swine, poultry, and veal calf operations. ELG requirements ensure the appropriate storage of manure, litter, and process wastewater and proper land application practices. They vary depending upon the type of animals confined: Subpart A for horses and sheep; subpart B for ducks; subpart C for dairy cattle, heifers, steers, and bulls; and subpart D for swine, poultry, and veal calves. 40 CFR part 412. Additionally, NSPS for beef and dairy operations were not affected by the decision and remain unchanged (40 CFR 412.35).

Permitted small and medium CAFOs are not subject to the ELGs specified in part 412. Rather, they must comply with technology-based requirements developed by the permitting authority on a case-by-case basis (*i.e.*, best professional judgment (BPJ)), pursuant to CWA section 402(a)(1)(B) and as defined in 40 CFR 125.3(c)(2) and (d).

E. EPA's Response to the Waterkeeper Decision

On June 30, 2006, EPA published a proposed rule to revise the Agency's regulations governing discharges from

CAFO's in response to the *Waterkeeper* decision. 71 FR 37,744. In summary, EPA proposed to require only owners or operators of those CAFOs that discharge or propose to discharge to seek authorization to discharge under a permit. Second, EPA proposed to require CAFOs seeking authorization to discharge under individual permits to submit their NMPs with their permit applications or, under general permits, with their notices of intent. Permitting authorities would be required to review the NMP and provide the public with an opportunity for meaningful public review and comment. Permitting authorities would also be required to incorporate terms of the NMP as NPDES permit requirements. Additionally, EPA proposed a process for modifying a CAFO's NPDES permit to incorporate changes to the NMP during the permit term by designating permit modifications in accordance with that process to be ''minor modifications of permits'' under 40 CFR 122.63. The 2006 proposed rule also addressed the remand of issues for further clarification and analysis. These issues concerned clarifications regarding the applicability of water quality-based effluent limitations (WQBELs) to CAFO discharges; NSPS for swine, poultry, and veal CAFOs; and BCT effluent limitations guidelines for fecal coliform.

A March 7, 2008, **Federal Register** notice supplemented the 2006 proposed rule by proposing additional options considered by EPA for inclusion in this final rule in response to the Second Circuit's decision in the *Waterkeeper* decision. In that notice, EPA proposed a voluntary option for a CAFO to certify that the CAFO does not discharge or propose to discharge based on an objective assessment of the CAFO's design, construction, operation, and maintenance. EPA also proposed a framework for identifying the terms of the NMP and three alternative approaches for addressing rates of application of manure, litter, and process wastewater when identifying terms of the NMP to be included in the permit. In the 2008 supplemental proposal, EPA sought comment only on the issues presented in the 2008 supplemental proposal.

In addition to the changes made through this rulemaking, EPA extended certain deadlines in the NPDES permitting requirements and ELGs in two separate rulemakings in order to allow the Agency adequate time to complete this rulemaking in response to the *Waterkeeper* decision, in advance of those deadlines. The principal purpose of these rulemakings was to provide additional time for the Agency to complete this final rule. Neither of these date extension rules addressed any of the substantive issues addressed in this final rule or promulgated any provisions in response to the *Waterkeeper* decision. The first rule revised dates established in the 2003 CAFO rule by which facilities newly defined as CAFOs were required to seek permit coverage and by which all CAFOs were required to develop and implement nutrient management plans. 71 FR 6978–84 (February 10, 2006). EPA extended the date by which operations defined as CAFOs as of April 14, 2003, that were not defined as CAFOs prior to that date, were required to seek NPDES permit coverage, from February 13, 2006, to July 31, 2007. EPA also amended the date by which operations that become defined as CAFOs after April 14, 2003, due to operational changes that would not have made them a CAFO prior to April 14, 2003, and that are not new sources, were required to seek NPDES permit coverage, from April 13, 2006, to July 31, 2007. Finally, EPA extended the deadline by which CAFOs were required to develop and implement nutrient management plans, from December 31, 2006, to July 31, 2007. That rulemaking revised all references to the date by which CAFOs must develop and implement NMPs as specified in the 2003 CAFO rule.

As a result of the extensive array of public comments on the issues raised by the *Waterkeeper* decision, EPA was unable to complete this final rule prior to July 31, 2007. Thus, EPA published a second revision of the compliance dates on July 24, 2007, extending the dates from July 31, 2007, to February 27, 2009. The preamble to the second date change rule explained EPA's belief that the February 27, 2009, deadlines were appropriate because they would provide additional time for States, the regulated community, and other stakeholders to adjust to the new regulatory requirements. *See* 72 FR 40,245–50. In the 2008 supplemental rule, EPA requested comment on further extending the compliance deadline. For additional discussion of compliance dates, see section III.D of this preamble.

III. The Final Rule: Revisions to the 2003 CAFO Rule in Response to *Waterkeeper*

This final rule responds to the Second Circuit Court's vacature and remand orders.

A. Duty To Apply for a Permit

1. Provisions in the 2003 CAFO Rule

(a) Duty To Apply

The 2003 CAFO rule required all CAFOs to seek authorization to discharge under an NPDES permit unless the Director, *i.e.*, the permitting authority, determined that the CAFO had no potential to discharge.

(b) ''No Potential To Discharge'' Determination

The 2003 CAFO rule included a process for CAFOs to seek a ''no potential to discharge'' determination by the Director. Where the Director determined, based on information supplied by the CAFO operator, that a CAFO had no potential to discharge manure, litter, or process wastewater to waters of the U.S., the CAFO operator had no duty to apply for a permit, unless circumstances at the facility changed such that the facility would have the potential to discharge. Examples of facilities that possibly would have qualified for this exemption included facilities in very arid areas, facilities that are down slope from waters of the U.S., and facilities with completely enclosed operations.

2. Summary of the Second Circuit Court Decision

The Second Circuit Court of Appeals vacated the provision that required all CAFO owners or operators with a potential to discharge to apply for an NPDES permit. The court held that the Clean Water Act (CWA) authorizes EPA to require permits for the actual discharge of pollutants, but not for mere potential discharges. Because the 2003 CAFO rule imposed an obligation on all CAFOs to either apply for an NPDES permit or affirmatively demonstrate that they have no potential to discharge, the court ruled that it exceeded EPA's authority under the CWA. *Waterkeeper Alliance et al.* v. *EPA*, 399 F.3d 486, 506 (2d Cir. 2005).

3. This Final Rule

To address the court's decision on the duty to apply, EPA is revising the 2003 CAFO rule in three ways:

- Deleting the requirement that all CAFOs apply for an NPDES permit to provide instead that all CAFOs that ''discharge or propose to discharge'' have a duty to apply when they propose to discharge;
- Eliminating the procedures for a no potential to discharge determination; and
- Establishing a voluntary option for unpermitted CAFOs to certify that they

do not discharge or propose to discharge.

(a) Duty To Seek Permit Coverage

EPA proposed to replace the ''duty to apply'' requirement adopted in the 2003 rule, which states that all CAFO owners or operators must seek coverage under an NPDES permit unless they demonstrate ''no potential to discharge'' (40 CFR 122.21(a)(1) and 40 CFR 122.23(a) and 40 CFR 122.23(d)(1)) with a modified ''duty to apply'' provision. The 2006 proposed rule would have required that all CAFOs that ''discharge or propose to discharge'' seek coverage under an NPDES permit, which is the same language that applies generally to point sources under longstanding NPDES regulations at § 122.21(a)(1).

This rule adopts the approach in the 2006 proposed rule by replacing the ''duty to apply'' requirement of the 2003 rule with a requirement that a CAFO that ''discharges or proposes to discharge'' must seek authorization to discharge under an NPDES permit. Because a number of commenters misunderstood, or were confused by, the term ''propose to discharge,'' EPA is providing additional clarification in this rule and preamble on how operators should evaluate whether they discharge or propose to discharge. While commenters generally agreed that the changes proposed by EPA were consistent with the Second Circuit decision, some commenters thought that ''propose to discharge'' and ''potential to discharge'' were not sufficiently distinguishable, and that ''proposed'' discharges could be understood as contrary to the *Waterkeeper* court's holding that only ''actual'' discharges are subject to CWA requirements.

EPA disagrees with these commenters. Including a duty to apply for CAFOs that ''propose to discharge'' is not the same as requiring a permit for CAFOs with only a ''potential to discharge.'' Unlike the 2003 rule, which categorically required a permit for any CAFO with a ''potential to discharge,'' this final rule calls for a case-by-case evaluation by the CAFO owner or operator as to whether the CAFO discharges or proposes to discharge from its production area or land application area based on actual design, construction, operation, and maintenance. ''Potential'' connotes the possibility that there might—as opposed to will—be a discharge, which, as the *Waterkeeper* court held, is not sufficient under the CWA to trigger NPDES permitting requirements. In contrast to the 2003 rule, this rule requires a case-by-case assessment by each CAFO to determine whether the CAFO in question, due to its individual attributes, discharges or proposes to discharge. Therefore, revised § 122.23(d)(1) requires only CAFOs that actually discharge to seek permit coverage and clarifies that a CAFO proposes to discharge if based on an objective assessment it is designed, constructed, operated, or maintained such that a discharge will occur, not simply such that it might occur. Consistent with the *Waterkeeper* decision, CAFOs that are required to seek permit coverage must do so when they propose to discharge. (See below for discussion of the provision relating to when a CAFO must seek permit coverage, 40 CFR 122.23(f).) Thus, it is the responsibility of the CAFO owner or operator to seek authorization to discharge at the time they propose to discharge. A CAFO that discharges without a permit is in violation of the CWA section 301(a) prohibition on such discharges and additionally has the burden of establishing that it did not propose to discharge prior to the discharge (unless the permitting authority has a current, complete certification from that CAFO as provided by 40 CFR 122.23(j)(2), discussed below). If it is determined that it did, in fact, propose to discharge prior to the discharge (that is, it was designed, constructed, operated, or maintained such that a discharge would occur), it is also in violation of the § 122.23(d)(1) duty to apply. Section 122.23(j)(2) also clarifies how a CAFO may satisfy the burden of establishing that it did not propose to discharge.

Under section 301(a) of the CWA, only those CAFO discharges authorized by an NPDES permit (or otherwise authorized by the statute), regardless of the volume or duration of the discharge, are allowed. Any discharge from a CAFO, even one that is unplanned or accidental, is illegal unless it is authorized by the terms of a permit or is agricultural stormwater. While EPA recognizes that not every discharge indicates that the CAFO will discharge in the future, an operator should certainly consider any unplanned or accidental discharge that may have occurred in the past in deciding whether to seek permit coverage. CAFO operators must objectively assess whether a discharge from the CAFO, including from the production area or land application areas under the control of the CAFO, is occurring or will occur for purposes of determining whether to obtain permit coverage.

It is well established that ''discharge'' is not limited to continuous discharges of pollutants from a point source to waters of the U.S., but also includes intermittent and sporadic discharges. ''Intermittent or sporadic violations do not cease to be ongoing until the date when there is no real likelihood of repetition.'' *Chesapeake Bay Foundation* v. *Gwaltney of Smithfield*, 890 F.2d 690, 693 (4th Cir. 1989). Such intermittent, sporadic, even occasional, discharges may in fact be the norm for many CAFOs, but they are nonetheless ''discharges'' under the CWA and are prohibited unless authorized under the terms of an NPDES permit. CAFOs that have had such intermittent or sporadic discharges in the past would generally be expected to have such discharges in the future, and therefore be expected to obtain a permit, unless they have modified their design, construction, operation, or maintenance in such a way as to prevent all discharges from occurring.

EPA received a number of comments concerning past discharges. Some commenters asserted that a prior discharge is not, by itself, a sufficient basis for requiring a permit and observed that it is quite possible that a CAFO may have eliminated the cause of the discharge. EPA agrees that not every past discharge from a CAFO necessarily triggers a duty to apply for a permit; however, a past discharge may indicate that the CAFO discharges or proposes to discharge if the conditions that gave rise to the discharge have not changed or been corrected. See, *e.g., Gwaltney of Smithfield. Ltd.* v. *Chesapeake Bay Foundation,* 484 U.S. 49, 57 (1987) (''a reasonable likelihood that a past polluter will continue to pollute in the future'' is a continuous or intermittent violation); *American Canoe Ass'n* v. *Murphy Farms, Inc.,* 412 F.3d. 536 (4th Cir. 2005) (CWA violation continues where corrective measures are insufficient to eliminate real likelihood of repeated discharges). The same rationale that led the courts in these cases to conclude that the point sources in question were discharging in violation of the CWA underlies the final rule's requirement that CAFOs must seek permit coverage when they discharge or propose to discharge (*i.e.*, are designed, constructed, operated, or maintained such that a discharge will occur). Sections 122.23(d)(1) and (f).

An uncorrected past discharge is not the only indicator that operators should consider in assessing whether the CAFO discharges or proposes to discharge. Other key factors the operator should consider include the proximity of the production area to waters of the U.S., whether the CAFO is upslope from waters of the U.S., and climatic conditions. Similarly, the type of waste storage system, storage capacity, quality

of construction, and presence and extent of built-in safeguards are important factors. Standard operating procedures and level of maintenance are also critical factors for the operator to consider when assessing whether a CAFO discharges or proposes to discharge. Such considerations contributed to EPA's decision to include in this final rule an option for unpermitted CAFOs to certify that they do not discharge or propose to discharge by meeting the criteria in 40 CFR 122.23(i)(2), discussed in detail below. EPA encourages unpermitted CAFOs that choose not to certify to consider the set of criteria for certification eligibility when deciding whether to seek permit coverage, and this final rule provides in § 122.23(j)(2) that these same criteria may be used to establish that a CAFO did not propose to discharge prior to a discharge occurring.

As a result of the revisions to 40 CFR 122.23(d) and (f), only CAFOs that discharge or propose to discharge are required to seek permit coverage, and a CAFO that proposes to discharge must seek coverage as soon as it proposes to discharge in order to avoid having unpermitted discharges. In the event of a discharge from an unpermitted CAFO, the CAFO operator would be in violation of the CWA prohibition against discharging without a permit. Under this final rule, if the CAFO proposed to discharge prior to the discharge, the CAFO would also be in violation of the requirement in § 122.23(d)(1) and (f), implementing sections 308 and 402 of the CWA, that CAFOs seek permit coverage when they propose to discharge.

In revised § 122.23(d)(1), EPA is clarifying that ''a CAFO proposes to discharge if it is designed, constructed, operated, or maintained such that a discharge will occur.'' EPA intends that the CAFO operator should make an objective assessment of the operation to determine whether the CAFO will discharge. Such an objective assessment would take into account not only the characteristics of the manmade aspects of the CAFO itself, but climatic, hydrological, topographical, and other characteristics beyond the operator's control that impact whether the CAFO will discharge, given the design, construction, operation and maintenance of the CAFO.

To assist CAFO operators in making this objective assessment and to provide assurance for CAFOs deciding not to seek permit coverage that they are not required to obtain permit coverage, EPA is finalizing a voluntary certification option, proposed in the 2008 supplemental proposal. This option provides a means for a CAFO to certify that it does not discharge or propose to discharge. The voluntary certification provisions are discussed below in section III.A.3(c) of this preamble.

This rule is consistent with the *Waterkeeper* decision because the duty to apply for a permit only arises when a CAFO discharges or proposes to discharge, that is, when it discharges or is designed, constructed, operated, or maintained such that a discharge will occur. It is also consistent with *Chesapeake Bay Foundation* v. *Gwaltney of Smithfield,* discussed above, which found a violation under the CWA where it is reasonably likely that a discharge will occur due to existing circumstances. This rule derives from sections 402(a)(3) and 308 of the CWA, 33 U.S.C. 1342(a)(3), 1318. Under section 402(a)(3), EPA is required to establish a permit program that, among other things, ensures compliance with all applicable requirements of sections 301 (requirements for establishing technology-based and water quality-based effluent limitations), 306 (requirements for establishing new source performance standards), 308 (requirements relating to inspections, monitoring and entry, including requests for information to determine compliance status or support development of effluent limitations) and 402 (NPDES permits).

Section 301(a) prohibits the discharge of pollutants, except in compliance with specific provisions in the CWA. Particularly relevant to CAFOs, section 301(b) provides that ''there shall be achieved'' effluent limitations controlling pollutants discharged from point sources. Section 308(a) provides EPA broad authority to require the owner or operator of any point source (including CAFOs) to provide information necessary to develop effluent limitations, to ''carry out'' section 402, and to ''carry out'' the objectives of the Act, which are set forth in CWA section 101(a). Under section 501(a) EPA is authorized to prescribe ''such regulations as are necessary to carry out'' its functions under the CWA. Any permit program established to carry out section 402 must, of necessity, require point sources that discharge or propose to discharge to submit information to allow the permitting authority to determine prior to issuance of a permit what effluent limitations should apply to a discharger and be included in its permit (including providing the public and any other affected State notice and opportunity for public comment, as required by section 402(b)(3)). It is therefore reasonable for EPA to require those CAFOs that discharge or propose to discharge to apply for NPDES permit coverage.

Some commenters on the 2006 proposed rule opposed regulating entities that ''propose'' to discharge, or alternatively, suggested that EPA should clarify that ''propose'' means ''intend'' or ''plan.'' While EPA acknowledges that ''propose'' to discharge could be understood to mean ''intend'' or ''plan'' to discharge, under this final rule ''propose to discharge'' means that the CAFO is designed, constructed, operated, or maintained such that it will discharge. This is consistent with the *Waterkeeper* decision because a mere ''potential'' to discharge is not sufficient to trigger the revised duty to apply. Accordingly, as previously discussed, revised § 122.23(d)(1) clarifies that ''a CAFO proposes to discharge if it is designed, constructed, operated, or maintained such that a discharge will occur.'' The CAFO's decision as to whether to apply for a permit should be based on an objective assessment of conditions at that operation. As discussed below, under this final rule, a CAFO that is not designed, constructed, operated, or maintained in a manner such that the CAFO does or will discharge is not required to seek permit coverage under § 122.23(d)(1) and may choose to take advantage of the voluntary no discharge certification.

Some commenters on the 2006 proposed rule requested that EPA specifically state in the regulation that facilities designed to the 25-year, 24-hour design standard have not ''proposed'' to discharge. One commenter questioned whether existing operations should be required to obtain permit coverage if they have installed structures and production area BMPs using Natural Resources Conservation Service (NRCS) standards and if they have been operating without discharging. The commenter indicated that ''since EPA is requiring that a zero discharge standard be met only for certain new CAFOs and not existing CAFOs, it is unreasonable to expect all existing animal operations that do not otherwise come under a permit to meet a zero discharge standard.''

EPA disagrees that CAFOs designed for the 25-year, 24-hour storm should be categorically excluded from the requirement to apply for a permit simply based on their design standard. EPA also believes that it is reasonable to expect unpermitted CAFOs to meet a zero discharge standard. The CWA is very clear that point source discharges from CAFOs are illegal unless the operator has applied for and obtained an NPDES permit. Thus, ''zero discharge'' is the only standard to which EPA can

hold unpermitted CAFOs under the CWA. Large storms and chronic rainfall events do occur and production areas built to the 25-year, 24-hour storm design standard can and do discharge during precipitation events. Under the CWA, as previously discussed, a violation of the prohibition against discharging without a permit occurs even if the discharge was not planned or intended. Conversely, in the event of a discharge from a permitted CAFO, the discharge will not violate the CWA if the CAFO is in compliance with its permit.

EPA notes that design is only one aspect for a CAFO to consider when assessing whether or not to apply for a permit. Construction, operation, and maintenance are equally important components of a CAFO's operation and can make the difference between a CAFO that discharges and one that does not. With regard to the commenter's question about the applicability of NRCS standards, a CAFO's decision as to whether to seek permit coverage should be based on an objective assessment of conditions at the operation, including, but not limited to, the manure storage design standard. EPA notes that whether or not a CAFO is designed according to NRCS standards may be an important component of the objective evaluation it undertakes to assess whether it is designed, constructed, operated, or maintained such that a discharge will occur. A CAFO that does not discharge or propose to discharge is not required to seek permit coverage under § 122.23(d)(1) and may be eligible for no discharge certification under 40 CFR 122.23(i).

CAFO NPDES permit requirements include, but are not limited to, best management practices (BMPs) to eliminate discharges from the production area under most circumstances and to ensure appropriate agricultural utilization of nutrients in manure, litter, and process wastewater that is applied to land under the CAFO's control. EPA expects that an unpermitted CAFO would also need to implement BMPs in order to ensure that it does not discharge or propose to discharge. However, in many, if not most, cases the BMPs called for will be more rigorous than those required for permitted CAFOs, because the operator of an unpermitted CAFO is never authorized to discharge under CWA section 301(a). Permitted CAFOs have greater flexibility because, in addition to being authorized to discharge under the circumstances prescribed by the permit, other discharges can be excused when the conditions contained in EPA's upset and/or bypass regulations are met. *See* 40 CFR 122.41(m) and (n).

In contrast to commenters who believe that some non-discharging CAFOs will needlessly go through the permitting process, other commenters expressed concern that some CAFOs that should have permits will not seek needed permit coverage. They contended that many CAFOs are currently discharging without a permit and objected to having CAFOs make the determination themselves as to whether or not they discharge or propose to discharge, as such an approach would, in their view, establish a self-permitting scheme. These commenters further contended that the administrative record from the 2003 rule supports the presumption that all Large CAFOs actually discharge and, therefore, such CAFOs should be required to obtain a permit.

EPA does not agree that the rule establishes a self-permitting scheme. As is the case with all point sources, it is up to the operator to determine whether or not to apply for a permit in the first instance, by assessing whether the point source (CAFO) discharges or proposes to discharge. Point sources that do not discharge or propose to discharge are not subject to CWA permitting requirements. *See* § 122.21(a)(1). Regarding the administrative record for the 2003 rule, that rule established a duty to apply for all CAFOs unless the CAFO could demonstrate to the satisfaction of the permitting authority that it had no ''potential to discharge.'' That provision was vacated by the Second Circuit, which noted that EPA did not argue that the administrative record supported a regulatory presumption that all Large CAFOs actually discharge. 399 F.3d at 506, n.22. Thus, consistent with the *Waterkeeper* decision, EPA is promulgating a rule which requires those CAFOs that discharge or propose to discharge, but not CAFOs with a mere ''potential'' to discharge, to seek permit coverage on a case-by-case basis. With regard to the comments that EPA should establish a categorical presumption that all Large CAFOs discharge, the Agency is evaluating various options for exploring the nature of discharges from Large CAFOs.

Finally, this rule revises the regulatory provisions for when a CAFO must seek permit coverage and the duty to maintain permit coverage for CAFOs. The final rule clarifies that those CAFOs that are required under § 122.23(d)(1) to seek permit coverage must do so ''when the CAFO proposes to discharge,'' unless a later deadline, such as February 27, 2009, is specified for the specific category of operation. EPA is recodifying 40 CFR 122.23(g) as § 122.23(f) because the paragraph codified as § 122.23(f) in the 2003 rule is being removed. See section III.A.3(b) of this preamble. Revised § 122.23(f) is consistent with the revised duty to apply requirement in § 122.23(d)(1) and EPA's authority under sections 301, 308 and 402 of the CWA to require CAFOs that actually discharge to seek permit coverage. None of the specific timeframes for the various categories of CAFOs in paragraphs (1)–(5) of § 122.23(f), as amended by the 2007 date change rule (72 FR 40,245), is affected by this rule. The revised language in the introductory paragraph of § 122.23(f) simply conforms to the requirements of § 122.23(d)(1).

EPA is making corresponding revisions to the regulatory text requiring CAFOs to maintain permit coverage. Due to the fact that § 122.23(f) as codified in 2003 is being removed, EPA is recodifying 40 CFR 122.23(h), ''Duty to Maintain Permit Coverage,'' as § 122.23(g). See section III.A.3(b) of this preamble. Also, in the 2006 proposed rule, EPA proposed to revise this provision to address the *Waterkeeper* court's decision vacating the requirement for all CAFOs to seek permit coverage unless they obtained a no potential to discharge determination. *See* 71 FR 37,785. In this final rule (as in the proposed rule), a CAFO would not need to reapply based solely on the fact of having had a permit, if the permit had been terminated in accordance with the NPDES provisions at 40 CFR 122.64(b). Since a CAFO that terminated permit coverage is no longer a permitted CAFO, it is not subject to the duty to maintain permit coverage provision. Consistent with the requirement that only CAFOs that discharge or propose to discharge seek NPDES permit coverage, new § 122.23(g) excludes CAFOs that will not discharge or propose to discharge upon expiration of the permit from the requirement to reapply 180 days in advance of permit expiration.

(b) ''No Potential To Discharge'' Determination

In this final rule, EPA is deleting the regulatory provisions adopted in the 2003 CAFO rule allowing CAFOs to demonstrate that they have no potential to discharge and authorizing the Director to make such a determination. 40 CFR 122.23(d)(2) and 122.23(f). Because EPA is not requiring CAFOs to seek permit coverage based merely on potential to discharge, this provision is no longer relevant to determining whether or not a facility needs to seek permit coverage. This final rule is

unchanged from the 2006 proposed rule in this respect.

Overall, most commenters supported eliminating the ''no potential to discharge'' provisions in the CAFO regulations, noting that it is no longer necessary because only CAFOs that discharge or propose to discharge must apply for permits. One State observed that the ''no potential to discharge'' criteria could still be useful to CAFOs in determining whether they need to apply for a permit. While these criteria may continue to be useful to CAFO owners and operators for that purpose, EPA is eliminating these provisions from 40 CFR 122.23 of the regulations.

(c) Voluntary No Discharge Certification

In this final rule, the Agency is adopting a new provision that allows CAFOs to voluntarily certify that the CAFO does not discharge or propose to discharge. As discussed above, EPA received several hundred comments on the 2006 proposed rule related to how a CAFO operator would decide whether to seek permit coverage under a revised rule that requires CAFOs that discharge or propose to discharge to apply for a permit or submit a Notice of Intent for coverage under a general permit. Several commenters were particularly concerned with the consequences for an unpermitted CAFO that has an ''accidental discharge'' because they understood EPA's proposal to mean that a CAFO that does not apply for a permit and subsequently has a discharge of pollutants to waters of the U.S. would be liable for two violations, one associated with the discharge itself and another violation for failing to apply for a permit for authority to discharge. In response to these comments, in the 2008 supplemental proposal, EPA requested public comment on an option that would allow a CAFO that determines, based on an objective assessment, that it does not discharge or propose to discharge to certify to the permitting authority that it is designed, constructed, operated, and maintained not to discharge. In the unlikely event that a properly certified CAFO discharges (which would constitute a violation of section 301(a) of the CWA), the CAFO would not be liable for failing to apply for a permit prior to the discharge in accordance with the permit application requirements of 40 CFR 122.23(d)(1) and (f).

EPA received many comments on the proposed voluntary certification option. Commenters were divided, with some generally supportive and others generally opposed to the concept of a voluntary certification option for unpermitted CAFOs. Those in favor stated that certification would assist CAFOs that do not discharge or propose to discharge by providing a structured process for CAFOs to notify the permitting authority that they are not required to seek permit coverage. Some commenters opposed to certification believe the Agency's record supports a regulatory presumption that all CAFOs discharge, and, therefore, the no discharge certification process is a further departure from the decision of the *Waterkeeper* court. The majority of State permitting authorities commenting on the 2008 supplemental proposal were opposed to the certification option, as proposed.

In this final rule, EPA has addressed both the decision from the *Waterkeeper* court that CAFOs with only a potential to discharge are not subject to NPDES permitting requirements and the concerns expressed by commenters that some CAFOs may be uncertain as to whether they discharge or propose to discharge. In the NPDES program, the first step is for a point source to decide whether it needs to seek permit coverage. Generally, the question of whether a point source needs permit coverage is easily answered; indeed other point sources are typically designed to discharge to waters of the U.S. After careful consideration of the comments and in light of the unique characteristics of CAFOs among point sources, EPA has concluded that providing a voluntary option for unpermitted CAFOs to certify to the Director that the CAFO does not discharge or propose to discharge based on an objective assessment of the CAFO's design, construction, operation, and maintenance is reasonable and appropriate for CAFOs. However, in response to comments received on the proposed certification option, EPA is clarifying several aspects of the process, eligibility requirements, and effect of certification as discussed below. The Agency is also making several changes to the proposed option to ensure that certification will be properly implemented.

Under this final rule, and as proposed in the 2008 supplemental proposal, a CAFO operator may certify that the CAFO does not discharge or propose to discharge by signing and submitting a certification statement to the Director. The objective assessment necessary for the CAFO to qualify for certification takes into account the CAFO's production area design and construction and its operating and maintenance procedures and practices as described in its nutrient management plan (NMP) in accordance with the eligibility criteria, described in detail below. The certification option established by this rule does not change the requirement that CAFOs that propose to discharge must seek permit coverage when they propose to discharge pursuant to § 122.23(f). It does, however, provide a structured process for CAFOs that wish to certify to establish by objective means that they do not discharge or propose to discharge. EPA believes that such a structured process is helpful to CAFOs as they decide whether to seek permit coverage. A CAFO's no discharge certification is not subject to review by the permitting authority in order for it to become effective and the permitting authority is not required to make the certification available to the public for comment because the certification is not a permit application for which review is required under section 402 of the CWA. EPA wishes to emphasize that submission of a no discharge certification is voluntary and the process for obtaining a certification has been developed with that underlying principle in mind.

As explained in detail above, under § 122.23(d)(1) a CAFO that does not discharge or propose to discharge is not required to apply for an NPDES permit. A certification in accordance with this final rule documents the CAFO operator's basis for making an informed decision not to seek permit coverage because the CAFO does not discharge or propose to discharge. A CAFO that certifies in accordance with the requirements of this final rule, discussed in detail below, is properly certified so long as the CAFO maintains its eligibility. EPA believes that providing a properly certified CAFO assurance that it is not required by § 122.23(d)(1) to seek permit coverage is reasonable and justified. The threshold question regarding which CAFOs are required to seek permit coverage—whether the CAFO discharges or proposes to discharge—is the same for all CAFOs. A CAFO that does not discharge or propose to discharge can choose to certify or not. Certification in accordance with the requirements of 40 CFR 122.23(i) requires a CAFO owner or operator to undertake and document a rigorous analysis of the operation's structure and design, and to be committed to operation and maintenance protocols designed to ensure no discharge, discussed in detail below.

EPA is adding subsection (j) 40 CFR 122.23 to clarify the effect of certification. As provided in new paragraph (j)(1), a CAFO certified in accordance with § 122.23(i) is presumed not to propose to discharge. A CAFO that is ''certified in accordance with

§ 122.23(i)'' has submitted a complete certification that is in effect pursuant to 40 CFR 122.23(i)(4). In the unlikely event that such a CAFO does discharge, it will not be in violation of the requirement that CAFOs that propose to discharge seek permit coverage pursuant to § 122.23(d)(1) and (f), with respect to that discharge, provided the CAFO maintained its certification by continuing to be designed, constructed, operated, and maintained in accordance with the eligibility criteria in 40 CFR 122.23(i)(2). This is because meeting the eligibility criteria at the time of the discharge establishes that the CAFO did not propose to discharge. If a certified CAFO does discharge, and the Director believes that the CAFO's certification was invalid at the time of the discharge (i.e., not in accordance with the eligibility criteria in § 122.23(i)(2)), the presumption means that, in any enforcement action alleging failure to seek permit coverage prior to the discharge, the burden is on the Director to establish that the CAFO ''proposed to discharge'' prior to the discharge. EPA notes that any unpermitted discharge from a properly certified CAFO is still a violation of CWA section 301(a) and terminates the certification pursuant to § 122.23(i)(4). Moreover, if subsequent to the discharge event the CAFO is designed, constructed, operated, or maintained such that a discharge will occur, it must seek permit coverage under § 122.23(d)(1) and (f). For additional discussion of past discharges from unpermitted CAFOs see section III.C.3(a) of this preamble.

To further clarify the effect of voluntary certification, EPA is also including in the final rule a provision specifically related to uncertified CAFOs. As provided in 40 CFR 122.23(j)(2) of this final rule, in any enforcement proceeding for failure to seek permit coverage under § 122.23(d)(1) or (f) that is associated with a discharge from an unpermitted CAFO that has not submitted certification documentation as provided in 40 CFR 122.23(i)(3) or 40 CFR 122.23(i)(6)(iv), the CAFO would have the burden to establish that it did not propose to discharge prior to the discharge. Also, a CAFO that had submitted a certification more than five years prior to the discharge (and not recertified within the past five years) or that had withdrawn its certification pursuant to 40 CFR 122.23(i)(5) prior to the discharge would also have the burden to establish that it did not propose to discharge. EPA's intent is to clarify that when an unpermitted CAFO discharges and the permitting authority does not have a current, signed certification from that CAFO, it is the CAFO's responsibility to show that it was not required to have applied for permit coverage (*i.e.*, did not propose to discharge) prior to the discharge. Section 122.23(j)(2) provides that the CAFO can satisfy this burden by establishing that at the time of the discharge the CAFO's design, construction, operation, and maintenance were all in accordance with the certification eligibility criteria of § 122.23(i)(2).

Unlike the 2003 rule that required all CAFOs to seek permit coverage in order to operate unless they obtained a determination of ''no potential to discharge,'' the certification provision is entirely voluntary. The requirement for a CAFO to apply for a permit is triggered if a CAFO discharges or proposes to discharge, regardless of whether it has certified or not. Any CAFO operator's decision as to whether to seek permit coverage should be made based on an objective assessment of the CAFO's design, construction, operation, and maintenance, in contrast to the 2003 rule, which required the operator either to seek permit coverage or prove to the satisfaction of the Director that the CAFO had no potential to discharge. Therefore, under § 122.23(d)(1) and (i), the operator must evaluate based on such an objective assessment whether it discharges or proposes to discharge. If it does it must seek and obtain permit coverage; if it does not it may operate without a permit and decide either (1) to certify under the provisions at § 122.23(i); or (2) to operate without a permit and without certifying. The purpose of certification is to provide a voluntary mechanism for the CAFO to establish in advance that it does not discharge or propose to discharge. As previously discussed, a CAFO that operates without a permit must be designed, constructed, operated, and maintained such that no discharge will occur, because any discharge (other than agricultural stormwater) is prohibited from unpermitted CAFOs pursuant to CWA section 301(a), while permitted CAFOs are allowed to discharge under specified conditions and may also have defenses for upset and bypass. NPDES permit coverage reduces CAFO operator risk and provides certainty to CAFO operators regarding activities and actions that are necessary to comply with the CWA. In contrast, certified CAFOs are not allowed to discharge under any conditions (other than discharges of agricultural stormwater), and are liable for any unpermitted discharge pursuant to CWA 301(a), but they will not additionally be held liable for a violation of the duty to apply, provided their certification is valid and still in effect at the time of discharge. EPA strongly recommends that all CAFOs that have any doubt about their ability to operate under all circumstances without discharging seek to obtain NPDES permit coverage, and believes it is in their interest to do so. However, in accordance with the *Waterkeeper* decision, EPA is requiring CAFOs to seek permit coverage only if they discharge or propose to discharge.

The final rule provisions for certification eligibility and submission, and conditions for a valid certification are discussed in detail below.

(i) Certification Eligibility Criteria

EPA is establishing specific eligibility criteria for CAFO certification at 40 CFR 122.23(i)(2). Meeting these criteria establishes that the CAFO does not ''discharge or propose to discharge'' for purposes of 40 CFR 122.23(d)(1), for as long as the certification is valid. Eligibility for certification means meeting the criteria described below at the time certification is established and continuing to meet the eligibility criteria throughout the period of certification as new information or situations arise. The three criteria are as follows: (1) An objective evaluation which shows that the CAFO's production area is designed, constructed, operated, and maintained so as not to discharge, (2) development and implementation of an NMP to ensure no discharge (other than agricultural stormwater discharges) that, at a minimum, addresses the elements set forth in 40 CFR 122.42(e)(1) and 40 CFR 412.37(c), including operation and maintenance practices for the production area and land application areas under the control of the CAFO, and (3) maintenance of the documentation required for certification either on site, at a nearby office, or where it can be made readily available to the permitting authority upon request. A statement that describes the basis for the CAFO's certification that it satisfies these eligibility criteria must be submitted to the Director, but there is no requirement for permitting authority review in order for the certification to be valid.

The first two criteria concern the existing physical and operational conditions at the CAFO. In addition, meeting these criteria includes making proper accommodations during the certification period to address changes to the operation. For example, if an increase in animals will cause the CAFO to exceed the existing storage capacity for precipitation, manure and process

wastewater required for no discharge, in order to remain certified, the CAFO must remedy the storage capacity problem prior to bringing the additional animals to the operation. Operation and maintenance practices may need to be modified to accommodate changes to the CAFO. For example, a reduction in fields available for land application would trigger the need to reevaluate the adequacy of manure storage and handling protocols. The third eligibility criterion requires a certified CAFO to maintain records needed to support the basis for the certification throughout the duration of the certification, such as monitoring and inspection records, records of maintenance and repairs, and land application records, including updated documentation to match current conditions and circumstances at the CAFO. Certified CAFOs, like any other permitted or unpermitted CAFO, may be asked to send information to the permitting authority that is relevant to implementation of the CWA, or inspected by EPA or authorized State inspectors. During an inspection the certified CAFO could be required to produce the documentation showing that it meets the eligibility criteria, including that the CAFO has been and is being operated and maintained in accordance with an NMP that has been updated as necessary.

Commenters offered numerous perspectives on the proposed eligibility criteria. Some commenters asserted that the proposed criteria were too extensive, stringent, and complex, and therefore would make it unlikely that self-certifying CAFOs could accurately demonstrate their eligibility. These commenters indicated that, as proposed, the eligibility criteria would be expensive to implement and, thus, would serve as a disincentive for a CAFO to choose to certify. In response to these comments, EPA emphasizes that certification is voluntary, and CAFOs may choose not to certify. As noted above, EPA believes that it is generally in an operator's best interest to obtain permit coverage. However, EPA has provided the certification option for CAFOs that choose not to seek permit coverage but would like to establish up front that they do not discharge or propose to discharge. The final rule contains stringent eligibility criteria because in light of the CWA prohibition against unpermitted discharges, the eligibility criteria for certification must establish that the CAFO does not discharge or propose to discharge. Only CAFOs that establish eligibility and meet all of the certification provisions in 40 CFR 122.23(i)(2)–(3) will receive the benefit of certification, which is that a validly certified CAFO that discharges will not be in violation of the requirement to apply for a permit pursuant to § 122.23(d)(1) and 40 CFR 122.23(f). As EPA is clarifying in 40 CFR 122.23(j), without a certification, an unpermitted CAFO that discharges has the burden of establishing that it did not propose to discharge in an enforcement action arising from a discharge from the CAFO.

In contrast, other commenters indicated that the proposed criteria do not ensure that a certified CAFO will not discharge and, therefore, additional requirements and procedures should be imposed for certification eligibility. In response to these comments, the certification eligibility criteria in this final rule have been modified from the 2008 supplemental proposal in order to clarify what EPA expects of a certified CAFO. The final rule clarifies that the CAFO's NMP must include any operation and maintenance practices that are established by the technical evaluation of production area open storage structures as necessary to ensure no discharge. Also, EPA reminds unpermitted CAFOs considering certification that many site-specific factors, such as location and the facility's discharge history, must be taken into account when demonstrating certification eligibility in accordance with this final rule. A CAFO in close proximity to waters of the U.S. or a conduit to waters of the U.S. may need to take additional protective measures for design, construction, operation and maintenance in order to be able to demonstrate that it will not discharge. A CAFO operator who intends to establish eligibility for certification should be mindful that, as stated above in the discussion of revised § 122.23(d)(1), a CAFO that has discharged in the past would generally be expected to discharge in the future, and therefore be expected to obtain a permit, unless it has modified the design, construction, operation or maintenance in such a way as to prevent any discharges from occurring.

The first eligibility criterion for valid certification covers the design, construction, operation, and maintenance of the CAFO's production area. As proposed, 40 CFR 122.23(i)(2)(i) of this final rule requires the CAFO to demonstrate that the CAFO's production area is designed, constructed, operated, and maintained so as not to discharge. Due to the variations in production area design based on the type of containment system used at the operation, EPA proposed and is finalizing today a rule with two parts for the first eligibility criterion: the first for open manure storage structures and the second for any part of the production area not considered to be open containment.

Consistent with the 2008 supplemental proposal, under the final rule, any CAFO with an open manure storage structure seeking to certify that it does not discharge or propose to discharge is required to perform a technical evaluation under 40 CFR 122.23(i)(2)(i)(A). To demonstrate that the CAFO meets the production area requirement for certification, this evaluation must be conducted in accordance with the elements of the technical evaluation required for open storage new source swine, poultry and veal calf operations seeking to demonstrate no discharge under 40 CFR 412.46(a)(1)(i)–(viii), as revised by this action. EPA clarifies that, although this provision references the new source performance standard (NSPS) for swine, poultry and veal calf operations, this eligibility criterion applies to any unpermitted CAFO with open manure storage seeking to certify that it does not discharge or propose to discharge, not just new sources in the swine, poultry and veal calf sectors with open storage.

Elsewhere in this final rule, EPA is revising the provisions at 40 CFR 412.46(a)(1) to allow such new sources with open containment to meet the no discharge requirement for their NPDES permit using best management practices based in part on a rigorous site-specific technical evaluation that includes use of the most recent versions of the Animal Waste Management (AWM) software, or equivalent software, and the Soil Plant Air Water (SPAW) Hydrology Tool, or an equivalent model. For a discussion of the technical evaluation and the AWM and SPAW modeling tools, see section III.F of this preamble.

Several commenters expressed the need for evaluation criteria specific to beef cattle feedlots, based on their belief that reliance on swine, poultry, and veal calf new source provisions is inappropriate for all animal sectors. As described in more detail in Section III.F of this preamble, AWM software is a planning and design tool for animal feeding operations that can be used to estimate the production of manure, bedding, and process water and determine the size of storage facilities necessary to meet no discharge. AWM (CCE version 2.3.0) currently provides manure characteristics for eight animal types with the ability to modify these characteristics and add animal types as necessary. The field and pond hydrologic analyses conducted with the SPAW model are not specific to any animal species. Therefore beef and dairy

operators can use the AWM and SPAW tools to establish the appropriate design, construction, operation and maintenance of their facility to meet the no discharge requirement of certification.

EPA also received comments seeking clarification regarding how the technical evaluation for new source swine, poultry and veal calf operations can apply to existing facilities given that EPA stated in the preamble to the 2003 CAFO rule that the no discharge performance standard was not economically achievable for existing facilities. While EPA has determined that the no discharge performance standard was not appropriate to require for existing facilities on a national basis (*see* 68 FR 7218), EPA acknowledges that there are existing CAFOs that could meet the standard. Existing CAFOs that feel it is not economically achievable to meet a no-discharge standard always have the option of applying for a permit.

In order to meet the second part of the first eligibility criterion, the final rule requires, in 40 CFR 122.23(i)(2)(i)(B), that any certifying CAFO must demonstrate that all of its production area, as defined at 40 CFR 122.23(b)(8), not just open containment structures, is designed, constructed, operated, and maintained such that there will be no discharge of manure, litter, process wastewater, or raw materials, such as feed, to surface waters. For a CAFO without open containment, this provision requires a demonstration of no discharge from the entire production area. For a CAFO that has an open containment structure, this provision requires a demonstration that the remainder of the production area (other than the open containment structure subject to the demonstration in § 122.23(i)(2)(i)(A)), also will not discharge. Because of the special risk of discharge from open manure storage structures, greater specificity is provided regarding the elements of the demonstration in § 122.23(i)(2)(i)(A); however, the demonstration in § 122.23(i)(2)(i)(B) must be technically sound and must be adequate to demonstrate that the production area is designed, constructed, operated, and maintained for no discharge. This demonstration must be based on an evaluation of site-specific characteristics, including, among others, the amount of manure generated during the storage period, the size of the storage structure, control measures to ensure diversion of clean water, and seasonal restrictions on land application. The preamble to the 2003 rule provides additional information regarding production area design for total containment and closed manure storage systems, such as lagoon covers, underhouse pit storage systems, and stockpile storage sheds. *See* 68 FR 7176, 7219–20. Some CAFOs may have a combination of open manure storage structures and covered structures, while others will house all animals and store all manure, feed and by-products under cover. In either case, all parts of the production area must be included in the demonstrations required under § 122.23(i)(2)(i)(A) and (B).

In addition, as proposed under 40 CFR 122.23(i)(2)(i)(C), this final rule requires any certified unpermitted CAFO to implement the measures set forth in 40 CFR 412.37(a) and (b) for the production area. These additional measures pertain to operation and maintenance and include provisions for visual inspections, depth markers for all open surface liquid impoundments, corrective action, mortality handling and recordkeeping. This final rule also requires these measures for permitted new swine, poultry and veal calf operations to meet a no discharge standard. Since both these permitted new source operations and unpermitted certified CAFOs need to ensure no discharge from the production area under the permit and certification requirements, respectively, it is appropriate to rely, in part, on those provisions to establish eligibility criteria for no discharge certification. The documents that are necessary to satisfy the first eligibility criterion, which addresses the CAFO's design, construction, operation, and maintenance of the entire production area, include design documentation and all recordkeeping and operation and maintenance planning necessary to address the elements of § 122.23(i)(2)(i), which includes the measures set forth in § 412.37(a) and (b).

In the preamble to the 2008 supplemental proposal, EPA requested comment on whether a recordkeeping checklist for use by certified CAFOs would be a useful tool. EPA suggested the possibility of making such a checklist available to all CAFO operators. Commenters generally supported the concept of a recordkeeping checklist that could be used by certified CAFOs, since the checklist could be used to document ''expectations for risk management.'' Commenters added that the checklist should be developed in concert with the States. EPA plans to work with States to develop a checklist and consider whether State-specific checklists would also be appropriate.

The second eligibility criterion requires the CAFO to have developed and be implementing an NMP that addresses, at a minimum, the elements set forth in § 122.42(e)(1) and 40 CFR 412.37(c), and all site-specific operation and maintenance practices necessary to ensure that the CAFO will not discharge. The NMP must include provisions regarding nutrient management in the production area as well as in all land application areas under the control of the CAFO where the CAFO will land-apply manure. Because operation and maintenance practices and procedures are critical to discharge prevention, implementation of an NMP is an essential component of any CAFO's efforts to ensure that it will not discharge from its production or land application areas. Furthermore, in order for any certified CAFO that land applies to ensure that the only discharges from the land application areas are non-point source agricultural stormwater discharges, the CAFO would, at a minimum, need to land apply in accordance with practices that ensure appropriate agricultural utilization of nutrients, including conservation practices and agronomic rates of application. For detailed discussion of unpermitted CAFOs and the agricultural stormwater exemption, see section III.B of this preamble.

EPA received comments indicating that the final rule should establish a link between a facility's open storage structure design and the land application practices outlined in a CAFO's NMP. In the 2008 supplemental proposal, EPA intended that the CAFO's NMP would reflect any operation and maintenance practices related to and assumed in the technical evaluation performed for open containment structures. To clarify this intent, 40 CFR 122.23(i)(2)(ii)(B) of this final rule states that the operation and maintenance practices required to be part of the NMP must include ''any practices or conditions established by a technical evaluation pursuant to paragraph (i)(2)(i)(A),'' the provision applicable to CAFOs with open containment. For example, an existing facility may develop an NMP and then use AWM and the SPAW model to evaluate the adequacy of the designed storage facility and overall water budgets for the operation, respectively, which will rely upon inputs from the CAFO's NMP such as the number and type of animals, soil profiles and planned crop rotations. In such a scenario, the CAFO may learn from the technical evaluation that more frequent lagoon drawdowns are necessary in order to achieve no discharge. To be eligible for certification under the final rule, the CAFO's NMP

would then need to be revised to include the adjusted operation and maintenance practices resulting from the technical evaluation. It is these changed operation and maintenance practices that EPA is referring to in the § 122.23(i)(2)(ii)(B) requirement for the NMP to address ''any practices or conditions established by'' the technical evaluation required for CAFOs with open containment structures under the first eligibility criteria.

Commenters requested that EPA define what criteria can be used to meet the NMP eligibility requirement (*e.g.*, whether a comprehensive nutrient management plan (CNMP) would suffice). As EPA stated in the 2008 supplemental proposal, a CAFO may rely upon a CNMP [2] for purposes of certification eligibility, so long as the minimum NMP requirements of § 122.42(e)(1) and § 412.37(c) are met by the CAFO's plan, including all necessary operation and maintenance protocols.[3]

As discussed below, 40 CFR 122.23(i)(4) requires the certified CAFO to at all times be designed, constructed, operated, and maintained such that it meets the eligibility criteria to establish that the operation does not discharge or propose to discharge. Thus, to maintain a valid certification, a certified CAFO must update its NMP if any of the design specifications, practices, or other NMP provisions change over time. For example, if a certified CAFO operator decides to land-apply manure on a field that is not included in the NMP, the CAFO will need to calculate rates of application in accordance with the protocols for land application consistent with 40 CFR 122.42(e)(1)(viii) and revise the NMP to include the new field and the corresponding application rates and any other land application practices for the field in accordance with the protocols. Furthermore, since the eligibility criteria require the certified CAFO to implement the ''up-to-date'' NMP, the CAFO would then need to land apply in accordance with the application rates and other practices incorporated into the NMP for that field.

In the 2008 supplemental proposal, EPA stated that it would encourage CAFOs seeking certification to consult with qualified third-party professionals, but did not propose to require such consultation. Some commenters supported EPA's position, while others believe that a third-party validation of the certification by an NRCS-certified technical service provider and professional engineer should be a required element of the eligibility criteria. Commenters expressed concerns that many CAFOs do not have the requisite knowledge to make technically sound determinations regarding how to meet the eligibility criteria for certification. EPA continues to believe that it is appropriate that the third-party consultation be recommended but not required because certification is voluntary and it is the CAFO owner or operator who must certify to the operation's eligibility. Because a CAFO's certification will not be approved by the permitting authority, it is up to the CAFO operator to be certain that the certification is valid in order to benefit from the presumption that it does not propose to discharge. Therefore, EPA recommends consultation with a qualified third-party. As stated in the preamble to the 2008 supplemental proposal, any professional consulted by the CAFO should have the requisite training, experience and expertise to conduct and/or substantively review the required analyses, and to advise the owner or operator as to whether the CAFO is, in fact, designed, constructed, operated, and maintained such that it will not discharge.

The third eligibility criterion for certification established by this final rule, 40 CFR 122.23(i)(2)(iii), requires that the CAFO maintain the documentation required by the first two criteria ''either on site or at a nearby office, or otherwise make such documentation readily available to the Director or Regional Administrator upon request.'' The 2008 supplemental proposal included a regulatory requirement that the NMP and other documentation of eligibility be maintained by the CAFO ''on site.'' Many commenters expressed the need for the final rule to include regulatory language allowing all documentation of the certification eligibility criteria to be held on-site or made readily available upon request. These commenters were primarily concerned that a requirement to maintain the documentation on site would be unreasonably burdensome on facilities that have multiple production sites with one central office. EPA agrees that the documentation necessary to demonstrate certification eligibility, including the CAFO's site-specific NMP, should be maintained either on site or at a nearby office, or otherwise made readily available to the permitting authority upon request. The final rule established today includes this revision to the proposed language, which is also consistent with the provision established today applicable to the agricultural stormwater discharge exemption for unpermitted CAFOs, discussed in section III.B of this preamble. EPA recommends that operators maintain the necessary documentation on-site to ensure proper implementation of all operation and maintenance procedures.

(ii) Submitting the Certification

Under the certification option promulgated by this action, a CAFO seeking to certify that it does not discharge or propose to discharge is required to submit the certification to the permitting authority. Under 40 CFR 122.23(i)(3), the submission to the Director must include: (1) The CAFO owner or operator's name, address and phone number; (2) information regarding the CAFO's location, including latitude and longitude; (3) a description of the basis for the CAFO's certification that it satisfies the eligibility requirements of 40 CFR 122.23(i)(2); (4) the certification statement set forth in 40 CFR 122.23(i)(3)(iv); and (5) an official signature that meets the signatory requirements of 40 CFR 122.22.

The signed certification makes the CAFO legally responsible for its representations to the Director regarding the design, construction, operation, and maintenance of the CAFO. As EPA noted in the preamble to the 2008 supplemental proposal, the language regarding legal liability for making a false statement under the certification option is consistent with language in 40 CFR 122.26(g) which applies to facilities seeking to obtain a ''no exposure'' exclusion from the requirement for an industrial stormwater discharge permit. EPA clarifies that under the applicable signatory requirements in § 122.22, signing the certification signifies that the signer is certifying that the certification was prepared under his/her direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted and that based on the responsible official's inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the

[2] Technical Guidance for Developing Comprehensive Nutrient Management Plans, USDA Natural Resources Conservation Service (2003), available at *http://policy.nrcs.usda.gov/viewerFS.aspx?id=3073.*

[3] It is common for an operation to have one or more operation and maintenance plans in order to properly implement a number of NRCS conservation practice standards simultaneously. Also, to the extent that the necessary operation and maintenance requirements to implement any provision of the NMP are not included in the NMP itself, those requirements need to be implemented and included in an operation and maintenance plan to be maintained on site or at a nearby location.

information, the information submitted is, to the best of their knowledge and belief, true, accurate and complete.

This final rule makes no changes to the existing regulations concerning how CAFOs may make Confidential Business Information (CBI) claims with respect to information they must submit to the permitting authority and how those claims will be evaluated. A facility may make a claim of confidentiality under the existing regulations at 40 CFR part 2, subpart B.

The third item the Agency is requiring for submission to the Director, as listed above, is a statement describing the basis for the CAFO's certification that it is designed, constructed, operated, and maintained in accordance with the certification eligibility criteria. EPA's expectation for what this description should include is unchanged from the 2008 supplemental proposal. In the preamble to the 2008 supplemental proposal, EPA requested public comment on whether the scope and type of information included in the description of eligibility submitted to the Director should include: (1) The type and number of animals; (2) the type and capacity of manure and wastewater storage and/or containment; (3) storm size used as the basis for containment design; (4) whether the CAFO consulted with a professional engineer or technical service provider (TSP); (5) identification of the documents maintained on site in accordance with the eligibility criteria; and (6) any technical standards, tools (*e.g.* , RUSLE and Phosphorus Index) and formulas used to calculate application rates of manure, litter, and process wastewater.

Commenters expressed differing viewpoints as to what documentation must be provided to the Director for the no discharge certification. Some commenters felt that the 2008 supplemental proposal would have required the submission of too much information, and that CAFOs should only be required to submit a list of the documents created to establish a facility's eligibility. Some of these stated that submission of any facility design or operation specifics is superfluous given that there is no review by the permitting authority. In contrast, other commenters believed that the extent of documentation to be submitted to the Director was insufficient to establish that a facility is designed, operated, and maintained in a way to ensure that it is not discharging. Specifically, these commenters desired that submissions include all documents associated with meeting the eligibility criteria for certification.

After consideration of these comments, EPA believes that the list of information presented in the preamble to the supplemental proposal balances the need of the Director to be informed of critical aspects of the certified CAFO's operation with the fact that the certification is not subject to review by the Director in order to become effective. It is reasonable that the description of the CAFO's basis for certification be submitted as part of the certification, including the type of information listed above, as proposed in the supplemental proposal. EPA also recognizes that depending on site-specific conditions at a particular facility, certain information may not be necessary (*e.g.* , an operation with no land application areas would not need to provide information about application rates of manure, litter, and process wastewater). Furthermore, if the Director is concerned that a CAFO that discharges or proposes to discharge has submitted a certification, the Director has the authority to request additional information from the CAFO, as discussed below.

The authority given to the permitting authority under section 308 of the CWA to conduct inspections at operations is not affected by this rule. Section 308 authorizes, among other things, EPA to require owners or operators of point sources to establish records, conduct monitoring activities and inspections, and make reports, to enable the permitting authority to determine whether there is any violation of any prohibition, or any requirement established under section 308, 402, or 504 of the CWA. Therefore, any CAFO, whether it is certified, permitted, or neither, may be subject to an information gathering request or inspection, at the Director's discretion and for any of the reasons provided by section 308 of the CWA. 33 U.S.C. 1318.

Under this final rule, 40 CFR 122.23(i)(4), a ''certification that meets the requirements of paragraphs (i)(2) and (i)(3) * * * shall become effective on the date it is submitted, unless the Director establishes an effective date of up to 30 days after the date of submission.'' A certification is effective if the CAFO meets the eligibility criteria in § 122.23(i)(2) and submits the signed certification statement and other required information in accordance with § 122.23(i)(3). This rule also requires the use of certified mail or an equivalent method of documentation for identifying the date of submission, consistent with the supplemental proposal, in order to notify the Director that the CAFO has chosen to self-certify.

EPA notes that under the final provision, the Director may, but is not required to, establish that certifications will become effective after a specified number of days, not to exceed 30 days, following submission of the certification if the Director deems such action appropriate, as discussed below. Regardless of whether the permitting authority chooses to establish an effective date in accordance with § 122.23(i)(4), a certification becomes effective (either on the date it is submitted or on the date established by the Director) without acceptance or approval by the permitting authority. A decision by the permitting authority to delay the effective date would allow the permitting authority to become aware of the CAFO's certification prior to it going into effect. A delayed effective date of up to 30 days could provide the opportunity for the permitting authority and the CAFO to have a focused exchange of information before the certification becomes effective. For example, as a result of such an exchange the CAFO may choose to consider making revisions to its certification to be assured it has submitted a certification that meets all the requirements of § 122.23(i)(2) and (3). Also, such an exchange could provide an opportunity for the CAFO to obtain additional information about maintaining a valid certification after it goes into effect. The permitting authority can also request information from an unpermitted CAFO, as provided in section 308 of the CWA, and provide feedback to the CAFO operator if the Director believes that the CAFO has not met the certification requirements.

EPA emphasizes that the final rule does not require Director review of the certification. Therefore, if, for example, the permitting authority establishes that certifications in that State will become effective 30 days after submission, a certification from a CAFO that has met the eligibility and submission requirements in § 122.23(i)(2)–(3) will go into effect on day 30 regardless of any activities that take place during the 30-day period, so long as the CAFO maintains eligibility throughout that period. Similarly, because the certification is not subject to permitting authority review and approval, inaction on the part of the permitting authority at any time during or after the 30 days does not indicate that the CAFO either has or has not met the eligibility and submission requirements. An effective date that is no more than 30 days after submission provides sufficient time for the permitting authority to receive the certification and have an exchange with

the CAFO, but it does not constitute an unreasonable delay for the CAFO to obtain a valid certification. Given these underlying principles, EPA has determined that it is appropriate to allow the Director discretion to establish an effective date that is up to, but not more than, 30 days after submission.

EPA received comments concerning the submission process for no discharge certifications. Numerous commenters expressed concerns with the lack of any explicit requirement for Director review and approval of certifications. Some commenters asserted that the lack of review and public participation under the 2008 supplemental proposal violates the CWA and the *Waterkeeper* decision, and that without such review, certification provides no assurance of ''no discharge'' and creates an impermissible permitting structure based on self-regulation. Other commenters indicated that Director review of key documentation is necessary to ensure that a facility's certification meets applicable criteria. Some commenters requested that the documents necessary to meet the eligibility criteria also be subject to review by the Director and that approval of the no discharge certification be made contingent on such review.

EPA does not agree that the lack of a requirement for Director review is contrary to the CWA or the *Waterkeeper* decision. The voluntary certification option is available only to CAFOs that do not discharge or propose to discharge and, therefore, are not required to seek NPDES permit coverage. Neither the CWA nor the *Waterkeeper* decision requires a permitting authority to review no discharge certifications or to subject such information to public participation. Under the CWA, such requirements apply only to the permitting process. In addition, EPA emphasizes that certification is not a substitute for a permit. Rather, a valid certification simply allows an unpermitted CAFO that is designed, constructed, operated, and maintained not to discharge to establish and document that it does not discharge or propose to discharge, in exchange for the assurance provided by a no discharge certification that it is not subject to the regulatory requirement to seek permit coverage in 40 CFR 122.23(d)(1) and (f). It is the CAFO's choice and responsibility to establish and maintain a valid certification or lose the benefits afforded by the certification. Furthermore, as mentioned above, the final rule allows the permitting authority to establish an effective date for certification of up to 30 days after the date of submission by the CAFO. Allowing States the discretion to delay the effective date of certification addresses some comments from States expressing uncertainty about the role of the permitting authority in the certification process.

(iii) Limitations on Certification

This rule includes several limitations on certification related to the term of a certification, withdrawal of certification, and recertification after a certification becomes invalid.

Consistent with the 2008 supplemental proposal, under this final rule, a no discharge certification will expire five years after the effective date, unless the CAFO voluntarily withdraws the certification or the certification becomes invalid (*i.e.*, the CAFO has either discharged or ceases to be designed, constructed, operated, and maintained in accordance with certification eligibility criteria) during the five-year term. *See* 40 CFR 122.23(i)(4). Some commenters agreed with the proposed five-year term of certification, because the limited term of certification would ensure that the CAFO reevaluates eligibility. Other commenters contended that facilities should recertify on a more frequent basis, either annually or triennially, to ensure more frequent reevaluation of their certification. A number of commenters did not believe that a term of certification should be prescribed; several of these commenters maintained that if a facility remains in compliance with the certification criteria and does not make any significant changes in operation, the certification should remain valid indefinitely.

After considering the comments regarding the appropriate term for certification, EPA has concluded that the proposed five-year term is appropriate. At the end of this term the certification can be renewed, if desired by the CAFO. Since CAFOs commonly alter their operations over time, it is reasonable for the CAFO to periodically reevaluate and update its certification submission. In addition, renewal every five years does not create an undue burden on the CAFO or the permitting authority because CAFOs that have not had major changes in operations may be able to use much of the same documentation as prepared previously, and permitting authorities are not required to review and approve the certification. A shorter term for certification, such as one or three years, is not necessary because a properly certified CAFO needs to evaluate the facility at regular intervals as part of the inspection and recordkeeping requirements. Thus, a five-year term is reasonable.

Under 40 CFR 122.23(i)(5) a CAFO may withdraw its certification at any time by notifying the Director, by certified mail or equivalent method of documentation, that it is withdrawing its certification. The certification is effectively withdrawn on the date the notification is submitted to the Director. If a CAFO's certification becomes invalid as provided in § 122.23(i)(4), discussed below, § 122.23(i)(5) requires the CAFO operator to withdraw its certification within three days of the date on which the CAFO becomes aware that the no discharge certification is invalid. As proposed, this final rule does not require the CAFO operator to notify the Director of the reason for withdrawing the certification because certification is voluntary.

EPA received a number of comments concerning the withdrawal of certification. These comments generally focused on the need for a certified CAFO to provide more information regarding its actions leading to the withdrawal. Some commenters observed that in order to withdraw certification, CAFOs should have to submit the reasons for such withdrawal to the Director. EPA believes it is reasonable for a CAFO to be able to withdrawal its voluntary certification at any time without additional explanation. The decision to certify is voluntary, and thus, it is appropriate to allow a CAFO to decide to withdraw its certification for any reason with no further explanation. However, certain situations require the CAFO to withdraw its certification. This final rule requires that a CAFO withdraw its certification by notifying the Director in the event that the certification is no longer valid, either because of a discharge or because the CAFO ceases to meet the eligibility criteria. *See* § 122.23(i)(4) and (5). Notifying the Director that a CAFO is withdrawing its certification provides the information necessary for the Director to maintain an up-to-date record of certified CAFOs. A CAFO that fails to withdraw its certification within three days of becoming aware that the certification is invalid would be in violation of this regulatory requirement. EPA believes these provisions appropriately balance the voluntary nature of certification with the value to the Director of maintaining accurate records of the universe of certified CAFOs.

This final rule describes in § 122.23(i)(4) the situations that cause a certification to become invalid. First, in the unlikely event of a discharge from a properly certified CAFO, the

certification would cease to be valid and would no longer be in effect. Second, should a CAFO fail to continue to meet any of the eligibility criteria, the CAFO's certification would no longer be valid. Circumstances that could result in the certification becoming invalid include, for example, an increase in animals that exceeds the capacity of the production area for manure storage and handling or a loss of land application areas such that the assumptions in the NMP concerning land application would no longer be appropriate, if the CAFO's operations, NMP and certification documentation were not revised to address these changed circumstances. EPA emphasizes that failure by a certified CAFO to continue to meet the eligibility requirements in 40 CFR 122.23(i)(2) is not, in and of itself, a violation of any regulatory requirement because certification is strictly voluntary. For example, failure to implement the measures set forth in 40 CFR 412.37(a)–(b), which are required for no discharge certification eligibility under 40 CFR 122.23(i)(2)(i), is not a violation of § 412.37(a)–(b) but renders the certification invalid. However, failure to withdraw a certification that has become invalid is a violation of the requirement to do so.

As explained in the 2008 supplemental proposal, once a certification ceases to be valid, the operator cannot rely on it if a subsequent enforcement action is brought for a violation of the duty to apply for a permit that is triggered after the certification becomes invalid. In other words, once a CAFO's certification becomes invalid, the CAFO is in the same position as any other unpermitted and uncertified CAFO. After withdrawing the invalid certification, the operator may be interested in seeking to recertify that the CAFO does not discharge or propose to discharge or, if the CAFO does discharge or propose to discharge, the CAFO is required to seek permit coverage, as stated in 40 CFR 122.23(i)(5)(ii).

In the 2008 supplemental proposal, EPA proposed to allow a previously certified CAFO to recertify by revising its operations to address the deficiency that led to the invalid certification and submitting a new certification statement. Under the proposal, if the certification was rendered invalid by a discharge, in order to recertify a CAFO would have to submit to the Director the information required under 40 CFR 122.23(i)(3) and additional information describing the discharge and the steps taken by the CAFO to permanently address the cause of the discharge. As proposed, such a recertification submission, like the initial submission, would not be subject to review.

Under this final rule, if a CAFO's certification becomes invalid due to a failure to meet the eligibility criteria, as opposed to because of a discharge, and the CAFO wishes to recertify, the owner or operator would need to make the changes necessary to establish eligibility under § 122.23(i)(2). The provisions applicable to the recertification submission and effective date would be the same as for any certification. *See* § 122.23(i)(3) and (4). If the CAFO wishes to recertify after a discharge has occurred, the CAFO would need to meet the additional requirements of 40 CFR 122.23(i)(6), discussed in detail below.

Commenters expressed several viewpoints with regard to the proposed provisions for recertification after a discharge. Some commenters supported the recertification process as proposed. These commenters generally recognized that CAFOs may encounter unusual circumstances that result in a discharge and that it is appropriate to allow for recertification once the conditions that resulted in the discharge are addressed. Certain other commenters argued that subsequent to a discharge any recertification should be reviewed by the permitting authority and open to public comment to ensure a rigorous assessment of whether recertification is appropriate. Some commenters asserted that recertification after a discharge should not be allowed at all under the CAFO regulations. Furthermore, some commenters believe it would be inequitable for unpermitted CAFOs to discharge and recertify if other discharging operators are required to seek permit coverage. Several of these commenters asserted that any CAFO that discharges should be required to obtain an NPDES permit.

EPA emphasizes that it will be highly unlikely for a CAFO that is designed, constructed, operated, and maintained in accordance with the eligibility criteria in § 122.23(i)(2) to discharge. Furthermore, EPA maintains its position, stated in the preamble to the 2008 supplemental proposal, that the Agency generally considers a recurring discharge as evidence that a CAFO is not eligible for certification or recertification and needs to seek permit coverage. However, given the possibility of a discharge from a properly certified CAFO, albeit remote, EPA believes it is necessary for the final rule to include provisions specifically for a CAFO seeking to recertify after a discharge.

In response to comments, EPA has established specific criteria in this final rule that limit a CAFO's ability to recertify after a discharge to those situations where (1) the certification was valid at the time of the discharge, meaning the CAFO continued to be designed, constructed, operated, and maintained for no discharge in accordance with all provisions of the NMP and any operation and maintenance plans included in the certification; (2) the operator has made any necessary changes to the CAFO's design, construction, operation and maintenance to permanently address the cause of the discharge and ensure that no discharge from this cause occurs in the future; and (3) the CAFO has not previously recertified after a discharge from the same cause. The first criterion limits the availability of recertification after a discharge by excluding CAFOs that discharge after allowing the certification to lapse. EPA believes that a CAFO that certifies under penalty of law that it is and will continue to be designed, constructed, operated, and maintained so as not to discharge, that then fails to satisfy this criterion and subsequently discharges, should not be given the opportunity to once again obtain the benefits of a no discharge certification. The second criterion ensures that a CAFO will only recertify after it has carefully evaluated the cause of the discharge and taken whatever action is necessary to ensure that a discharge from the same cause will not occur again. Finally, the third criterion constrains a CAFO from engaging in a cycle of recertifying after multiple discharges from the same cause. The voluntary certification option established in this rule is not intended to be a mechanism for discharging CAFOs to avoid obtaining permit coverage, a concern cited by several commenters who opposed the certification option. On the contrary, EPA is providing the certification option to allow CAFOs that meet the eligibility criteria to establish up front that they do not discharge or propose to discharge.

The final rule provides that the CAFO's recertification will not become effective until 30 days from the date of submission. The operator is also required to submit the following information for review by the Director: A description of the discharge, including the date, time, cause, duration and approximate volume of the discharge, and a detailed explanation of the steps taken by the CAFO to permanently address the cause of the discharge. This 30-day review period provides an opportunity for the Director to consider the circumstances leading to the discharge, any actions taken by the CAFO to permanently address the cause of the discharge, and any other relevant

compliance information regarding the facility. EPA encourages State permitting authorities to take advantage of this opportunity to consider such information. As is true for the general certification process described above, when a CAFO seeks to recertify after a discharge, the Director has the authority to collect additional information from the CAFO, assess whether the criteria in this rule are satisfied, and provide feedback to the CAFO if he/she believes that the CAFO has not met the recertification criteria. For example, the 30-day review period will allow the Director to assess whether or not the CAFO has previously recertified after a discharge from the same cause. However, as with the initial certification, the Director is not required to take any action for a certification to become effective at the end of the 30-day review period and inaction does not indicate that the CAFO has met the recertification criteria. After considering public comments on the 2008 supplemental proposal regarding recertification after a discharge, EPA has determined that this 30-day review period is reasonable and prudent to allow the Director to review situations where a previously certified CAFO has had an actual discharge.

Overall, the limited conditions under which a CAFO can recertify following a discharge, the description of the discharge submitted to the permitting authority, and the required 30-day review period prior to the recertification becoming effective, provide an opportunity for the Director to determine whether the CAFO discharges or proposes to discharge and must seek coverage under an NPDES permit. For example, as provided in 40 CFR 122.28(b)(2)(vi), the Director has the authority to direct that the CAFO be covered under a general permit if one is available.

EPA believes the final rule provisions covering recertification after a discharge provide an appropriate balance of the flexibility offered by voluntary certification and the need for scrutiny of previously certified CAFOs that have discharged. Additionally, under the final rule, any previously certified CAFO that discharges or proposes to discharge is subject to the permit application requirements of 40 CFR 122.23(d)(1) and (f), and therefore must apply when the CAFO proposes to discharge. A CAFO that has permanently addressed the cause of the discharge such that the CAFO does not ''discharge or propose to discharge'' is not required to seek permit coverage regardless of whether it recertifies. For further discussion of the effects of a past discharge on a CAFO's permit application requirements, see the duty to apply discussion at section III.A.3(a) of this preamble.

B. Agricultural Stormwater Exemption

1. Provisions in the 2003 CAFO Rule

The discharge of manure, litter, or process wastewater from a land application area under the control of a CAFO is a discharge subject to NPDES permitting requirements, unless the discharge is an ''agricultural stormwater discharge,'' which is excluded from the meaning of the term ''point source'' under 33 U.S.C. 1362(14). In the 2003 CAFO rule, EPA differentiated between discharges from land application areas under the control of the CAFO that are point source discharges and those that are ''agricultural stormwater discharges'' exempt from NPDES permit requirements.

In the 2003 rule, EPA promulgated a definition of agricultural stormwater for CAFO land application areas that referenced 40 CFR 122.42(e)(1)(vi)–(ix). The referenced regulatory text includes requirements for edge-of-field buffers or equivalent measures, testing of manure and soil, land application at site-specific agronomic rates, and recordkeeping. While not explicitly included in the definition of agricultural stormwater, technical standards established by the Director, in accordance with effluent limitations guidelines (ELGs) in 40 CFR 412.4(c) applied to Large CAFOs' nutrient management plans for land application. These more specific limitations implemented the general requirements at § 122.42(e)(1)(vi)–(ix), and because the 2003 rule required all CAFOs with a potential to discharge to obtain permits, virtually all Large CAFOs were required to comply with them.

2. Summary of the Second Circuit Court Decision

The Second Circuit upheld EPA's definition of agricultural stormwater established by the 2003 rule. In addition, ELG requirements of 40 CFR 412.4(c) concerning land application for Large CAFOs were not challenged. The court did not, however, specifically address the applicability of these requirements to unpermitted Large CAFOs seeking to claim the agricultural stormwater exemption for land application discharges, in light of its vacature of the duty to apply for all Large CAFOs. *Waterkeeper Alliance et al.* v. *EPA*, 399 F.3d 486 (2d Cir. 2005).

3. This Final Rule

As a result of the regulatory revisions being made by this action in response to the *Waterkeeper* decision, which held that EPA does not have authority to require facilities with solely a potential to discharge to obtain permits, Large CAFOs are not required to seek NPDES permit coverage unless they discharge or propose to discharge. For those Large CAFOs that obtain NPDES permit coverage, provisions for determining whether precipitation-related discharges from their land application areas qualify for the agricultural stormwater exemption were promulgated in the 2003 rule and codified at 40 CFR 122.23(e). As explained above, under the 2003 rule, Large CAFO NPDES permits must require the development and implementation of nutrient management plans for land application in accordance with the ELG in 40 CFR part 412. Nutrient management plans for land application in accordance with 40 CFR 412.4(c) include application rates and other practices for manure, litter, and process wastewater developed in compliance with technical standards, as well as other requirements. These land application requirements are then incorporated into the permit pursuant to 40 CFR 122.42(e)(1). Therefore, for permitted Large CAFOs that land apply manure, litter, or process wastewater, ''site-specific nutrient management practices * * * as specified in § 122.42(e)(1)(iv)–(ix)'' in § 122.23(e) include land application rates and other practices determined in compliance with technical standards.

The 2003 rule at § 122.23(e) specifies how Large CAFOs that have NPDES permits qualify for the agricultural stormwater exemption. Specifically, under the existing regulation, the permit must set forth the site-specific nutrient management practices that ensure appropriate agricultural utilization of nutrients as specified in 40 CFR 122.42(e)(1)(vi)–(ix) in order for precipitation-related discharges from such land application areas to be exempt agricultural stormwater discharges. EPA did not propose to amend the existing agricultural stormwater discharge exemption provision in § 122.23(e), nor has EPA otherwise reopened the provision.

In this rule, however, EPA is adopting a new regulatory provision clarifying what constitutes agricultural stormwater for unpermitted Large CAFOs. The *Waterkeeper* court held that Large CAFOs with a mere potential to discharge were not required to obtain permits. Because the existing regulations could be construed as

applying only to Large CAFOs with NPDES permits, EPA explained in the preamble to the 2006 proposed rule that a CAFO with no discharges other than precipitation-related discharges from its land application areas would not be considered to ''discharge'' if it applies manure, litter, or process wastewater to land under its control in accordance with nutrient management practices that ensure appropriate agricultural utilization of the nutrients in the manure, litter, or process wastewater as specified § 122.42(e)(1)(vi)–(ix). The Agency also expressly stated in its 2006 proposal that, for unpermitted Large CAFOs to qualify for the statutory agricultural stormwater exemption, manure, litter, and process wastewater must be applied in compliance with technical standards, noting that technical standards are, in significant part, intended to ensure the appropriate agricultural utilization of the nutrients contained in the manure, litter, or process wastewater. 71 FR 37,750. EPA also requested comment on whether to codify language to require that unpermitted Large CAFOs that land apply manure, litter, or process wastewater must comply with the technical standards established by the Director in order to qualify for the agricultural stormwater discharge exemption for precipitation-related discharges from land application areas under their control.

In the preamble to the 2006 proposed rule, EPA also discussed the reference to the documentation requirement found in 40 CFR 122.42(e)(1)(ix). EPA noted that documentation is a crucial element for determining whether a CAFO is land applying manure, litter, or process wastewater in a manner that ensures the appropriate agricultural utilization of nutrients such that any runoff from land application areas under a CAFO's control consists only of exempt agricultural stormwater discharges. 71 FR 37,750.

The provision established in this rule at § 122.23(e)(1) clarifies that in order for unpermitted Large CAFOs to have their precipitation-related discharges qualify as agricultural stormwater discharges, they must land apply manure, litter, or process wastewater ''in accordance with site-specific nutrient management practices that ensure appropriate agricultural utilization of the nutrients in the manure, litter, or process wastewater, as specified in § 122.42(e)(1)(vi)–(ix).'' This interpretation of the statutory agricultural stormwater exemption was upheld by the Second Circuit in the *Waterkeeper* decision. In addition, the new provision established at 40 CFR 122.23(e)(2) requires unpermitted Large CAFOs to have nutrient management planning documentation on site, at a nearby office, or otherwise make it readily available upon request to support assertions that the only discharges from their land application areas are precipitation-related discharges that qualify for the agricultural stormwater exemption. As noted above, EPA has not reopened any aspect of the 2003 CAFO rule applicable to permitted CAFOs. Rather, the new provisions clarify how the agricultural stormwater exemption applies to Large CAFOs that do not have an NPDES permit. This is not a new requirement for unpermitted CAFOs, but rather a clarification of EPA's existing interpretation of the agricultural stormwater exemption in CWA section 502(14).

EPA is modifying the interpretation articulated by EPA in the 2006 proposal of how technical standards apply to unpermitted CAFOs seeking to have their precipitation-related discharges from land application areas qualify for the agricultural stormwater exemption. Under this final rule, a precipitation-related discharge from land application areas under the control of an unpermitted Large CAFO constitutes an agricultural stormwater discharge where the CAFO has land applied manure, litter, or process wastewater in accordance with site-specific nutrient management practices that ensure appropriate agricultural utilization of the nutrients in the manure, litter, or process wastewater, as specified in § 122.42(e)(1)(vi)–(ix). Nutrient management practices and rates of application satisfy the requirements of 40 CFR122.42(e)(1)(viii) when they are in accordance with technical standards established by the Director. The form, source, amount, timing, and method of application of nutrients are essential components of the protocols for land application of manure, litter, or process wastewater specified in § 122.42(e)(1)(viii). As explained below, CAFOs that land apply using nutrient management practices based on standards other than the technical standards established by the Director would have to demonstrate that such practices ensure the appropriate agricultural utilization of the nutrients in the manure, litter, or process wastewater as specified in § 122.42(e)(1)(viii).

Technical standards established by the Director provide an objective basis for determining when precipitation-related discharges from land application areas are exempt from NPDES permit requirements. Such technical standards are reviewed and determined by the permitting authority to provide a technically sound framework for establishing rates of application that generally would satisfy the requirements of § 122.42(e)(1)(viii). Such technical standards specify the method or methods for determining whether land application rates are to be based on nitrogen or phosphorus, or whether existing nutrient loads in the soil preclude land application, and also address the form, source, amount, timing, and method of application on each field to achieve realistic production goals while minimizing movement of nitrogen and phosphorus to surface waters. Thus, technical standards provide an objective and reliable framework for developing rates of application and other practices for each field, taking into account a range of critical factors. For purposes of § 122.42(e)(1)(viii), rates of application developed using technical standards must encompass and include all of the factors discussed above.

Because the technical standards established by the Director represent the permitting authority's judgment as to practices that ensure appropriate agricultural utilization of nutrients, as discussed above, they provide a sound basis for determining and documenting that a precipitation-related discharge from land application areas will meet the requirements of § 122.42(e)(1)(viii). If a facility chooses to take a different approach and follow other standards, the facility would need to demonstrate not only that its practices accorded with such alternative standards, but also that the standards provided a reliable, technically valid basis for meeting the terms of § 122.42(e)(1)(viii). While technical standards established by the Director would have undergone careful review by the Director to determine their validity for purposes of applying the agricultural stormwater exemption, there may not have been a comparable review in place for alternative standards. Thus, the CAFO may have to demonstrate both the appropriateness of alternative standards and that its practices conformed to them in order for its discharges to qualify for the agricultural stormwater exemption.

EPA recognizes that there may be other standards that are developed besides those established by the Director that may also provide guidance to producers regarding appropriate agronomic nutrient management practices and the development of rates of application. Under this rule, owners and operators of unpermitted CAFOs are not precluded from relying on such other standards. However, while other

standards may provide useful guidance, in the absence of being reviewed and established by the Director, it is the CAFO's responsibility to demonstrate that such alternative standards do, in fact, ''ensure appropriate agricultural utilization of the nutrients in the manure, litter, or process wastewater,'' as required by § 122.42(e)(1)(viii).

In determining whether a CAFO's site-specific nutrient management practices do ''ensure appropriate utilization of the nutrients'' in the land applied manure, litter, or process wastewater, EPA will evaluate an unpermitted CAFO's nutrient management practices using the technical standards established by the Director as a baseline and expects the same of authorized States. As discussed, EPA considers the technical standards established by the Director to be a sound measure for determining whether the form, source, amount, timing, and method of application meet the requirements of § 122.42(e)(1)(viii).

As noted above, in order for an unpermitted Large CAFO without an NPDES permit to establish that the only precipitation-related discharges from its land application areas are agricultural stormwater discharges, it must have documentation showing that its nutrient management practices are in accordance with § 122.23(e)(1). This is not a new concept, as one of the requirements specified in § 122.23(e) promulgated in the 2003 rule is to maintain documentation as required by 40 CFR 122.42(e)(1)(ix). Section 122.42(e)(1)(ix) requires specific records to be maintained to document the implementation of the elements of § 122.42(e)(1)(vi)–(viii). As stated in the preamble to the 2006 proposed rule, the necessary documentation includes both the nutrient management planning documents and the additional recordkeeping that demonstrates the actual nutrient management practices that have been implemented. *See* 71 FR 37,750. Such documentation is essential for determining whether precipitation-related discharges from a land application area are agricultural stormwater discharges or point source discharges.

It is reasonable and appropriate that unpermitted CAFOs be required to demonstrate that their nutrient management practices, including rates of application, meet the regulatory definition of agricultural stormwater promulgated in 2003, and to do so means maintaining documentation of their nutrient management practices. Without adequate documentation, it would be difficult, if not impossible, to know whether such precipitation-related discharges are unpermitted point source discharges or are exempt agricultural stormwater discharges.

Because unpermitted CAFOs are not subject to the place and time recordkeeping requirements of § 122.42(e)(2), EPA is in this rule requiring that unpermitted CAFOs that land apply manure, litter, or process wastewater maintain on site or at a nearby office, or otherwise make available upon request documentation showing that precipitation-related discharges from their land application areas are agricultural stormwater discharges. The requirement for documentation is referenced in § 122.42(e)(1)(ix), and is authorized by section 308(a) of the CWA. Section 308(a) gives EPA authority to require any point source to establish and maintain records for determining whether ''any person is in violation'' of a prohibition, including the section 301(a) prohibition against point source discharges unless authorized under an NPDES permit. Section 308(a)(4) authorizes EPA to require records, reports, and other information when required to carry out provisions of the CWA, including sections 301 and 402. The inclusion of this requirement for unpermitted CAFOs to keep the documentation on site or to make it readily available upon request is for the purpose of giving States and EPA a basis for determining whether the CAFO's land application discharges are within the statutory exemption for agricultural stormwater. EPA expects that, in general, CAFOs will maintain their nutrient management plans for land application on site because they set out the protocols that must be followed in practice. Documentation of the site-specific nutrient management practices that is not produceable to an inspector at the time of a permitting authority's inspection would not be considered to be made ''readily available'' and, further, would raise questions as to whether it is actually being properly used by the CAFO.

EPA received comments in support of its position that a facility need not have an NPDES permit in order for precipitation-related discharges from land application areas to be deemed agricultural stormwater discharges. Other commenters disagreed for a variety of reasons. First, commenters asserted that the proposal was inconsistent with the approach EPA established in the 2003 rule. Second, some commenters argued that allowing the CAFO owner or operator to determine whether its nutrient management practices meet the requirements of the rule creates a similar ''impermissible self-regulatory permitting scheme'' as that struck down by the Second Circuit Court of Appeals in the *Waterkeeper* decision. They argued that these nutrient management practices must be subject to review and consideration by the permitting authority and the public.

EPA does not agree that only CAFOs with NPDES permits should be allowed to claim that discharges from their land application areas are agricultural stormwater discharges. The question is whether a precipitation-related discharge from a CAFO's land application area is exempt from permitting requirements as an ''agricultural stormwater discharge'' or whether it is a point source discharge that requires a permit. As the Court of Appeals for the Second Circuit reiterated in the *Waterkeeper* decision, ''a discharge from an area under the control of a CAFO can be considered either a CAFO discharge that is subject to regulation or an agricultural stormwater discharge that is not subject to regulation.'' 399 F.3d 486 at 508 (citing *Concerned Area Residents for the Environment* v. *Southview Farms*, 34 F.3d 114 (2d Cir. 1994)). The assessment of whether a discharge is exempt as agricultural stormwater or a point source discharge subject to permitting requirements is not part of the permitting process, but rather precedes it.

For the same reason, EPA does not agree that a self-regulatory regime is created by allowing unpermitted CAFOs to claim that precipitation-related discharges from their land application areas are exempt if they land apply manure, litter, or process wastewater in accordance with appropriate nutrient management practices as required by § 122.23(e). In the context of the agricultural stormwater discharge exemption, nutrient management practices are not effluent limitations, which can only be established and enforced through NPDES permits. NPDES permits are authorized by section 402 of the CWA for the ''discharge of any pollutant'' under the terms of that section, including compliance with effluent limitations. Section 502(12) defines ''discharge of a pollutant'' and ''discharge of pollutants'' as ''the addition of any pollutant * * * from any point source.'' The definition of ''point source'' in section 502(14) expressly excludes ''agricultural stormwater discharges and return flows from irrigated agriculture.'' Therefore, NPDES permits are necessary for point source discharges, but not for agricultural stormwater discharges. Consequently, the site-specific nutrient

management practices that a CAFO must implement in order for precipitation-related discharges from areas under the CAFO's control to be considered agricultural stormwater discharges are not effluent limitations. Rather, they are preconditions for determining whether the agricultural stormwater exemption applies for discharges from land application areas under the CAFO's control. Because the site-specific nutrient management practices are not effluent limitations, they are not subject to the requirements in section 402 for public review and comment. However, persons who believe that an unpermitted Large CAFO's nutrient management practices are not sufficient to qualify for the agricultural stormwater exemption are free to bring citizen suits under CWA section 505 alleging that the CAFO is discharging without a permit.

The *Waterkeeper* court upheld EPA's construction of the definition of point source as articulated in § 122.23(e) as reasonable. In this rule, EPA has not in any way reopened this provision of the 2003 rule. Nor is EPA changing any aspect of § 122.23(e) with respect to what is required in order for precipitation-related discharges from land under the control of a CAFO where manure, litter, or process wastewater is applied to qualify as ''agricultural stormwater discharges.'' The approach taken in this rule is simply to describe how a CAFO without an NPDES permit may come within the scope of the existing language in § 122.23(e).

C. Nutrient Management Plans

1. Provisions in the 2003 CAFO Rule

Under the 2003 CAFO rule, an NPDES permit issued to a CAFO must include a requirement for the permittee to develop and implement a nutrient management plan (NMP). At a minimum, the NMP is required to include best management practices (BMPs) and procedures necessary to achieve effluent limitations and standards, to the extent applicable, including the minimum requirements of 40 CFR 122.42(e)(1)(i)–(ix). Effluent limitations for Large CAFOs are set forth in the effluent limitations guidelines (ELG) in 40 CFR part 412, which contain specific NMP requirements applicable to both the production area and the land application areas under the control of Large CAFOs in the cattle, swine, poultry, and veal calf subcategories. For small and medium CAFOs, and other operations not subject to 40 CFR part 412 requirements, effluent limitations, including those applicable to land application areas, are established on the basis of the best professional judgment (BPJ) of the permitting authority pursuant to CWA section 402(a)(1)(B) and defined in 40 CFR 125.3(c)(2).

2. Summary of the Second Circuit Court Decision

The U.S. Court of Appeals for the Second Circuit found that the terms of an NMP are effluent limitations and vacated the 2003 CAFO rule insofar as the rule allowed permitting authorities to issue NPDES permits to CAFOs without (1) reviewing the terms of the NMPs; (2) providing for adequate public participation in the development, revision, and enforcement of the nutrient management plans; and (3) including the terms of the NMP in the permit. *Waterkeeper Alliance et al.* v. *EPA*, 399 F.3d 486, 498–504 (2d Cir. 2005). The decision did not affect the substantive requirements for NMPs established at 40 CFR 122.42(e)(1) and 412.4(c) in the 2003 CAFO rule.

3. This Final Rule

To address the court's decision, EPA is revising the 2003 CAFO rule and other provisions of the NPDES regulations to provide for:

- Receipt and review of the NMP by the permitting authority prior to issuing an individual permit or granting coverage under a general permit;
- Adequate public participation prior to issuing an individual permit or granting coverage under a general permit;
- Incorporation of the terms of the NMP into the NPDES permit; and
- The process to address changes to the NMP once permit coverage is granted, for both individual and general permits.

The individual permitting process already allows for review of NMPs by the permitting authority and the public, and incorporation of the terms of the NMP into the individual permit consistent with the CWA. This is not the case, however, for general permits. Given that fact, in promulgating these revisions, EPA is devoting particular attention to the process for issuance of general permits. Furthermore, EPA expects most CAFOs to be covered by general permits.

To effectuate these changes, EPA is revising 40 CFR 122.21, 122.23, 122.28, 122.42, 122.62, and 122.63. As mentioned above, EPA extended the deadlines set in the 2003 CAFO rule for NMP development and implementation, as well as for newly defined CAFOs to seek permit coverage in separate rulemakings. 71 FR 6978 (February 10, 2006); 72 FR 40,245 (July 24, 2007).

The preamble discussion that follows is divided into eight sections to separately address each of the following issues:

- CAFO permit application or notice of intent requirements;
- Procedures for permitting authority review and public participation prior to permit coverage;
- Identification of terms of the NMP;
- Process for incorporating terms of the NMP into a general permit;
- Changes to a permitted CAFO's NMP;
- Process for review of changes to an NMP and for modifying terms of the NMP incorporated into the permit;
- Annual reporting requirements; and
- EPA nutrient management plan template.

(a) CAFO Permit Application or Notice of Intent Requirements for Nutrient Management Plans

EPA is revising 40 CFR 122.21(i)(1)(x) to require the applicant to submit, as part of its permit application or notice of intent (NOI) to be covered by a general permit, an NMP developed in accordance with the provisions of 40 CFR 122.42(e) and, for Large CAFOs subject to subparts C or D of 40 CFR part 412, the requirements of 40 CFR 412.4(c), as applicable. Although this change is codified in the section of the regulations applicable to individual permit applications (40 CFR 122.21(i)(1)), it also applies to NOIs, because the regulation governing NOIs (40 CFR 122.28(b)(2)(ii)) cross-references the requirements of § 122.21(i)(1). EPA revised Application Form 2B to reflect these changes, and the revised form is provided as Appendix A of this notice.

The final rule adopts the approach that EPA proposed. This approach is consistent with the *Waterkeeper* decision, which left undisturbed the substantive requirements for nutrient management plans in the 2003 CAFO rule but held that such plans must be submitted to the permitting authority for public review prior to permit coverage. These revisions do not change the required contents of the NMP, but add a requirement for CAFOs to submit their NMP as part of their application for an individual permit or NOI to be covered under a general permit. This differs from the requirements of the 2003 rule, which required that NMPs be submitted only at the request of the Director.

In the 2006 proposed rule, EPA proposed requiring an applicant to submit, as part of its permit application or NOI, an NMP developed in accordance with the provisions of 40 CFR 122.42(e)(1) and if applicable, 40

CFR 412.4(c)(1). The permitting authority would then make the NMP available for review prior to issuing an individual permit or providing coverage under an NPDES general permit.

Many commenters supported the proposed requirements to submit NMPs with the initial permit application or NOI. One State commented that a CAFO should be allowed to submit the NOI information in batches so that the permitting authority could begin processing the NOI before a facility has completed its NMP to prevent delays in the review and approval process. The commenter added that authorization to discharge under the permit could not be granted until the permitting authority had received, processed, and reviewed all required NOI and NMP information according to the regulations.

Nothing in this rule prohibits permitting authorities from accepting permit application information in batches, provided that the application information and submission process satisfies all applicable requirements. For example, existing NPDES regulations address, in relevant part, the effective date of an application and the processing of a permit. *See* 40 CFR 124.3. EPA recognizes that early communication between the owner or operator of a CAFO and the permitting authority can help facilitate the permitting process, and EPA encourages CAFOs to work closely with their permitting authorities.

EPA received some comments suggesting that the Director issue a general permit that defines the terms of the NMP and details BMP options for a range of possible conditions combined with a requirement for the CAFO to submit a summarized NMP. The summarized NMP would include site-specific facility information needed to apply the management approach prescribed by the general permit. One State recommended that, for general permits, CAFOs submit a ''universal NMP'' with their NOI that contains decision-making tools used by producers to determine application rates, dates, and methods rather than including site-specific information in the permit. This would allow for the public to comment on a generic ''universal NMP'' and would reduce the number of comments that the State regulatory agencies would need to review and consider if comments were provided for each individual NMP submitted for a general permit.

EPA weighed these comments in deciding what information needed to be submitted to the Director for review to comport with the CWA requirements cited by the *Waterkeeper* Court. The final rule requires any CAFO seeking coverage under a general permit to submit with the NOI an NMP that meets the requirements of § 122.42(e) and applicable effluent limitations and standards. EPA did not identify any other specific regulatory alternatives that substantially reduce burden while still providing for meaningful permitting authority and public review of site-specific NMPs prior to permit coverage. Thus, EPA is promulgating an approach that is consistent with the *Waterkeeper* decision and the NPDES CAFO permit program requirements, while continuing to allow for the use of general permits for CAFOs.

EPA also received a comment that production and land application areas should have separate permitting requirements such that a facility that does not land apply would not need to submit an NMP that addresses its land application area. EPA is not revising the NMP requirements established in the 2003 CAFO rule that added land application requirements for permitted CAFOs. Under the NPDES regulations established in the 2003 rule, permits issued to CAFOs apply to the entire facility, including land application areas. Furthermore, the NMP provisions address discharges that can originate either from production areas or from land application areas. Thus, NMPs have been designed to be comprehensive documents required of all permitted CAFOs. The NMP provisions at § 122.42(e)(1) must be included in a CAFO's NMP ''to the extent applicable.'' Thus, if a facility does not land apply manure, litter, or process wastewater, the land application provisions of the regulation would not be applicable. CAFOs should note, however, that even facilities that do not land apply manure, litter, or process wastewater, but transfer all manure, litter, or process wastewater to other persons, are required by 40 CFR 122.42(e)(3) to provide the ''most current nutrient analysis'' to the recipient.

Although EPA is not revising the substantive requirements of paragraph (e)(1) in this rule, EPA is modifying the introductory paragraph to conform to the procedural requirements promulgated in this rule. Because this rule requires an NMP to be submitted as part of the CAFO's permit application or NOI, EPA is removing, from paragraph (e)(1), the permit condition for development of an NMP once permit coverage is granted. EPA is thus revising § 122.42(e)(1) simply to require that any individual or general NPDES permit issued to a CAFO require the implementation of an NMP that contains best management practices (BMPs) as specified in 40 CFR 122.42(e)(1)(i)–(ix) and the applicable effluent limitations and standards. Applicable effluent limitations include, for Large CAFOs, the requirements of 40 CFR part 412, and for other CAFOs BAT requirements set on a best professional judgment (BPJ) basis.

EPA notes that the definition of ''BMPs'' in the NPDES regulations (40 CFR 122.2) is very broad and includes both practices and procedures to be implemented by a permittee. For this reason, EPA is also changing the phrase in the introductory paragraph of § 122.42(e)(1) concerning the contents of an NMP from ''best management practices and procedures'' to simply reference ''best management practices'' without intending any change in the actual scope of what must be included in an NMP.

(b) Procedures for Permitting Authority Review and Public Participation Prior to Permit Coverage

This rule promulgates 40 CFR 122.23(h), which provides new general permit procedures for CAFO general permits. The provisions of § 122.23(h) supplement the general permitting requirements of 40 CFR 122.28 with specific provisions for review and incorporation of CAFO NMPs into general permits for CAFOs. These provisions implement the decision of the *Waterkeeper* courts concerning public review of NMPs and incorporation of the terms of the NMP into CAFO permits, specifically for CAFOs seeking authorization under a general permit.

After the permitting authority receives an application or an NOI from a CAFO, it is the permitting authority's responsibility to review the application or NOI to ensure that it meets the requirements of the regulations, and for general permits, the requirements of the general permit. This includes determining whether the nutrient management plan meets the requirements of 40 CFR 122.42(e)(1) and, for Large CAFOs subject to 40 CFR 412 subpart C or D, the applicable requirements of 40 CFR 412.4(c). As part of that process, the Director must review the NMP for both completeness and sufficiency, as required by the *Waterkeeper* decision. Also, because the *Waterkeeper* decision requires terms of the NMP to be incorporated as permit terms, the Director must provide for adequate public participation in the process of establishing permit terms based on each CAFO's NMP.

The general permit issuance process and the individual permitting process

differ in how a permit is developed and the means by which individual facilities obtain authorization to discharge. A general permit covers multiple facilities, and is made available to facilities seeking permit coverage after it is finalized. When the permitting authority develops a draft general permit, it must provide the public (including potential future permittees) an opportunity to review the permit, submit comments, and request a hearing. After considering comments submitted, the permitting authority then finalizes the general permit. Facilities may then submit an NOI seeking coverage under the final general permit. Typically, the permitting authority may then, without the need for further public notice and comment, either grant coverage under the general permit, require the facility to seek coverage under an individual permit, or deny permit coverage. Existing regulations establish a right for any interested person to petition the Director to require a facility authorized under a general permit to apply for an individual permit. *See* 40 CFR 122.28(b)(3).

For individual permits, the NMP will be submitted and reviewed as part of the permit application. The decision-making procedures in 40 CFR part 124 apply to the Director's review of the application, which includes the NMP. Part 124 requires review of the completeness and sufficiency of the permit application, includes an opportunity for the CAFO to modify the plan or provide additional information to the permitting authority, and requires a final decision by the Director after an opportunity for the public to comment and request a hearing.

Although a review process for data submitted by applicants, including NMPs, is already provided for in existing NPDES regulations that address issuance of individual permits, such a process has not previously been expressly available in the regulations for CAFO general permits. Following the *Waterkeeper* decision, general permits for CAFOs must include the terms of an NMP applicable to each specific CAFO authorized under the permit. Moreover, *Waterkeeper* requires that the public have an opportunity to review each CAFO-specific NMP and comment on terms of the NMP to be incorporated into the permit. Thus, a second round of public notice and comment is necessary when providing coverage for CAFOs under a general permit. To fill these gaps and address the *Waterkeeper* decision, this rule creates new provisions at § 122.23(h) that establish a process for permitting authority and public review of NMPs for CAFO general permits.

(i) Permitting Authority Review of Nutrient Management Plans

As discussed above, the *Waterkeeper* court held that NMPs must be reviewed by the permitting authority before permit coverage is issued to any CAFO. *Waterkeeper*, 399 F.3d at 498–502. The process for permitting authority review of NMPs for CAFOs seeking coverage under a general permit is established by this final rule at 40 CFR 122.23(h)(1). Section 122.23(h) requires the Director to review the NOI submitted by a CAFO owner or operator to ensure that the NOI includes the information required by 40 CFR 122.21(i)(1), including an NMP that meets the requirements of 40 CFR 122.42(e) and applicable effluent limitations and standards, including those specified in 40 CFR part 412. Section 122.23(h)(1) also provides that if, upon review, the permitting authority determines that additional information is necessary to complete the NOI or clarify, modify, or supplement previously submitted material, the Director will notify the CAFO owner or operator and request that the appropriate information be provided. When the NOI is complete, the Director must then proceed with the public notification process required by this rule and discussed below.

In the 2006 proposed rule, EPA proposed a new regulatory provision to establish permitting authority review of NMPs for general permits. This provision would require the Director to review the NMP submitted with the NOI and to take appropriate steps to ensure that the NMP meets the applicable requirements of 40 CFR 122.42(e)(1) and, for Large CAFOs, 40 CFR 412.4(c). Upon review of the NMP, the permitting authority would request from the CAFO owner or operator any additional information needed to complete the NOI or clarify, modify, or supplement the submitted material. The permitting authority would then notify the public of its receipt of a complete NOI and of the terms of the NMP proposed to be incorporated into the general permit. After allowing time for public comment and a public hearing, if needed, the permitting authority would decide whether to authorize coverage under the general permit.

Many commenters disagreed with the proposed modified general permit process that would add permitting authority review of the NMP. The primary concern was that the permitting authorities may have insufficient resources to review all NMPs, which could limit the usefulness of general permits. To address this concern, a number of commenters suggested variations on the proposed process. These suggestions are addressed in more detail below under the corresponding discussion for the respective stage of the general permitting process.

The *Waterkeeper* decision held that permitting authorities must review the permit application and the NMP to ensure that all applicable requirements have been met. The court made no distinction between individual or general permits with regard to this requirement. Because existing regulations do not provide for a review process that addresses the submission and review of NMPs for inclusion in a general permit, and given that EPA expects many CAFOs to be permitted under general permits, EPA is adopting provisions at § 122.23(h) that provide for permitting authority review of the CAFO NOI and NMP, as well as opportunity for the public to comment and request a hearing on the NOI, NMP, and the terms of the NMP to be incorporated into the permit.

The procedure for review and notice of CAFO NOIs and NMPs will impose some increased burden on permitting authorities and will add steps to the process of administering a general permit. However, EPA has worked to adapt these new requirements to a two-stage review process that comports with the *Waterkeeper* decision and the CWA and adds some flexibility to the parallel NPDES permit procedure regulations of 40 CFR part 124.

Commenters stated that EPA should establish a correlation between the timing of the application process and permit coverage. These commenters wanted the regulation to automatically authorize discharges within 60 days from the date of application/NOI submission unless the permitting authority denied permit coverage within that period, even if the public review process was incomplete. They took the view that CAFOs should not be penalized by a review process that could vary in length based on factors out of the control of the CAFO. Similarly, some commenters stated that EPA's final regulation should provide a clearly defined process with a limited length of time for permitting authority review. Suggestions for a time limit ranged from 30 to 60 days.

To provide permitting authorities flexibility to review NMPs of varying complexity, this action does not require a specific timeframe for completion of the permitting authority review process. This approach is consistent with the existing NPDES regulations in part 124 for other industries, which similarly do

not specify a timeframe for automatic authorization to discharge or for the completion of the permitting authority and public review processes.

Commenters expressed concern over the additional workload that reviewing individual NMPs would create, and suggested alternatives to reduce permitting authority workload, including: Submission of a ''universal NMP'' with permit applications for use in determining application rates, timing, and methods rather than including site-specific information in the permit; and combining a detailed, clear general permit with the submission of a summarized NMP for review.

In developing the 2006 proposed rule EPA evaluated alternative approaches for reducing operator and permitting authority workload. For example, EPA considered the use of an NMP template as a voluntary tool to facilitate completion and review of the NMP by CAFO applicants and permitting authorities, respectively. 71 FR 37,752. Such a template could serve as one of many tools available to support CAFO permitting and reduce permitting authority workloads. See preamble section III.C.3(h) for a discussion of the template. EPA also plans to develop additional tools and guidance to reduce the burden on both the CAFO operator and the permitting authority to meet the requirements of the NPDES regulations. For example, EPA is developing a training course that focuses on development and review of NMPs to comport with this final rule. EPA plans to first make the course available to State and federal permitting authorities in 2009.

Another possible approach for minimizing permitting authority resource expenditures is utilizing a third-party for NMP review. A few commenters noted that having permitting authority staff review NMPs that have already been prepared by a State-certified planner is duplicative and unnecessary. Commenters believe that, due to their extensive training, certified planners are in the best position to review and certify NMPs coupled with appropriate public agency oversight. This is one State commenter's established NMP review process. Commenters noted that, in some States, another State agency (typically the State agricultural agency) reviews and approves NMPs. A State commenter asserted that the final rule would meet the intent of the *Waterkeeper* decision if it allowed NMP review by qualified professionals meeting educational and technical training requirements as set forth by the Director. Such professionals should be properly trained and subject to a quality assurance protocol. One commenter asserted that this flexibility is imperative for effective State programs.

The permitting authority is responsible for reviewing NMPs and for ensuring that the terms of the NMP meet the applicable requirements of the NPDES process. There is no reason, however, why a State cannot obtain assistance and advice from technical experts, or tailor its review based on the development or certification of NMPs by State-certified nutrient management planners. However, it is the permitting authorities' responsibility to ensure that comments are properly addressed and the final permit terms are incorporated.

Regarding the increased workload permitting authorities may experience due to review of NMPs, EPA notes that 30 out of the 44 States that regulate CAFOs currently require NMPs to be submitted with a CAFO's request for NPDES permit application coverage. Further, 28 of these States allow for public review of these NMPs. Thus, even though EPA did not specifically require this in the 2003 CAFO rule, such a review process already exists for many State regulatory authorities.

(ii) Public Review of Nutrient Management Plans

In the *Waterkeeper* decision, the Second Circuit held that ''The CAFO rule deprives the public of the opportunity for the sort of participation that the Act guarantees because the Rule effectively shields the nutrient management plans [NMPs] from public scrutiny and comment.'' 399 F.3d at 503. This rule responds to the *Waterkeeper* decision by establishing public participation requirements that ensure adequate opportunity for public review of both a CAFO's NMP and the terms of the NMP to be incorporated into the permit prior to the CAFO obtaining authorization to discharge under the permit.

As previously discussed, procedures for public participation in the issuance of individual permits are already established in the NPDES regulations. *See* 40 CFR part 124. Because this rule requires CAFOs to submit their NMP as part of their permit application (see discussion at section III.C.3(a) of this preamble; 40 CFR 122.21 and 122.23)), the public will have access to the NMP prior to permit issuance and will also have full opportunity to comment on the adequacy of the plan and on the nutrient management terms in the draft NPDES permit developed for the specific CAFO facility. This individual permit process addresses the court's decision in this respect.

To preserve the option of general permits for CAFOs and to conform to the *Waterkeeper* decision which requires the terms of each CAFO's NMP to be incorporated into the CAFO's permit, this rule establishes new provisions, at 40 CFR 122.23(h), that require the permitting authority to allow public review of both the NMP and the terms of the NMP to be included in a general permit.

In § 122.23(h), the rule establishes new general permitting procedures for CAFOs that require permitting authorities to incorporate the terms of site-specific NMPs, which must be submitted with the NOI, into CAFO general permits when authorizing coverage under a general permit. These procedures require the Director to notify the public that the permitting authority is proposing to grant coverage for a facility under the general permit and make available for public review and comment the CAFO's NOI (including its NMP) and the draft terms of the NMP to be incorporated into the permit. The public will also have an opportunity to request a hearing on this information before the CAFO is authorized to discharge under the general permit.

After making a preliminary determination that the NOI meets the requirements of 40 CFR 122.21(i)(1) and 122.42(e), the Director has discretion as to how best to provide the requisite public notification in the general permit context. For example, public notification may be provided on the permitting authority's Web page or through other electronic means. Another alternative is to use the notice or fact sheet for the general permit to establish a procedure allowing any person to request notice by mail or electronically of the receipt of an NOI, the permitting authority's proposed action, and the terms of the NMP proposed to be incorporated into the permit. These are appropriate ways to balance the competing concerns of providing adequate notification to the public, providing flexibility to the permitting authority, and ensuring the practicality of general permits.

Under this rule, the Director also has discretion to establish an appropriate period of time for public review of the NOI and draft terms of the NMP proposed to be incorporated into the permit. Under 40 CFR 122.23(h)(1), the Director may establish by regulation or in the general permit an appropriate period of time for the public to comment and request a hearing. This differs from the specifications in 40 CFR 124.10, which sets a 30-day public notice period for proposed coverage under individual permits. Having the

Director set the time period for public review by regulation or in the general permit process will allow the public and other interested parties an opportunity to comment on the sufficiency of that time period. Factors the permitting authority might consider when establishing an appropriate time period include the number of NOIs being publicly noticed at any one time, the complexity of the material made available for public review, the expected level of public interest based on prior notices of CAFOs seeking coverage, the opportunity for the public to request an extension of the comment period for one or more facilities, and whether individuals can request and receive individual notification of CAFOs seeking authorization to discharge under the permit in a timely fashion.

As mentioned above, the Director must also provide an opportunity for the public to request a hearing. The procedures for requesting and holding a hearing on the terms of the NMP to be incorporated into the general permit are the same as those for draft individual permits, which are provided in 40 CFR 124.11 through 40 CFR 124.13. When granting permit coverage, the Director must respond to all significant comments received during the comment period as provided in 40 CFR 124.17, and if necessary, require the CAFO owner or operator to revise their NMP.

Additionally, under the procedures promulgated in § 122.23(h)(1) of this rule, if after the public notice period and the conclusion of any hearings, the Director decides to authorize discharge under the permit, the permitting authority must notify the CAFO and inform the public. Such notification is necessary to ensure that the applicant and interested individuals are aware of the Director's final decision on granting authorization to discharge under the general permit and incorporating site-specific NMP terms into the general permit. Furthermore, the provision provides notification equivalent to that required when CAFOs are issued coverage under individual permits consistent with this rule revision.

EPA is promulgating 40 CFR 122.23(h)(2), which establishes additional procedures for EPA-issued permits. Paragraph (h)(2) requires the EPA Regional Administrator to notify each person who has submitted written comments on the proposal to grant permit coverage and the draft terms of the NMP of the final permit decision. A person affected by the general permit can either challenge the general permit in court, or apply for an individual permit as authorized in 40 CFR 122.28.

The public notice process described above also includes providing notice to other affected States, as required by the CWA. Section 402(b)(3) of the CWA provides that the Administrator, in approving a State program, shall make sure the State has adequate authority to ensure notice to ''any other State the waters of which may be affected.'' Section 402(b)(5) provides that the Administrator must ensure that any State ''whose waters may be affected by the issuance of a permit may submit written recommendations to the permitting State,'' and that if those recommendations are rejected, the permitting State must notify the affected State in writing of the reasons for the rejection. The public notice provisions in this rule provide notification to affected States as well as to the public in general. Additionally, the permitting authority's response to all significant comments will include responses to comments from affected States.

This rule balances several competing concerns regarding public participation procedures for general permitting of CAFOs. First, the final rule maintains the utility of a general permit program as a resource-efficient method by which to authorize multiple CAFOs under an NPDES permit while meeting the Second Circuit's directive to ''provide for adequate public participation'' in the development of site-specific effluent limitations. *Waterkeeper*, 399 F.3d at 524. Second, the final rule provides sufficient flexibility for State permitting authorities to adopt their own procedures while ensuring that they meet the public participation requirements of the CWA. Because of the large number of CAFOs that may seek permit coverage, the Agency considers it appropriate to have procedures that allow and encourage permitting authorities to continue the use of NPDES general permits as a means for applying CWA limitations and standards to CAFOs on a timely basis. Of course, existing regulations give the Director authority to require a facility to apply for an individual permit instead of allowing coverage under a general permit (even after coverage under a general permit has been granted). The Director may thus choose not to issue a general permit for CAFOs, but instead to require all CAFOs seeking permit coverage to obtain coverage under individual permits.

The 2006 proposed rule included procedures for public review of NOIs and draft terms of the NMP substantially the same as the procedures promulgated today in § 122.23(h). EPA solicited comment on the proposal to give the Director discretion regarding the means of public notification and the length of the public notice period, and also on the possibility of fixed minimum time frames for public review. The Agency also specifically sought comment on whether the proposed public participation process achieved an appropriate balance between the competing interests of maintaining the utility of general permits for CAFOs and providing adequate public review of permit terms.

Several commenters expressed concern that public review of the NMP would eliminate the use of general permits, noting that States have limited resources for accommodating a public review process. Several commenters stated that the proposed process provided inadequate opportunity for public input. Some believed that the proposed public participation process is inconsistent with the general permitting approach and that only individual permits are appropriate for CAFOs since the terms of the NMP constitute site-specific effluent guidelines. Others felt that the public participation process needed to begin before the development of the NMP to provide an opportunity for comment on the specific best management practices (BMPs) to be included in the plan.

The procedures for public participation in this final rule preserve the availability of general permits for CAFOs. As discussed above, the changes to the CAFO general permit process made in this rule are necessary to meet the requirements of the *Waterkeeper* decision. In addition, EPA has provided flexibility where it could with regard to how a permitting authority provides public notice and makes key information available. Further, the rule provides permitting authorities with flexibility to establish an appropriate time period for public review. Finally, the rule does not change any of the existing regulations that allow a permitting authority to require an individual permit when appropriate. Overall, the final rule maintains the utility of a CAFO general permit program as a resource-efficient method for authorizing multiple CAFOs under an NPDES permit while meeting the court's directive to ''provide for adequate public participation'' in the development of site-specific effluent limitations.

One commenter stated that public access to the entire NMP will strongly compel operators to risk noncompliance by operating without authorization under a permit. Some commenters were concerned that sensitive information will be made available to the public.

EPA understands the sensitivity of some information that may be contained in a CAFO's NMP. However, public availability and permitting authority review of a CAFO's NMP is not a new practice; rather, it is one that is currently employed in many State NPDES CAFO programs. As stated above, 30 of the 44 States that permit CAFOs request that NMPs be submitted as part of their permit application process. In most of those States the permitting authority conducts a comprehensive technical review of the NMPs prior to granting authorization to discharge under the permit. These NMPs have already been publicly available in these States for some time. Moreover, most of these States provide notice to the public of the availability of these plans and seek public review, with some conducting public meetings as well. Any information submitted to the permitting authority as part of a permit application or NOI must be made available for public review and comment, unless it is confidential business information (CBI). *See* 40 CFR 122.7.

EPA disagrees with commenters who believe that the permitting process provides inadequate opportunity for public input or that such opportunity should arise earlier in the process. The final rule provides ample opportunity for the public to comment on the terms and conditions of the general permit, including for each permitted CAFO, the opportunity to comment on permit coverage and the terms of the NMP. This rule requires that the public have access to the NOI and the NMP when reviewing and commenting on BMPs and other terms of the NMP to be incorporated as enforceable conditions of the permit.

Several commenters supported permitting authority discretion on the method of providing public notice of the opportunity to comment on an NMP or request a hearing. One commenter stated that EPA should allow applications to be processed jointly so that the permitting authority could provide notice to the public of multiple NMPs at the same time. Another commenter supported web-based or other electronic notice. One commenter suggested that the general permit fact sheet be utilized to establish a procedure allowing any person to request notice by mail or electronically of the receipt of an NOI, the permitting authority's proposed action, and the terms of the NMP proposed to be incorporated into the permit. Such an approach would provide flexibility to the permitting authority and reduce the number of notices that must be published.

As stated above, this rule allows the permitting authority discretion as to how best to provide such public notification in the general permit context. For example, public notification may be provided on the permitting authority's Web page or through other electronic means. The final rule does not restrict the ability of a permitting authority to provide notice of multiple NMPs at one time provided the all applicable procedural and substantive permitting requirements are satisfied. However, notice must be adequate, and the opportunity to comment must be meaningful.

Some commenters expressed that EPA should require a minimum of 30 days for public review and that the 2006 proposed rule provided permitting authorities too much discretion. Others stated that the public participation process should be limited, with many suggesting no more than 30 days for an initial submission. In addition, commenters requested that EPA limit the circumstances under which the comment period could be extended. EPA believes that the decision as to how much time should be allowed for public participation is best decided by the Director for reasons discussed above, including that the public will have an opportunity to comment on the length of the public notice period when reviewing either the draft regulations or draft general permit.

EPA also received comments suggesting that EPA specify that each facility would be subject to only one public hearing on a draft permit; that the decision to hold a public hearing on a draft permit and NMP should be based on a finding of a significant degree of public interest and limited to issues germane to permitting; and that public review of a general permit be limited to the terms of the NMP that are incorporated into the permit. Several commenters were concerned that without some limitations, the public review process could be misused. This rule specifies that permitting authorities follow the procedures set forth in § 124.11–124.13. These protocols are well established for NPDES permits and allow the Director to weigh the relevant circumstances in addressing each of the issues raised by commenters.

State commenters were generally supportive of EPA's proposed approach and the flexibility it allows for permitting authorities in the general permit process. In particular, these commenters said that establishing timeframes for public review should be left to the permitting authority.

One State suggested that the public participation aspects of the 2006 proposed rule be limited to only new Large CAFOs and that NMP terms for previously authorized Large CAFOs be made available as part of a modified annual reporting requirement. The public participation requirements in this final rule are applicable to all CAFO NPDES permits. The *Waterkeeper* decision did not distinguish between new facilities seeking permit coverage for the first time and existing facilities seeking permit reissuance for purposes of public participation in reviewing CAFO NMPs. Such a distinction would not make sense given that the Second Circuit found that the terms of NMPs are effluent limits that must be included in the permit and presented for public review and comment. Providing the NMP terms to the public only in an annual report would not address the *Waterkeeper* requirement that the permitting authority must provide for public notice and the opportunity to comment on the NMP terms and that the NMP terms must be enforceable.

EPA regulations applicable to State NPDES programs specify that where notice and opportunity for comment must be provided, a permitting authority must respond to significant public comments (§ 124.17). Several commenters said EPA should specifically narrow what constitutes a significant comment warranting a response by the permitting authority. Their general position was that comments must have a technical or scientific basis, or address errors, omissions, or misrepresentations in order to be considered significant. Some said that comments should be limited only to issues under the purview of the CWA, and generalized grievances about the operation or location should be identified as insignificant and not warrant any response by the permitting authority. Other commenters, namely State agencies, identified the need to provide the permitting authority with flexibility for determining which comments are significant and warrant a response. They also indicated that the permitting authority will have limited resources for responding to all comments on a draft permit and NMP.

EPA intends that this final rule be consistent with existing regulatory provisions addressing public participation in the NPDES program and believes that it provides a reasonable amount of discretion and flexibility for permitting authorities to determine and respond to those comments deemed to be significant.

(c) Identification of Terms of the NMP

In the *Waterkeeper* decision, the Second Circuit held that because the terms of the NMP constitute effluent limitations, the CAFO Rule, ''by failing to require that the terms of the nutrient management plans be included in NPDES permits—violates the CWA and is otherwise arbitrary and capricious in violation of the Administrative Procedure Act.'' 399 F.3d at 502.

To respond to the *Waterkeeper* decision, the Agency is promulgating 40 CFR 122.42(e)(5) in order to specify the minimum terms of the nutrient management plan (NMP) that must be enforceable requirements of a CAFO's NPDES permit. As discussed in the preambles to both the 2006 proposed rule and 2008 supplemental proposal, EPA is not revisiting the decisions the Agency made in 2003 with respect to the contents of the nutrient management plan because the *Waterkeeper* decision did not affect these requirements. This rule requires that, based on the provisions promulgated in 2003 that define nutrient management plans (40 CFR 122.42(e)(1) and 412.4(c)), the ''terms'' of the nutrient management plan become terms and conditions of the permit, as required by the Second Circuit decision.

The *Waterkeeper* court clearly indicated that the terms of the NMP must be included in the permit and that the terms must include ''waste application rates'' developed by Large CAFOs pursuant to their NMPs. 399 F.3d at 502. Paragraph (e)(5) includes two alternative approaches for specifying terms of the NMP with respect to rates of application, which are needed to satisfy the requirement that the NMP include ''protocols to land apply manure, litter, or process wastewater * * * that ensure appropriate agricultural utilization of the nutrients.'' 40 CFR 122.42(e)(1)(viii). For Large CAFOs, use of either of these alternative approaches also satisfies the requirements set forth in 40 CFR 412.4

(i) Background

In the 2006 proposed rule and 2008 supplemental proposal, EPA discussed how the ''terms'' of a CAFO's NMP could be identified so as to address the nine minimum required elements in 40 CFR 122.42(e)(1)(i)–(ix)) and 412.4(c) (for Large CAFOs, as applicable).

The 2006 proposed rule preamble identified a number of factors that are necessary to the development of an NMP and discussed the need to allow a CAFO some flexibility in managing its operation. 71 FR 37,753–55. With respect to portions of the NMP that would be incorporated as permit terms, the Agency also proposed regulatory language for accommodating changes to the NMP that involve changes to the terms during the permit period. 71 FR 37,756.

EPA received many comments on the NMP issues highlighted in the 2006 proposed rule preamble concerning the complexity associated with nutrient management planning, particularly with respect to land application, and seeking clarification of what constitutes the terms of the NMP. In particular, commenters sought clarification for terms regarding rates of application, given the complexity of factors used to determine rates of application and the dynamics associated with such factors.

In light of these concerns, EPA in March 2008, issued a supplemental proposal that proposed what elements of the NMP would be terms of the NMP that would be required to be included as enforceable terms of a CAFO's NPDES permit. EPA received many comments on the supplemental proposal that identified the need for some further revisions to EPA's proposed approach concerning the terms of the NMP.

(ii) Terms of the NMP To Be Included in the Permit

In this final rule, EPA is promulgating 40 CFR 122.42(e)(5) to identify the minimum terms of an NMP to be included in a CAFO's NPDES permit as enforceable requirements of the permit. Paragraph (e)(5) establishes that any permit issued to a CAFO must require the CAFO to comply with the terms of the CAFO's site-specific nutrient management plan.

Paragraph (e)(5) states that the terms of the NMP ''are the information, protocols, best management practices, and other conditions'' identified in a CAFO's nutrient management plan and determined by the permitting authority to be necessary to meet the requirements of 40 CFR 122.42(e)(1). For Large CAFOs subject to the land application requirements of the effluent limitations guideline, the terms would include the best management practices necessary to meet the requirements of 40 CFR 412.4(c) in addition to the requirements of 40 CFR part 122. This requirement is thus broadly applicable to all of the measures required to be included in a CAFO's NMP. EPA believes that this clarification should address the concerns of some commenters that the proposed terms of the NMP were limited to land application requirements only.

The ''information, protocols, best management practices, and other conditions'' that constitute the terms of a CAFO's NMP include what the CAFO operator would be required to do to properly implement its NMP and determinative conditions upon which such actions are based. For example, both the structural design capacity necessary to satisfy the storage requirement of 40 CFR 122.42(e)(1)(i) and the associated operational and maintenance conditions necessary to ensure adequate storage, would be considered terms of the NMP. Likewise, the terms of the NMP would need to ensure, for example, proper management of mortalities and diversion of clean water. However, the number of animals confined would not necessarily need to be a term of the NMP because a CAFO operator would be required to properly operate and maintain the CAFO's storage facilities regardless of the number of animals or the volume of manure, litter, or process wastewater generated.

Some commenters asserted that the entire NMP should be included in or expressly referenced by the permit and that all the elements of a CAFO's NMP must be included in a CAFO's NPDES permit so as to ensure that the permit requires the CAFO to comply with every discharge reduction or prevention measure in its NMP. These commenters disagreed with EPA's interpretation of *Waterkeeper* and felt that the 2006 proposed rule put forth a more narrow meaning of the word ''terms'' than intended by the court. They also felt that the proposed rule provided the permitting authority too much discretion for determining what constitutes the ''terms'' of the NMP.

The Agency agrees that the enforceable terms of the NMP must be clear so as to provide notice, both to the operator and to the public, about what is enforceable and to ensure compliance with the discharge reduction and prevention measures in the NMP. However, EPA does not agree that the all of the information in the NMP constitutes enforceable terms. By establishing the information, protocols, best management practices, and other conditions or activities necessary to meet the requirements of 40 CFR part 122 and part 412, this rule ensures that effluent limitations in the permit will be fully implemented, consistent with the NPDES regulations, the effluent guidelines, and the *Waterkeeper* decision. In addition, this approach preserves NMPs as comprehensive management tools used to guide a wide range of practices regarding nutrient production, storage, and use. Regarding the degree of discretion afforded to the Director, the requirements of this final

rule concerning terms of the NMP and the opportunity for public review of the full NMP together with the draft terms of the NMP to be incorporated into the permit provides a check on the exercise of that discretion.

Moreover, whether the NMP has been properly developed, whether the information in the NMP is accurate, and whether calculations are correct and consistent with applicable requirements are issues which are properly addressed when the NMP is reviewed by the Director and by the public. This is analogous to the types of calculations and data submitted in a permit application and found in the fact sheet that accompanies a draft NPDES permit for other types of permitted point sources.

Other commenters observed that NMPs do not fit well in this regulatory context due to their design and the way in which they have been used by CAFO operators. Rather, they asserted that NMPs are developed to guide management decisions regarding nutrients and, by necessity, must remain flexible to address the many conditions that affect nutrient generation and management.

The final rule allows for the incorporation of the key NMP terms in a regulatory context without overburdening the permitting process or completely recasting the NMP itself. As discussed above, the terms of the NMP include whatever is contained in the NMP that is necessary to ensure compliance with § 122.42(e)(1) and, for Large CAFOs, 40 CFR 412.4. Additional content of the NMP that is beyond the scope of compliance with those regulatory requirements would not be a term of the NMP.

Some commenters on the 2006 proposed rule urged EPA to provide greater clarity, guidance, and certainty in the final rule on the meaning and significance of the distinction between the NMP and the ''terms'' of the NMP. As proposed in the 2008 supplemental proposal, the final rule establishes more specific requirements for terms of the NMP applicable to CAFOs that land apply manure, litter, and process wastewater than were included in the proposed rule. For such CAFOs, paragraph (e)(5) includes as terms the fields available for land application, field-specific rates of application, and timing limitations for land application.

As stated above, with respect to land application, the terms of every NMP must include the fields the CAFO plans to use for land application. The site-specific elements of the NMP can only be properly represented in the NMP by the inclusion of field-specific information that must be made available for review by the Director and for public review in determining, for example, the appropriate conservation practices and rates of application to be included in the plan and, ultimately, in the permit. Compliance with the permit during the period of coverage would require any new fields (*i.e.*, fields not addressed specifically in the terms of the permit) to first be added to the NMP and the permit, in accordance with the requirements of 40 CFR 122.42(e)(6), discussed below, before they could be used by the CAFO for land application. Similarly, as discussed in greater detail below, field-specific, crop-specific application rates would be terms of the NMP, as would certain factors needed to determine the rates. However, background information that is fixed and unchangeable, such as actual historic yields used in the development of an NMP, while important for determining rates of application, would not need to be terms of the NMP. Such information is also relevant and important for public review of the draft permit, in order to ascertain that the terms relating to rates of application are correct and enforceable. In other words, this is an example of information necessary for the development of the NMP, but is not relevant for compliance or enforcement purposes.

Finally, the terms of the NMP must include any timing limitations in the NMP that would make fields unavailable for land application at certain times or under certain conditions.[4] Insofar as the NMP includes such limitations, the resulting limitations are terms of the NMP and thus enforceable.

(iii) Rates of Application

40 CFR 122.42(e)(1)(viii) requires the nutrient management plan to include ''protocols to land apply manure, litter, or process wastewater in accordance with site-specific nutrient management practices that ensure appropriate agricultural utilization of the nutrients in the manure, litter, or process wastewater.'' As EPA noted in the 2006 proposed rule, the *Waterkeeper* court focused on rates of application as perhaps the most important term of the NMP, in particular the provisions of the effluent limitations guidelines in 40 CFR 412.4(c), and emphasized their site-specific nature. 71 FR 37,753. In the 2008 supplemental notice, the Agency proposed regulatory requirements to ensure that legally-enforceable field- and crop-specific application rates are included in the permit as part of the protocols for land application required to be in the NMP under § 122.42(e)(1)(viii).

This rule promulgates two alternative approaches for expressing the terms of the nutrient management plan with respect to rates of application. 40 CFR 122.42(2)(5)(i)–(ii). Each approach provides a means by which a CAFO may articulate in its NMP annual maximum rates of application of manure, litter, and process wastewater by field and crop for each year of permit coverage and identify the minimum required terms of the NMP specific to that approach. One approach expresses field-specific maximum rates of application in terms of the amount of nitrogen and phosphorus from manure, litter, and process wastewater allowed to be applied. This is called the ''linear approach.'' The other approach expresses the field-specific rate of application as a narrative rate prescribing how to calculate the amount of manure, litter, and process wastewater allowed to be applied. This is called the ''narrative rate approach.''

Each of the approaches requires the CAFO operator to develop an NMP that projects for each field and for each year of permit coverage the crops to be planted, crop rotation, crop nutrient needs, expected yield, amount of nitrogen and phosphorus to be land applied, and projected amounts of manure, litter, and process wastewater to be applied. However, each approach is different in identifying which of these projections would be required to be ''terms of the NMP.'' In neither approach is the projected amount of manure, litter, and process wastewater to be land applied a term of the permit because these projected amounts must be adjusted at least once a year.

Several commenters suggested that the NMP and permitting authority review of the NMP should focus on how agronomic rates are developed in the NMP rather than the specific rate determined in the NMP, based on the difficulty of developing accurate application rates for a five-year term and because agency review of specific application rates for each field would be too burdensome. As discussed above and in the 2006 proposed rule, the *Waterkeeper* court focused on rates of application as perhaps the most important term of the NMP and emphasized their site-specific nature.

[4] There are two types of ''timing'' referred to in this rule regarding land application. One type relates specifically to rates of application, *i.e.*, the availability of nutrients for crop uptake based on the timing (and method) of application. There are also timing limitations, such as restrictions on applying under certain conditions, such as on saturated or frozen fields, or at certain times of the year. The latter types of timing restrictions are the subject of this paragraph.

To comply with the decision of the *Waterkeeper* court with regard to the terms of the NMP and to allow flexibility both for CAFO operators to develop NMPs in a manner appropriate for a particular operation as well as for States to develop regionally-appropriate program requirements that meet the needs of a particular agency, EPA in this final rule is providing two alternatives for expressing rates and determining the associated terms of the NMP.

Rates of application are field-specific and are designed to ensure that crops receive sufficient nutrients to meet yield goals, while minimizing the amounts of nutrients that could be transported from the field. The discussion that follows summarizes the basic process for establishing rates of application in an NMP, in light of the comments received in the 2008 supplemental proposal, as an introduction to the specific discussion of the two approaches promulgated in this final rule.

To develop appropriate land application rates for each field where land application will occur, CAFOs must identify the crops to be planted and the planned crop rotations, or other uses, and the nitrogen and phosphorus needs of these crops or other uses. The NMP also must identify the realistic yield expected from the crop or crops planted in the field, in order to calculate the proper amount of nutrients to apply. A crop's nutrient needs are generally determined in accordance with the nutrient recommendations for a given crop (or other planting, such as forage or pasture) and the per acre realistic yield goal for that crop. The State land grant university typically provides these values or the formulas for calculating these values. The realistic yield goal can also be based on historic field-specific yield data.

Because a CAFO operator could plant more than one crop on a field in a given year, the plant available amount of nitrogen and phosphorus needs to be calculated with reference to the nutrient needs of all the crops to be planted on such field in a given year in order to be accurate. This includes accounting for other field uses, such as pasture and cover crops.

A properly developed NMP must also evaluate the condition of the fields to be used for land application. A field-specific assessment based on soil test nutrient levels and other factors required by the technical standards established by the Director provides information needed to determine whether land application of manure is appropriate for a site. The capacity of the field for manure, litter, or process wastewater application generally depends on the capacity of the soil to retain phosphorus. The phrase ''outcome of the field-specific assessment of the potential for nitrogen and phosphorus transport from each field,'' as used in this rule, reflects the terminology typically associated with the use of the phosphorus index, which is one of three field-specific risk assessment methods discussed in NRCS conservation practice standard 590. However, in this final rule, EPA is using this phrase to reflect the results of whichever method is required by the technical standards established by the Director, including the soil test phosphorus method and the phosphorus threshold method.

One commenter suggested that, for some States, it may be appropriate to require that the field-specific assessment of the potential for nitrogen and phosphorus transport be conducted on an annual basis. EPA recognizes that some States require, for example, use of a phosphorus index that factors into the calculated risk rating the amount of manure applied to the field in the previous year. EPA agrees that, for these States, it would be appropriate to require recalculation of the phosphorus index on an annual basis and anticipates that such States would include the appropriate requirements in technical standards, permits, or other requirements applicable to CAFOs. Furthermore, EPA encourages CAFO operators to reevaluate field-specific assessments of the potential for nitrogen and phosphorus transport as frequently as necessary to ensure minimization of nutrient transport from each field.

Ultimately, the purpose of the field-specific assessment of the potential for nitrogen and phosphorus transport is to determine the appropriate limiting nutrient for developing land application rates, *i.e.*, whether phosphorus or nitrogen limits the amount of manure, litter, or process wastewater that can be applied and the degree to which the limiting nutrient restricts land application, or whether land application is to be avoided altogether. State technical standards typically allow nitrogen-based application rates on fields with a low phosphorus risk rating. For fields that have a moderate to very high phosphorus risk rating, State technical standards generally limit the amount of phosphorus that may be added to a field.

In determining rates of application where phosphorus is the limiting nutrient, the amount of phosphorus that may be land applied is based on the annual phosphorus removal rate for each crop or other field use. In deciding how much manure may be land applied, the amount of plant available phosphorus already in the field is not deducted because State technical standards identify the rate of application based on the crop removal rate. Because soil levels tend to change incrementally, depending on the buffering capacity of the soil, and because a phosphorus-based application rate doesn't reduce the amount of phosphorus already in soil, phosphorus-based rates of application may remain relatively constant for a period of several years or longer, so long as the outcome of the assessment of phosphorus transport does not change during that time. However, any multi-year phosphorus application must be done in accordance with State technical standards.

In determining rates of application where nitrogen is the limiting nutrient, the NMP must consider the total amount of plant available nitrogen for each crop from residual nitrogen already in the field and the nitrogen added for a particular field. Residual nitrogen is the nitrogen that remains from prior applications of manure, litter, process wastewater, or chemical fertilizer, or from other sources such as crop residues and nitrogen fixing legumes. The addition of nitrogen to a field includes application of chemical fertilizer as well as application of manure, litter, or process wastewater and other materials such as biosolids.

Crediting for all residual nitrogen in the field that will be plant available, as a result of prior additions (*e.g.*, crop residue, legume credits, and previous manure applications), should be done in accordance with the directions provided in the technical standards established by the Director (required for all permitted Large CAFOs). Since organic forms of nitrogen typically become plant available when they are converted to inorganic forms, such as nitrate and ammonium, crediting generally identifies the amount of organic nitrogen likely to be converted to inorganic forms that will be plant available. Credits are calculated using soil test results included in the NMP and projected applications of nitrogen from manure, litter, and process wastewater during intervening years, as well as other additions, including from crops (*e.g.*, where crops are plowed under or residues are left on the field or where nitrogen-fixing legumes are grown), and other sources of nitrogen remaining on the field that would be plant available during the next growing season.

EPA expects a complete NMP also to account for any other additions of plant available nutrients during the crop year,

such as chemical fertilizer, irrigation water (groundwater may have measurable concentrations of nutrients), and biosolids, where applied.

The forms of nitrogen and phosphorus to be factored into calculations for rates of application are generally identified in the technical standards established by the Director or in other documentation referenced in the State's technical standards. Typically, the amount of plant available phosphorus is determined based on the amount of various forms of phosphate added to or present in the soil and the amount of organic phosphorus that will mineralize during the growing season. The amount of plant available nitrogen is based on the amount of inorganic nitrogen (*e.g.*, nitrate and ammonium-nitrogen) added to or present in the soil and the amount of organic nitrogen that will mineralize during the growing season. The amount of plant available nitrogen also depends on losses due to volatilization, which is calculated using the nitrogen volatilization rate associated with the source of nutrients and the timing and method of land application. As previously discussed, it is the forms of nitrogen and phosphorus that will be available to a given crop that are most relevant in determining rates of application. In this final rule, the appropriate forms of nitrogen and phosphorus to be factored into these calculations must be expressed in chemical forms determined to be acceptable by the Director, such as in the permit or in the technical standards established by the Director.

As discussed above, the NMP must include calculations projecting for the length of the permit term the amount of manure, litter, or process wastewater, in tons or gallons, to be land applied in order to meet, but not exceed, crop nutrient needs (after considering residual nutrients and other additions of nutrients and results of the most recent manure test) based on the outcome of the field-specific assessment of the potential for nitrogen and phosphorus transport, *i.e.*, whether application rates will be limited by nitrogen or phosphorus. These calculations must also take into account, with respect to each crop to be grown or other agricultural use, the source and form of nutrients to be land applied; the method of application of manure, litter, and process wastewater; and the timing of when application will occur. Although a properly developed NMP addresses all of these factors, some operators may have multiple sources of manure, litter, or process wastewater and may need to make the determination as to which source to draw from for land application to a particular field in a given year at some point in time after the NMP has been developed. The method of application depends on the source and form of manure, litter, or process wastewater; the location of a particular field and the equipment available for such field; the soil nutrient status; and the crop to be planted. For example, wastewater could be spray-irrigated, otherwise surface applied, or injected, whereas poultry litter is most likely to be surface applied by a manure spreader.

Whereas one CAFO operator may wish to follow the planned sequence of steps for planting crops and applying manure, litter, and process wastewater described in the NMP submitted to the Director, another operator may want or need to vary from that linear sequence of events, due to choices made in the course of normal operations, or in response to events or circumstances beyond the CAFO's control, such as weather, crop failure, or market conditions. EPA has addressed this concern in this final rule by including two alternative approaches for determining the terms of an NMP, as discussed below.

As indicated above, EPA is promulgating two approaches for defining the terms of an NMP for rates of application, rather than the three approaches that were proposed in the 2008 supplemental notice. While a number of commenters encouraged EPA to include all three proposed approaches in the final rule to allow operators the greatest number of alternative options, many commenters were critical of the matrix approach. Some commenters suggested EPA should finalize only the narrative rate approach because they felt that the linear and matrix approaches were too inflexible to be useful. Others suggested that the inclusion of three approaches would create a program that is too complicated for permittees, permitting authorities, and the public. One commenter stated that the matrix approach fails to fully address the complexity of the decision-making process facing the CAFO operator. Several industry commenters found the matrix approach to be less flexible than necessary and overly burdensome. Environmental group commenters found the matrix approach to be too rigid to ensure protection of water quality and not inclusive of critical information. In reviewing the comments, EPA agrees that the matrix approach does not adequately address the complexity of the nutrient management decisions to be made by the CAFO operator and that it could result in over-application of manure, litter, or process wastewater. In addition, EPA agrees that having three approaches to identifying terms of the NMP with respect to application rates is unduly complicated and would be unnecessarily burdensome. Moreover, EPA believes that the improvements and clarifications to the linear and narrative rate approaches promulgated in this final rule make inclusion of the matrix approach unnecessary. In considering comments that criticized the inability of the matrix approach, as proposed, to more directly address the complex dynamics relating application rates to crop needs, EPA would have needed to make adjustments that would have made the matrix approach either more like the linear approach or more like the narrative rate approach. As a result, and in consideration of comments stating that including three approaches is unnecessary and burdensome, EPA has decided to eliminate the matrix approach as an option for identifying the terms of the NMP for rates of application.

Some industry commenters indicated that CAFOs should be allowed to choose from either approach as long as they maintain the same approach for the five-year permit term while another industry commenter stated that CAFOs should be allowed to switch approaches during the permit term. This final rule does not address the possibility of switching approaches during a permit term. It is up to the discretion of the Director whether such a change would be allowed. However, because each approach differs in what are the terms of the permit, switching approaches during the permit term would require a permit modification to include the terms of the NMP associated with the selected approach into the permit.

Under both of the approaches, the terms of the NMP are required to include specific factors used for the development of rates of application. These include:

- The outcome of the field-specific assessment of the potential for nitrogen and phosphorus transport from each field;
- The crop or 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 by the Director for each crop or use identified for each field.

Both of the approaches account for other information necessary for determining the amount of manure, litter, and process wastewater to be land applied. This information relates to: (1)

Credits for residual nitrogen available in each successive year during the five year term of the permit; (2) consideration of any multi-year phosphorus application; (3) accounting for additions of commercial fertilizer and other additions of nitrogen and phosphorus during each successive year; (4) the form (liquid, solid) and source (*e.g.*, lagoon, compost, process wastewater) of the material to be land applied; (5) nitrogen and phosphorus content of the manure, litter, or process wastewater; (6) timing of application; and (7) method of application (*e.g.*, spreading, spray, injection). However, the two approaches differ in the way they incorporate this information in expressing the rates of application as terms of the NMP. The following sections of the preamble describe the two approaches and how each approach accounts for this information.

(A) Linear Approach—Rates Expressed in Pounds of Nitrogen and Phosphorus From Manure, Litter, and Process Wastewater

The first approach (*see* 40 CFR 122.42(e)(5)(i)) allows the CAFO to express rates of application as pounds of nitrogen and phosphorus from manure or litter, and process wastewater. The terms of the NMP include maximum application rates for each year of permit coverage, for each crop identified in the NMP, in pounds per acre, per year, for each field to be used for land application. In addition, the terms of the NMP include the following factors:

- The outcome of the field-specific assessment of the potential for nitrogen and phosphorus transport from each field;
- The crop or 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;
- The nitrogen and phosphorus recommendations from sources specified by the Director for each crop or use identified for each field;
- Credits for all nitrogen in the field that will be plant available;
- 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 to be land applied; and
- The timing and method of land application.

The terms also include the methodology by which the NMP accounts for the amount of nitrogen and phosphorus in the manure, litter, and process wastewater to be applied.

This approach is considered a ''linear'' approach because it is based on the use of only those crops included in the planned crop rotations in the NMP; the amounts of nitrogen and phosphorus from manure, litter, and process wastewater to be land applied according to the planned schedule for land application (including source and method and timing of application); and the projected values for plant available nitrogen and phosphorus from other sources. Under this approach, a single set of field-specific rates of application would be established, based on the predicted sequence of activities the CAFO plans to follow in implementing its NMP, and a CAFO would be required to follow the sequence identified in the NMP for each field-specific crop rotation and each planned step for land application of manure, litter, or process wastewater.

Under this linear approach, a CAFO must land apply manure, litter, and process wastewater in amounts that will result in application of no more than the amounts of nitrogen and phosphorus from manure, litter, and process wastewater specified for each field in the NMP, following the schedule and the methods of application described in the NMP. When applying manure, litter, and process wastewater, CAFOs will need to take into account manure test results, including for Large CAFOs the annual manure test results required by the 2003 final rule, so as to not exceed the nutrient needs of the crops. Medium and small CAFOs must apply manure, litter, and process wastewater consistent with Best Professional Judgment (BPJ)-based requirements established in the permit for accounting for the nutrient content of the manure. Large CAFOs using the linear approach must calculate the maximum amount of manure, litter, and process wastewater to be land applied at least once each year using the results of the most recent representative manure, litter, and process wastewater tests for nitrogen and phosphorus taken within 12 months of the date of land application.

The methodology used for translating the amounts of nutrients in pounds into the amount of manure, litter, and process wastewater to be land applied, in tons or gallons, is a term in the linear approach. This includes incorporation of manure test results in determining such rates.

The final rule differs from the proposed linear approach with respect to the expression of the rates of application. EPA proposed that application rates in the linear approach be expressed in terms of tons or gallons of manure, litter, and process wastewater. Several commenters stated that the application rate under the linear approach should be expressed in terms of pounds of nitrogen and phosphorus rather than tons and gallons of manure and wastewater. The commenters felt that this approach would more accurately account for the actual nutrient content of the manure and wastewater being applied. EPA agrees with the commenters and has changed the linear approach accordingly to address this concern. The key advantage of this change is that it ensures that the results of manure testing, which for Large CAFOs is required to be done annually, are used in determining the actual amount of manure, litter, and process wastewater to be applied. EPA believes that expressing the rate in terms of pounds of nitrogen and phosphorus from manure, litter, and process wastewater provides greater environmental protection by requiring operators to adjust the actual amount of manure, litter, and process wastewater applied based on the most current manure nutrient test results.

The utility of this approach, nevertheless, hinges on the CAFO making accurate predictions in the NMP that are not disrupted by changes to the CAFO's operation or by circumstances beyond the control of the CAFO operator. Any changes to the terms of the NMP would constitute a change to the terms of the permit, which would require a permit modification. See discussion in section III.C.3(e) of this preamble, ''Changes to a Permitted CAFO's Nutrient Management Plan.'' For example, any change to the planned crop sequence, such as the addition of a second crop to a field, requires a permit modification.

On the other hand, the advantage of this approach is its relative simplicity for CAFOs with predictable crops and land application. The linear approach would be particularly suitable for operations that consistently plant one crop or two crops in rotation on the same fields, using the same source and form of manure, litter, or process wastewater, and that land apply on a regular annual schedule using the same application method(s).

EPA notes that even under the linear approach, operators may provide themselves some flexibility by specifying more than one field-specific crop rotation plan in the NMP, with application rates of nitrogen or phosphorus specified for each alternative plan for inclusion in the permit. This might be practical for operators who are reasonably confident

that they will follow one of two or three potential crop rotations. EPA is promulgating the other approach for operators seeking a greater degree of flexibility.

(B) Narrative Rate Approach—Rates Derived From Total Amounts of Plant Available Nitrogen and Phosphorus

This final rule includes a second approach that would allow rates of application to be expressed as a narrative rate that includes the total amount of plant available nutrients from all sources combined with a specific, quantitative method for calculating the amount, in tons or gallons, of manure, litter, and process wastewater allowed to be land applied. (*See* 40 CFR 122.42(e)(5)(ii).) Unlike the linear approach, in this quantitative narrative rate approach, the terms of the NMP include the maximum amounts of nitrogen and phosphorus from all sources of nutrients for each crop or other field use identified in the NMP, in chemical forms determined to be acceptable to the Director, in pounds per acre, for each field.

As required at 40 CFR 122.42(e)(5)(ii)(A), the narrative rate approach also includes as terms the following four factors:

- The outcome of the field-specific assessment of the potential for nitrogen and phosphorus transport from each field;
- The crop or 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 by the Director for each crop or use identified for each field.

In addition, this narrative rate approach includes as a term of the NMP the methodology by which the NMP accounts for certain factors when calculating the amounts of manure, litter, and process wastewater to be land applied. A CAFO using the narrative rate approach is required to apply in accordance with the resulting calculations. This final rule requires the methodology in NMPs developed using this approach to account for the following factors:

- Results of soil tests conducted in accordance with protocols identified in the nutrient management plan, as required by 40 CFR 122.42 (e)(1)(vii);
- 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;
- 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.

The factors listed above are not themselves required to be terms in the narrative rate approach, but the methodology used to account for them in the CAFO's permit is a term. Thus, the CAFO operator will be bound by the methodology and the way in which these factors must be accounted for in calculating the actual amount of manure, litter, or process wastewater allowed to be applied to the field. The terms of the NMP under this approach do not include the amount of nitrogen and phosphorus in the manure, litter, or process wastewater allowed to be land-applied as set forth in the NMP, but they do include the methodology prescribed in the NMP for calculating these amounts. And while the terms of the NMP do not include the predicted source, form, timing, and method of application of manure, litter, or process wastewater set forth in the NMP, they include the methodology that accounts for these factors in determining the amount of manure, litter, or process wastewater allowed to be applied. This allows the actual inputs and results for these factors to be something other than what was projected in the NMP during the period of permit coverage, using the methodology, while ensuring that the CAFO meets the requirements of 40 CFR 122.42(e)(1) and, for Large CAFOs, 40 CFR 412.4, by applying in accordance with the methodology and other terms of the NMP.

This approach requires that the CAFO apply manure, litter, or process wastewater according to the results of this calculated amount. For example, if the NMP projected an amount of manure to be applied based on incorporation of solid manure, the operator could apply process wastewater from the lagoon by spraying the field instead. In this example, the methodology must account for factors of form, source, and method of application such that these inputs and results can be other than what was projected in the NMP and the amount of manure allowed to be applied will be predictably and accurately calculated. In other words, the methodology and requirement that application be in accordance with the rate calculated using that methodology are enforceable term that must be complied with at the time of determining how much, from which source, in what form is allowed to be applied to the field using which method of application.

40 CFR 122.42(e)(5)(ii)(C) clarifies that the amount of manure, litter, and process wastewater to be applied as projected in the NMP submitted with the permit application or NOI is not a term of the NMP under the narrative rate approach. As explained above, the amount of manure, litter, and process wastewater is to be calculated using the methodology included in the NMP and based on actual amounts of plant available nitrogen and phosphorus from all sources at the time of land application. Other projections that must be included in the NMP but are not terms are the CAFO's planned crop rotations for each field; credits for all nitrogen in the field that will be plant available; consideration of multi-year phosphorus application; accounting for all other additions of plant available nitrogen and phosphorus to the field; the predicted form, source, and method of application of manure, litter, and process wastewater for each crop; and the timing of application for each field, insofar as it concerns the calculation of rates of application (permitting authorities may establish in permits or technical standards for nutrient management land application timing restrictions, such as prohibitions on land application to frozen or saturated ground, that would be permit terms).[5]

As specified at 40 CFR 122.42(e)(5)(ii)(B), NMPs for which terms are identified using the narrative rate approach may also include alternative crops not included in the planned rotation in the NMP, so long as the NMP includes for each crop realistic yield goals, nitrogen and phosphorus recommendations from sources specified by the Director, and maximum amounts of nitrogen and phosphorus from all sources. The terms and factors associated with alternative crops would be the same as the terms and factors required for the crops included in the planned rotation in the NMP.

EPA received several comments on the proposed terms and factors for the narrative rate approach. Commenters requested that EPA refer only to ''plant available'' nutrients in the narrative rate approach. Some confusion may have been caused by EPA's reference in the preamble to the 2008 supplemental proposal to the ''maximum amount of total nitrogen and phosphorus'' with regard to expression of the application rate under the narrative approach. This

[5] See footnote 4.

language was intended to refer to the total amounts of nitrogen and phosphorus, rather than referring to a specific chemical form (''total nitrogen'' or ''total phosphorus''). This has been corrected in this final rule and preamble by removing the word ''total.'' The final rule refers to plant available forms of nutrients with regard to determining credits for nitrogen in the field and accounting for all other additions of plant available nitrogen and phosphorus to the field. Otherwise, the rule requires expression of application rates in chemical forms determined to be acceptable to the Director, such as indicated in the technical standards established by the Director, or in the permit.

One commenter suggested that crop yields be included as a factor under the narrative rate approach and that yield goals should be adjusted for operations that consistently fail to meet them. This final rule includes realistic yield goals as a term under both approaches. Realistic yield goals will be included in the NMP and, therefore, will be subject to review by the permitting authority and the public. In addition, States may establish in their technical standards criteria for deriving realistic yield goals including criteria for adjusting yield goals based on actual crop yields. EPA believes that this is sufficient to ensure that the yield goals used to calculate application rates in NMPs are appropriate. Upon subsequent permit issuance, the public will have the opportunity to review yield goals in light of actual yields reported by the CAFO in its annual reports (see 40 CFR 122.42(e)(4)(viii)).

The narrative rate approach would eliminate certain issues associated with a five-year planning cycle previously discussed in connection with the linear approach presented above. A key difference of the narrative rate approach, is that it would require application rates for manure, litter, and process wastewater to be recalculated at least annually using the methodology specified in the NMP (40 CFR 122.42(e)(5)(ii)(D)). Unlike the linear approach, the narrative rate approach allows CAFOs that may need to adjust their rates of application of manure, litter, and process wastewater due to changes in soil levels of nitrogen and phosphorus to do so without requiring the permit to be modified. Therefore, it is important to ensure that the actual changes in soil levels of plant available nitrogen and phosphorus are taken into account, rather than relying on five-year projections of fluctuations provided in the NMP.

The narrative rate approach requires an annual determination of soil levels of nitrogen and phosphorus. For nitrogen, the annual determination must include a concurrent calculation of nitrogen that will be plant available consistent with the methodology specified in the NMP. As described above, this methodology must account for the factors that would affect soil nitrogen levels on an annual basis such as the form and timing of previous land application(s); the actual amount of nitrogen in the manure, litter, and process wastewater previously applied; and volatilization and mineralization rates for nitrogen. For phosphorus, the annual determination must include the results of the most recent soil test conducted in accordance with sampling requirements approved by the Director. As in the case of other technical determinations to be made by the Director as part of this final rule, the Director's determination concerning sampling requirements may be made in the technical standards established by the Director, in the permit, or by an equivalent determination made elsewhere. Many States require sampling to be done every two or three years, for most conditions. Some require more frequent sampling generally, and others require more frequent sampling at higher concentrations of soil test phosphorus. If sampling is conducted more frequently than required by the Director, then the determination must be based on the results of the most recent test.

EPA proposed that CAFOs using the narrative rate approach would be required to test soils annually for nutrient content and that these data be used in recalculating the amount of manure, litter, and process wastewater to apply annually. Many commenters opposed annual soil testing for phosphorus. These commenters stated that annual testing is inconsistent with State land grant university guidance, is unnecessary because phosphorus levels in the soil do not change significantly from year to year and that such testing would be cost-prohibitive for many operations. A number of commenters suggested alternative testing frequencies ranging from three to five years. Several commenters suggested that annual phosphorus testing be required only where the soil phosphorus level is already high or previous applications have exceeded the crop phosphorus removal rate (such as where manure is applied at a nitrogen-based rate). A few commenters asked EPA to clarify that annual soil testing only applies to fields that will receive manure in the year the testing is performed. One commenter indicated that, under certain circumstances, manure nutrient testing should be required more frequently than annually. Although the supplemental proposal did not specifically propose to require annual soil nitrogen testing, several commenters indicated that such testing should not be required, citing limitations in accuracy and effectiveness of the testing methods currently available. EPA agrees with commenters that, in a number of States, annual soil testing for phosphorus has been determined to be unnecessary. EPA recognizes that soil test requirements vary from State to State, and may include testing for nitrogen as well as phosphorus. Based on these responses from a range of commenters and the various suggested alternatives, EPA has replaced the proposed annual soil testing requirement for the narrative rate approach with the requirement that an annual determination of soil nutrient levels be based on current data and calculations as described above to support ''real time'' calculation of appropriate application rates. This final rule does not specify a minimum frequency for soil phosphorus testing, but instead requires CAFOs to include the results of the most recent soil tests for phosphorus conducted in accordance with soil testing requirements approved by the Director.

The annual recalculation of the amount of manure, litter, and process wastewater allowed to be applied must also rely on the results of the most recent representative manure, litter, and process wastewater tests taken within 12 months of the date of land application. These data along with the annual determination of soil levels of nitrogen and phosphorus must be used to calculate, in real time, the amount of manure, litter, and process wastewater to be applied to supply the remaining nitrogen and phosphorus needed for the actual crop being planted on the field. Commenters requested that the narrative rate approach express application rates in terms of pounds of nutrients rather than tons of manure to allow appropriate utilization of nutrients in manure whose nutrient content varies over time. In practice, the narrative rate approach requires that amounts of manure, litter, and process wastewater to be land applied be calculated first in pounds of nutrients and then translated into tons or gallons of manure, litter, and process wastewater using current manure nutrient analyses. The information presented to the public in the CAFO's NMP will include the projected amounts for the planned crop rotation, in tons or gallons of manure,

litter, or process wastewater, since this is the endpoint of the calculation of the amount to be applied. As discussed above, these projected amounts are not themselves terms, since they will need to be recalculated each year based on updated information.

One commenter suggested that EPA specify that manure tests and plant tissue tests also be used in the annual rate recalculation. As described above, this final rule does require consideration of recent manure test results in annual application rate recalculations. Plant tissue testing may be an effective tool for determining nitrogen deficiencies (and the need for supplemental nitrogen application), as well as for determining excess nitrogen. However, plant tissue tests are typically taken after manure applications have been made on a field and thus are unavailable at the time the operator is determining rates of application. A CAFO's NMP may include plant tissue testing as part of the CAFO's methodology so long as it is done consistently with State technical standards.

In addition to accounting for the crop and field information, the methodology for the annual recalculation of the amount of manure, litter, and process wastewater to apply must account for a number of other variables, including the form and source of the manure, litter, and process wastewater and the timing and method of application, as described above. The operator may not apply more than the maximum amount of nitrogen and phosphorus calculated using the methodology.

Under this approach, the NMP will include planned crop rotations for each field and corresponding projected amounts, in tons or gallons, of manure, litter, and process wastewater to be applied, including all of the calculations for determining such projected amounts, for the period of permit coverage. This will give the permitting authority and the public an opportunity to review, prior to permit issuance, the adequacy of the CAFO's methodology and the way the CAFO uses the methodology to calculate the appropriate amount of manure, litter, and process wastewater to be applied, based on the operator's planned crop rotation at the time of permit issuance. Again, these planned crop rotations and projected amounts are not terms, as they will need to be recalculated each year based on updated information; however these projections will allow the public to see how the methodology (which is a term) is applied to a projected set of facts to calculate the amounts to be land applied.

Several commenters expressed concerns about the enforceability of the narrative rate approach, citing the lack of an objective rate and public availability of supporting information used to calculate the rate. The narrative rate approach requires the CAFO to recalculate the amount projected in the NMP of manure, litter, and process wastewater to be land applied, using the methodology in the NMP, at least once a year, throughout the period of permit coverage. In recalculating these amounts, a CAFO will be required to use concurrent calculations of credits for all plant available nitrogen in the field and the results of the most recent soil tests for phosphorus in the field. The CAFO will then calculate the maximum amount of nitrogen and phosphorus from manure, litter, and process wastewater allowed to be applied, as a portion of the total amount of nitrogen and phosphorus from all sources, using the methodology in the NMP. Under the narrative rate approach, the CAFO must use the methodology specified in the NMP (which is a term) to account for the amount of nitrogen and phosphorus in the manure, litter, and process wastewater to be applied when calculating the maximum amount of manure, litter, and process wastewater allowed to be applied. To ensure that such recalculations are made available to the Director and the public, the recalculations and the new data from which they are derived are required to be reported in the CAFO's annual report for the previous twelve months. In other words, the rate of application would be an objective, enforceable rate, because the permit will specify the methodology required for calculating the amount of manure, litter, and process wastewater allowed to be applied, certain values or sources of information required to be used in the methodology, and will limit the total amount of nitrogen and phosphorus from all sources for each crop. Failure to comply with the rate established under the permit would be a violation of the permit, and the Director and the public will be able to determine whether the rate was complied with from the annual report.

Most commenters who commented on the narrative rate approach were supportive of the approach in terms of its degree of flexibility. Some commenters suggested that it should be the only approach adopted in the final rule. EPA believes that the flexibility of the narrative rate approach will reduce the burden on permitting authorities and CAFO operators by decreasing the number of substantial changes to the permit which require public notice and comment, arising from changes to the CAFO's crop rotations, while ensuring that all effluent limitations applicable to a permitted CAFO are incorporated as terms of the permit, as required by the Waterkeeper decision.

As many commenters on the 2006 proposed rule pointed out and EPA recognizes, there may be changes in field conditions or practices at a CAFO, including, for example, those that alter the projected levels of plant available nitrogen and phosphorus in the soil or in the manure over the period of permit coverage. Such changes introduce some uncertainty in setting application rates for five years as enforceable terms of the permit. The narrative rate approach is designed to accommodate these concerns by allowing a CAFO to compensate for changes in soil levels of plant available nutrients, in manure nutrient content, or in the timing and method of application, by adjusting the application rates accordingly without the need for a permit modification. However, the operator will be limited to the total crop-specific amount of nitrogen and phosphorus from all sources and will have to adhere to a methodology that establishes the way in which such rates are to be calculated. Thus, in the second and later years of the permit term, this approach will provide an accurate and verifiable means of achieving realistic production goals while minimizing transport of phosphorus and nitrogen from the field. This will help CAFOs avoid the possibility of over-application of nitrogen or phosphorus because of increased levels of nutrients in the soil, compared to what was projected at the time of permit issuance, and, conversely, the possibility of failing to meet crop agronomic needs due to under-application of nitrogen or phosphorus.

(d) Process for Incorporating Terms of the Nutrient Management Plan Into a General Permit

The Agency is also promulgating procedural requirements for incorporating the terms of the NMP into an NPDES general permit, in new paragraph 40 CFR 122.23(h)(1).

Once the processes for publicly reviewing the NMP and the terms of the NMP have been completed, the Director must address all significant comments raised and make a final decision whether to grant coverage under a general permit. As necessary, the Director will require a CAFO owner or operator to revise their NMP to address issues raised during the review process. Once the Director determines that the

process for the development of a CAFO's NMP is complete, the Director must make the final decision whether to grant permit coverage to the CAFO under the general permit. If coverage is granted, the Director must incorporate the relevant terms of the NMP into the general permit (as described later) and inform the CAFO owner or operator and the public that coverage has been authorized and of the applicable terms and conditions of the permit. Once a CAFO obtains authorization to discharge under an NPDES permit, the CAFO must implement the terms and conditions of the nutrient management plan as incorporated into the permit, as of the date of permit coverage authorization.

The preamble to the 2006 proposed rule discussed and requested comment on approaches for the Director to identify the terms of the NMP to be incorporated into the permit. These options ranged from attaching the entire NMP to the permit to identifying specific elements to be included in the permit as terms. Based on comments received on the proposed rule, EPA is specifying certain elements of NMPs with respect to land application as ''terms of the NMP'' that must be incorporated into the permit. EPA is not, however, requiring a single approach whereby the terms are made part of the permit, leaving to the Director the discretion to decide whether, for example, to attach the entire NMP to the permit and require compliance with the terms of the NMP or to specify the terms of the NMP and specifically identify each of them in the permit. Under this final rule, incorporation of the terms of a particular CAFO's NMP into a general permit is not a permit modification subject to 40 CFR 122.62. Rather, it is an extension of the CAFO general permitting process itself. As discussed above, EPA intends the process proposed in 40 CFR 122.23(h) to generally parallel the procedures in 40 CFR part 124.

Commenters supported an approach allowing a permitting authority to incorporate the entire NMP as a condition of the permit without distinguishing between the NMP and the ''terms'' of the NMP. Some supported attaching an NMP to the permit or general permit and requiring that the CAFO implement that NMP as a permit condition. As discussed above, this rule requires that a permit include the terms of a site-specific NMP. However, EPA is not prescribing the manner in which this incorporation takes place. The permitting authority may satisfy this requirement by incorporating a CAFO's NMP by reference into the permit or as described in the preamble to the 2006 proposed rule, the permitting authority may extract the terms of the NMP and attach them to the permit. Either way, the terms of the NMP are enforceable terms of the NPDES permit.

Other commenters sought greater State discretion in implementing NMP requirements as permit conditions. These commenters recognized the importance of implementing the NMP provisions but did not want this rule to interfere with effective existing State approaches. In addition, these commenters wanted to preserve the administrative advantages of using general permits.

This rule provides some State discretion by allowing permitting authorities to determine which NMP provisions to include as terms of the permit. The rule specifies what must be included at a minimum in the permit as terms of the NMP. However, States have the authority to adopt additional or more stringent requirements, under CWA section 510.

(e) Changes to a Permitted CAFO's Nutrient Management Plan

It is well understood that agricultural operations modify their nutrient management and farming practices during the normal course of their operations. Such alterations may require changes to a permitted CAFO's NMP during the period of permit coverage.

As discussed in the preamble to the 2006 proposed rule, the permit does not need to be modified for all operating changes. Because of the way NMPs are developed and the flexibility provided by the two options for developing the terms of the nutrient management plan at 40 CFR 122.42(e)(5), most routine changes at a facility should not require changes to the NMP itself. For example, a CAFO using the narrative rate approach would not ordinarily need to change its NMP when it makes changes to factors that are not themselves terms but are accounted for in the methodology. To minimize the need for revision, nutrient management plans should anticipate and accommodate routine variations inherent in agricultural operations such as anticipated changes in crop rotation, as well as changes in numbers of animals and volume of manure, litter, or process wastewater resulting from normal fluctuations or a facility's planned expansion. Typically, an NMP is developed to accommodate, for example, normal fluctuations in herd or flock size, capacity for manure, litter, and process wastewater storage, the fields available for land application and their capacity for nutrient applications. Moreover, as discussed in this preamble, EPA would encourage operators to develop an NMP that includes reasonably predictable alternatives that a CAFO may implement during the period of permit coverage. However, unanticipated changes to a nutrient management plan may nevertheless be necessary.

The final rule includes 40 CFR 122.42(e)(6), which requires a CAFO to notify the Director of changes to the CAFO's NMP. Section 122.42(e)(6) excludes the results of calculations made in accordance with 40 CFR 122.42(e)(5)(i)(B) and 122.42(e)(5)(ii)(D) from the requirements of paragraph (e)(6). The results of these calculations, which are required of Large CAFOs using the linear approach and all CAFOs using the narrative rate approach, must be reported in the CAFO's annual report. Thus, there is no need to provide this information pursuant to the requirements of paragraph (e)(6).

In the 2006 proposed rule, EPA proposed a process that CAFOs and the permitting authority would need to follow when a CAFO makes changes to its NMP. The proposal also included criteria for determining when a change to a CAFO's NMP should be considered a substantial change. In the 2008 supplemental notice, the Agency solicited comment on several modifications to the 2006 proposal including a list of changes to the NMP that would constitute a substantial change.

In this final rule, EPA is including a list of changes to the NMP that would constitute a substantial change to the terms of a facility's NMP, thus triggering public notice and permit modification. Substantial changes include: (1) Addition of new land application areas not previously included in the CAFO's NMP; (2) any changes to the maximum field-specific annual rates of application or to the maximum amounts of nitrogen and phosphorus derived from all sources for each crop, as expressed in accordance with, respectively, the linear approach or the narrative rate approach; (3) addition of any crop not included in the terms of the CAFO's NMP and corresponding field-specific rates of application; and (4) changes to field-specific components of the CAFO's NMP, where such changes are likely to increase the risk of nitrogen and phosphorus transport from the field to waters of the U.S.

This final rule also makes one exception to the first type of substantial change (a land application area being

added to the nutrient management plan), where such additional land is already included in the terms of another existing NMP incorporated into an existing NPDES permit. If, under the revised NMP, the CAFO owner or operator applies manure, litter, or process wastewater on such land application area in accordance with the existing field-specific terms of the existing permit, such addition of new land would not be a substantial change to the terms of the CAFO owner or operator's NMP.

EPA received a number of comments on the list of substantial changes in the 2006 proposed rule and 2008 supplemental proposal. One commenter encouraged EPA to state that substantial changes under the narrative rate approach only occur when the CAFO changes the system used to determine maximum allowable application rates. EPA agrees that changes in the methodology may be substantial changes to the terms of the NMP if they result in changes to the maximum rates of application or maximum amounts of nitrogen and phosphorus derived from all sources for each crop or if they result in changes likely to increase the risk of nutrient transport to waters of the U.S. However, EPA does not agree that there are no other changes that are substantial changes under the narrative rate approach. EPA believes that the four substantial changes identified in this final rule are appropriate for both of the approaches for determining rates of application. For example, proper implementation of the narrative rate approach depends on identification of the fields to be used for land application, so use of a new field for land application that had not been previously covered in the facility's (or another facility's) permit terms would constitute a substantial change. In addition, under the narrative rate approach a change to the field-specific maximum amounts of nitrogen and phosphorus derived from all sources is a substantial change to the NMP, because it defines the upper bounds on nutrient additions.

Some commenters suggested that EPA expand the list of substantial changes to include changes such as the maximum number of animals allowed for the CAFO site; production area changes that alter the volume and composition of waste; using soil, manure, plant tissue test results to refine the NMP; and changes in the status of the receiving waterbodies. With regard to the number of animals confined and the volume of waste generated, EPA has stated that the number of animals confined at a CAFO would not necessarily be a term of the NMP because a CAFO operator is required to properly operate and maintain the CAFO's storage facilities regardless of the number of animals or the volume of manure, litter, or process wastewater generated. For the same reasons, EPA believes that changes to these factors will not necessarily trigger substantial change to a CAFO's permit, although accommodating an increase in the number of animals or volume of manure could lead to changes to the NMP that would constitute substantial changes to terms of the NMP (and the permit). With regard to the use of soil and manure tests, both approaches discussed above for expressing land application rates in NMPs and associated terms allow for consideration of manure testing on an annual basis; and the narrative rate approach also requires consideration of the most recent soil test results. Finally, NPDES permits for all types of dischargers, including CAFOs, typically include reopener provisions under which the Director may revise the permit during the permit term based on factors such as changes to the status of the receiving water body. EPA believes that such standard NPDES provisions are sufficient to allow permit revisions necessary to support the criteria and standards established for receiving waters.

The Agency believes that the list of substantial changes included in this final rule address changes that most directly affect fundamental components of the NMP that relate to the land application of manure, litter, and process wastewater, which was a primary focus of the *Waterkeeper* decision. First, by identifying the addition of new land application areas not originally included in the terms of the NMP as a substantial change, the Agency makes clear that the fields to be used for land application must be permit terms, as all permitted CAFOs that land apply manure, litter, and process wastewater are required to do so at field-specific agronomic rates. The identification of land application areas in the NMP is essential for determining the effluent limitations applicable to a particular CAFO, which the *Waterkeeper* decision required be made available for public review and comment and incorporated into the permit. Thus, the public must have an opportunity to comment on the fields planned for land application during both the initial permit issuance phase and any subsequent permit modification phase. The exception for the addition of new fields already covered by an existing NPDES permit is consistent with the *Waterkeeper* decision because the rates of application for those land application areas will have already been publicly reviewed, approved, and incorporated into a permit as required by *Waterkeeper*.

Some commenters supported the addition of new land application areas as a substantial change. They also commented that adding or reducing land application areas would require a recalculation of the application rate. Some commenters were concerned that the addition of new land application areas as a substantial change is counterproductive, severely limits flexibility for producers to plan, does not add water quality benefit, discourages producers from adding land to their NMP and will hinder a CAFO's ability to quickly add more fields to the NMP. These commenters suggested the addition of land application areas can be addressed by requiring producers to submit this information with their annual reports. Some commenters also suggested granting States the flexibility to define when and what types of land application area additions would be considered a substantial change. Some commenters suggested that only the loss of land application areas should be treated as a major modification which requires public participation. As discussed above, under *Waterkeeper*, the public must have opportunity to review the fields planned for land application during both the initial permit issuance phase and any subsequent permit modification phase in order to determine whether field-specific rates of application have been properly developed. For this reason, the addition of new land application areas not already addressed under an existing NMP and permit must be considered a substantial change and made available for public review.

The second substantial change is any change to the field-specific maximum rates of application. The *Waterkeeper* decision makes clear the importance of these rates as terms of the NMP. Some commenters indicated this change should not apply to NMPs developed using the narrative approach, since the appropriate application rate should be calculated using the approved methodology. This final rule clarifies that, for the narrative rate approach, a substantial change is triggered by a change in the field-specific maximum amount of nitrogen and phosphorus derived from all sources.

The third substantial change is the addition to the NMP of crops or other uses not previously included in the CAFO's NMP, together with the corresponding maximum field-specific

rates of application for those crops or other uses. Because rates of application are based on the yield goals for each specific crop, any crops or other uses newly added to the plan will require corresponding newly calculated rates of application. In addition, because the maximum rates of application must be made available to the public for review prior to incorporation as terms of the permit, consistent with *Waterkeeper*, the addition of new crops or other uses and their corresponding rates of application is considered a substantial change.

Finally, any change to site-specific components of the CAFO's nutrient management plan that is likely to increase the risk of nitrogen and phosphorus transport to waters of the U.S. is a substantial change. The Agency recognizes a number of changes as potentially triggering this requirement, including the following examples: (1) Alternate timing of land application that would diminish the potential for plant nutrient uptake; (2) methods of land application not provided for in the NMP calculation of amount of manure, litter, and process wastewater to be applied; (3) changes to conservation practices; and (4) changes in the CAFO's procedures for handling, storage, or treatment of manure, litter, and process wastewater. The actual crop planted, timing and method of land application, crop uptake, and conservation practices utilized with respect to the land application areas are all key factors that affect nitrogen and phosphorus runoff from the land application area. Changes to any of the planning considerations listed above can directly (and measurably) alter the outcome of the decisions made in an NMP and the efficacy of that plan in ensuring appropriate agricultural utilization of those nutrients that are land applied.

An advantage of the narrative rate approach is that it reduces the likelihood that changes to a CAFO's operation would result in a substantial change to the terms of the CAFO's NMP. For example, a change to the method or timing of application would be a substantial change to the terms of the NMP for CAFOs using the linear approach if the Director determines that it is likely to increase the risk of nutrient transport to surface waters. For a CAFO using the narrative rate approach, a change in the method or timing of application would not be a change to the terms of the NMP, and therefore not a substantial change, so long as the methodology in the NMP (itself a permit term) accounts for the change in method or timing.

Because changes to the NMP could result in a change to a permit term, the 2006 proposed rule provided that whenever a CAFO makes any change to its NMP, the owner or operator would be required to provide the Director with the revised NMP and identify the changes from the previous version submitted. Of course, any change to the CAFO's implementation of its NMP that does not constitute a change to the NMP itself would not be submitted to the Director. For example, for CAFOs following the narrative rate approach, any change in crop rotation or substitution of crops in a given rotation with alternative crops identified in the NMP for a given field would not be a change and thus would not need to be submitted to the Director prior to implementation.

Some commenters felt that substantial changes could be addressed by making those changes part of the annual report. For example, some commenters recommended that CAFOs using the narrative rate approach be required to include information associated with the addition of new crops in their annual reports. The annual report does not provide sufficient public notice for making changes to the terms of the NPDES permit. Those procedures are detailed below.

(f) Process for Review of Changes to an NMP and for Modifying Terms of the NMP Incorporated Into the Permit

When a permitted CAFO operator revises its NMP, this rule requires the CAFO operator to submit the revised NMP to the permitting authority for review and for the permitting authority to incorporate any revised terms of the NMP into the permit. This rule includes provisions that enable the Director to determine whether revisions to the CAFO's NMP necessitate revisions to the terms of the NMP incorporated into the permit, and if so, whether such changes are substantial or non-substantial. This rule identifies several specific types of changes that must be considered substantial changes to the NMP, and this preamble provides further guidance for distinguishing between substantial and non-substantial changes. This final rule also establishes a streamlined process for formal public notice and comment that the permitting authority must follow for permit modification when a CAFO is seeking to make substantial changes to the terms of its NMP. Non-substantial changes to the terms of the NMP are not subject to public notice and comment before the permit is revised. Finally, this rule establishes provisions for incorporating both substantial and non-substantial revisions to terms of the NMP into the permit as a minor permit modification. These procedures apply to all permitted CAFOs, regardless of whether they are covered under an individual permit or under a general permit. These procedures are discussed in greater detail, below.

As mentioned above, this final rule requires that whenever a CAFO makes any change to its NMP (see discussion in section III.C.3(e) of this preamble, ''Changes to a Permitted CAFO's Nutrient Management Plan''), the owner or operator must provide the Director with the revised NMP and identify the changes from the previous version submitted to the permitting authority. *See* 40 CFR 122.42(e)(6)(i). 40 CFR 122.24(e)(6)(ii) requires the Director to then review the revised plan to ensure that it still meets the requirements of 40 CFR 122.42(e) and applicable effluent limitations and standards, including those specified in 40 CFR part 412. This rule also requires the Director to determine whether the changes necessitate revision to the terms of the NMP that were incorporated into the permit issued to the CAFO. If not, the Director must notify the CAFO that the permit does not need to be modified. Upon such notification the CAFO may implement the revised nutrient management plan.

If, on the other hand, the Director determines that the changes to the NMP do require that the terms of the NMP that were incorporated into the permit be revised, the Director must next decide whether or not the change is substantial. The Director will evaluate the change based on the provisions in § 122.42(e)(6)(iii) discussed above. Pursuant to 40 CFR 122.42(e)(6)(ii)(A), for non-substantial changes, the Director must make the revised nutrient management plan publicly available and include it in the permit record, revise the terms of the nutrient management plan incorporated into the permit, and notify the owner or operator and inform the public of any changes to the terms of the nutrient management plan that are incorporated into the permit. Upon such notification the CAFO may implement the revised nutrient management plan.

If the changes to the terms of the NMP are substantial, the Director will also modify the permit as necessary by incorporating revised terms of the NMP, but only after the public has had the opportunity to review and comment on the NMP changes pursuant to the requirements of 40 CFR 122.24(e)(6)(ii)(B). The process for public comments, hearing requests, and the hearing process if a hearing is

granted must follow the procedures for draft permits set forth in 40 CFR 124.11–13. The Director must respond to all significant comments received during the comment period as provided in 40 CFR 124.17, and require the CAFO owner or operator to further revise the nutrient management plan if necessary. Once the Director incorporates the revised terms of the nutrient management plan into the permit, the Director must notify the owner or operator and inform the public. A permit modification to revise the terms of the NMP incorporated into the permit may be appealed in the same manner as the initial final permit decision.

The Director may establish by regulation, or in the general permit for CAFOs authorized under a general permit, an appropriate period of time for the public to comment and request a hearing on the proposed substantial changes to the terms of the nutrient management plan incorporated into the permit that differs from the time period specified in 40 CFR 124.10. EPA is providing this discretion to the Director to allow CAFOs to implement revised nutrient management practices in accordance with growing seasons and other time sensitive circumstances. As is stated above in section III.C.3(b) of this preamble regarding public review of NMPs during the general permit process, the public will have an opportunity to comment on the sufficiency of the time period when the Director proposes it, either in the regulations or general permit.

Because the process in § 122.42(e)(6)(ii) allows for public review of substantial changes to the terms of nutrient management plans and the underlying data and calculations, the incorporation of changes to the permit through this process will be treated as a minor permit modification, under 40 CFR 122.63(h), and not require additional review. EPA considered requiring that any change to the NMP be considered a permit modification subject to procedures under 40 CFR 122.62, but rejected this interpretation as it would significantly limit permitting authorities and CAFO operators' ability to make necessary and timely minor changes to NMPs as discussed above.

Commenters identified several issues associated with the proposed process for making substantial changes to NMPs. Several commenters indicated that the need for the permitting authority to review, provide public notice and comment, and approve substantial changes to NMPs will likely result in significant delays which will impact the operational ability of many CAFOs to make timely nutrient management decisions. Some commenters suggested that the process for making such changes be streamlined or time-limited. Other commenters requested that EPA provide flexibility to accommodate existing State criteria and procedures for determining and addressing substantial changes. Some State commenters indicated that they already have effective procedures in place. Some commenters simply asserted that the State Director should have discretion whether or not to require a permit modification.

The NPDES regulations at § 122.62 specifically require that any change to permit terms and conditions requires permit modification to be subject to public review and comment procedures, unless it falls under a minor modification listed at 40 CFR 122.63. In this rule, EPA has accounted for the frequent operational changes unique to CAFOs which are not typical for other NPDES-regulated industries. This tailoring is an effort to balance environmental protection with the burden to CAFOs and permitting authorities as well as the need to allow other operational changes that would not trigger the substantial modification requirements.

The process in this rule for making changes to NMPs and incorporating such changes in permits is necessary as a result of the *Waterkeeper* decision, which held that terms of the NMP are effluent limitations and that the CWA requires that the terms of each NMP be incorporated into a corresponding permit and be subject to public notice and comment and permitting authority review. Within this context, EPA has worked to streamline the process to the extent possible. This includes promulgating a process for revising NMPs that delineates what are substantial changes to the terms of the NMP and allows non-substantial changes to proceed in an expedited manner. It also includes provisions that allow a CAFO to develop NMPs with operational contingencies to minimize the number of substantial changes that must be made. As explained herein, the process and criteria in 40 CFR 122.42(e)(6) are reasonable and necessary to provide permitting authorities an effective mechanism to maintain linkage between the NMP and the permit in a manner consistent with the *Waterkeeper* decision.

Commenters suggested changes to the process in the 2006 proposed rule. Several commenters requested that EPA approve certain substantial changes as long as the CAFO continues to comply with all applicable technical requirements. Such substantial changes could include adding a new and substantially different field or increasing the animal headcount so as to exceed the previously identified ''maximum'' amount of manure in the NMP. In addition, one commenter recommended that the permitting authority inspect the CAFO before allowing any substantial changes to the NMP.

The final rule does not expressly provide that a permitting authority can pre-approve certain substantial changes, unless they are specified in an NMP that encompasses normal fluctuations or variations, because the *Waterkeeper* decision dictates that NMPs must be subject to permitting authority review and the terms of the NMP available for public comment. In addition, EPA does not believe an inspection is needed prior to allowing any substantial change to an NMP. Apart from the burden this would entail, EPA expects that self-reported information is credible and notes that there are significant penalties for submitting false or misleading information.

Many commenters supported the proposal that non-substantial changes would require only that the CAFO submit a revised NMP and that the permitting authority would notify the public of the change without allowing for public comment. Commenters encouraged EPA to clarify that, upon submission, the CAFO may proceed to implement such changes if the CAFO believes they are non-substantial. Many commenters stated that there is a need to ensure that CAFOs can quickly make changes to NMPs. One commenter recommended that EPA allow CAFOs to accumulate minor changes and submit them as a group when renewing their permit. Another commenter suggested that any changes incurred during a given year be reported in an annual NMP update form. EPA decided that, because the terms of the NMP are enforceable terms and conditions of the permit, CAFOs must submit changes to the NMP to the permitting authority and receive approval before a change is made, not annually or at the beginning of each new permit cycle.

Commenters were generally unsupportive of the proposed 180-day temporary approval period for implementation of certain substantial changes. Numerous commenters stated that this would not be helpful to CAFO owners because they would be hesitant to invest significant amounts of money to make substantial changes based only on a temporary approval, since final approval would remain subject to an uncertain regulatory status. Others

requested clarification regarding what happens if a change is implemented and then not approved. Some of these commenters suggested as an alternative that EPA require the permitting authority to process the applications in fewer than 45 days, and then allow seven days of public review.

Another commenter stated that the temporary approval period is inadequate because 180 days is longer than the crop growing season. This commenter observed that the temporary approval would allow CAFOs to change their entire land application patterns for an entire crop season without having public comment and review by the permitting agency. This commenter suggested that CAFOs plan in advance for any substantial changes and that only if the substantial changes are the result of unforeseen circumstances outside the control of the CAFO, should it be allowed temporary approval.

Based on comments, EPA reevaluated the usefulness of the 180-day temporary approval. In light of the comments, EPA recognizes that such an approach may be problematic for both industry and permitting authorities. Some industry commenters stated that the 180-day grace period would be meaningless because no operator would employ expensive changes without knowing if they would be approved. States commented that any permit modification must be approved before it is implemented. There is no requirement precluding operators from purchasing new land; rather, practices on the land cannot be employed until approved by the permitting authority. Further, EPA encourages operators to take advantage of the exception for substantial changes relating to the addition of new land application areas provided in § 122.42(e)(6)(iii)(A). Thus, EPA has not included the proposed 180-day temporary approval period in the final rule.

Under this final rule, when a CAFO submits changes to an NMP to the permitting authority, the Director must determine whether the changes affect the terms of the NMP incorporated into the permit, and if so, whether such changes are substantial. Depending on this determination, the process and timing of modifying a permit will vary. A CAFO owner or operator must remain in compliance with his or her permit and, thus, should work closely with the permitting authority and should initiate this coordination as early as possible. EPA believes that permitting authorities will be sensitive to the needs of CAFOs to make a range of changes to NMPs from time to time and, as a result, will be diligent in reviewing and making determinations regarding such changes.

(g) Annual Reporting Requirements

In the 2006 proposed rule, EPA discussed the use of annual reports to balance greater flexibility for CAFO operators in making cropping decisions with ensuring appropriate permitting authority and public oversight of permit compliance. The preamble solicited comment as to whether the annual report requirements should be modified to require all permitted CAFOs to submit information in their annual reports indicating how the CAFO achieved substantive compliance with the terms of the NMP as set forth in the permit. In the 2008 supplemental proposal, the Agency proposed additional annual reporting requirements for CAFOs that relate to the proposed provisions regarding the terms of the NMP.

In this action, the Agency is establishing additional annual report requirements, in 40 CFR 122.42(e)(4)(viii), mandating all permitted CAFOs to include in their annual reports the actual crop(s) planted and actual yield(s) for each field, the actual nitrogen and phosphorus content of the manure, litter, and process wastewater, and the amount of manure, litter, or process wastewater applied to each field during the previous 12 months. The Agency believes that it is important for the permitting authority to obtain this information on an annual basis in order to ensure that the CAFO has been operating in compliance with the terms of its permit. The annual report will inform the Director and the public how the CAFO has operated, given the flexibility for the terms of the NMP incorporated into the permit.

The Agency is also requiring CAFOs that follow the second (''narrative rate'') approach for describing rates of application in the NMP to submit as part of their annual report the results of all soil testing and concurrent calculations to account for residual nitrogen and phosphorus in the soil, all recalculations, and the new data from which they are derived. The CAFO is required to report the amounts of manure, litter, process wastewater and the amount of chemical fertilizer applied to each field during the preceding 12 months. Together with the total amount of plant available nitrogen and phosphorus from all sources, the information that is required to be included in the annual report provides the information necessary to determine that the CAFO was adhering to the terms of its permit when calculating amounts of manure, litter, and process wastewater to apply.

Many commenters supported the use of additional annual reporting requirements to address either non-substantial changes or all changes to the NMP. States also generally supported such an approach and sought flexibility regarding the content and use of the process to address other changes to the NMP. Another commenter noted that if CAFOs are allowed to provide alternative management scenarios in the original NMP, the CAFO must be required to submit documentation to the Director to specify which practices it is using from the ''menu'' of combinations in its NMP. This would allow the permitting authority and the public to know what practices the CAFO is actually implementing at any given time.

Although EPA recognizes that NMPs may change throughout the period of permit coverage, as discussed above in section III.C.3(e), the annual report requirements are only appropriate for use in addressing implementation of existing NMP provisions and changes to the NMP contemplated through flexibilities built into the NMP during the initial planning process or subsequent modifications in accordance with 40 CFR 122.42(e)(6). Because this rule requires the terms of the NMP to be incorporated as enforceable terms and conditions of the permit, an outcome of the *Waterkeeper* decision, changes to the terms of the NMP constitute changes to the permit and therefore must be processed according to § 122.42(e)(6), as discussed above in section III.C.3(e).

Some commenters expressed concern that CAFOs would be unable to complete more detailed reports and provide the information necessary to document changes to the NMP, and that some of the reporting requirements would be redundant. Some commenters also believed that reporting crop yields would be overly intrusive and would not be representative of the NMP effectiveness. In this rule, EPA has modified the content of the annual report to supplement the existing annual report requirements promulgated in 2003 so as to allow the public and the permitting authority to review whether the CAFO has implemented the NMP in accordance with the terms and conditions of its permit. This approach balances the recognized need to provide additional flexibility and the need for CAFOs to provide information concerning actual rates of application. The additional information required in this final rule is a limited burden on both the CAFO and the permitting authority that will provide public access

to information about NMP implementation throughout the period of permit coverage. For example, crop yield goals are a critical factor in developing rates of application. Other commenters expressed concern that facilities might overstate crop yields goals. As previously mentioned, by making information about actual crop yields public, both the Director and the public will have better information when evaluating NMPs for subsequent permit coverage.

(h) EPA Nutrient Management Plan Template

As described in the 2006 proposed rule, EPA developed a draft template, made available in the rulemaking public record for public comments, which could be used as a voluntary tool to facilitate completion of the NMP by CAFO permit applicants, as well as to facilitate review by the permitting authority. As discussed in the proposed rule, EPA believed that such a template would help to systematically organize the information necessary to satisfy the NMP requirements in the regulation. Some commenters supported the concept of a voluntary NMP template and considered the draft template an excellent user-friendly model. Other commenters disagreed, stating that the detailed information required in the draft template would be quickly outdated. Other comments received on the NMP template include the following:

- A ''one size fits all'' template does not lend itself well to the different climates and terrains across the country, and use of the template should not be required by the regulation;
- The draft template lacked specific information to ensure that CAFOs are meeting technical standards and the ELGs;
- The draft template was too long and appeared to be more of an inspection checklist than a basic guideline;
- A concern that some States may actually adopt the template, once completed, as the required NMP format;
- The template could be a valuable tool to clearly differentiate between the terms of the NMP, for purposes of incorporation into the permit, and the background information;
- The template would be more beneficial if it is standardized through the use of a computer program which allows ease and flexibility in making changes to the NMP; and
- The template could be useful to an unpermitted CAFO to identify land application practices needed to qualify for the agricultural stormwater exemption.

States generally agreed with the concept of using a consistent, stable template but wanted assurance that it is strictly a voluntary tool and can be modified to better address specific State requirements. Additionally, commenters stated that the draft template failed to address all of the regulatory requirements and should be modified accordingly by including additional technical portions. Other commenters suggested that a template would unnecessarily micromanage the structure or content of NMPs and that States should have the responsibility to define effective nutrient management strategies. Other commenters mentioned the need to keep the template flexible because NMPs are dynamic documents that change rapidly, and a plan that is too detailed will bind the producer to practices that, if altered, would require costly revisions and reviews. A few commenters also indicated that the format and sequence for providing information within the draft template was disjointed and inconsistent with the nutrient management planning process. Other State commenters did offer, however, that the template may be adequate for most public participation processes.

After considering public comments, EPA, in coordination with USDA, has decided not to utilize the draft template. Instead, the two agencies have worked on the development of a planning tool that would generate a single document that meets the objectives of both agencies. The one document would include the required elements of an NMP as well as the elements of a voluntary comprehensive nutrient management plan (CNMP) developed in accordance with USDA technical guidance. A CNMP is a plan much like the NMP required by EPA's CAFO regulations. There are some minor differences between the scope of the two documents, such as a CNMP option to include feed management plans (which are not required for the NMP) and an NMP requirement to include chemical handling plans (which are not part of a CNMP). However, the EPA and USDA agree that there is no reason why one document could not suffice for both the CNMP and NMP by accommodating both agencies' requirements. To that end, EPA, in partnership with USDA, is in the process of coordinating the information necessary to complete an NMP as well as a CNMP and developing a software program that could integrate both sets of planning requirements, known as Manure Management Planner (MMP). Of course, even though both agencies would promote the use of a single tool, it would remain the CAFO operator's responsibility to provide that information to the Director in order to meet the requirements of this rule, inasmuch as USDA does not make facility-specific information available to other agencies or the public. EPA will encourage the use of the MMP to facilitate the development and review of NMPs under the NPDES permit program.

The MMP software, under development by a grant from EPA and USDA to Purdue University, is a computer program that would provide permitting authorities and producers with a mix of programs, not currently available elsewhere, to assist in CNMP and/or NMP development. The objective of this effort is to accelerate the CNMP and NMP development process by integrating other software programs used to calculate manure application rates. Among these technologies are RUSLE II, the Phosphorus Index (PI), and other State-specific risk assessment tools used in CNMP and NMP development. In the longer term it is planned that additional integration will be achieved with planning, recordkeeping technologies and connectivity to the USDA Customer Service Toolkit. The MMP program incorporates field-specific data tables that allow the producer to list the type of crops planned, crop rotation by planting season, nutrients available for each crop based on previous manure applications, and the rate of application per crop. These data tables could provide permitting authorities with specific information that could be extracted as terms of the NMP that would be inserted into a permit. It also provides producers the flexibility to comply with the optional approach of calculating application rates as pounds of nutrients by developing tables with expanded crop contingency plans and related application rates. See section III.C.3(c) for detailed discussion of nutrient management plan terms.

EPA and USDA anticipate that the MMP software can eventually be tailored to all individual State technical standards, requirements and circumstances. At present, the program has been tailored to approximately 34 States, and is available and ready for use in those States. EPA and USDA plan on updating and improving the MMP software and tailoring it to other States.

When completed, the MMP software will be a user-friendly program available without charge. It is strictly a voluntary tool. There may be some situations at a livestock operation, such as varying terrains and unusual cropping sequences, which the MMP cannot

accommodate; thus the program may not, at present, be a good fit for all operators. Permitting authorities and producers may still choose to use an established State NMP software program or other technical standards methods to develop and implement their NMP. More information on MMP can be found at the Purdue University Web site, *http://www.agry.purdue.edu/mmp/*.

EPA and USDA are also developing a national nutrient management planning course that will cover how to develop, review, and implement an NMP and how to use the MMP software program.

D. Compliance Dates

Following issuance of this rule, authorized States have up to one year to revise, as necessary, their NPDES regulations to adopt the requirements of this rule, or two years if statutory changes are needed, as provided in 40 CFR 123.62. States are not required to adopt the provisions for no discharge certification in this time period.

As discussed above in section II.E, EPA has twice extended certain compliance dates originally established in the 2003 CAFO rule. Following the Second Circuit Court's decision in *Waterkeeper Alliance et al.* v. *EPA*, 399 F.3d 486 (2d Cir. 2005), the Agency extended dates for newly defined CAFOs to seek permit coverage and for all permitted CAFOs to develop and implement NMPs to July 31, 2007. 71 FR 6978 (February 10, 2006) (hereinafter the ''2006 date change rule'').

The 2006 proposed rule did not anticipate a need to revise the July 31, 2007, compliance dates established by the 2006 date change rule. However, as a result of an array of public comment on the issues raised by the *Waterkeeper* decision, EPA was unable to complete this final rule prior to July 31, 2007. EPA published a second revision of the compliance dates on July 24, 2007, extending the dates from July 31, 2007, to February 27, 2009. 72 FR 40,245 (July 24, 2007) (hereinafter the ''2007 date change rule''). The 2007 date change rule does not affect the applicable time for seeking permit coverage for existing facilities defined as CAFOs prior to the 2003 CAFO rule, nor does it apply to newly constructed CAFOs not subject to new source performance standards (NSPS) or to new source CAFOs subject to NSPS that discharge or propose to discharge. The February 27, 2009, compliance dates also do not affect the approximately 9,000 CAFOs currently covered under existing permits. Furthermore, for Large CAFOs that are new sources (*i.e.*, those commencing construction after the effective date of the 2003 CAFO rule) and are required to seek permit coverage under the revised duty to apply provision in this rule (40 CFR 122.23(d)(1)), the land application requirements at 40 CFR 412.4(c) apply immediately because new sources are subject to the NSPS under 40 CFR 412.35 and 412.46, which do not include a delayed date for new sources to come into compliance with § 412.4(c). The 2003 rule did not delay compliance with the land application requirements for new sources. *See* CWA section 306(e).

EPA received comments on the 2006 proposed rule related to the July 31, 2007, compliance dates in place at that time. The comments received generally focused on two issues: (1) That the permit application date did not allow enough time for States to revise their permitting programs, and (2) that the date did not allow CAFO operators sufficient time to develop permit applications and NMPs. Many commenters stated that it would not be possible for CAFOs to seek coverage under an NPDES permit by July 31, 2007, and that the deadline should be extended. A number of extension periods were suggested ranging from several months to up to two years after promulgation of the final rule. Rationales for extending the dates included the need to allow States to revise their programs to fully reflect CAFO regulations (which, in turn, allows CAFOs to know what requirements apply to them), limited technical assistance, and the need for adequate time to develop an NMP in the period between rule promulgation and the deadline for seeking permit coverage. Commenters asserted that CAFO owners and operators cannot know the precise requirements for NMPs, or the associated documentation and public participation requirements, until the rule is final. EPA promulgated the 2007 date change rule with these comments in mind.

In the 2008 supplemental proposal (73 FR 12,336) EPA solicited comments on its intention to not extend the compliance deadlines beyond February 27, 2009. Some commenters stated that the deadline should be extended in order to allow States to adapt their existing programs. Others noted that more time would be needed for CAFO owners and operators to implement such complex rules and come into compliance. A number of extension periods were suggested ranging from several months to up to two years after promulgation of the final rule. Commenters were opposed to an extension of the deadlines; did not want to further delay the environmental benefits; and noted that an extension would provide a comparative advantage to those CAFOs that have not made capital improvements and promote interstate discrepancies that undermine the integrity of State CAFO programs.

In this final rule, EPA is not extending the February 27, 2009, compliance deadlines. EPA believes that the time between publication of this final rule and February 27, 2009, is adequate for unpermitted CAFOs that discharge or propose to discharge to develop an NMP and seek permit coverage. EPA notes that most of the technical provisions of the 2003 CAFO rule (*e.g.*, the substantive NMP requirements) were unaffected by the *Waterkeeper* decision, and therefore CAFOs have already had the information they need to develop NMPs and have not needed to wait for further EPA action before doing so. In States where general permits have been issued and have not expired, eligible CAFOs may seek permit coverage under applicable existing general permits. Where general permits are not available, CAFOs may seek permit coverage by submitting an individual permit application. As mentioned above, 40 CFR 123.62(e) provides that States will have one year from the promulgation date of this final rule, or two years if statutory changes are needed, to adopt the requirements of this final rule. During this interim period, EPA expects States to issue permits that comply with all technical requirements of the 2003 rule that were unaffected by the *Waterkeeper* decision and, absent regulatory or statutory barriers, to provide for NMP submission, public review of NMPs, and incorporation of the NMP terms into the permit. EPA is committed to working with States to implement CAFO permitting requirements.

The CWA does not allow any CAFO to discharge without a permit, regardless of whether a permit application has been submitted. EPA and States have a range of tools to help regulated entities come into compliance with new rules including outreach, compliance assistance, compliance incentives and compliance monitoring. For new rules EPA generally focuses on outreach initially. Where EPA becomes aware of particular instances of noncompliance, EPA may pursue appropriate enforcement. Since 2005, EPA has designated unpermitted CAFOs subject to the 1976 rule as an enforcement priority and continues to focus its efforts on those facilities. With respect to CAFOs subject to permitting as of February 27, 2009, EPA would take into consideration whether a permit application has been submitted and whether the entity is operating in

accordance with its NMP and all other applicable requirements of the 2003 CAFO rule and this final rule.

E. Water Quality-Based Effluent Limitations

Water quality-based effluent limitations (WQBELs) are one of two fundamental types of limitations imposed in NPDES permits. The other is technology-based effluent limitations. NPDES permits are required to contain technology-based limitations and, if the technology-based limitations are insufficient to meet applicable water quality standards, more stringent water quality-based effluent limitations (WQBELs). CWA section 301(b)(1)(C), 33 U.S.C. 1311(b)(1)(C); and 40 CFR 122.44(d). While technology-based limitations are calculated taking into account the availability or effectiveness of treatment technologies and/or their associated costs, WQBELs are established without consideration of availability or effectiveness of treatment technologies or the costs that discharges would incur to meet such limits. *Arkansas* v. *Oklahoma*, 503 U.S. 91 (1992); *Westvaco* v. *EPA*, 899 F.2d 1383 (4th Cir. 1990).

The environmental petitioners challenged the 2003 rule as violating both the CWA and the Administrative Procedure Act by failing to promulgate WQBELs for CAFO discharges and by being ambiguous as to whether States may promulgate WQBELs for CAFO discharges. As explained in II.C.3 above, the *Waterkeeper* Court agreed in part with petitioners, and remanded the rule for clarification regarding the applicability of WQBELs for CAFO discharges that are not exempt as agricultural stormwater, to explain why EPA justified its decision not to promulgate WQBELs for discharges other than agricultural stormwater, and to clarify whether the CAFO rule bars States from requiring WQBELs for such discharges. *Waterkeeper Alliance et al.* v. *EPA*, 399 F.3d 486, 522–524 (2d Cir. 2005).

As EPA stated in the preamble to the 2006 proposed rule, the only issue that EPA addressed in the 2003 rule with respect to WQBELs was their applicability to agricultural stormwater discharges. EPA had explained in 2003 that, because agricultural stormwater discharges are not point source discharges, agricultural stormwater discharges cannot be subject to NPDES permit requirements, including either technology-based limitations or WQBELs if technology-based limitations are insufficient to meet applicable water quality standards. The Second Circuit Court of Appeals agreed with EPA. However, the court seemed troubled by certain statements in the 2003 preamble that it thought might address how WQBELs apply to other CAFO discharges. The court therefore remanded the question of whether or not, and why, WQBELs are needed to assure attainment or maintenance of water quality standards as provided in section 302(a) of the CWA.

In the preamble to the 2006 proposed rule, EPA responded to the remand by clarifying that discharges from CAFOs that are not exempt from CWA permitting requirements as agricultural stormwater discharges are subject to NPDES requirements, including WQBELs. EPA clarified the applicability of WQBELs both with respect to land application areas under the control of a CAFO and with respect to discharges from a CAFO's production area.

1. Discharges From Land Application Areas

As explained in section III.B. above, under the 2003 rule, the agricultural stormwater discharge exemption applies only to precipitation-related discharges from land application areas under the control of the CAFO where application of manure, litter, or process wastewater is in accordance with appropriate nutrient management practices as specified in 40 CFR 122.42(e)(1)(vi)–(ix). Any other discharge from land application areas under the control of a CAFO is a point source discharge from the CAFO. 40 CFR 122.23(e). These point source discharges from land application areas are subject to NPDES permitting requirements, including WQBELs where necessary to meet applicable water quality standards.

In most instances, a CAFO that meets technology-based permit limits requiring manure to be applied at appropriate agronomic rates will eliminate all or most dry weather discharges. If such discharges remain, the permit writer will determine the need for additional WQBELs to meet applicable water quality standards based on the circumstances of each particular case.

Although EPA, in the 2003 rule preamble, encouraged States to address water quality protection issues in setting technical standards for appropriate land application practices (*see Waterkeeper*, 399 F.3d at 523, citing 68 FR 7198), EPA did not intend to change the basic regulatory scheme of the NPDES program. With respect to wet weather discharges, under 40 CFR 122.42(e)(1), the permit must already include effluent limitations defining the ''site-specific nutrient management practices'' required to be implemented under § 122.23(e) in order for the remaining wet weather (''precipitation-related'') discharges to be ''agricultural stormwater discharges.'' As previously explained, agricultural stormwater discharges are exempt from the definition of ''point source'' of section 502 of the CWA and are therefore not subject to permitting requirements under the CWA, including WQBELS. Thus, any precipitation-related discharge from land application areas remaining after compliance with the technology-based effluent limitations and permit conditions required pursuant to § 122.42(e)(1)(vi)–(ix) are exempt from CWA permitting requirements as agricultural stormwater, and these technology-based effluent limitations constitute the entirety of the federal NPDES permit requirements with respect to land application of manure, litter, and process wastewater. However, it is possible that a State may have additional requirements under its own State regulatory authorities that would go beyond the scope of the federal NPDES program. Thus, such agricultural stormwater discharges, though not subject to federal NPDES regulation, could be subject to additional State requirements, including additional requirements related to water quality. 33 U.S.C. 1370 and 40 CFR 123.1 and 123.25. These requirements, however, would not be viewed as WQBELs as that term is used under the CWA. Nor would these State-law requirements be federally enforceable. 40 CFR 123.1(i)(2).

2. Production Area Discharges

EPA also explained in the preamble to the 2006 proposed rule that permit writers may require WQBELs in appropriate cases to further limit discharges from CAFO production areas. As EPA stated in the 2003 rule, the exclusion for agricultural stormwater does not apply to discharges from the CAFO production area. 40 CFR 122.23(e) and 68 FR 7198. Because the ELGs allow occasional overflow discharges from properly designed, operated, and maintained lagoons and storage ponds, the technology-based limitations in the ELGs may not be as stringent as necessary to meet applicable water quality standards. In that case, a WQBEL would be appropriate. 40 CFR 122.44(d). For example, a facility subject to ELGs in 40 CFR part 412, subpart C is allowed to discharge from the production area, provided the production area is designed, constructed, operated, and maintained to contain all process wastewater plus any stormwater runoff resulting from the 25-year, 24-hour

storm. Thus, WQBELs would be necessary in a particular permit to further limit such discharges beyond the levels that are required under the CAFO ELGs, if necessary for the discharge to meet applicable water quality standards.

In the preamble to the 2006 proposed rule, EPA indicated that for CAFOs in the swine and poultry sectors subject to New Source Performance Standards (NSPS) in part 412, subpart D, permits could not require WQBELs for production areas, because the NSPS already prohibit all production area discharges from these new sources. 71 FR 37,744, citing 40 CFR 412.46(a). Some commenters, however, urged EPA to reconsider its position given a possibility of a discharge even from CAFOs subject to a no discharge standard. Nothing in this rule limits the Director's authority to include any more stringent limitation than the NSPS in a CAFO's permit when necessary to meet applicable water quality standards pursuant to CWA section 301(b)(1)(C). Nonetheless, EPA continues to believe that WQBELs would not be needed for swine and poultry CAFOs subject to the no discharge NSPS. The provisions for implementing the NSPS BMP-based effluent limitation, based on advanced modeling, are meant to improve implementation of this provision by promoting up-front design, construction, operation, and maintenance to ensure that predictable discharges do not occur. Permitting authorities have full authority and responsibility to determine if the facility's demonstration is adequate. Therefore, as a practical matter, EPA finds it difficult to imagine circumstances in which such a limitation would be necessary for permitted CAFOs subject to this NSPS no discharge standard.

F. New Source Performance Standards for Subpart D Facilities

This action responds to the Second Circuit's remand of certain aspects of the 2003 New Source Performance Standards (NSPS). First, EPA has deleted the remanded provisions that authorized two alternatives for compliance with the NSPS requirement for no discharge of manure, litter, or process wastewater into waters of the U.S. from the production area. Second, EPA is promulgating a new provision that would allow a CAFO using an open surface manure storage structure to request the NDPES permitting authority to establish site-specific effluent limitations for its NPDES permit that incorporate the NSPS no discharge requirement. These best management practices effluent limitations include design specifications and operational parameters and must be based on a technical evaluation of the adequacy of the CAFO's storage structure for achieving no discharge of manure, litter, or process wastewater into waters of the U.S. The new provision prescribes in detail the elements of that technical evaluation. A facility designed, constructed, operated, and maintained in accordance with these effluent limitations will meet the NSPS requirement for no discharge.

This provision will have several positive ancillary effects. Some CAFOs may be reluctant to use innovative technologies that incorporate open storage as part of their manure management system in view of the no discharge requirements of Subpart D. This provision creates an incentive for the use of innovative technologies to meet the no discharge requirement by providing an up-front determination that the CAFO will meet the no discharge requirement prior to potentially expensive construction. Second, in the case of new source Subpart D CAFOs that do apply for a permit, this provision provides for an up-front determination subject to public participation as part of the permitting proceeding, that the CAFO will meet the no discharge requirement. Finally, because facilities subject to no discharge of manure, litter, or process wastewater pollutants into waters of the U.S. may choose not to obtain a permit, and therefore are not eligible for upset and bypass defenses, the protection afforded by this provision provides an incentive for CAFOs to obtain a permit.

1. Background

The 2003 CAFO rule established NSPS for swine, poultry, and veal calf CAFOs as ''no discharge of manure, litter, or process wastewater pollutants into waters of the U.S. from the production area.'' The rule provided two compliance alternatives that allowed a CAFO in these categories to meet this requirement by showing that either (1) its production area was designed, constructed, operated, and maintained to contain all manure, litter, or process wastewater, and precipitation from the 100-year, 24-hour storm, or (2) it would comply with ''voluntary superior environmental performance standards'' based on innovative technologies. The ''voluntary superior environmental performance standards'' provision would allow a discharge from the production area if the discharge was accompanied by an equivalent or greater reduction in the quantity of pollutants released to other media (*e.g.*, air emissions).

The Second Circuit Court of Appeals remanded aspects of the NSPS to the Agency, holding that there was not adequate support in the record for the alternative standards. Specifically, the court directed EPA to clarify the statutory and evidentiary basis for allowing CAFOs to comply with a no discharge NSPS through either a production area containment structure or an alternate performance standard. With respect to the 100-year storm standard, the court noted that while certain studies showed that production area BMPs would have substantially prevented the production area discharges documented in the record, substantially preventing discharges is not the same as no discharge. With respect to the alternative performance standards, the court held that EPA had not justified its decision to allow compliance with the no discharge standard through an alternative standard that permits production area discharges so long as the aggregate pollution to all media is equivalent to or lower than that resulting from the baseline standards. The court further held that EPA did not provide adequate notice for either of these provisions under the CWA's public participation requirements. *See* 33 U.S.C. 1251(e) (public participation in the development, revision, and enforcement of any regulation, standard, effluent limitation, plan, or program established by the Administrator or any State under this Act shall be provided for, encouraged, and assisted by the Administrator and the States).

2. This Final Rule

This final rule makes the following changes to the 2003 NSPS in subpart D. First, EPA is deleting 40 CFR 412.46(a)(1) that allowed subpart D CAFOs subject to NSPS to meet the no discharge standard through the use of a 100-year, 24-hour rain event containment structure. In a conforming change, EPA is also modifying 40 CFR 412.37(a)(2) to remove the reference to such structures from § 412.37(a)(2). EPA is, however, retaining the requirement in § 412.37(a)(2) that all open surface liquid impoundments have a depth marker. The land application requirements for new sources remain unchanged.

The record for the 2003 NSPS showed that new facilities routinely include systems and employ practices that result in no discharge of manure, litter, or process wastewater pollutants into waters of the U.S. from the production areas. Based on this information, EPA determined that a no discharge standard represented the best available

demonstrated control technology for new sources. EPA now recognizes that a system that is properly designed, constructed, operated, and maintained to contain precipitation from the 100-year, 24-hour event may still discharge as a result of multiple unusual and severe precipitation events. Given the record information, EPA now agrees that a system designed, constructed, operated, and maintained to contain precipitation from the 100-year, 24-hour storm event is not necessarily equivalent to no discharge and has consequently deleted this provision.

Second, EPA is deleting 40 CFR 412.46(d) to remove the alternative voluntary superior performance NSPS for new swine, poultry, and veal calf sources in light of the Second Circuit Court of Appeals ruling.

Third, EPA is promulgating a new provision that authorizes the permitting authority to develop a site-specific, no discharge NSPS for new CAFO's using open storage containment structures. Thus, this rule provides that the NPDES Program Director may establish no discharge best management practice effluent limitations based upon a site-specific evaluation for an individual CAFO. CAFOs may request permit writers to establish no discharge best management practice effluent limitations on a case-by-case basis when the facility demonstrates through a rigorous modeling analysis that it has designed a containment system that will comply with the no discharge requirement. After such site-specific standards are established, a facility will be in compliance with the no discharge requirement if its containment system has complied with all of the specified site-specific design, construction, operation, and maintenance components of such a system demonstrated to meet the no discharge requirement.

3. EPA's Decision To Authorize Site-Specific, No Discharge Effluent Limitations

In its 2006 proposal, EPA proposed an alternative no discharge requirement that would authorize the NPDES Program Director to establish no discharge, BMP effluent limitations based upon a site-specific evaluation for an individual CAFO. A complete discussion of the proposal may be found at 71 FR 37,760–62. Such limitations would provide an alternate approach for CAFOs to meet the no discharge requirement through limitations designed to ensure no discharge of manure, litter, or process wastewater pollutants into waters of the U.S.

Specifically, EPA proposed to authorize permit writers, upon request by a CAFO, to establish no discharge BMP effluent limitations on a case-by-case basis when a facility demonstrated through a rigorous modeling analysis that it could design, construct, operate, and maintain an open containment system that would comply with the no discharge requirement. When a facility complied with all of the site-specific design, construction, operation, and maintenance components of such a system—all of which are conditions of its permit—the CAFO would be deemed to be in compliance with the no discharge requirement even in the event of an unanticipated discharge. EPA is promulgating the provision in essentially the same form as it was proposed.

Commenters raised a number of concerns with this provision. Commenters asserted that the alternative provision creates an exception to the no discharge requirement. Some commenters viewed the modeling exercise as an ineffective substitute for meeting effluent limitations. Commenters also questioned the enforceability of the alternative provision if a new source would have a discharge.

A number of reasons support EPA's decision to promulgate this provision and should allay commenters' concerns. First, the alternative provision requires a CAFO to demonstrate to the satisfaction of the permitting authority, after public notice and comment on the demonstration, that its open storage system is a no discharge system. In order for a new CAFO employing an open storage system to obtain no discharge BMP effluent limitations, the CAFO must demonstrate that the entirety of its operation including its production area, site-specific NMP and other best management practices are designed to ensure no discharge from the entire CAFO. Because this demonstration must be based on the use of a prescribed model and precipitation data for 100 years, any showing of no discharge will necessarily account for a wide range of circumstances. Given the stringency of the required modeling exercise, described more fully below, a successful no discharge demonstration means that the site-specific limitations, in fact, are equivalent to a no discharge requirement. Moreover, because this demonstration will be subject to public participation requirements that apply to any permitting proceeding, commenters are assured that there will be an opportunity for public review of the assumptions used to support the no discharge conclusion. Further, the final determination will also be subject to judicial review as would be the case with any other final permit decision.

Second, the argument that site-specific no discharge limitations are not true no discharge limitations reflects a fundamental misunderstanding on commenters' part. Commenters fail to recognize that the provision allowing site-specific, no discharge effluent limitations essentially places a CAFO with such limitations in the same position as a CAFO without such limitations. Commenters have apparently forgotten that, even in the absence of a provision like that promulgated today, permitted facilities that are subject to no discharge effluent limitations may discharge and not be subject to an enforcement action (or have a defense to any enforcement action) in certain uncontrollable and unforeseeable circumstances. The 2003 CAFO rule specifically provided for the availability of an upset/bypass defense from an enforcement action. *See* 40 CFR 412.47(a)(3) (''Provisions for upset/bypass as provided in 40 CFR 122.41(m)–(n) apply to a new source subject to this provision.'').

Thus, EPA NPDES regulations currently would provide a defense to an enforcement action, albeit in severely restricted circumstances, for discharges from any permitted new source CAFO. Under the 2003 rule, ''no discharge'' for those facilities, in fact, means no discharge except in certain narrowly prescribed circumstances. The demonstration required under this rule to support the establishment of alternative site-specific no discharge limitations is designed to show that there will be no discharge from the CAFO except in exactly the circumstances provided in EPA's upset/bypass regulations and described under the 2003 rule.

Under EPA's regulations, an ''upset'' is defined as ''an unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee.'' 40 CFR 122.41(n). Under the regulations, the upset defense to an enforcement action would not be available to the extent that the noncompliance with permit conditions was due to operational error, an improperly designed treatment system, inadequate treatment system, improper maintenance or careless and improper operation. 40 CFR 122.41(n)(1).

This rule adopts requirements for an upfront demonstration that parallel the conditions under which an upset/bypass defense would be available in the event of a discharge from a no

discharge facility. It provides that, before a permit writer may establish site-specific limitations, the permittee must demonstrate through a rigorous modeling exercise that its open containment system would not discharge. Given the requirement for evaluation of the system's adequacy (size, operational practices, maintenance conditions and other factors) using precipitation data for 100 years, such an assessment would support the conclusion that any discharge that might occur results from ''factors beyond the reasonable control of the permittee,'' the conditions under which the upset/bypass defense would be available. Moreover, as noted, all of the design, construction, operation, and maintenance components evaluated for the site-specific permit become permit conditions. This similarly mirrors the provisions of the upset regulations which do provide for a defense only in the limited circumstances outlined in § 122.41(n)(1), *e.g.*, no operational error, improper design, or other factors as described above. As a consequence, this alternative NSPS provision requires an upfront determination that the CAFO would only discharge in circumstances that would parallel those for which an upset/bypass defense would be available.

This final rule's new NSPS provision allowing site-specific BMP effluent limitations gives the CAFO complying with its permit conditions more certainty that its operations meet its CWA requirements. The permitting process has already established that the discharge is unintentional and beyond the reasonable control of the permittee. Therefore, in the extremely unlikely event of a discharge from a new source that is complying with a permit containing these site-specific no discharge effluent limitations, the CAFO would already have established in the permitting process an affirmative defense with respect to any discharge, and would not need to rely on § 122.41(n).

Establishment of these no discharge, BMP effluent limitations represents a determination by the permit writer that the CAFO will not discharge. The only time a CAFO under this provision could potentially discharge would be in an extreme, rare event not reasonably foreseeable or under the reasonable control of CAFO as demonstrated in the permitting process and explained above.

Fourth, while site-specific BMP effluent limitations provide greater certainty to CAFOs, they also provide the permitting authority and citizens more specific measures of compliance than is the case for CAFOs without such permit conditions. Unlike a CAFO that does not discharge or propose to discharge and therefore chooses not to seek permit coverage, a CAFO relying on site-specific BMP effluent limitations would have a permit and permit terms that include the design, construction, operation, and maintenance measures that formed the basis for the permitting authority's determination that the CAFO will meet no discharge. Because the elements demonstrating no discharge are permit conditions established in a process that provides for public participation and on-going oversight, use of this alternative should further ensure compliance with the no discharge requirements.

So long as the facility complies with its BMP effluent limitations (and other terms of the permit such as monitoring or recordkeeping requirements), the CAFO will not be subject to enforcement action. EPA underscores for the regulated community that the protections afforded by this provision are only available through permits issued to new source CAFOs. EPA further wishes to emphasize that the more general upset and bypass regulations are only available to permitted CAFOs, and are otherwise unaffected by this NSPS provision.

Finally, policy considerations support the Agency's adoption of an alternative no discharge approach. EPA encourages CAFOs to implement anaerobic digesters, multi-cell treatment lagoons, and nitrification/denitrification technologies. In addition, EPA wants to encourage the development of innovative technologies for meeting the no discharge requirement. To do this, CAFOs want certainty that the technologies they develop and implement will comply with the CWA. EPA recognizes that the upset and bypass provisions do not provide certainty to the operator that any discharge will be excused. In particular, CAFOs operating innovative or advanced technologies may be reluctant to rely on the standard upset and bypass provisions. Under the regulation adopted here, an operator must demonstrate to the permitting authority's satisfaction, after public comment, that an innovative approach that includes an open storage system will be designed, constructed, operated, and maintained to achieve no discharge. This demonstration would mean that this CAFO would not discharge, except during an event beyond the CAFO's reasonable control; an event that could be excused under the normal upset provisions. Once this demonstration has been made, it makes sense to provide the CAFO with the certainty that would eliminate the need for the CAFO to go through the upset/bypass process in most circumstances.

In addition, this approach is consistent with CWA section 101(f), requiring EPA to use efficient procedures for decision-making. Because of this provision, in the rare occurrence of a catastrophic event, this provision would relieve permitting authorities and CAFOs from the typical procedures necessary to meet the upset/bypass requirements.

4. Discussion of the New Provisions

The CAFO NSPS provisions adopted today require an evaluation of the adequacy of the designed storage facility using the AWM (Animal Waste Management) tool and an evaluation of overall water budgets using SPAW (Soil Plant Air Water) Field and Pond Hydrology Tool, or equivalent analytic tools. EPA has concluded that 100 years of climate data is an ample time frame for simulation purposes and will support a reasonable finding that the system will not discharge. However, EPA is aware that 100 years of continuous rainfall data may not be available for all CAFOs. Models can be run using actual rainfall data where available, and then simulated with a confidence interval analysis over a period of 100 years.[6]

AWM is a planning and design tool for animal feeding operations that can be used to estimate the production of manure, bedding, and process water, and thus determine the size of needed storage facilities. AWM accounts for wastewater, flush water, precipitation, runoff, and other additions to the waste stream. AWM can estimate storage facility sizes using either a defined storage period or by drawdown dates specified by the user. A monthly water and waste budget for each storage component is generated, in most cases allowing the CAFO to demonstrate no discharge from the entire production area. The procedures and calculations used in AWM are based on the USDA–NRCS Agricultural Waste Management Field Handbook.

The SPAW model consists of two linked routines. The first routine develops field hydrologic budgets based upon daily climatic data, crop data, and hydraulic characteristics of the soil profile. The second routine utilizes the

[6] Some commenters confused the 100-year simulation analysis with the requirement in the 2003 final CAFO rule for a system designed to contain the precipitation associated with the 100-year, 24-hour storm design event. Neither the proposed revisions nor these final requirements for new sources subject to subpart D refer to the 100-year storm event.

climatic and hydrologic outputs of one or more farm fields as the input to hydrologic budgets for downstream ponds. These daily pond water budgets can be used to evaluate the performance, operation or reliability for many types of ponds such as liquid waste storage facilities. Water budget processes may be evaluated by making daily adjustments to crop canopy cover and antecedent soil moisture. For each user-specified soil profile and crop rotation, SPAW simulates possible runoff from fields as well as the irrigation water needs of fields receiving the manure storage effluent. Hydrologic groups are used by the model to rate soils for the potential to release excess water down grade.

AWM tracks gross nutrients, but does not track the mass or concentration of nutrients. Further, the storage period or drawdown schedule is usually determined by the individual CAFO. Therefore, the CAFO's NMP must be used as an input to confirm both a water balance and a nutrient balance has been achieved by the CAFO. The NSPS provisions require that each CAFO use the SPAW tool to assess daily hydrologic budgets for each field. The complete modeling demonstration shows not only that the storage facility does not discharge, but also that there is no runoff of process wastewater from fields during land application activities consistent with the CAFO's NMP, which is necessary to ensure that the open containment system is operated in a way to meet the land application requirements of the rule. In EPA's view, the requirement to use the SPAW model (or an equivalent approved by the permitting authority) ensures CAFOs will rely on appropriate operational measures to achieve no discharge standards.

The CAFO NSPS provisions require certain specified information regarding design, construction, operation, and maintenance of the system to be included in the CAFO's NMP under 40 CFR 122.42(e)(1). This includes the key user-defined inputs and model system parameters. CAFOs must submit a site-specific analysis to the Director. See 40 CFR 412.46(a)(1). These site-specific design, construction, operation, and maintenance measures are enforceable requirements in the CAFO's permit. As long as the CAFO complies with these requirements, the CAFO presumptively meets the no discharge requirement. EPA has determined that the final rule revisions provide a clear and enforceable standard for the CAFO to achieve as well as providing assurance to the public that the proposed system complies with the no discharge requirement.

Under these final amendments to the NSPS, the Director has the discretion to require additional information from a new source subpart D CAFO owner or operator to support site-specific BMP effluent limitations. The burden is on the CAFO to demonstrate that any proposed system it employs, including an open system, meets the new source standard. EPA expects CAFOs will utilize the most current version of AWM and SPAW when submitting their demonstration to the permitting authority. However, EPA is aware that other peer-reviewed models and programs have been or may be developed that could be determined to be equivalent to AWM and SPAW. Therefore the rule gives the Director the discretion to approve design software or procedures equivalent to AWM and SPAW. Once approved by the Director, the public still would have the opportunity to comment on the CAFO's submitted modeling and demonstration as discussed earlier.

The information, design, and evaluation process required of all CAFOs wishing to avail themselves of this alternative is intended to allow CAFOs the flexibility to demonstrate compliance with the no discharge requirements for any type of open storage facility. As a practical consideration, EPA expects most CAFOs selecting this compliance alternative will submit designs for open manure storage structures accompanied by a narrow range of acceptable operation and management practices. However, for a given type of storage facility design (for example, an integrator with several company-owned CAFOs each designed and constructed in an essentially identical manner within the same county), EPA believes it is possible to conduct a series of assessments that together fully encompass the range of operational and management measures that would be used across multiple CAFOs with the specified storage facility design. In this case, SPAW could be run to validate a wide range of NMP and storage pond management scenarios (to continue the above example, the CAFOs all have the same sets of crops, soil types, land application equipment, etc.). This alternative does not change the requirement for a CAFO to develop a site-specific NMP. These final amendments authorize the permitting authority to determine that any CAFO using the specified facility type and submitting an NMP that falls within the pre-approved range of operational and management practices would not need to conduct an individualized assessment step (*i.e.*, the validation using SPAW).

The availability and use of such a geographical and categorical approach will require that the permit writer determine that a number of conditions are met. First, the assessment must fully account for all pertinent factors relevant to determination of the potential for discharge from an open storage system. The assessment must also include all parameters necessary to mirror properly the range of soil, plant, climatic, and hydrological conditions within the geographical area for which the assessment is intended to be representative. Second, the permittee must establish that the parameters reflected in the general assessment used to establish no discharge are, in fact, representative of those parameters for each CAFO. Finally, the assessment must reflect the operational and management practices to be employed by each CAFO at each individual site. As with the individual assessment, each CAFO must have a site-specific NMP that includes the operational and management measures utilized in the geographical assessment.

EPA is eliminating the requirement to indicate the capacity for a 100-year, 24-hour storm for new sources. EPA is maintaining the requirement to have a depth marker for all open storage structures. In EPA's view, a marker indicating the storage pond or containment depth can be an excellent means of displaying how much storage a CAFO has, whether it is time to pump down levels in the lagoon, pond, or other storage structure, or whether alternative management steps must be taken to prevent a full storage structure and potential overflow. Existing sources and new sources subject to subpart C continue to have the requirement for a depth marker that indicates the 25-year, 24-hour storm event. New sources subject to subpart D and using an open storage structure must use the depth marker to indicate the maximum volume of manure and process wastewater the structure is designed to contain.

While one component of preventing discharge from an open system is to provide adequate storage of manure and wastewater during critical periods, ensuring adequate physical capacity is not sufficient. Rather, determining whether there is adequate storage is based on a site-specific evaluation of the CAFO's entire waste handling system. Adequate storage has to be based on climate-specific variables that define the appropriate storage volume, but of equal importance are the nutrient management plan and other

management decisions that specify when and how the storage can be emptied. The link between adequate storage and land application practices is one of the most critical considerations in developing and implementing a site-specific nutrient management plan. For example, the amount of land available for application, the hydraulic limitations (ability of the land to handle additional water without the occurrence of runoff), geology, and soil properties of the available land base can play an important role. See Chapter 2 of EPA's technical guidance for CAFOs ''Managing Manure Nutrients at Concentrated Animal Feeding Operations'' (EPA–821–B–04–00) for more information. EPA expects these criteria preclude a CAFO from withdrawing manure and process wastewater from liquid storage structures and subsequently land applying process wastewater at inappropriate times. Given these considerations, EPA is establishing procedures for approval of site-specific management practices for open containment systems with the expectation that a system can be designed and operated to meet the no discharge standard. EPA has concluded that the design, construction, operation, and maintenance elements and the comprehensive analytical assessment are sufficient to achieve this objective.

G. BCT Limitations for Fecal Coliform

In response to the Second Circuit remand, EPA is today affirmatively finding that the best conventional pollutant control technology (BCT) limitations it adopted in 2003 do, in fact, represent the best conventional control technology limitations for fecal coliform. After assessing various conventional pollutant removal technologies, EPA has determined that there are no available and economically achievable technologies that are cost reasonable that would result in greater removal of fecal coliform than the technologies on which EPA based the 2003 best practicable control technology currently available (BPT) and BCT effluent limitations guidelines (ELG).

As EPA has explained, establishing BCT limitations begins by identifying technology options that provide additional conventional pollutant control beyond the level of control provided by BPT effluent limitations. Any such candidate technologies are then evaluated to determine if they meet the threshold CWA requirements of ''availability'' and ''economic achievability.'' 51 FR 24,974, 24,976; July 9, 1986. A technology is economically achievable if its costs may be ''reasonably borne'' by the CAFOs. *Waterkeeper Alliance et al.* v. *EPA,* 399 F.3d 486, 516 (2d Cir. 2005). The Clean Water Act adds an additional evaluation step to the effluent limitations development process for conventional pollutants. ''In addition to the Clean Water Act requirement that effluent limitations be economically achievable, the cost associated with the BCT effluent limitations must also be 'reasonable' in relation to the effluent pollutant reductions.'' 51 FR 24,974. In determining this, the statute requires that EPA look at a number of factors including a comparison of the cost of effluent reductions for POTWs to that for direct dischargers using candidate BCT technologies. Thus, the statute requires that, not only must the costs of additional control be costs that CAFOs may reasonably bear (economically achievable), but the costs must also be reasonable relative to the costs for POTWs to achieve such conventional pollutant reductions.

EPA evaluated 41 BCT candidate technologies for this rule and determined that all but two of them were either not available (technically feasible for all CAFOs in a subcategory) or not economically achievable. For the remaining two technologies, while their costs are high and EPA believes it likely that they are also not economically achievable, EPA was unable to conduct its traditional tests for economic achievability and thus has not determined in this rule whether or not they are economically achievable. However, EPA has determined that these two technologies, even if economically achievable, would not be cost reasonable, and has therefore rejected them as BCT technologies.

As a result of this assessment, EPA has concluded that there are no available and economically achievable technologies that are cost reasonable that would provide greater fecal coliform removal than the BPT technology. How EPA performed this assessment and the results of that assessment supporting EPA's finding that the 2003 BPT/BCT limitations represent BCT technology for controlling fecal coliform is described in detail below.

1. The *Waterkeeper* Decision

As previously noted, the *Waterkeeper* court remanded the 2003 CAFO rule's BCT standard for further clarification and analysis with regard to the appropriate BCT standard for pathogens.[7] EPA's 2003 rule established non-numeric effluent limitations based on BPT and the best available technology economically achievable (BAT) as well as BCT limitations. In the 2003 CAFO rule, EPA established BPT effluent limitations guidelines for Large beef, dairy, and veal calf (Subpart C), swine and poultry (Subpart D) CAFOs.

At that time, EPA concluded that there were no available BCT technologies on which to base limits for conventional pollutants that were more stringent than the BPT limitations, and EPA therefore established BCT requirements equal to BPT limitations. EPA based this determination in part on the combined pollutant reductions (Table 7.2 of 68 FR 7239), and in particular its evaluation of the reductions in discharges of the conventional pollutants (TSS, BOD, and fecal coliform) associated with the various technology options it considered. 71 FR 37,763. EPA noted difficulties in quantifying the loadings and reductions in discharges of these pollutants—in particular, in assessing fecal coliform—and relied primarily on reductions in sediment discharges as a surrogate for reductions in TSS in reaching its BCT determination. EPA concluded that there were no technologically feasible candidate BCT technologies that would achieve greater TSS removals than the BPT requirements for either Subpart C or Subpart D facilities, and no economically achievable technologies for Subpart C facilities that would reduce discharges of BOD. Consequently, EPA found that there were no BCT technologies for establishing limits on conventional pollutants that would achieve greater removal than the BPT technology and established BCT requirements that were equal to BPT. 68 FR 7224.

While EPA's assessment of the effectiveness of various control options did attempt to measure pathogen reductions for the final rule, EPA did not establish any specific BPT or BCT limitations to control fecal coliform, a conventional pollutant and pathogen. The *Waterkeeper* court remanded the 2003 CAFO rule's BCT standard for further clarification and analysis because EPA had failed to make an affirmative finding that the BCT limitations it had adopted in fact represented the best conventional

[7] As the Second Circuit recognized, the CWA lists only one pathogen, fecal coliform, as a conventional pollutant for which BCT limitations are required. *Waterkeeper,* 399 F.3d at 518. Section 304(a)(4) of the CWA provides that EPA may identify additional pollutants as conventional pollutants. EPA has identified only one additional pollutant, oil and grease as a conventional pollutant. Thus, the only pathogen subject to the Second Circuit remand is fecal coliform.

pollutant control technology for reducing pathogens—specifically, fecal coliform. 399 F.3d at 519. EPA's final rule issued today responds to the court's remand.

As EPA proposed, in this final rule EPA is affirmatively concluding that the current BCT limitations for conventional pollutants represent the best conventional control technology for fecal coliform and is establishing BCT limitations for fecal coliform that are equal to the current BPT/BCT limitations. These limitations prohibit the discharge of manure, litter, or process wastewater into waters of the U.S. from the production areas of CAFO except in limited circumstances. A discharge is allowed only if an existing, permitted CAFO has a properly designed, constructed, and operated storage structure with the capacity to contain all manure, litter, and process wastewater associated with the facility as well as the runoff and direct precipitation from a 25-year, 24-hour rainfall event. *See* 40 CFR 412.31(a). The current rules also provide that a Large CAFO that land applies manure, litter, or process wastewater must do so in accordance with several BMPs: A nutrient management plan that includes the determination of application rates for manure, litter, and process wastewater; a field-specific assessment of the potential for nitrogen and phosphorus transport from the field to surface waters; manure and soil sampling; and setback requirements. *See* 40 CFR 412.4. EPA is not promulgating more stringent BCT limitations for fecal coliform because there is no available, achievable, and cost reasonable technology on which to base such limitations.

2. Background

The CWA requires point sources to achieve effluent pollutant levels established by EPA that are attainable through progressively more stringent pollutant control technology. The CWA calls for technology-based control in two stages. As originally enacted in 1972, the Act required existing point sources to comply in the first stage with EPA-established limitations that are achievable by application of the ''best practicable control technology currently available'' or ''BPT.'' These limitations control conventional, toxic, and nonconventional pollutants. EPA has typically based BPT limitations on the average pollutant removal performance of the best facilities examined by EPA. The 1972 Act also required existing point sources to comply in the second stage with EPA-established limitations that are achievable by the application of ''best available technology economically achievable,'' or ''BAT.'' In 1972, these limitations also controlled conventional, toxic and non-conventional pollutants.

The 1977 amendments to the CWA replaced BAT for conventional pollutants with limitations that represent ''best conventional pollutant control technology'' or ''BCT.'' Section 304(a)(4) designates the following as conventional pollutants: Biochemical oxygen demand (BOD), total suspended solids (TSS), fecal coliform (FC), pH, and any additional pollutants defined by the Administrator as conventional. The Administrator designated oil and grease as an additional conventional pollutant, on July 30, 1979 (44 FR 44,501), but has listed no other pollutants for regulation as conventional pollutants.

The decision to amend section 304(a) of the CWA to require achievement of BCT, rather than BAT, for control of conventional pollutants reflected two factors. The first was Congressional desire not to require ''treatment for treatment's sake'' and the second, Congress's view that BAT control of conventional pollutants might not be necessary to achieve the water quality goals of the Act. S.Rep. No. 370 at 43, 1st Sess. 43 (1977), *reprinted in* Comm. on Env. and Public Works, 95th Cong., 2d Sess., *A Legislative History of the Clean Water Act of 1977* at 676–77 (hereinafter *''Legislative History''*).

The CWA Amendments of 1977 that require EPA to determine BCT limitations also specify the factors to be taken into account in this determination of BCT. Section 304(b)(4)(B) provides that the factors to be assessed:

> [S]hall include consideration of the reasonableness of the relationship between costs of obtaining a reduction in effluents and the effluent reductions benefits derived, and a comparison of the cost and level of reduction of such pollutants from the discharge from publicly owned treatment works to the cost and level of reduction of such pollutants from a class or category of industrial sources. * * * 33 U.S.C. 1314(b)(4)(B).[8]

In the words of Senator Muskie, the Senate Floor Manager and leading sponsor of the amendments:

> The Administrator must determine whether or not the cost of achieving reductions of conventional effluent bears a reasonable relationship to the amount of effluent reduction achieved. In making this determination, the Administrator is to compare the costs of industrial effluent reduction to the cost of municipal waste treatment. Legislative History at 458.

Accordingly, EPA developed a ''BCT Methodology'' to answer the question of whether it is ''cost-reasonable'' for industry to control two conventional pollutants, BOD (or oil and grease in the case of certain metals industries) and TSS, at a level more stringent than already required by BPT effluent limitations. EPA first explained its BCT methodology when it promulgated BCT effluent guidelines for 41 industry subcategories (44 FR 50,732; August 29, 1979).[9] The crux of the methodology was a comparison of the costs of removing the conventional pollutants BOD (or oil and grease) and TSS for a candidate BCT technology within a particular industry segment, to the costs of removal for an average-sized POTW.

A number of industries and industry associations challenged the regulation, and, in 1981, the U.S. Court of Appeals for the Fourth Circuit remanded it to the Agency, directing EPA to include an assessment of the cost-effectiveness of industry conventional pollutant removal in addition to the POTW test in its evaluation of cost reasonableness. *American Paper Inst.* v. *EPA,* 660 F. 2d 954 (4th Cir. 1981). EPA proposed a revised BCT methodology in 1982 (47 FR 49,176) that addressed the industry cost-effectiveness test (the ''second'' test), again limited to the conventional pollutants BOD and TSS. EPA proposed to base the POTW benchmark on model plant costs in a 1984 notice (49 FR 37,046). The final BCT methodology, promulgated as a rule in 1986 (51 FR 24,974), maintained the basic approach of the 1982 proposed BCT methodology while also updating POTW removal cost with new POTW data. EPA again specifically noted that it had developed

[8] As the Conference Report to the 1977 amendments explained:

> The cost test for conventional pollutants is a new test. It is expected to result in a determination of reasonableness which could be somewhat more than best practicable technology or could be somewhat less than best available technology for other conventional pollutants. The result of the cost test could be a 1984 requirement which is no more than that which would result from best practicable technology but also could result in effluent reductions equal to that required in the application of best available technology. Joint Explanatory Statement of the Committee of Conference, 95th Cong. 1st Sess., H.R. No. 95–830 at 85, *Legislative History* at 269.

[9] As noted above, the 1977 amendments established a second level of technology-based controls for conventional pollutants-BCT limitations. Accordingly, in 1979, pursuant to Congressional direction, EPA completed its review of then-existing BAT limitations for conventional pollutants to determine if they were more stringent than would be required by BCT technology. EPA limited its review to limitations for, and correspondingly developed its BCT methodology to address, only two categories of conventional pollutants: BOD (or oil and grease) and TSS. 44 FR 50,732–33. Noting the industries under consideration do not have fecal coliform discharges, EPA performed no analysis for fecal coliform.

its BCT methodology to evaluate more stringent BOD or TSS limits.

3. EPA's BCT Determination in the 2003 Rule

As previously explained, EPA established BCT requirements equal to BPT in the 2003 CAFO rule (*see* 40 CFR 412.33 and 412.44). For its assessment of BCT limitations, EPA first considered whether there were any technically feasible technologies that would achieve greater conventional pollutants removals than the BPT limitations. Because of the difficulties in quantifying reductions of conventional pollutant discharges,[10] EPA relied primarily on sediment discharges (as a surrogate for TSS) in evaluating potential BCT requirements. EPA identified no BCT technology option that achieves significantly greater TSS removals than the BPT requirements eventually promulgated in 2003 with one exception. This option would have prohibited any discharge from swine and poultry CAFOs. Because this option was not an economically achievable one, EPA therefore concluded that there were no BCT technologies on which to base limits for conventional pollutants that were more stringent than BPT. EPA did note that if it had identified available and economically achievable technology options that achieve greater reductions of conventional pollutants than are achieved by BPT, then EPA would have evaluated these technologies applying EPA's two-part BCT cost test. 68 FR 7224.

EPA also evaluated pathogen reductions associated with the 2003 BPT limitations. The BPT limitations prohibit dry weather discharges from land application areas, and the BPT land application requirements (including technical standards for timing, form, and rate of application, as well as the required vegetated buffer, setback, or equivalent practices) already minimize discharges from land application areas. The BPT production area requirements prohibit discharges, except for overflows from liquid storage structures that meet certain design and operational criteria. EPA used fecal coliform and fecal streptococcus as surrogates to estimate the pathogen reductions achieved by the CAFO rule requirements. EPA concluded that the BPT limitations would reduce these two pathogens by 2.7 x 10^{22} colony forming units (CFU), or a 46 percent reduction over baseline pollutant loadings. See Chapter 12 of ''Development Document for the Final Revisions to the NPDES and the Effluent Guidelines for CAFOs'' EPA–821–R–03–001. Other pathogens would likely be reduced by a similar degree. EPA projected $0.3 to $3.4 million in improved shellfish harvests associated with reduced pathogen discharges from Large CAFOs. 68 FR 7240.

4. This Rule

As noted, EPA has determined that there are no technically feasible and economically achievable candidate technologies for fecal coliform removal that are cost reasonable and would achieve greater removals than the 2003 BPT limitations. The following discussion summarizes the basis for this final determination.

(a) EPA's Approach To Establishing BCT Limitations for Fecal Coliform

As previously explained, the first step to establishing BCT limitations is to identify technology options that provide additional conventional pollutant control beyond the level of control provided by the application of BPT limitations and to evaluate these technologies for ''availability'' (including technical feasibility) and ''economic achievability.'' *See* 33 U.S.C. 1311(b)(2)(E). Out of 41 candidate technologies, EPA has identified no technologies that are both available and achievable for Subpart D facilities, and has identified only two available technologies that might be [11] economically achievable for Subpart C facilities.

The next step in determining BCT is to evaluate any candidate technology that is both technically feasible and economically achievable for cost reasonableness. Traditionally, EPA has evaluated candidate BCT technologies for cost-reasonableness using a two-part BCT cost test it developed for two conventional pollutants, BOD and TSS. The test is intended to assess whether there are cost-reasonable technologies that will achieve greater BOD and TSS removals than required by the BPT technology for an industry category by comparing the incremental cost-effectiveness of candidate BCT technologies with the incremental cost-effectiveness of BOD and TSS removals at POTWs through advanced secondary treatment as compared to secondary treatment. This test makes sense for BOD and TSS because advanced secondary treatment is specifically designed to remove additional BOD and TSS. However, it is not designed for additional fecal coliform removal, so the incremental cost-effectiveness of advanced secondary treatment in removing fecal coliform is not a good benchmark for use in evaluating candidate BCT technologies for fecal coliform removal.

The methodology is appropriate for BOD and TSS because advanced secondary treatment is specific to the removal of BOD and TSS. Costs associated with upgrading a POTW from secondary to advanced secondary treatment were based on polymer addition to the activated sludge basin. The purpose of the polymer addition was to enhance removal of BOD and TSS in the secondary clarifier, and achieve final effluent concentrations of 20 mg/L BOD5 and 20 mg/L TSS. Therefore, the cost increment between secondary and advanced secondary treatment represents the incremental cost of removal of additional BOD and TSS at POTWs. 51 FR 24,981.

Unlike BOD and TSS, advanced secondary treatment is not designed to remove additional increments of fecal coliform beyond secondary treatment. When both secondary and advanced secondary treatment systems include disinfection, the total fecal coliform removal is nearly the same, over 99 percent. Secondary treatment by itself (without disinfection) also removes significant amounts of fecal coliform, although almost all POTWs include disinfection at some point in their treatment train. The polymer addition in advanced secondary treatment is not intended for additional fecal coliform removal since both secondary and advanced secondary POTWs use disinfection treatments to prevent fecal coliform releases to surface water. Therefore, because the object of the BCT cost test is to ensure that the costs of additional removals of conventional pollutants associated with BCT limitations do not exceed POTW conventional removal costs, distinguishing fecal coliform removals between advanced secondary treatment and secondary treatment is not relevant. Because advance secondary treatment is not intended to be more effective than secondary treatment at removing fecal coliform (and is not added for this purpose), it is not appropriate to apply

[10] For example, EPA could not easily assess fecal coliform loadings because they vary greatly depending on site characteristics. Further, quantifying discharges of other conventional pollutants is complicated by the challenge of distinguishing between CAFO and non-CAFO sources. 71 FR 37,763.

[11] For Subpart C (beef cattle, heifer, and dairy) facilities, in the 2003 final CAFO rule, EPA rejected more stringent BAT options on availability, not economic achievability grounds. Thus, for this final rule, EPA had no comparison technology that it had already determined to be not economically achievable. Thus, while the two available technologies have high costs relative to BPT and are likely not economically achievable, EPA was not able to determine this using its traditional methodology or the analysis from the 2003 rule.

the same POTW cost test used for evaluating BOD and TSS BCT limitations to the evaluation of fecal coliform limitations.

Given these circumstances, EPA recognized that if it were to use a similar numeric BCT cost test to evaluate fecal coliform removal for BCT, EPA would have to modify the traditional BCT cost test to address the issue that advanced secondary treatment at POTWs is not designed to remove fecal coliform. When the Agency promulgated the BCT methodology (including descriptions of how to apply the cost test), EPA envisioned the need for adjustments to the BCT cost test methodology in future rulemakings to account for lack of comparable data or other industry-specific factors. 51 FR 24,974, 24,976. Moreover, section 304(b)(4)(B) authorizes EPA to consider other appropriate factors in establishing BCT.

Accordingly, for the proposal, EPA suggested a modified BCT cost test. However, based on comments, EPA has identified a number of problems with the proposed test. These problems are discussed briefly here and described more fully in the Response to Comments Document prepared for this rule. First, although the revised test used a different cost-effectiveness calculation from the traditional test, it still relied indirectly on a comparison of the cost-effectiveness of BCT candidate technologies to the cost-effectiveness of advanced secondary treatment, even though, as just noted, advanced secondary treatment is not designed to remove fecal coliform. Second, the revised test did not compare the incremental cost-effectiveness of the candidate technologies to the incremental cost-effectiveness of fecal coliform removals at POTWs and therefore did not allow a comparison of ''the cost and level of reduction of [fecal coliform] from the discharge from publicly owned treatment works to the cost and level of reduction of [fecal coliform] from * * * industry sources * * *'' as required by the statute. As a result, EPA has now determined that it cannot use the revised test to evaluate cost reasonableness.

For this final rule, EPA also considered other possible approaches for evaluating cost reasonableness. One approach would have been to identify a technology that is used at POTWs specifically for fecal coliform removal and develop a test similar to the traditional cost test but based on this technology. EPA considered disinfection as one possible benchmark technology for fecal coliform removal, but determined that there is significant variability in the manner in which disinfection is used in combination with other technologies at different POTWs and it would thus be extremely difficult, both theoretically and logistically, to develop a revised benchmark based on this technology.

Consequently, for the final rule, EPA has applied a simplified cost reasonableness test designed to specifically address fecal coliform. This approach is consistent with section 304(b)(4) of the CWA and is one EPA has used in the past. While the traditional cost test compares reductions from BCT candidate technologies to those of POTWs, EPA has, on occasion, rejected BCT technologies without comparing them to POTW performance, even for BOD and TSS. Thus, for example, where EPA lacked sufficient data to quantitatively evaluate BOD and TSS reductions under the traditional test, EPA rejected more stringent BCT limitations solely on the basis of an evaluation of the incremental costs of further reductions. *See* 51 FR 24,974, 24,991.

(b) EPA's Evaluation of Candidate Technologies for Technical Feasibility and Economic Achievability

Based on its consideration of information submitted by commenters and its own analysis, EPA has determined that there are only two of 41 candidate technologies that are technically feasible and may be economically achievable that provide greater removals of fecal coliform than the technologies selected as the basis for BPT limitations in the 2003 rule. The discussion below provides the basis for this conclusion.

In its evaluation of candidate BCT technologies, EPA reviewed data on different types of CAFO manure management systems. These systems employed treatment technologies, best management practices (BMPs) for pollution prevention, and management practices for the handling, storage, treatment, and land application of wastes. Sources of information included available technical literature, over 11,000 comments submitted by industry and other public commenters, and insights gained from conducting over 116 site visits to CAFOs.

In its search for candidate technologies, EPA initially reexamined the technology options it had considered for the 2003 rule because the Agency concluded that these might provide more fecal coliform reductions than the option selected for BPT limitations. EPA looked at technology Options 3, 5, 6 and 7 described in the proposal at 71 FR 37,763 and the Technical Development Document. Options 3, 5, 6, and 7 represented additional controls beyond the controls (*e.g.*, nutrient-based land application rates and production area discharges only under specified conditions). Option 3 would have required a reduction of discharges to ground water beneath the production area. Option 5 would require total containment of all manure and process wastewater by swine and poultry operations. Option 6 would require anaerobic digesters at swine and dairy facilities. Option 7 would require a national prohibition of manure application to frozen, snow-covered, or saturated ground.

In addition to the four technologies reviewed for the 2003 final rule, EPA looked at an additional 37 technologies and systems identified either by EPA or commenters as candidate fecal coliform BCT technologies. At the outset of assessment for this rule, EPA rejected all of these technologies as the basis for BCT limitations for fecal coliform for Subpart D CAFOs because they were either not technically feasible for all Subpart D CAFOs, or were not economically achievable. Many of the rejected technologies were costlier than Option 5 which EPA in the 2003 final CAFO rule had earlier determined was not economically achievable for Subpart D (*i.e.*, swine, poultry, and veal calf) facilities. The *Waterkeeper* court sustained the Agency's determination that CAFOs cannot reasonably bear the cost associated with Option 5. 399 F.3d at 516. Option 5 would have cost Subpart D facilities $167 million. *See* 68 FR 7218. Of the 19 technologies and systems approaches identified by commenters, none of the technologies costs less than $167 million. The least costly of these technologies—gasification recycle, digester based systems, super soils composting, aerobic digestion, and ABS—cost 1.3 times the cost of Option 5. Other technologies reviewed cost as much as seven times the total national costs of Option 5. Having determined that the costs of Option 5 were unachievable for Subpart D facilities, EPA did not evaluate further those treatment technologies that had similar or greater total costs. After rejecting the economically unachievable technologies identified by commenters, 22 technologies remained for further assessment with respect to technical feasibility. EPA found that none of these technologies were technically feasible for all CAFOs in Subpart D.

For Subpart C facilities, EPA did not have a previously identified option that it had already determined to be economically unachievable against which to compare the costs of candidate

BCT technologies. To do an economic achievability analysis of candidate technologies for Subpart C, EPA would have had to conduct an analysis of the economic conditions of individual CAFOs in order to estimate potential closures and evaluate appropriate financial ratios, as it traditionally does for economic achievability analysis. EPA determined that conducting such an analysis was not practical, and eventually also determined that it was not necessary to do so to complete its evaluation of candidate BCT technologies for subpart D. Rather, EPA first evaluated the candidate technologies for technical feasibility, and on this basis, rejected 39 of the 41 technologies (the four options considered for the 2003 rule, 16 identified by EPA and 19 suggested by commenters) as the basis for BCT limitation for fecal coliform for Subpart C. The two remaining technologies were then evaluated directly for cost reasonableness, without considering economic achievability, as explained in section III.G.4(c) of this preamble.

EPA explained the basis for its decisions with respect to feasibility of the other candidate technologies (for both Subparts C and D) in the proposed rule, and commenters have not provided any information that would lead the Agency to change its conclusions. 71 FR 37,768–71.

In addition, EPA specifically solicited comment on additional candidate technologies that might prove feasible and less costly than the technologies already evaluated for the proposal. EPA is aware of technologies that may, on a site-specific basis, be used to provide further reductions of conventional pollutants as compared to the technologies on which the 2003 BPT/BCT limitations were based. However, EPA's record shows these other technologies are not available engineering alternatives for most CAFOs, and they are therefore not feasible technology candidates. See Chapter 8 of the ''Development Document for the Final Revisions to the NPDES and the Effluent Guidelines for CAFOs'' and the docket accompanying this action for descriptions of these additional technologies.

In response to its requests for additional information, EPA received no new data that support evaluation of additional candidate technologies or warrant revision to EPA's conclusions about the costs or performance of the candidate technologies EPA identified. Specifically, while some commenters recommended consideration of additional digester systems, the costs of the various digester systems do not vary sufficiently to warrant a detailed analysis of the costs of these technologies at every type of CAFO. To date, EPA has not identified less expensive, and consequently, economically achievable candidate technologies than those it had previously evaluated. Furthermore, EPA did not further evaluate the systems approach (combinations of one or more candidate technologies) recommended by some commenters because it would not reduce fecal coliform more than the 99 percent assumed by EPA [12] in its analysis as the yardstick for performance of the candidate BCT technology. While not obtaining pollutant removals greater than those already considered by EPA, these systems would cost more than the cost of the individual technologies already reviewed. Therefore, EPA did not evaluate the suite of candidate technologies that performed comparably but were more expensive than the suite of technologies evaluated here. For the reasons described in Chapter 8 of the ''Development Document for the Final Revisions to the NPDES and the Effluent Guidelines for CAFOs'' and the proposal at 71 FR 37,765–8, EPA has determined that the candidate technologies it rejected are not technologically feasible and economically achievable for all CAFOs across a subcategory and thus not appropriate technologies for BCT limitations. The CWA does not authorize EPA to establish BCT limitations that are based on technologies that are not technologically feasible and economically achievable. Because only two technologies were both technically feasible and potentially economically achievable for Subpart C facilities (and none were for Subpart D facilities), EPA is only required to evaluate these two technologies further for cost reasonableness.

(c) EPA's Evaluation of the Remaining Candidate Technologies for Cost Reasonableness

The above assessment resulted in only two remaining candidate technologies (composting and constructed wetlands) that are potentially [13] technically feasible and economically achievable for fecal coliform control for one subcategory, the Subpart C (beef and dairy) subcategory. As discussed above, EPA did not conduct a new analysis of economic achievability for these technologies at Subpart C facilities, although EPA notes the costs are high relative to the BPT technology (which EPA also determined to be BAT). Specifically, the cost of the BPT technology for Subpart C was $214 million per year, while the cost of composting was estimated to be $1.4 billion per year, and the cost of constructed wetlands was $2.9 billion. Thus, EPA expects that if it had conducted a formal economic achievability analysis, EPA would have determined that both of these technologies are not economically achievable.

However, instead of evaluating these technologies with respect to economic achievability, EPA evaluated the cost reasonableness of the technologies using the simplified approach described above. In the past, EPA has adopted such an approach when it lacked a full data base to evaluate different BCT technologies. A simplified approach fits the circumstances here for two reasons. First, as noted, EPA has developed no standardized BCT cost test for fecal coliform. Second, EPA lacks the data to provide a comparison of incremental fecal coliform removals that is the basis for the BCT cost test for TSS and BOD.

The annual operating costs for composting would be more than six times as much as the full BPT level of control at Subpart C facilities (see Chapter 4 and Table A–15 of the Final Cost Methodology, EPA–821–R–03–004), while constructed wetlands would cost Subpart C facilities more than an order of magnitude (13) times the cost of the BPT level of control (see chapter 15 in the supplement to the TDD). EPA has determined that these costs are too high relative to the additional removals. EPA thus concludes that the incremental costs of the additional removals alone support a determination that these technologies are not cost reasonable.

To further evaluate this conclusion, EPA conducted a modeling analysis of POTW removal costs for fecal coliform. As discussed above, the available data do not permit an empirical cost comparison between CAFO candidate

[12] In the proposed rule, as a simplifying assumption all technologies were expected to achieve a 99 percent reduction in fecal coliform. 71 FR 37,765 and 37,767.

[13] EPA believes it is likely that some Subpart C facilities will have space constraints under either candidate technology. In this case the technology would not be feasible for all CAFOs in the subcategory. However, EPA lacks data regarding land availability and possible land constraints beyond an aggregate of data showing the average acres of cropland at Subpart C facilities. To the extent CAFOs can take the necessary amount of land out of crop production to provide the space to install construct wetlands or composting windrows, EPA does not have the data to estimate lost revenues associated with such losses of cropland. Therefore, EPA's estimated costs of such candidate technologies are potentially understated. Nonetheless, EPA analyzed cost reasonableness as if the technologies are feasible.

technologies and POTW fecal coliform performance. However, EPA was able to model POTW fecal coliform removal costs using reasonable approximating assumptions. EPA recognizes that the resulting calculation lacks the rigor of the determination of the 1986 POTW benchmark for TSS and BOD removal costs.[14] What this assessment shows is that POTW average costs of removals of fecal coliform are very low (*i.e.*, $0.33 per trillion CFU; *see* 71 FR 37,772). This is not surprising, given that most POTW permits require achievement of fecal coliform reduction near 99 percent.[15] In contrast, the two technologies being evaluated for cost reasonableness (composting and constructed wetlands) have higher costs for fecal coliform removal ($0.51 per trillion CFU for composting, and $1.02 per trillion CFU for constructed wetlands). (See supplement to Chapter 15 of the TDD, showing unit costs of NCSU technologies as provided by commenters, total national costs of employing such technologies at CAFOs, and a comparison of those costs to the BPT/BAT level of control.)

Even recognizing the necessary imprecision associated with EPA's calculations, EPA has determined that this limited POTW cost comparison further supports its determination that the costs of these two BCT candidate technologies are not cost reasonable, given the lack of hard data on which to base the determination. This is fully consistent with EPA's findings in the proposed rule that POTWs are very cost effective at fecal coliform removals. 71 FR 37,772. The assessment confirms what logic suggests: Given a POTW's requirement to virtually eliminate the extremely high fecal coliform discharges in its influent (basically raw sewage), POTWs, on a national basis, achieve fecal coliform removal on a cheaper basis than CAFOs.

Finally, EPA notes that Congress intended the BCT level of control to be somewhere between the BPT and the BAT levels of control, as established in the statute. As noted in the conference report to the 1977 amendments establishing BPT:

> ''The result of the cost test could be a 1984 requirement which is no more than that which would result from best practicable technology but also could result in effluent reductions equal to that required in the application of best available technology.'' Joint Explanatory Statement of the Committee of Conference, 95th Cong. 1st Sess., H.R. No. 95–830 at 85, *Legislative History* at 269.

Thus, candidate technologies with costs between 6 and 13 times the costs of technologies that have already been determined to be BAT would not generally be appropriate as the basis for BCT.

5. Additional Comments on the Proposal

The following discussion summarizes additional significant comments received by EPA on the proposed CAFO BCT determination for pathogens. For a complete response to the issues raised by commenters, see the Response to Comment Document.

In calculating the BPT cost per unit of fecal coliform removal for its cost-reasonableness assessment, one commenter noted the cost was erroneously calculated in units of dollars per billion colony forming units (CFU); the units should have been dollars per trillion CFU in order for the test to be comparable and consistent with the remaining BCT cost calculations. EPA agrees with this comment and has corrected all calculations to dollars per trillion CFU.

Some commenters correctly noted that as part of the BCT cost test for fecal coliform, EPA calculated the POTW and industry cost benchmarks as the difference in average costs of removing fecal coliform between secondary treatment and advanced secondary treatment rather than as the incremental cost for the upgrade. These commenters believed that such an approach was incorrect. As discussed above, EPA agrees and has not used the revised BCT cost test for this final rule. In regards to the BCT options that were selected for further analysis, some commenters believe that numerical limits are feasible for CAFOs and should have been selected for BCT. They would have liked to see EPA take a similar approach to CAFO waste that EPA has taken regarding human sewage sludge (*i.e.*, setting numerical pathogen standards for use). Some commenters pointed to the ''sludge rule'' or ''biosolids'' program under 40 CFR part 503 as a possible basis for pathogen standards in the CAFO rule. EPA notes that the CWA statutory criteria for sewage sludge standards under section 405 of the Act are health and welfare-based. By contrast, CWA effluent limitations require consideration of different factors. However, the technologies used to meet the regulations in part 503 may, in some cases, be used by CAFOs. For these reasons, EPA included sewage sludge pollution reduction technologies such as composting and lime addition in the suite of BCT candidate technologies the Agency considered. In addition, some commenters criticized EPA's cost analysis for not including cost-share from federal sources such as EQIP, and for not including cost offsets from sale of treated manure. EPA considered both of these aspects in the cost analysis to the 2003 final CAFO rule, and was upheld on its economic analysis. 399 F.3d 486. In addition, EPA considered such cost offsets in a sensitivity analysis, and concluded that the cost offsets did not change EPA's fundamental conclusions regarding economic achievability and feasibility. See Chapter 14 of the TDD for more information.

By contrast, other commenters found no fault or shortcomings in the EPA analysis of the technical feasibility of conventional technologies in determining BCT for pathogen removal. They agree that the candidate technologies examined by EPA present insurmountable challenges to many CAFOs that make them inappropriate as a basis for BCT. They found no fault with the cost data or analytical techniques used by EPA in the BCT cost test. These commenters also presented additional economic analysis of the candidate technologies that has been published in the ''Phase 3'' report on the ''Development of Environmentally Superior Technologies'' per agreements between the North Carolina Attorney General and major pork producers in the State. These commenters note that the ''Phase 3'' economic analysis found that none of the 16 technologies studied were economically feasible for existing swine operations in North Carolina, which is consistent with EPA's findings as discussed in detail above. These commenters also provided State records of CAFO violations and discharge data for the past three years to support their position that EPA has overstated the frequency of production area overflows. These additional data may be found in the record for this final action.

IV. Impact Analysis

A. Environmental Impacts

When EPA issued the revised CAFO regulations on February 12, 2003, it estimated annual pollutant reductions

[14] EPA made a number of assumptions for its calculations because it did not have the data to establish on a national basis the costs to POTWs of fecal coliform control. Thus, EPA's assessment used the cost of advanced secondary treatment as a proxy for the cost of additional technologies (*e.g.*, filtration) that POTWs may employ to achieve high fecal coliform removals (98 percent) required by water quality standards of 200 colony forming units (CFU) per ml. This assumption may overstate the costs of such technologies, in which case the cost per trillion CFU removed would be lower.

[15] As described in the proposal, POTW influents are approximately 5 million CFU per 100 ml, and PCS data shows effluent concentrations of ~ 20 CFU per ml.

for the rule at 56 million pounds of phosphorus, 110 million pounds of nitrogen, and two billion pounds of sediment. This final, revised rule will not change these environmental benefits since the technical requirements for CAFOs that discharge are not affected and all CAFOs, whether covered by NPDES permits or not, still need to control nutrient releases from the production and land application areas in order to comply with the Clean Water Act. Under this rule, all CAFOs that do not apply for permits must be designed, constructed, operated, and maintained such that the CAFO does not discharge or propose to discharge. Therefore, as was true under the 2003 rule, all discharges from CAFOs (except precipitation-related discharges from land application areas under a CAFO's control that qualify as agricultural stormwater discharges) are required to be covered by NPDES permits. The overall magnitude of the benefits will increase compared to 2003 due to growth in the industry, but the analysis for this rule does not recalculate these effects since the increase is not due to changes in the CAFO regulations. EPA is assuming full compliance with the rule, which is standard Agency procedure when modeling impacts of a final rule.

B. Administrative Burden Impacts

Since there is no change in technical requirements, changes in impacts on respondents are due exclusively to changes in the information collection burden. To determine the administrative burden for the Paperwork Reduction Act (PRA) analysis, the Agency first examined the two key permitting changes resulting from the *Waterkeeper* decision and how they would be implemented under the final regulations. These are the change in the duty to apply for CAFOs and the change to the nutrient management plan (NMP) related provisions for CAFO permits.

The 2003 CAFO rule had a universal duty to apply requirement which required virtually all CAFOs to obtain NPDES permit coverage. The supporting analysis for the 2003 rule estimated that as a result of this requirement, approximately 15,500 CAFOs would ultimately receive NPDES permits. See the Technical Development Document for the 2003 rule, Chapter 9.

This final rule changes the duty to apply requirement so that only CAFOs that discharge or propose to discharge are required to seek NPDES coverage. To derive the number of CAFOs that could ultimately fall into this category, EPA first projected total industry size for 2008 based on both U.S. Department of Agriculture (USDA) Census of Agriculture statistics as well as Agency-based sector expertise. This exercise yielded an estimate of approximately 20,700 total CAFOs for 2008. EPA then combined the 2008 projections for each animal sector with information on standardized operational profiles to anticipate the number of facilities as of 2008 that might discharge. For example, when inclement weather precludes land application or dewatering activities, open lot type facilities such as beef lots and dairy operations are more likely to experience conditions that could result in a discharge due to the use of open on-site lagoons. Additionally, EPA assumed that all dairies generate wastewater from the production area and generally have uncovered on-site lagoons. Thus, for purposes of burden estimates, EPA assumed that all dairies and most beef feedlots would apply for permits.

Even though the industry grew to roughly 20,700 CAFOs from 2002 to 2008, the change in the duty to apply requirement is anticipated to reduce the number of facilities needing permit coverage to approximately 15,300 discharging CAFOs. Based on these updated figures, EPA estimates that approximately 25 percent of the total universe of CAFOs would not discharge and thus would not need NPDES coverage under this final rule. Although these facilities may not need to apply for permits, the administrative burden analysis performed by EPA under the PRA nonetheless accounts for the costs that unpermitted facilities will incur for the nutrient management planning that are necessary for demonstrating that the facility is land applying manure in such a way as to qualify for the agricultural stormwater exemption.

These figures may overstate the numbers of CAFOs needing NPDES permits in that the estimates of the number of discharging facilities in each sector make conservative categorical assumptions about the likelihood of a discharge based on broad operational profiles and do not account for more subtle stratifications within specific operational categories. For instance, although most dairies generate wastewater from the production area and have on-site lagoons, there do, in fact, exist dairies designed to be no discharge operations.

Based on the updated estimates of the CAFO universe, EPA's PRA analysis projects, as shown in Table 4.1, that CAFO operators and permitting authorities will collectively experience an increase in total annual administrative burden of approximately $0.5 million as a result of the EPA regulations to address the court decision. Although the PRA burden to CAFOs and permitting authorities declines as a result of the Waterkeeper court decision to limit permits only to discharging CAFOs, this burden reduction is offset by the new NMP-related requirements for permits and by the assumption, for purposes of this PRA analysis, that all unpermitted CAFOs will certify under the voluntary no discharge certification option. More specifically, CAFO operators will experience a $0.2 million reduction in net annual administrative burden. This net result is based on several offsetting changes. CAFOs that do not seek permit coverage under this final rule because they do not discharge or propose to discharge will save approximately $14 million annually in reduced permitting costs. However, even though fewer CAFOs will need to be covered by NPDES permits, permitted facilities as a group face an increase in annual administrative burden of $1.2 million per year due to the new NMP requirements.

EPA's analysis of burden impacts to CAFOs also accounts for the burden that unpermitted facilities will incur in order to be able to qualify for the agricultural stormwater exemption—a cost category that EPA estimates will result in a burden on unpermitted facilities of $12.2 million annually. In addition, EPA estimates that the voluntary certification option for unpermitted CAFOs could add $0.4 million annually to the PRA burden for CAFOs. Although certification is voluntary, EPA elected to cost the PRA burden associated with this option so as to provide a complete accounting of all rule-related impacts. As noted above, the net result of these impacts is an administrative burden savings across all CAFO operators, permitted and unpermitted, of $0.2 million annually.

Permitting authorities, on the other hand, are projected to experience a $0.7 million increase in annual administrative burden. Although the burden to issue permits declines by $4.2 million annually due to fewer facilities needing permits, this decline is more than offset by the added workload arising from the new NMP-related requirements. EPA estimates that States would face an additional PRA burden of $4.9 million annually specifically as a result of the new NMP-related requirements. In addition, States are projected to face a burden increment of up to $0.04 million annually to process the new certifications.

EPA's estimate of PRA burden impacts changed from a reduction of $14.9 million annually for the 2006 proposed rule to an increase of $0.5

million annually in the final rule. This change is due principally to the Agency's decision, as discussed earlier in this section, to amend the PRA analysis to account for the burden incurred by unpermitted CAFOs for nutrient management planning, which is necessary for any unpermitted CAFO that land applies irrespective of whether the CAFO is certified under the voluntary no discharge certification option.

The PRA burden analysis presented in this rule accounts both for growth in the industry and changes in labor rates since the 2003 rule was issued. In addition, the changes are based on annualized impacts and assume a permit term of five years as stipulated in the CWA. EPA submitted draft ICRs with the 2006 proposed rule and 2008 supplemental proposal, and did not receive any comments from the Office of Management and Budget (OMB). The documentation in the public record on the PRA analysis for this rulemaking discusses more fully the assumptions used to estimate the numbers of CAFOs needing permits and to project the associated administrative burden.

TABLE 4.1—PRA BURDEN IMPACT CHANGES

[Note: Numbers may not add due to rounding.]

			Total baseline PRA burden: based on 2003 CAFO rule requirements [1]	Total amended PRA burden: based on final rule requirements	Net change in paperwork burden (2003 rule compared to final rule)
CAFOs needing permits (2008) [2].	.....	.....	20,685	15,281	
CAFOs seeking agricultural stormwater exemption only (2008).	.....	.....	n/a	5,404	
Total CAFOs (2008)	.....	.....	20,685	20,685	
Annualized Costs [3] (in $ millions).	CAFOs	Base NPDES Permit	$54.0	$40.0	($14.0)
		New NMP Provisions	n/a	$1.2	$1.2
		Agricultural Stormwater Exemption ...	n/a	$12.2	$12.2
		Certification	n/a	$0.4	$0.4
		Total CAFO Burden	$54.0	$53.8	($0.2)
	Permitting Authorities	Base NPDES Permit	$16.5	$12.2	($4.2)
		New NMP Provisions	n/a	$4.9	$4.9
		Certification	n/a	$0.04	$0.04
		Total Permit Authority Burden	$16.5	$17.1	$0.7
	All Respondents		$70.5	$71.0	$0.5

[1] 2003 baseline impacts adjusted to reflect current labor rates and growth in facilities.
[2] Facility totals are annualized over 5 years in burden calcultions presented below to reflect CWA requirement for NPDES permit renewal every 5 years.
[3] Annualized costs represent labor, capital and O&M costs.

C. Response to Public Comment on the Proposal

The Agency received a variety of comments on the impacts analysis presented for the 2006 proposed rule and the 2008 supplemental proposal. Several commenters indicated that the Agency erred in assuming that the environmental benefits from the 2003 rule would be retained under the approach adopted in this final rule. The Agency stands by its position presented in the 2006 proposed rule, but has revised the burden analysis to reflect more fully that all unpermitted CAFOs do not discharge or propose to discharge and, therefore, must implement nutrient management practices to ensure that any discharge from the CAFO's land application area qualifies for the agricultural stormwater exemption. As a consequence, as indicated above, the annual burden reduction realized by CAFOs under the final revised rule is shown as approximately $0.2 million as opposed to the $15.4 million reduction projected for CAFOs in the 2006 proposed rule. This revised analysis also addresses specific comments suggesting that the Agency should recognize that operators without permits will continue to incur costs under the regulation in order to meet the burden of proof required to qualify for the agricultural stormwater exemption.

Other commenters indicated that the impacts analysis underestimated the costs to CAFO operators of complying with the EPA regulations. Careful review of these statements makes clear that commenters with this viewpoint either did not account for the fact that the impacts analysis presented for this rulemaking is exclusively an assessment of the paperwork burden—not the overall compliance burden—faced by CAFOs, or did not fully consider that the costs shown represent average yearly (annualized) burden rather than total paperwork-related costs for a five-year CAFO NPDES permit.

Other commenters provided specific information on nutrient management plan (NMP) development costs, which the Agency determined corroborated the original NMP cost estimates.

One State commenter claimed that the Agency had underestimated costs to permitting authorities for managing the potential public hearings precipitated by the new requirements for public notice. This commenter projected that every public notice regarding NMPs would result in a public hearing. The Agency re-examined its assumptions regarding the incidence of public hearings, but did not find information to corroborate the commenter's projection either based on past NPDES public hearing patterns or based on expectations from other States regarding the number of hearings likely to be triggered by NMP-related public notices. This assumption that public hearings would not be requested for every NMP is further confirmed by the experiences of States that currently require NMPs to be submitted as part of their permitting process.

Several commenters indicated that they believed that the Agency had also

underestimated the cost to States of processing voluntary no discharge certifications. This final rule does not require permitting authority review of no discharge certifications. See discussion of certification submission in section III.A.3(c) of this preamble. The Agency notes that the cost analysis it performed to assess the paperwork burden associated with the final rule shows a net paperwork burden reduction to States on this aspect of the rule, since the 2003 rule required permits-which are more burdensome for permitting authorities to process-from all CAFOs.

V. Cross-Media Considerations and Pathogens

A. Cross-Media Approaches

Since 2003, EPA and CAFO stakeholders have been interested in developing a framework to enable CAFOs to pursue superior environmental performance across all media. Today, some CAFOs voluntarily conduct whole-farm audits to evaluate releases of pollutants to all media through Environmental Management Systems (*e.g.*, ISO 14001 certification), self-assessment tools, EPA's performance track, and State-approved trade-offs in reducing discharges to water and emissions to air that accomplish the best overall level of protection given State and local conditions. The development of new and emerging technologies offers the potential to achieve equivalent or greater pollutant reductions relative to those achieved by the effluent guidelines and standards. Many of these are superior from a cross-media perspective, and EPA encourages superior cross-media solutions. These regulations regarding nutrient management plans may provide an opportunity for EPA to encourage cross-media approaches at CAFOs. For example, the nutrient value in the animal byproducts provides a valuable source of fertilizer for crops. However, inappropriate application can lead to preventable discharges to water and emissions to air. Optimal application technologies and rates reduce potential water quality and air quality standards violations.

The fact that EPA has multiple efforts underway relating to livestock operations under several environmental statutes underscores the need to explore how to leverage existing regulatory authorities most effectively. For example, in addition to the regulations being finalized in this rulemaking, the Agency has recently undertaken a National Air Emissions Monitoring Study. EPA also proposed a rule that would exempt animal feeding operations from certain requirements relating to reporting of air releases under hazardous waste laws.

EPA solicited comment in the 2006 proposed rule on the feasibility (including consideration of legal, technical, and implementation issues) of allowing flexibility in how facilities meet various programmatic requirements, for instance those of the Clean Air Act and the Clean Water Act (CWA), in order to achieve greater cross-media pollutant reductions. EPA received generalized support for this type of approach in the comments submitted in response. EPA will continue to explore cross-media considerations as it works together with CAFOs and stakeholders to build further experience on this issue.

As an example of the Agency's work in this area, in October 2007, EPA awarded $8 million in federal grants for providing technical assistance to livestock operators, including animal feeding operations, for the prevention of water discharges and reduction of air emissions. More recently, EPA's Agricultural Advisor announced the establishment of the Farm, Ranch, and Rural Communities Federal Advisory Committee. One of the issues the committee will focus on will be identification and development of a comprehensive environmental strategy for livestock operations. EPA anticipates that the committee will offer timely observations on the opportunities and challenges of cross-media approaches to programs for addressing environmental concerns at livestock operations as its work progresses.

B. Pathogens and Animal Feeding Operations

Although this final rule does not require any new best conventional pollutant control technology (BCT) effluent limitations specifically to control fecal coliform, EPA is continuing to assess environmental and human health concerns associated with the management of manure and wastewater at CAFOs. Pollutants most commonly associated with animal waste include nutrients (including ammonia), organic matter, solids, odorous compounds, and various pathogens. These pollutants, and others, can be released into the environment through discharge or runoff if manure and wastewater are not properly handled and managed. EPA is interested in recently initiated studies to assess potential impacts from pathogens in livestock manure, especially those which may pose unique risks such as Cryptosporidium and Giardia. These pathogens may be of concern if they make their way into drinking water sources (*e.g.*, lakes, rivers, and streams) because of their stability in the natural environment and their resistance to the most commonly used drinking water disinfection procedure (*i.e.*, chlorination). If proper treatment is not provided for these pathogens, they have the potential to cause adverse health impacts in exposed populations. While the Agency has a number of on-going efforts in these areas, research is still in its early stages. The absence of available information necessarily limits EPA's ability to act with respect to these potential concerns.

EPA's Office of Research and Development (ORD) is actively working to identify sources of Cryptosporidium. In collaboration with the Centers for Disease Control (CDC), EPA Region 3, and the Potomac River Drinking Water Source Protection Partnership (DWSPP), ORD has initiated Cryptosporidium source tracking studies of the Potomac River Watershed. The primary objective of this project is to develop and implement a monitoring program for Cryptosporidium source tracking in order to identify the most significant sources of this parasite within the watershed. Once identified, appropriate source protection efforts, where available, may be mobilized and directed to the reduction of these sources' contributions. In addition, in 2005 EPA's Science to Achieve Results (STAR) program held a solicitation for proposals entitled, ''Development and Evaluation of Innovative Approaches for the Quantitative Assessment of Pathogens in Drinking Water,'' and has funded eleven research grants from this proposal involving the development and evaluation of innovative approaches to quantitatively detect microbial pathogens in drinking water, including Cryptosporidium and Giardia. The goal of the STAR research is to improve the suite of available detection methods for known and emerging microbial drinking water contaminants. EPA expects that this research will result in methods that will, among other things, allow determination of the presence and quantities of waterborne pathogens; present a protocol for preparing and processing water samples for application of the proposed approach; and where possible, allow comparison of the performance of the new detection methods with existing approved EPA methods for specific pathogens.

ORD is also collaborating with the U.S. Department of Agriculture (USDA) in their research programs associated with Cryptosporidium. ORD scientists

participated in the USDA selection process for the National Research Initiative on Watershed Processes and Water Resources. Grants awarded under this program will explore the effects of a number of factors on Cryptosporidium mobility and contamination of waterways. These include the use of buffers and other best management practices for decreasing loadings of Cryptosporidium from land application of wastes and other soluble organic matter. EPA scientists have begun to review recently published research on Cryptosporidium and Giardia oocyst shedding. The research suggests that shedding is highest during early life stages of cattle and zoonotic forms and may greatly diminish as calves age. These factors have already led some veterinarians to recommend that farmers separate these high shedding young animals from older animals to decrease disease spread and economic losses among herds of cattle and dairy cows. The research also suggests that the separation may provide secondary environmental benefits by helping to prevent the release of Cryptosporidium into waterways. As part of their efforts to protect the New York City water supply, the New York State Department of Agriculture has recommended separation controls in their best management practice (BMP) guidance to dairy farmers. Other States, including California, are considering similar separation BMPs.

EPA's ORD will continue to collaborate and assess the impacts that these and other research efforts may have on any future CAFO management recommendations.

VI. Statutory and Executive Order Reviews

A. Executive Order 12866: Regulatory Planning and Review

Under Executive Order 12866 (58 FR 51,735; October 4, 1993), this action is a ''significant regulatory action.'' Accordingly, EPA submitted this action to the Office of Management and Budget (OMB) for review under Executive Order 12866 and any changes made in response to OMB recommendations have been documented in the docket for this action.

In addition, EPA prepared an analysis of the potential costs and benefits associated with this action. This analysis is contained in section IV of this preamble above, entitled *Impact Analysis.* A copy of the supporting analysis is available in the docket for this action.

B. Paperwork Reduction Act

The information collection requirements in this rule have been submitted for approval to the Office of Management and Budget (OMB) under the Paperwork Reduction Act, 44 U.S.C. 3501 *et seq.* The information collection requirements are not enforceable until OMB approves them. However, the Office of Management and Budget (OMB) has previously approved the information collection requirements contained in the existing regulations and has assigned OMB control number 2040–0250. The Information Collection Request (ICR) document prepared by EPA was assigned EPA ICR No. 1989.06.

The 2003 CAFO rule had a universal duty to apply requirement which required virtually all CAFOs to obtain NPDES permit coverage. This final revised rule changes the duty to apply requirement so that only CAFOs that discharge or propose to discharge must to seek NPDES coverage. EPA projects that CAFO operators and permitting authorities will collectively experience a reduction in total annual administrative burden of 25,500 hours as a result of the regulatory revisions to address the court decision. Labor burden is projected to undergo a net decrease compared to a net increase in administrative costs of $0.5 million annually as discussed in Chapter IV. This difference arises from the fact that the PRA analysis performed for the final rule converts labor hour burden to labor costs using a higher wage rate for State permitting authorities than for CAFO operators.[16] The higher wage rate for State permitting authorities causes the State labor cost increase to be large enough to offset the labor cost reduction experienced by CAFO operators once labor hours are converted to dollars in the PRA analysis of annual administrative impacts.

More specifically, the estimated reduction in total annual administrative burden of 25,500 hours is based on a projected decrease in labor burden to CAFO operators of approximately 54,100 hours annually and a projected increase in labor burden to State permitting authorities of approximately 28,600 hours annually. For CAFOs, much of the labor burden decrease derives from the smaller number of facilities that will need permits, which results in an annual burden decrease of more than 703,000 labor hours. This burden reduction for CAFOs is offset by a concomitant increase of 603,200 labor hours annually at unpermitted facilities for activities necessary to meet the agricultural stormwater exemption, along with an increment of 33,100 hours annually for permitted facilities to undertake the NMP-related activities and 12,600 hours annually for those CAFOs who elect to pursue the voluntary certification option.

The annual labor burden increase for State permitting authorities of 28,600 hours includes an estimated annual reduction in labor burden of 93,000 hours due to the need to process fewer permits. However, for State permitting authorities this burden reduction is more than offset by an increment in annual labor burden of 120,700 hours to address the new NMP-related requirements combined with a relatively minor annual burden increase of 900 hours to handle the voluntary certifications.

Additional details on the assumptions and parameters of the PRA analysis are available in the ICR document referenced above, which is available in the docket supporting this final rulemaking. Burden is defined at 5 CFR 1320.3(b).

An agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for EPA's regulations in 40 CFR are listed in 40 CFR part 9.

This final rule responds to OMB or public comments on the information collection requirements as discussed in the *Impact Analysis* (section IV) in this preamble.

C. Regulatory Flexibility Act

The Regulatory Flexibility Act (RFA) generally requires an agency to prepare a regulatory flexibility analysis of any rule subject to notice and comment rulemaking requirements under the Administrative Procedure Act or any other statute unless the agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. Small entities include small businesses, small organizations, and small governmental jurisdictions.

For purposes of assessing the impacts of this rule on small entities, small entity is defined as: (1) A small business based on Small Business Administration (SBA) size standards at 13 CFR 121.201; (2) a small governmental jurisdiction that is a government of a city, county, town, school district, or special district with a population of less than 50,000; and (3) a small organization that is any

[16] Wage rates for the PRA analysis supporting this rulemaking were drawn from recent reports filed by the U.S. Department of Labor, Bureau of Labor Statistics. For further information please refer to the ICR prepared by EPA for the rulemaking, available in the record as EPA ICR No. 1989.06.

not-for-profit enterprise which is independently owned and operated and is not dominant in its field.

After considering the economic impacts of this rule on small entities, I certify that this action will not have a significant adverse economic impact on a substantial number of small entities. This final rule does not change the substantive requirements for CAFO operators or increase the net paperwork burden faced by facilities compared to the burden imposed under the 2003 CAFO rule. Some CAFOs will face increased permitting costs due to the new NMP provisions, while others will face reduced costs due to the changes in the duty to apply. However, these paperwork cost changes are generally small and do not rise to the level of a significant adverse economic impact on a substantial number of operators. Additionally, this rule would not affect small governments as the permitting authorities are State or federal agencies.

D. Unfunded Mandates Reform Act

Title II of the Unfunded Mandates Reform Act of 1995 (UMRA), Public Law 104–4, establishes requirements for federal agencies to assess the effects of their regulatory actions on State, local, and tribal governments and the private sector. Under section 202 of UMRA, EPA generally must prepare a written statement, including a cost-benefit analysis, for proposed and final rules with ''federal mandates'' that may result in expenditures to State, local, and tribal governments, in the aggregate, or to the private sector, of $100 million or more in any one year. Before promulgating an EPA rule for which a written statement is needed, section 205 of the UMRA generally requires EPA to identify and consider a reasonable number of regulatory alternatives and adopt the least costly, most cost-effective, or least burdensome alternative that achieves the objectives of the rule. The provisions of section 205 do not apply when they are inconsistent with applicable law. Moreover, section 205 allows EPA to adopt an alternative other than the least costly, most cost-effective, or least burdensome alternative if the Administrator publishes with the final rule an explanation why that alternative was not adopted. Before EPA establishes any regulatory requirements that may significantly or uniquely affect small governments, including tribal governments, it must have developed under section 203 of the UMRA a small government agency plan. The plan must provide for notifying potentially affected small governments, enabling officials of affected small governments to have meaningful and timely input in the development of EPA regulatory proposals with significant federal intergovernmental mandates, and informing, educating, and advising small governments on compliance with the regulatory requirements.

EPA has determined that this rule does not contain a federal mandate that may result in expenditures of $100 million or more for State, local, and tribal governments, in the aggregate, or the private sector in any one year. The revised administrative burden EPA calculated for the final rule constitutes a reduction of roughly 25,500 labor hours annually compared to the administrative burden estimated for the 2003 CAFO rule. This burden reduction reflects a decrease in annual labor burden of 54,100 hours for CAFO operators and an annual labor burden increase to State permitting authorities of 28,600 hours. In addition, this rulemaking is in response to a federal court decision and is necessary to assure compliance with applicable law. Thus, this rule is not subject to the requirements of sections 202 and 205 of the UMRA.

EPA has determined that this rule contains no regulatory requirements that might significantly or uniquely affect small governments. There are no local or Tribal governments authorized to implement the NPDES permit program and the Agency is unaware of any local or Tribal governments who are owners or operators of CAFOs. Thus this rule is not subject to the requirements of section 203 of UMRA.

E. Executive Order 13132: Federalism

Executive Order 13132, entitled ''Federalism'' (64 FR 43,255; August 10, 1999), requires EPA to develop an accountable process to ensure ''meaningful and timely input by State and local officials in the development of regulatory policies that have federalism implications.'' ''Policies that have federalism implications'' is defined in the Executive Order to include regulations that have ''substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.''

This final rule does not have federalism implications. It will not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government, as specified in Executive Order 13132. EPA estimates that the average annual impact on all authorized States together is a cost increase of $0.7 million. EPA does not consider an annual impact of this magnitude on States to be a substantial effect. In addition, EPA does not expect this rule to have any impact on local governments. EPA also considered flexibility as an important factor when developing this regulation.

Further, the revised regulations will not alter the basic State-federal scheme established in the CWA under which EPA authorizes States to carry out the NPDES permitting program. EPA expects the revised regulations to have little effect on the relationship between, or the distribution of power and responsibilities among, the federal and State governments. Thus, Executive Order 13132 does not apply to this rule.

In the spirit of Executive Order 13132, and consistent with EPA policy to promote communications between EPA and State and local governments, EPA specifically solicited comment on the proposed rule from State and local officials. In addition, through a variety of meetings with State associations during the rulemaking process, States have been informed about the issues related to addressing the court's decisions. States provided input during these meetings. State concerns generally focused on the process for incorporating NMPs into permits and the related public review process, and also on guidance related to what constitutes a discharge from a CAFO given that the proposed rule would have required only those operations that discharge or propose to discharge to apply for a permit. These concerns have been addressed in such a way as to provide flexibility and accountability in the new permit application requirements and review processes promulgated in this rule.

F. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments

Executive Order 13175, entitled, ''Consultation and Coordination with Indian Tribal Governments'' (65 FR 67,249; November 9, 2000), requires EPA to develop an accountable process to ensure ''meaningful and timely input by tribal officials in the development of regulatory policies that have tribal implications.''

This rule does not have tribal implications. There are currently no tribal governments authorized for the NPDES program. This rulemaking provides increased opportunity for the public and tribal governments to comment on specific CAFOs' applications for permit coverage. It will not have substantial direct effects on

tribal governments, on the relationship between the federal government and Indian tribes, or on the distribution of power and responsibilities between the federal government and Indian tribes, as specified in Executive Order 13175. Thus, Executive Order 13175 does not apply to this rule.

In the spirit of Executive Order 13175, and consistent with EPA policy to promote communications between EPA and tribal governments, EPA specifically solicited comment on the proposed rule from tribal officials.

G. Executive Order 13045: Protection of Children From Environmental Health and Safety Risks

Executive Order 13045 ''Protection of Children from Environmental Health Risks and Safety Risks'' (62 FR 19,885; April 23, 1997) applies to any rule that: (1) Is determined to be ''economically significant'' as defined under Executive Order 12866, and (2) concerns an environmental health or safety risk that EPA has reason to believe may have a disproportionate effect on children. If the regulatory action meets both criteria, the Agency must evaluate the environmental health or safety effects of the planned rule on children, and explain why the planned regulation is preferable to other potentially effective and reasonably feasible alternatives considered by the Agency.

This final rule is not subject to Executive Order 13045 because it is not economically significant as defined in Executive Order 12866, and because the Agency does not have reason to believe the environmental health or safety risks addressed by this action present a disproportionate risk to children. The benefits analysis performed for the 2003 CAFO rule determined that the rule would result in certain significant benefits to children's health. (Please refer to the *Benefits Analysis* in the record for the 2003 CAFO final rule.) This action does not affect the environmental benefits of the 2003 CAFO rule.

H. Executive Order 13211: Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use

This rule is not a ''significant energy action'' as defined in Executive Order 13211, ''Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use'' (66 FR 28,355; May 22, 2001) because it is not likely to have a significant adverse effect on the supply, distribution, or use of energy. EPA has concluded that this rule is not likely to have any adverse energy effects since CAFOs in general do not figure significantly in the energy market, and the regulatory revisions finalized in this rule are not likely to change existing energy generation or consumption profiles for CAFOs.

I. National Technology Transfer and Advancement Act

Section 12(d) of the National Technology Transfer and Advancement Act of 1995 (''NTTAA''), Public Law 104–113, 12(d) (15 U.S.C. 272 note) directs EPA to use voluntary consensus standards in its regulatory activities unless to do so would be inconsistent with applicable law or otherwise impractical. Voluntary consensus standards are technical standards (e.g., materials specifications, test methods, sampling procedures, and business practices) that are developed or adopted by voluntary consensus standards bodies. The NTTAA directs EPA to provide Congress, through OMB, explanations when the Agency decides not to use available and applicable voluntary consensus standards.

This final rule does not change the technical requirements for land application from those of the 2003 rule. Production area requirements are the same for existing sources and for new sources as in the 2003 rule. The no discharge production area requirements for new sources in this rulemaking, however, now include an option for complying with the requirement through the development of site-specific design, operation and maintenance permit conditions that will ensure no discharge from the site. However, the specific no discharge conditions applicable to a specific operator choosing this option for compliance will be determined by the permitting authority on a site-specific BPJ basis. EPA encourages the use by permitting authorities of voluntary consensus standards, such as those that may be developed by USDA, in establishing the site-specific technical requirements in CAFO permits when the permittee demonstrates that these standards are consistent with the achievement of no discharge from a specific CAFO.

This rule for new source requires that CAFOs complying with the no discharge requirement through the development of site-specific design, maintenance and operation standards must use prescribed technical standards in demonstrating that a specific CAFO's design, operation and maintenance will be consistent with no discharge from its production area. (In certain circumstances, a CAFO may use either equivalent evaluation and simulation procedures or technical standards developed for a class of specific facilities within a specified geographical area if approved by its permitting authority), EPA has not required the use of any particular voluntary consensus standards in this rule. The use, however, of voluntary consensus standards such as those that may be developed by USDA for the required demonstration that site-specific design, maintenance and operational requirements for CAFOs to comply with the no discharge standard is encouraged. The decisions as to what specific best management practices and technologies must be applied at individual animal feeding operations are left to the State or EPA in the exercise of their NPDES authority.

J. Congressional Review Act

The Congressional Review Act, 5 U.S.C. 801 *et seq.*, as added by the Small Business Regulatory Enforcement Fairness Act of 1996, generally provides that before a rule may take effect, the agency promulgating the rule must submit a rule report, which includes a copy of the rule, to each House of the Congress and to the Comptroller General of the United States. EPA will submit a report containing this rule and other required information to the U.S. Senate, the U.S. House of Representatives, and the Comptroller General of the United States prior to publication of the rule in the **Federal Register**. A major rule cannot take effect until 60 days after it is published in the **Federal Register**. This action is not a ''major rule'' as defined by 5 U.S.C. 804(2). This rule will become effective December 22, 2008.

BILLING CODE 6560–50–P

APPENDIX TO PREAMBLE – FORM 2B
NPDES Application Form for Concentrated Animal Feeding Operations (and Concentrated Aquatic Animal Production Facilities)

EPA I.D. NUMBER (*copy from Item 1 of Form 1*)

OMB Control No. 2040-0250
Approval expires *xx/xx/xx*

FORM 2B NPDES

EPA U.S. ENVIRONMENTAL PROTECTION AGENCY
APPLICATIONS FOR PERMIT TO DISCHARGE WASTEWATER
CONCENTRATED ANIMAL FEEDING OPERATIONS AND AQUATIC ANIMAL PRODUCTION FACILITIES

I. GENERAL INFORMATION Applying for: Individual Permit ☐ Coverage Under General Permit ☐

A. TYPE OF BUSINESS	B. CONTACT INFORMATION	C. FACILITY OPERATION STATUS
❑ 1. Concentrated Animal Feeding Operation (complete items B, C, D, and section II) ❑ 2. Concentrated Aquatic Animal Production Facility (complete items B, C, and section III)	Owner/or Operator Name: ..... Telephone: (.....) ..... Address: ..... Facsimile: (.....) ..... City: ..... State: ..... Zip Code:	❑ 1. Existing Facility ❑ 2. Proposed Facility

D. FACILITY INFORMATION

Name: ..... Telephone: (.....) .....
Address: ..... Facsimile: (.....) .....
City: ..... State: ..... Zip Code: .....
County: ..... Latitude: ..... Longitude: .....

If contract operation: Name of Integrator: .....
Address of Integrator: .....

II. CONCENTRATED ANIMAL FEEDING OPERATION CHARACTERISTICS

A. TYPE AND NUMBER OF ANIMALS

1. TYPE	2. ANIMALS	
	NO. IN OPEN CONFINEMENT	NO. HOUSED UNDER ROOF
❑ Mature Dairy Cows		
❑ Dairy Heifers		
❑ Veal Calves		
❑ Cattle (not dairy or veal calves)		
❑ Swine (55 lbs. or over)		

B. Manure, Litter, and/or Wastewater Production and Use

1. How much manure, litter, and wastewater is generated annually by the facility? .....tons ..... gallons

2. If land applied how many acres of land under the control of the applicant are available for applying the CAFOs manure/litter/wastewater? .....acres

3. How many tons of manure or litter, or gallons of wastewater produced by the CAFO will be transferred annually to other persons? ..... tons/gallons (*circle one*)

❑ Swine (under 55 lbs.)			
❑ Horses			
❑ Sheep or Lambs			
❑ Turkeys			
❑ Chickens (Broilers)			
❑ Chickens (Layers)			
❑ Ducks			
❑ Other Specify.....			
3. TOTAL ANIMALS			

C. ❑ TOPOGRAPHIC MAP

D. TYPE OF CONTAINMENT, STORAGE AND CAPACITY

1. Type of Containment	Total Capacity (in gallons)	
❑ Lagoon		
❑ Holding Pond		
❑ Evaporation Pond		
❑ Other: Specify		

2. Report the total number of acres contributing drainage: ..... acres

3. Type of Storage	Total Number of Days	Total Capacity (gallons/tons)	
❑ Anaerobic Lagoon			
❑ Storage Lagoon			
❑ Evaporation Pond			
❑ Aboveground Storage Tanks			
❑ Belowground Storage Tanks			
❑ Roofed Storage Shed			
❑ Concrete Pad			
❑ Impervious Soil Pad			
❑ Other: Specify			

E. NUTRIENT MANAGEMENT PLAN

Note: Effective February 27, 2009, a permit application is not complete until a nutrient management plan is submitted to the Permitting Authority.

1. Please indicate whether a nutrient management plan has been included with this permit application. ☐ Yes ☐ No

2. If no, please explain:

_____

_____

3. Is a nutrient management plan being implemented for the facility? ☐ Yes ☐ No

4. The date of the last review or revision of the nutrient management plan. Date: .....

5. If not land applying, describe alternative use(s) of manure, litter, and or wastewater:

_____

_____

F. LAND APPLICATION BEST MANAGEMENT PRACTICES

Please check any of the following best management practices that are being implemented at the facility to control runoff and protect water quality:

❑ Buffers ❑ Setbacks ❑ Conservation tillage ❑ Constructed wetlands ❑ Infiltration field ❑ Grass filter ❑ Terrace

III. CONCENTRATED AQUATIC ANIMAL PRODUCTION FACILITY CHARACTERISTICS

A. For each outfall give the maximum daily flow, maximum 30-day flow, and the long-term average flow.

B. Indicate the total number of ponds, raceways, and similar structures in your facility.

1. Outfall No.	2. Flow (*gallons per day*)			1. Ponds	2. Raceways	3. Other
	a. Maximum. Daily	b. Maximum 30 Day	c. Long Term Average	C. Provide the name of the receiving water and the source of water		
				1. Receiving Water	2. Water Source	

D. List the species of fish or aquatic animals held and fed at your facility. For each species, give the total weight produced by your facility per year in pounds of harvestable weight, and also give the maximum weight present at any one time.

1. Cold Water Species			2. Warm Water Species		
a. Species	b. Harvestable Weight (*pounds*)		a. Species	b. Harvestable Weight (*pounds*)	
	(1) Total Yearly	(2) Maximum		(1) Total Yearly	(2) Maximum

E. Report the total pounds of food during the calendar month of maximum feeding.	1. Month	2. Pounds of Food

IV. CERTIFICATION .....

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. Name and Official Title (*print or type*)	B. Phone No. ( )
C. Signature	D. Date Signed

EPA Form 3510-2B (08-08)

INSTRUCTIONS

GENERAL

This form must be completed by all applicants who check "yes" to Item II-B in Form 1. Not all animal feeding operations or fish farms are required to obtain NPDES permits. Exclusions are based on size and whether or not the facility discharges proposed to discharge. *See* the description of these exclusions in the CAFO regulations at 40 CFR 122.23.

For aquatic animal production facilities, the size cutoffs are based on whether the species are warm water or cold water, on the production weight per year in harvestable pounds, and on the amount of feeding in pounds of food (*for cold water species*). Also, facilities which discharge less than 30 days per year, or only during periods of excess runoff (*for warm water fish*) are not required to have a permit.

Refer to the Form 1 instructions to determine where to file this form.

Item I-A

See the note above to be sure that your facility is a "concentrated animal feeding operation" (CAFO).

Item I-B

Use this space to give owner/operator contact information.

Item I-C

Check "proposed" if your facility is not now in operation or is expanding to meet the definition of a CAFO in accordance with the CAFO regulations at 40 CFR 122.23.

Item I-D

Use this space to give a complete legal description of your facility's location including name, address, and latitude/longitude. Also, if a contract grower, the name and address of the integrator.

Item II

Supply all information in item II if you checked (1) in item I-A.

Item II-A

Give the maximum number of each type of animal in open confinement or housed under roof (either partially or totally) which are held at your facility for a total of 45 days or more in any 12 month period. Provide the total number of animals confined at the facility.

Item II-B

Provide the total amount of manure, litter, and wastewater generated annually by the facility. Identify if manure, litter, and wastewater generated by the facility is to be land applied and the number of acres, under the control of the CAFO operator, suitable for land application. If the answer to question 3 is yes, provide the estimated annual quantity of manure, litter, and wastewater that the applicant plans to transfer off-site.

Item II-C

Check this box if you have submitted a topographic map of the entire operation, including the production area and land under the operational control of the CAFO operator where manure, litter, and/or wastewater are applied with Form 1.

Item II-D

1. Provide information on the type of containment and the capacity of the containment structure (s).
2. The number of acres that are drained and collected in the containment structure (s).
3. Identify the type of storage for the manure, litter, and/or wastewater. Give the capacity of this storage in days.

Item II-E

Provide information concerning the status of submitting a nutrient management plan for the facility to complete the application. In those cases where the nutrient management plan has not been submitted, provide an explanation. If not land applying, describe the alternative uses of the manure, litter, and wastewater (*e.g.*, composting, pelletizing, energy generation, etc.).

Item II-F

Check any of the identified conservation practices that are being implemented at the facility to control runoff and protect water quality.

Item III

Supply all information in Item III if you checked (2) in Item I-A.

Item III-A

Outfalls should be numbered to correspond with the map submitted in Item XI of Form 1. Values given for flow should be representative of your normal operation. The maximum daily flow is the maximum measured flow occurring over a calendar day. The maximum 30-day flow is the average of measured daily flow over the calendar month of highest flow. The long-term average flow is the average of measure daily flows over a calendar year.

Item III-B

Give the total number of discrete ponds or raceways in your facility. Under "other," give a descriptive name of any structure which is not a pond or a raceway but which results in discharge to waters of the United States.

Item III-C

Use names for receiving water and source of water which correspond to the map submitted in Item XI of Form 1.

Item III-D

The names of fish species should be proper, common, or scientific names as given in special Publication No. 6 of the American Fisheries Society. "A List of Common and Scientific Names of Fishes from the United States and Canada." The values given for total weight produced by your facility per year and the maximum weight present at any one time should be representative of your normal operation.

Item III-E

The value given for maximum monthly pounds of food should be representative of your normal operation.

Item IV

The Clean Water Act provides for severe penalties for submitting false information on this application form.

Section 309(C)(2) of the Clean Water Act provides that "Any person who knowingly makes any false statement, representation, or certification in any application..shall upon conviction, be punished by a fine of no more than $10,000 or by imprisonment for not more than six months, or both."

	Federal regulations require the certification to be signed as follows: A. For corporation, by a principal executive officer of at least the level of vice president. B. For a partnership or sole proprietorship, by a general partner or the proprietor, respectively; or C. For a municipality, State, federal, or other public facility, by either a principal executive officer or ranking elected official. **Paper Reduction Act Notice** **The public reporting and recordkeeping burden for this collection of information is estimated to average 9.5 hours per response. The public reporting and recordkeeping burden for development of the nutrient management plan to be submitted with the form is estimated to average 58 hours per response. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Include the OMB control number in any correspondence. Do not send the completed form to this address.**

BILLING CODE 6560–50–C

List of Subjects

40 CFR Part 9

Environmental protection, Reporting and recordkeeping requirements.

40 CFR Part 122

Administrative practice and procedure, confidential business information, hazardous substances, reporting and recordkeeping requirements, water pollution control.

40 CFR Part 412

Environmental protection, feedlots, livestock, waste treatment and disposal, water pollution control.

Dated: October 31, 2008.

Stephen L. Johnson,

Administrator.

■ For the reasons set out in the preamble, chapter I of Title 40 of the Code of Federal Regulations is to be amended as follows:

PART 9—OMB APPROVALS UNDER THE PAPERWORK REDUCTION ACT

■ 1. The authority citation for part 9 continues to read as follows:

Authority: 7 U.S.C. 135 *et seq.*, 136–136y; 15 U.S.C. 2001, 2003, 2005, 2006, 2601–2671; 21 U.S.C. 331j, 346a, 348; 31 U.S.C. 9701; 33 U.S.C. 1251 *et seq.*, 1311, 1313d, 1314, 1318, 1321, 1326, 1330, 1342, 1344, 1345(d) and (e), 1361; Executive Order 11735, 38 FR 21243, 3 CFR, 1971–1975 Comp. p. 973; 42 U.S.C. 241, 242b, 243, 246, 300f, 300g–1, 300g–2, 300g–3, 300g–4, 300g–5, 300g–6, 300j–1, 300j–2, 300j–3, 300j–4, 300j–9, 1857 *et seq.*, 6901–6992k, 7401–7671q, 7542, 9601–9657, 11023, 11048.

■ 2. In § 9.1 the table is amended by adding entries in numerical order under the indicated heading to read as follows:

§ 9.1 OMB approvals under the Paperwork Reduction Act.

* * * * *

40 CFR citation	OMB control No.
* * * * *	
EPA Administered Permit Programs: The National Pollutant Discharge Elimination System	
* * * * *	
122.21(i)	2040–0250
* * * * *	
122.23 (d), (e), (h)	2040–0250
* * * * *	

PART 122—EPA ADMINISTERED PERMIT PROGRAMS: THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

■ 3. The authority citation for part 122 continues to read as follows:

Authority: The Clean Water Act, 33 U.S.C. 1251 *et seq.*

■ 4. Section 122.21 is amended by revising the last sentence in paragraph (a)(1), and revising paragraph (i)(1)(x), to read as follows:

§ 122.21 Application for a permit (applicable to State programs, see § 123.25).

(a) * * *

(1) * * * The requirements for concentrated animal feeding operations are described in § 122.23(d).

* * * * *

(i) * * *

(1) * * *

(x) A nutrient management plan that at a minimum satisfies the requirements specified in § 122.42(e), including, for all CAFOs subject to 40 CFR part 412, subpart C or subpart D, the requirements of 40 CFR 412.4(c), as applicable.

* * * * *

■ 5. Section 122.23 is amended as follows:

■ a. By revising paragraph (a).

■ b. By revising paragraphs (d)(1) and (d)(2).

■ c. By adding paragraphs (e)(1) and (e)(2).

■ d. By revising paragraph (f).

■ e. By revising paragraph (g).

■ f. By revising paragraph (h).

■ g. By adding paragraph (i).

■ h. By adding paragraph (j).

§ 122.23 Concentrated animal feeding operations (applicable to State NPDES programs, see § 123.25).

(a) *Scope.* Concentrated animal feeding operations (CAFOs), as defined in paragraph (b) of this section or designated in accordance with paragraph (c) of this section, are point sources, subject to NPDES permitting requirements as provided in this section. Once an animal feeding operation is defined as a CAFO for at least one type of animal, the NPDES requirements for CAFOs apply with respect to all animals in confinement at the operation and all manure, litter, and process wastewater generated by those animals or the production of those animals, regardless of the type of animal.

* * * * *

(d) * * *

(1) *Permit Requirement.* The owner or operator of a CAFO must seek coverage under an NPDES permit if the CAFO discharges or proposes to discharge. A

CAFO proposes to discharge if it is designed, constructed, operated, or maintained such that a discharge will occur. Specifically, the CAFO owner or operator must either apply for an individual NPDES permit or submit a notice of intent for coverage under an NPDES general permit. If the Director has not made a general permit available to the CAFO, the CAFO owner or operator must submit an application for an individual permit to the Director.

(2) *Information to submit with permit application or notice of intent.* An application for an individual permit must include the information specified in § 122.21. A notice of intent for a general permit must include the information specified in §§ 122.21 and 122.28.

* * * * *

(e) * * *

(1) For unpermitted Large CAFOs, a precipitation-related discharge of manure, litter, or process wastewater from land areas under the control of a CAFO shall be considered an agricultural stormwater discharge only where the manure, litter, or process wastewater has been land applied in accordance with site-specific nutrient management practices that ensure appropriate agricultural utilization of the nutrients in the manure, litter, or process wastewater, as specified in § 122.42(e)(1)(vi) through (ix).

(2) Unpermitted Large CAFOs must maintain documentation specified in § 122.42(e)(1)(ix) either on site or at a nearby office, or otherwise make such documentation readily available to the Director or Regional Administrator upon request.

(f) When must the owner or operator of a CAFO seek coverage under an NPDES permit? Any CAFO that is required to seek permit coverage under paragraph (d)(1) of this section must seek coverage when the CAFO proposes to discharge, unless a later deadline is specified below.

(1) *Operations defined as CAFOs prior to April 14, 2003.* For operations defined as CAFOs under regulations that were in effect prior to April 14, 2003, the owner or operator must have or seek to obtain coverage under an NPDES permit as of April 14, 2003, and comply with all applicable NPDES requirements, including the duty to maintain permit coverage in accordance with paragraph (g) of this section.

(2) *Operations defined as CAFOs as of April 14, 2003, that were not defined as CAFOs prior to that date.* For all operations defined as CAFOs as of April 14, 2003, that were not defined as CAFOs prior to that date, the owner or operator of the CAFO must seek to obtain coverage under an NPDES permit by February 27, 2009.

(3) *Operations that become defined as CAFOs after April 14, 2003, but which are not new sources.* For a newly constructed CAFO and for an AFO that makes changes to its operations that result in its becoming defined as a CAFO for the first time after April 14, 2003, but is not a new source, the owner or operator must seek to obtain coverage under an NPDES permit, as follows:

(i) For newly constructed operations not subject to effluent limitations guidelines, 180 days prior to the time CAFO commences operation;

(ii) For other operations (*e.g.*, resulting from an increase in the number of animals), as soon as possible, but no later than 90 days after becoming defined as a CAFO; or

(iii) If an operational change that makes the operation a CAFO would not have made it a CAFO prior to April 14, 2003, the operation has until February 27, 2009, or 90 days after becoming defined as a CAFO, whichever is later.

(4) *New sources.* The owner or operator of a new source must seek to obtain coverage under a permit at least 180 days prior to the time that the CAFO commences operation.

(5) *Operations that are designated as CAFOs.* For operations designated as a CAFO in accordance with paragraph (c) of this section, the owner or operator must seek to obtain coverage under a permit no later than 90 days after receiving notice of the designation.

(g) *Duty to Maintain Permit Coverage.* No later than 180 days before the expiration of the permit, or as provided by the Director, any permitted CAFO must submit an application to renew its permit, in accordance with § 122.21(d), unless the CAFO will not discharge or propose to discharge upon expiration of the permit.

(h) *Procedures for CAFOs seeking coverage under a general permit.* (1) CAFO owners or operators must submit a notice of intent when seeking authorization to discharge under a general permit in accordance with § 122.28(b). The Director must review notices of intent submitted by CAFO owners or operators to ensure that the notice of intent includes the information required by § 122.21(i)(1), including a nutrient management plan that meets the requirements of § 122.42(e) and applicable effluent limitations and standards, including those specified in 40 CFR part 412. When additional information is necessary to complete the notice of intent or clarify, modify, or supplement previously submitted material, the Director may request such information from the owner or operator. If the Director makes a preliminary determination that the notice of intent meets the requirements of §§ 122.21(i)(1) and 122.42(e), the Director must notify the public of the Director's proposal to grant coverage under the permit to the CAFO and make available for public review and comment the notice of intent submitted by the CAFO, including the CAFO's nutrient management plan, and the draft terms of the nutrient management plan to be incorporated into the permit. The process for submitting public comments and hearing requests, and the hearing process if a request for a hearing is granted, must follow the procedures applicable to draft permits set forth in 40 CFR 124.11 through 124.13. The Director may establish, either by regulation or in the general permit, an appropriate period of time for the public to comment and request a hearing that differs from the time period specified in 40 CFR 124.10. The Director must respond to significant comments received during the comment period, as provided in 40 CFR 124.17, and, if necessary, require the CAFO owner or operator to revise the nutrient management plan in order to be granted permit coverage. When the Director authorizes coverage for the CAFO owner or operator under the general permit, the terms of the nutrient management plan shall become incorporated as terms and conditions of the permit for the CAFO. The Director shall notify the CAFO owner or operator and inform the public that coverage has been authorized and of the terms of the nutrient management plan incorporated as terms and conditions of the permit applicable to the CAFO.

(2) *For EPA-issued permits only.* The Regional Administrator shall notify each person who has submitted written comments on the proposal to grant coverage and the draft terms of the nutrient management plan or requested notice of the final permit decision. Such notification shall include notice that coverage has been authorized and of the terms of the nutrient management plan incorporated as terms and conditions of the permit applicable to the CAFO.

(3) Nothing in this paragraph (h) shall affect the authority of the Director to require an individual permit under § 122.28(b)(3).

(i) *No Discharge Certification Option.* (1) The owner or operator of a CAFO that meets the eligibility criteria in paragraph (i)(2) of this section may certify to the Director that the CAFO does not discharge or propose to discharge. A CAFO owner or operator who certifies that the CAFO does not

discharge or propose to discharge is not required to seek coverage under an NPDES permit pursuant to paragraph (d)(1) of this section, provided that the CAFO is designed, constructed, operated, and maintained in accordance with the requirements of paragraphs (i)(2) and (3) of this section, and subject to the limitations in paragraph (i)(4) of this section.

(2) Eligibility Criteria. In order to certify that a CAFO does not discharge or propose to discharge, the owner or operator of a CAFO must document, based on an objective assessment of the conditions at the CAFO, that the CAFO is designed, constructed, operated, and maintained in a manner such that the CAFO will not discharge, as follows:

(i) The CAFO's production area is designed, constructed, operated, and maintained so as not to discharge. The CAFO must maintain documentation that demonstrates that:

(A) Any open manure storage structures are designed, constructed, operated, and maintained to achieve no discharge based on a technical evaluation in accordance with the elements of the technical evaluation set forth in 40 CFR 412.46(a)(1)(i) through (viii);

(B) Any part of the CAFO's production area that is not addressed by paragraph (i)(2)(i)(A) of this section is designed, constructed, operated, and maintained such that there will be no discharge of manure, litter, or process wastewater; and

(C) The CAFO implements the additional measures set forth in 40 CFR 412.37(a) and (b);

(ii) The CAFO has developed and is implementing an up-to-date nutrient management plan to ensure no discharge from the CAFO, including from all land application areas under the control of the CAFO, that addresses, at a minimum, the following:

(A) The elements of § 122.42(e)(1)(i) through (ix) and 40 CFR 412.37(c); and

(B) All site-specific operation and maintenance practices necessary to ensure no discharge, including any practices or conditions established by a technical evaluation pursuant to paragraph (i)(2)(i)(A) of this section; and

(iii) The CAFO must maintain documentation required by this paragraph either on site or at a nearby office, or otherwise make such documentation readily available to the Director or Regional Administrator upon request.

(3) Submission to the Director. In order to certify that a CAFO does not discharge or propose to discharge, the CAFO owner or operator must complete and submit to the Director, by certified mail or equivalent method of documentation, a certification that includes, at a minimum, the following information:

(i) The legal name, address and phone number of the CAFO owner or operator (see § 122.21(b));

(ii) The CAFO name and address, the county name and the latitude and longitude where the CAFO is located;

(iii) A statement that describes the basis for the CAFO's certification that it satisfies the eligibility requirements identified in paragraph (i)(2) of this section; and

(iv) The following certification statement: ''I certify under penalty of law that I am the owner or operator of a concentrated animal feeding operation (CAFO), identified as [Name of CAFO], and that said CAFO meets the requirements of 40 CFR 122.23(i). I have read and understand the eligibility requirements of 40 CFR 122.23(i)(2) for certifying that a CAFO does not discharge or propose to discharge and further certify that this CAFO satisfies the eligibility requirements. As part of this certification, I am including the information required by 40 CFR 122.23(i)(3). I also understand the conditions set forth in 40 CFR 122.23(i)(4), (5) and (6) regarding loss and withdrawal of certification. I certify under penalty of law that this document and all other documents required for this certification were prepared under my direction or supervision and that qualified personnel properly gathered and evaluated the information submitted. Based upon my inquiry of the person or persons directly involved in gathering and evaluating the information, the information submitted is to the best of my knowledge and belief true, accurate and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.''; and

(v) The certification must be signed in accordance with the signatory requirements of 40 CFR 122.22.

(4) Term of Certification. A certification that meets the requirements of paragraphs (i)(2) and (i)(3) of this section shall become effective on the date it is submitted, unless the Director establishes an effective date of up to 30 days after the date of submission. Certification will remain in effect for five years or until the certification is no longer valid or is withdrawn, whichever occurs first. A certification is no longer valid when a discharge has occurred or when the CAFO ceases to meet the eligibility criteria in paragraph (i)(2) of this section.

(5) Withdrawal of Certification. (i) At any time, a CAFO may withdraw its certification by notifying the Director by certified mail or equivalent method of documentation. A certification is withdrawn on the date the notification is submitted to the Director. The CAFO does not need to specify any reason for the withdrawal in its notification to the Director.

(ii) If a certification becomes invalid in accordance with paragraph (i)(4) of this section, the CAFO must withdraw its certification within three days of the date on which the CAFO becomes aware that the certification is invalid. Once a CAFO's certification is no longer valid, the CAFO is subject to the requirement in paragraph (d)(1) of this section to seek permit coverage if it discharges or proposes to discharge.

(6) Recertification. A previously certified CAFO that does not discharge or propose to discharge may recertify in accordance with paragraph (i) of this section, except that where the CAFO has discharged, the CAFO may only recertify if the following additional conditions are met:

(i) The CAFO had a valid certification at the time of the discharge;

(ii) The owner or operator satisfies the eligibility criteria of paragraph (i)(2) of this section, including any necessary modifications to the CAFO's design, construction, operation, and/or maintenance to permanently address the cause of the discharge and ensure that no discharge from this cause occurs in the future;

(iii) The CAFO has not previously recertified after a discharge from the same cause;

(iv) The owner or operator submits to the Director for review the following documentation: a description of the discharge, including the date, time, cause, duration, and approximate volume of the discharge, and a detailed explanation of the steps taken by the CAFO to permanently address the cause of the discharge in addition to submitting a certification in accordance with paragraph (i)(3) of this section; and

(v) Notwithstanding paragraph (i)(4) of this section, a recertification that meets the requirements of paragraphs (i)(6)(iii) and (i)(6)(iv) of this section shall only become effective 30 days from the date of submission of the recertification documentation.

(j) *Effect of certification.* (1) An unpermitted CAFO certified in accordance with paragraph (i) of this section is presumed not to propose to discharge. If such a CAFO does discharge, it is not in violation of the requirement that CAFOs that propose to discharge seek permit coverage pursuant

to paragraphs (d)(1) and (f) of this section, with respect to that discharge. In all instances, the discharge of a pollutant without a permit is a violation of the Clean Water Act section 301(a) prohibition against unauthorized discharges from point sources.

(2) In any enforcement proceeding for failure to seek permit coverage under paragraphs (d)(1) or (f) of this section that is related to a discharge from an unpermitted CAFO, the burden is on the CAFO to establish that it did not propose to discharge prior to the discharge when the CAFO either did not submit certification documentation as provided in paragraph (i)(3) or (i)(6)(iv) of this section within at least five years prior to the discharge, or withdrew its certification in accordance with paragraph (i)(5) of this section. Design, construction, operation, and maintenance in accordance with the criteria of paragraph (i)(2) of this section satisfies this burden.

■ 6. Section 122.28 is amended by adding a new paragraph (b)(2)(vii), to read as follows:

§ 122.28 General permits (applicable to State NPDES programs, see § 123.25).

* * * * *

(b) * * *

(2) * * *

(vii) A CAFO owner or operator may be authorized to discharge under a general permit only in accordance with the process described in § 122.23(h).

* * * * *

■ 7. Section 122.42 is amended as follows:

■ a. By revising paragraph (e) introductory text and paragraph (e)(1) introductory text.

■ b. By removing the period at the end of paragraph (e)(4)(vii) and adding in its place ''; and''.

■ c. By adding paragraph (e)(4)(viii).

■ d. By adding paragraphs (e)(5) and (e)(6).

§ 122.42 Additional conditions applicable to specified categories of NPDES permits (applicable to State NPDES programs, see § 123.25).

* * * * *

(e) *Concentrated animal feeding operations (CAFOs).* Any permit issued to a CAFO must include the requirements in paragraphs (e)(1) through (e)(6) of this section.

(1) *Requirement to implement a nutrient management plan.* Any permit issued to a CAFO must include a requirement to implement a nutrient management plan that, at a minimum, contains best management practices necessary to meet the requirements of this paragraph and applicable effluent limitations and standards, including those specified in 40 CFR part 412. The nutrient management plan must, to the extent applicable:

* * * * *

(4) * * *

(viii) The actual crop(s) planted and actual yield(s) for each field, the actual nitrogen and phosphorus content of the manure, litter, and process wastewater, the results of calculations conducted in accordance with paragraphs (e)(5)(i)(B) and (e)(5)(ii)(D) of this section, and the amount of manure, litter, and process wastewater applied to each field during the previous 12 months; and, for any CAFO that implements a nutrient management plan that addresses rates of application in accordance with paragraph (e)(5)(ii) of this section, the results of any soil testing for nitrogen and phosphorus taken during the preceding 12 months, the data used in calculations conducted in accordance with paragraph (e)(5)(ii)(D) of this section, and the amount of any supplemental fertilizer applied during the previous 12 months.

(5) *Terms of the nutrient management plan.* Any permit issued to a CAFO must require compliance with the terms of the CAFO's site-specific nutrient management plan. The terms of the nutrient management plan are the information, protocols, best management practices, and other conditions in the nutrient management plan determined by the Director to be necessary to meet the requirements of paragraph (e)(1) of this section. The terms of the nutrient management plan, with respect to protocols for land application of manure, litter, or process wastewater required by paragraph (e)(1)(viii) of this section and, as applicable, 40 CFR 412.4(c), must include the fields available for land application; field-specific rates of application properly developed, as specified in paragraphs (e)(5)(i) through (ii) of this section, to ensure appropriate agricultural utilization of the nutrients in the manure, litter, or process wastewater; and any timing limitations identified in the nutrient management plan concerning land application on the fields available for land application. The terms must address rates of application using one of the following two approaches, unless the Director specifies that only one of these approaches may be used:

(i) *Linear approach.* An approach that expresses rates of application as pounds of nitrogen and phosphorus, according to the following specifications:

(A) The terms include maximum application rates from manure, litter, and process wastewater for each year of permit coverage, for each crop identified in the nutrient management plan, in chemical forms determined to be acceptable to the Director, in pounds per acre, per year, for each field to be used for land application, and certain factors necessary to determine such rates. At a minimum, the factors that are terms must include: The outcome of the field-specific assessment of the potential for nitrogen and phosphorus transport from each field; the crops to be planted in each field or any other uses of a field such as pasture or fallow fields; the realistic yield goal for each crop or use identified for each field; the nitrogen and phosphorus recommendations from sources specified by the Director for each crop or use identified for each field; credits for all nitrogen in the field that will be plant available; consideration of multi-year phosphorus application; and accounting for all other additions of plant available nitrogen and phosphorus to the field. In addition, the terms include the form and source of manure, litter, and process wastewater to be land-applied; the timing and method of land application; and the methodology by which the nutrient management plan accounts for the amount of nitrogen and phosphorus in the manure, litter, and process wastewater to be applied.

(B) Large CAFOs that use this approach must calculate the maximum amount of manure, litter, and process wastewater to be land applied at least once each year using the results of the most recent representative manure, litter, and process wastewater tests for nitrogen and phosphorus taken within 12 months of the date of land application; or

(ii) *Narrative rate approach.* An approach that expresses 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:

(A) 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 to the Director, in pounds per acre, for each field, and certain factors necessary to determine such amounts. At a minimum, the factors that are terms must include: the outcome of the field-specific assessment of the potential for nitrogen and phosphorus transport from each field; the crops to be planted in each field or any other uses such as pasture or fallow fields (including

alternative crops identified in accordance with paragraph (e)(5)(ii)(B) of this section); the realistic yield goal for each crop or use identified for each field; and the nitrogen and phosphorus recommendations from sources specified by the Director for each crop or use identified for each field. In addition, the terms 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, as required by paragraph (e)(1)(vii) of this section; 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.

(B) The terms of the nutrient management plan include alternative crops identified in the CAFO's nutrient management plan that are not in the planned crop rotation. Where a CAFO includes alternative crops in its nutrient management plan, the crops must be listed by field, in addition to the crops identified in the planned crop rotation for that field, and the nutrient management plan must include realistic crop yield goals and the nitrogen and phosphorus recommendations from sources specified by the Director for each crop. Maximum amounts of nitrogen and phosphorus from all sources of nutrients and the amounts of manure, litter, and process wastewater to be applied must be determined in accordance with the methodology described in paragraph (e)(5)(ii)(A) of this section.

(C) For CAFOs using this approach, the following projections must be included in the nutrient management plan submitted to the Director, but are not terms of the nutrient management plan: The CAFO's planned crop rotations for each field for the period of permit coverage; the projected amount of manure, litter, or process wastewater to be applied; projected credits for all nitrogen in the field that will be plant available; consideration of multi-year phosphorus application; accounting for all other additions of plant available nitrogen and phosphorus to the field; and the predicted form, source, and method of application of manure, litter, and process wastewater for each crop. Timing of application for each field, insofar as it concerns the calculation of rates of application, is not a term of the nutrient management plan.

(D) CAFOs that use this approach must calculate maximum amounts of manure, litter, and process wastewater to be land applied at least once each year using the methodology required in paragraph (e)(5)(ii)(A) of this section 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 by paragraph (e)(5)(ii)(A) of this section, and for phosphorus, the results of the most recent soil test conducted in accordance with soil testing requirements approved by the Director; and

(*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.

(6) *Changes to a nutrient management plan.* Any permit issued to a CAFO must require the following procedures to apply when a CAFO owner or operator makes changes to the CAFO's nutrient management plan previously submitted to the Director:

(i) The CAFO owner or operator must provide the Director with the most current version of the CAFO's nutrient management plan and identify changes from the previous version, except that the results of calculations made in accordance with the requirements of paragraphs (e)(5)(i)(B) and (e)(5)(ii)(D) of this section are not subject to the requirements of paragraph (e)(6) of this section.

(ii) The Director must review the revised nutrient management plan to ensure that it meets the requirements of this section and applicable effluent limitations and standards, including those specified in 40 CFR part 412, and must determine whether the changes to the nutrient management plan necessitate revision to the terms of the nutrient management plan incorporated into the permit issued to the CAFO. If revision to the terms of the nutrient management plan is not necessary, the Director must notify the CAFO owner or operator and upon such notification the CAFO may implement the revised nutrient management plan. If revision to the terms of the nutrient management plan is necessary, the Director must determine whether such changes are substantial changes as described in paragraph (e)(6)(iii) of this section.

(A) If the Director determines that the changes to the terms of the nutrient management plan are not substantial, the Director must make the revised nutrient management plan publicly available and include it in the permit record, revise the terms of the nutrient management plan incorporated into the permit, and notify the owner or operator and inform the public of any changes to the terms of the nutrient management plan that are incorporated into the permit.

(B) If the Director determines that the changes to the terms of the nutrient management plan are substantial, the Director must notify the public and make the proposed changes and the information submitted by the CAFO owner or operator available for public review and comment. The process for public comments, hearing requests, and the hearing process if a hearing is held must follow the procedures applicable to draft permits set forth in 40 CFR 124.11 through 124.13. The Director may establish, either by regulation or in the CAFO's permit, an appropriate period of time for the public to comment and request a hearing on the proposed changes that differs from the time period specified in 40 CFR 124.10. The Director must respond to all significant comments received during the comment period as provided in 40 CFR 124.17, and require the CAFO owner or operator to further revise the nutrient management plan if necessary, in order to approve the revision to the terms of the nutrient management plan incorporated into the CAFO's permit. Once the Director incorporates the revised terms of the nutrient management plan into the permit, the Director must notify the owner or operator and inform the public of the final decision concerning revisions to the terms and conditions of the permit.

(iii) Substantial changes to the terms of a nutrient management plan incorporated as terms and conditions of a permit include, but are not limited to:

(A) Addition of new land application areas not previously included in the CAFO's nutrient management plan. Except that if the land application area that is being added to the nutrient management plan is covered by terms of a nutrient management plan incorporated into an existing NPDES permit in accordance with the requirements of paragraph (e)(5) of this section, and the CAFO owner or operator applies manure, litter, or

process wastewater on the newly added land application area in accordance with the existing field-specific permit terms applicable to the newly added land application area, such addition of new land would be a change to the new CAFO owner or operator's nutrient management plan but not a substantial change for purposes of this section;

(B) Any changes to the field-specific maximum annual rates for land application, as set forth in paragraphs (e)(5)(i) of this section, and to the maximum amounts of nitrogen and phosphorus derived from all sources for each crop, as set forth in paragraph (e)(5)(ii) of this section;

(C) Addition of any crop or other uses not included in the terms of the CAFO's nutrient management plan and corresponding field-specific rates of application expressed in accordance with paragraph (e)(5) of this section; and

(D) Changes to site-specific components of the CAFO's nutrient management plan, where such changes are likely to increase the risk of nitrogen and phosphorus transport to waters of the U.S.

(iv) *For EPA-issued permits only.* Upon incorporation of the revised terms of the nutrient management plan into the permit, 40 CFR 124.19 specifies procedures for appeal of the permit decision. In addition to the procedures specified at 40 CFR 124.19, a person must have submitted comments or participated in the public hearing in order to appeal the permit decision.

■ 8. Section 122.62 is amended by adding paragraph (a)(17) to read as follows:

§ 122.62 Modification or revocation and reissuance of permits (applicable to State programs, see § 123.25)

* * * * *

(a) * * *

(17) *Nutrient Management Plans.* The incorporation of the terms of a CAFO's nutrient management plan into the terms and conditions of a general permit when a CAFO obtains coverage under a general permit in accordance with §§ 122.23(h) and 122.28 is not a cause for modification pursuant to the requirements of this section.

* * * * *

■ 9. Section 122.63 is amended by adding paragraph (h) to read as follows:

§ 122.63 Minor modification of permits.

* * * * *

(h) Incorporate changes to the terms of a CAFO's nutrient management plan that have been revised in accordance with the requirements of § 122.42(e)(6).

PART 412—CONCENTRATED ANIMAL FEEDING OPERATIONS (CAFO) POINT SOURCE CATEGORY

■ 10. The authority citation for part 412 continues to read as follows:

Authority: 33 U.S.C. 1311, 1314, 1316, 1317, 1318, 1342, and 1361.

■ 11. Section 412.37 is amended by revising paragraph (a)(2) to read as follows:

§ 412.37 Additional measures.

(a) * * *

(2) *Depth marker.* All open surface liquid impoundments must have a depth marker which clearly indicates the minimum capacity necessary to contain the runoff and direct precipitation of the 25-year, 24-hour rainfall event. In the case of new sources subject to effluent limitations established pursuant to § 412.46(a)(1) of this part, all open surface manure storage structures associated with such sources must include a depth marker which clearly indicates the minimum capacity necessary to contain the maximum runoff and direct precipitation associated with the design storm used in sizing the impoundment for no discharge.

■ 12. Section 412.46 is amended by revising paragraphs (a)(1), (d), and (e) to read as follows:

§ 412.46 New source performance standards (NSPS).

* * * * *

(a) * * *

(1) Any CAFO subject to this subpart may request that the Director establish NPDES permit best management practice effluent limitations designed to ensure no discharge of manure, litter, or process wastewater based upon a site-specific evaluation of the CAFO's open surface manure storage structure. The NPDES permit best management practice effluent limitations must address the CAFO's entire production area. In the case of any CAFO using an open surface manure storage structure for which the Director establishes such effluent limitations, ''no discharge of manure, litter, or process wastewater pollutants,'' as used in this section, means that the storage structure is designed, operated, and maintained in accordance with best management practices established by the Director on a site-specific basis after a technical evaluation of the storage structure. The technical evaluation must address the following elements:

(i) Information to be used in the design of the open manure storage structure including, but not limited to, the following: minimum storage periods for rainy seasons, additional minimum capacity for chronic rainfalls, applicable technical standards that prohibit or otherwise limit land application to frozen, saturated, or snow-covered ground, planned emptying and dewatering schedules consistent with the CAFO's Nutrient Management Plan, additional storage capacity for manure intended to be transferred to another recipient at a later time, and any other factors that would affect the sizing of the open manure storage structure.

(ii) The design of the open manure storage 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.

(iii) All inputs used in the open manure storage 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 manure storage structure.

(iv) The planned minimum period of storage in months including, but not limited to, the factors for designing an open manure storage structure listed in paragraph (a)(1)(i) of this section. Alternatively the CAFO may determine the minimum period of storage by specifying times the storage pond will be emptied consistent with the CAFO's Nutrient Management Plan.

(v) Site-specific predicted design specifications including dimensions of the storage facility, daily manure and wastewater additions, the size and characteristics of the land application areas, and the total calculated storage period in months.

(vi) An evaluation of the adequacy of the designed manure storage structure using the most recent version of the Soil Plant Air Water (SPAW) Hydrology Tool. The evaluation must include all inputs to SPAW including but not limited to daily precipitation, temperature, and evaporation data for the previous 100 years, user-specified soil profiles representative of the CAFO's land application areas, planned crop rotations consistent with the CAFO's Nutrient Management Plan, and the final modeled result of no overflows from the designed open manure storage structure. For those CAFOs where 100 years of local weather data for the CAFO's location is not available, CAFOs

may use a simulation with a confidence interval analysis conducted over a period of 100 years. The Director may approve equivalent evaluation and simulation procedures.

(vii) The Director may waive the requirement of (a)(1)(vi) for a site-specific evaluation of the designed manure storage structure and instead authorize a CAFO to use a technical evaluation developed for a class of specific facilities within a specified geographical area.

(viii) Waste management and storage facilities designed, constructed, operated, and maintained consistent with the analysis conducted in paragraphs (a)(1)(i) through (a)(1)(vii) of this section and operated in accordance with the additional measures and records required by § 412.47(a) and (b), will fulfill the requirements of this section.

(ix) The Director has the discretion to request additional information to support a request for effluent limitations based on a site-specific open surface manure storage structure.

* * * * *

(d) Any source subject to this subpart that commenced discharging after April 14, 1993, and prior to April 14, 2003, which was a new source subject to the standards specified in § 412.15, revised as of July 1, 2002, must continue to achieve those standards for the applicable time period specified in 40 CFR 122.29(d)(1). Thereafter, the source must achieve the standards specified in § 412.43(a) and (b).

(e) Any source subject to this subpart that commenced discharging after April 14, 2003, and prior to January 20, 2009, which was a new source subject to the standards specified in § 412.46(a) through (d) in the July 1, 2008, edition of 40 CFR part 439, must continue to achieve those standards for the applicable time period specified in 40 CFR 122.29(d)(1).

[FR Doc. E8–26620 Filed 11–19–08; 8:45 am]

BILLING CODE 6560–50–P

Attachment 3:

Unified National AFO Strategy Executive Summary
(United States Department of Agriculture and Environmental Protection Agency)

Unified National AFO Strategy Executive Summary

Over the past quarter century, the United States has made tremendous progress in cleaning up its rivers, lakes, and coastal waters. While pollution from factories and sewage treatment plants has been dramatically reduced, runoff from city streets, agricultural activities (including animal feeding operations or AFOs), and other sources continues to degrade the environment and puts drinking water at risk.

In February 1998, President Clinton released the Clean Water Action Plan (CWAP), which provides a blueprint for restoring and protecting water quality across the Nation. The CWAP identifies polluted runoff as the most important remaining source of water pollution and provides for a coordinated effort to reduce polluted runoff from a variety of sources. As part of this effort, the CWAP calls for the U.S. Department of Agriculture (USDA) and the U.S. Environmental Protection Agency (EPA) to develop a Unified National Strategy to minimize the water quality and public health impacts of animal feeding operations (AFOs).

USDA and EPA issued a draft of this Strategy on September 16, 1998, and requested public comment during a 120-day period. In addition, 11 national "listening sessions" were held throughout the U.S. to discuss the draft Strategy and hear public feedback. The final Strategy reflects written comments received as well as issues raised during the listening sessions.

The Unified AFO Strategy discusses the relationships between AFOs and environmental and public health, is based on a national performance expectation for all AFO owners and operators, and presents a series of actions to minimize public health impacts and improve water quality while complementing the long-term sustainability of livestock production.

Background

AFOs are agricultural enterprises where animals are kept and raised in confined situations. Approximately 450,000 AFOs in the United States congregate animals, feed, manure and urine, dead animals, and production operations on a small land area. USDA data indicate that the vast majority of farms with livestock are small -- about 85 percent of these farms have fewer than 250 animal units (AUs), where an AU is equal to roughly one beef cow (therefore 1,000 AUs is equal to 1,000 beef cows or an equivalent number of

other kinds of animals). About 6,600 AFOs had more than 1,000 AUs in 1992 and are considered to be large operations.

As a result of domestic and export market forces, technological changes, and industry adaptations, the past several decades have seen substantial changes in the animal production industry. Despite USDA support for sustainable agricultural practices, these factors have promoted expansion of confined production units, with growth in both existing areas and new areas; integration and concentration of some of the industries; geographic separation of animal production and feed production operations; and the concentration of large quantities of manure and wastewater on farms and in some watersheds.

AFOs can pose a number of risks to water quality and public health, mainly because of the amount of animal manure and wastewater they generate. Manure and wastewater from AFOs have the potential to contribute pollutants such as nutrients (e.g., nitrogen, phosphorus), organic matter, sediments, pathogens, heavy metals, hormones, antibiotics, and ammonia to the environment. These pollutants can cause several types of water quality and public health impacts, such as contamination of drinking water supplies and fish kills. While there are other potential environmental impacts associated with AFOs (e.g., odor, habitat loss, ground water depletion), this Strategy focuses on addressing surface and ground water quality problems. Once implemented, however, this Strategy will indirectly benefit other resources.

USDA and EPA's National Performance Expectation

To minimize water quality and public health impacts from AFOs and land application of animal waste, this Strategy is based on a national performance expectation that all AFO owners and operators develop and implement technically sound and economically feasible site-specific Comprehensive Nutrient Management Plans (CNMPs). A CNMP identifies actions that will be implemented to meet clearly-defined nutrient management goals at an agricultural operation. The following components may be contained in a CNMP:

- **Feed Management** - Animal diets and feed may be modified to reduce the amounts of nutrients in manure.
- **Manure Handling and Storage** - Manure needs to be handled and stored properly to prevent water pollution from AFOs.
- **Land Application of Manure** - Land application is the most common, and usually most desirable method, of utilizing manure because of the value of the nutrients and organic matter. Land application in accordance with the CNMP should minimize water quality and public health risk.
- **Land Management** - Tillage, crop residue management, grazing management, and other conservation practices should be utilized to minimize movement to surface and ground water of soil, organic materials, nutrients, and pathogens from lands where manure is

applied.

- **Record Keeping** - AFO operators should keep records that indicate the quantity of manure produced and how the manure was utilized, including where, when, and amount of nutrients applied.
- **Other Utilization Options** - Where the potential for environmentally sound land application is limited, alternative uses of manure, such as the sale of manure to other farmers, composting and sale of compost to home owners, and using manure for power generation may also be appropriate.

AFO owners and operators may seek technical assistance for the development and implementation of CNMPs from qualified specialists. These specialists should assist in implementation and provide ongoing assistance through periodic reviews and revisions of CNMPs, as appropriate. USDA and EPA recommend that certified specialists be used to develop and ensure the quality of CNMPs.

Relationship of Voluntary and Regulatory Programs

Voluntary and regulatory programs serve complementary roles in providing AFO owners and operators and the animal agricultural industry with the assistance and certainty they need to achieve individual business and personal goals, and in ensuring protection of water quality and public health.

Voluntary Program for Most AFOs

Voluntary programs provide an enormous opportunity to help AFO owners and operators and communities address water quality and public health concerns surrounding AFOs. For the vast majority of AFOs, voluntary efforts will be the principal approach to assist owners and operators in developing and implementing site-specific CNMPs, and in reducing water pollution and public health risks associated with AFOs. While CNMPs are not required for AFOs participating only in voluntary programs, they are strongly encouraged as the best possible means of managing potential water quality and public health impacts from these operations.

There are three types of voluntary programs to assist AFO owners and operators. USDA and EPA are both committed to promoting **locally led conservation** as one of the most effective ways to help AFO owners and operators achieve their conservation goals. **Environmental education** can bring an awareness of possible water quality problems and inform AFO owners and operators about practices that will address such problems. A variety of **financial and technical assistance** programs exist to provide AFO owners and operators advice in developing CNMPs and implementing solutions and to help

defray the costs of approved/needed structures (e.g., waste storage facilities for small operations) or to implement other practices, such as installation of conservation buffers to protect water quality.

Regulatory Program for Some AFOs

Impacts from certain higher risk AFOs are addressed through National Pollutant Discharge Elimination System (NPDES) permits under the authority of the Clean Water Act. AFOs that meet certain specified criteria in the NPDES regulations are referred to as concentrated animal feeding operations or CAFOs.

NPDES permits will require CAFOs to develop CNMPs and to meet other conditions that minimize the threat to water quality and public health and otherwise ensure compliance with the requirements of the Clean Water Act. NPDES permits will also ensure that the animal manure from CAFOs will be utilized properly and require reporting on whether the permittee has a CNMP including land application of animal manure and whether it is being implemented properly. The Strategy identifies three categories of CAFOs that are priorities for the regulatory program:

- **Significant Manure Production** - Large facilities (those with greater than 1000 animal units) produce quantities of manure that can be a risk to water quality and public health.
- **Unacceptable Conditions** - Facilities that have man-made conveyances that discharge animal waste to waters or have a direct discharge to waters that pass through the facility or come into direct contact with animals represent a significant risk to water quality and and public health.
- **Significant Contributors to Water Quality Impairment** - A facility that is significantly contributing to impairment of a waterbody or a watershed and nonattainment of a designated use is also a priority for the NPDES permitting program.

The Strategy supplements these regulatory program priorities with three types of incentives for some AFOs. Smaller CAFOs that meet certain conditions may exit the regulatory program at the end of their permit term if they correct the problem(s) that caused them to be covered by the regulatory program. The Strategy also describes a "good faith incentive" for some AFOs to avoid being covered by the regulatory program if they have and are implementing a CNMP. Finally, there are tax incentives that may be available to encourage AFOs owners and operators to develop and implement a CNMP.

Coordination with State and Tribal Programs

States and Tribes play a critical role in the development and implementation of national and State and Tribal resource protection programs. USDA and EPA expect to work with States and Tribes to implement effective programs to achieve the national goal and performance expectation of this Strategy. The Strategy includes actions to address a range of State and Tribal issues.

Strategic Issues

The Unified AFO Strategy addresses seven strategic issues. The discussion of each strategic issue identifies several action items.

- **Building Capacity for CNMP Development and Implementation** - The successful implementation of this Strategy depends on the availability of qualified specialists from either the private or public sectors to assist in the development and implementation of CNMPs. The Strategy describes actions to substantially increase AFO owners and operators' access to technical assistance for developing and implementing CNMPs.
- **Accelerating Voluntary, Incentive-Based Programs** - The Strategy sets out a desired outcome that all AFOs will have CNMPs by 2009. Several actions, including review and revision of USDA's practice standards, development of CNMP guidance, fair and equitable program delivery, and options for financial assistance, are directed toward achieving this objective.

- **Implementing and Improving the Existing Regulatory Program** - The Strategy describes the applicability and the requirements of the existing regulatory program, identifies permitting and enforcement priorities, recognizes State and Tribal CAFO permit programs, and describes EPA's plans to strengthen and improve existing regulations.
- **Coordinated Research, Technical Innovation, Compliance Assistance, and Technology Transfer** - USDA and EPA will establish coordinated research, technical innovation, and technology transfer activities, provide compliance assistance, and establish a single point information center. The two agencies are also committed to promoting sustainable agriculture and will support development of a livestock environmental issues curriculum for producers.
- **Encouraging Industry Leadership** - The animal agriculture industry can play a key role in helping to encourage adoption of CNMPs and in addressing water quality problems on individual AFOs. The Strategy includes possible actions that USDA and EPA may take to promote industry involvement.
- **Data Coordination** - Several kinds of data are useful in assessing and managing the water quality impacts of AFOs. USDA and EPA's efforts to coordinate on data sharing will both protect the relationship of trust between USDA and farmers and provide regulatory authorities with information that is useful in protecting water quality and public health.
- **Performance Measures and Accountability** - USDA and EPA believe that it is critical to establish performance measures to gauge our success in implementing the Strategy and meeting relevant goals in each agency's strategic plan established under the Government Performance and Results Act. USDA, EPA, States, Tribes, and other Federal agencies will work with other stakeholders to develop an approach for measuring the effectiveness of efforts to minimize the water quality and public health impacts of AFOs.

Printed copies of the Unified National Strategy for Animal Feeding Operations may be obtained by calling USDA on (202) 720-3210 or EPA on (202) 260-7786. Click here to view the full AFO Strategy.

Attachment 4:

U.S. EPA's settlement agreement with Waterkeeper Alliance, Sierra Club, and Natural Resources Defense Council ("Settlement Agreement") (May 25, 2010)

SETTLEMENT AGREEMENT

WHEREAS, on December 10, 2008, the Natural Resources Defense Council, Inc. ("NRDC"), Sierra Club and Waterkeeper Alliance (collectively, the "Environmental Petitioners"), timely filed a petition in the Ninth Circuit Court of Appeals for judicial review of the United States Environmental Protection Agency's ("EPA's") final rule under the Clean Water Act entitled "Revised National Pollutant Discharge Elimination System Permit Regulation and Effluent Limitations Guidelines for Concentrated Animal Feeding Operations in Response to the Waterkeeper Decision: Final Rule" ("Final Rule"), 73 Fed. Reg. 70,418 (Nov. 20, 2008);

WHEREAS, the petition for review was subsequently transferred to the Fifth Circuit Court of Appeals and consolidated with seven other petitions challenging the Final Rule, under the case caption National Pork Producers Council v. EPA, No. 08-61093;

WHEREAS, on December 2, 2009, Environmental Petitioners and EPA moved to sever the Environmental Petitioners' petition from the others challenging the Final Rule and hold it in abeyance pending the finalization and implementation of a then-proposed settlement agreement;

WHEREAS, on December 8, 2009, the Court responded to this motion by issuing an order severing the Environmental Petitioners' petition (case caption NRDC v. EPA, No. 09-60510), and dismissing it without prejudice pursuant to 5th Cir. R. 42.4 (the "December 8, 2009 Order");

WHEREAS, the December 8, 2009 Order provided that Environmental Petitioners could reinstate the petition within 180 days (i.e., by Monday, June 7, 2010);

WHEREAS, the Environmental Petitioners and EPA (the "Settling Parties") have now concluded their settlement negotiations;

WHEREAS, EPA intends to release a guidance document as described in Paragraph 1 below and to take the further actions described in Paragraphs 2 and 3; and

WHEREAS, in light of EPA's intentions, the Settling Parties wish to resolve this matter without any further litigation;

NOW, THEREFORE, the Environmental Petitioners and EPA, each intending to be bound by this Agreement, hereby agree as follows:

1. As soon as practicable after the Effective Date of this Agreement, but no later than May 28, 2010, EPA shall make publicly available a guidance document designed to assist permitting authorities in implementing the National Pollutant Discharge Elimination System ("NPDES") permit regulations and Effluent Limitations Guidelines and Standards for concentrated animal feeding operations ("CAFOs") by specifying the kinds of operations and factual circumstances that EPA anticipates may trigger the duty to apply for permits as discharging or proposing to discharge.

2. No later than twelve months after the Effective Date of this Agreement, EPA will propose a rule under section 308 of the Clean Water Act, 33 U.S.C. § 1318, to require all owners or operators of CAFOs, as point sources under the Act, regardless of whether they discharge or propose to discharge, to submit information to EPA. The rule will propose requiring submittal of the information listed below, or, if EPA does not propose requiring information about one or more of the items listed below, EPA's proposed rule preamble will discuss the item(s), explain why EPA chose not to propose requiring that information, and request comment on those items.

- Name and address of the owner and operator
- If contract operation, name and address of the integrator

- Location (longitude and latitude) of the operation
- Type of facility
- Number and type(s) of animals
- Type and capacity of manure storage
- Quantity of manure, process wastewater and litter generated annually by the CAFO
- Whether the CAFO land-applies
- Available acreage for land application
- If the CAFO land-applies, whether it implements a nutrient management plan for land application
- If the CAFO land-applies, whether it employs nutrient management practices and keeps records on site consistent with 40 C.F.R. § 122.23(e)
- If the CAFO does not land apply, alternative uses of manure, litter, and/or wastewater
- Whether the CAFO transfers manure off-site, and if so, quantity transferred to recipient(s) of transferred manure
- Whether the CAFO has applied for an NPDES permit

EPA also will propose requiring information to be submitted every five years, or, if EPA does not propose requiring information submittals every five years, EPA will explain in the proposed rule preamble why the agency chose not to propose requiring such re-submittals. EPA will take final action on the proposed rule within twenty-four months after the Effective Date of this Agreement.

3. EPA will release to the public information initially collected pursuant to rulemaking as described in Paragraph 2, except for information that constitutes methods, processes, or trade secrets entitled to protection as confidential information pursuant to 33 U.S.C. § 1318(b). For any such information that EPA withholds as confidential, EPA will identify the records being withheld (individually, or if a large number of similar records are being withheld, by described category); provide the reason that the records were withheld; and provide an estimate of the volume of records or information withheld, in number of pages or in some other reasonable form of estimation. If, based on the information received, Environmental Petitioners believe that there are categories of operations that presumptively discharge, and they submit a petition for rulemaking requesting EPA to develop a rule to require those categories to have NPDES permits, EPA agrees to grant or deny the petition within a reasonable time, after consideration of the petition and any other relevant information that is available and in the possession of EPA, including information collected pursuant to Paragraph 2 that EPA withheld as confidential.

4. Environmental Petitioners agree that they shall not seek reinstatement of their petition for judicial review of the Final Rule except as noted in Paragraph 10 below.

5. The United States agrees to pay Environmental Petitioners $95,000 in full satisfaction of their claim for attorney fees and costs in their challenge to the Final Rule through the Effective Date of this Agreement.

6. The Effective Date of this Agreement shall be the date on which representatives of all of the Settling Parties have signed the Agreement.

7. Nothing in this Agreement shall be construed to limit or modify the discretion accorded EPA by the Clean Water Act or by general principles of administrative law.

8. Except as set forth in this Agreement, Environmental Petitioners and EPA retain all rights, claims, defenses, and discretion they may otherwise have. This Agreement shall not constitute an admission or evidence of any fact, wrongdoing, misconduct, or liability on the part of the United States, its officers, or any person affiliated with it. Nor shall this Agreement constitute an admission by Environmental Petitioners that the Final Rule complies with the Clean Water Act or with the Administrative Procedure Act.

9. The commitments of EPA in this Settlement Agreement are subject to the availability of appropriated funds applicable for those purposes. No provision of this Agreement shall be interpreted as or constitute a commitment or requirement that EPA obligate or pay funds in contravention of the Anti-Deficiency Act, 31 U.S.C. § 1341-44 and 1511-19, or any other applicable provision of law.

10. In the event that EPA does not take any of the actions referenced in this Agreement, Environmental Petitioners' only remedy pursuant to this Agreement shall be to seek leave from the Court to reinstate its petition for review of the Final Rule, to the extent permitted by the December 8, 2009 Order. Under no circumstances shall any provision of this Agreement be the basis for any action for specific performance, mandamus, or any other remedy seeking to compel EPA to take any of the actions referenced in this Agreement.

11. Any term set forth in this Agreement may be modified by written agreement of Environmental Petitioners and EPA.

12. Nothing in this Agreement shall bind, obligate, or otherwise create any rights or duties applicable to or enforceable by, or impose any conditions or limitations upon, any person or entity that has not signed the Agreement, nor shall the Agreement be construed to make any such person or entity a third-party beneficiary of the Agreement.

13. Any notices required or provided for by this Agreement shall be made in writing, via facsimile, electronic mail, or other means, and sent to the following:

For NRDC:

JON DEVINE
Senior Attorney, Water Program
Natural Resources Defense Council
1200 New York Ave., NW, Suite 400
Washington, DC 20005
Telephone: (202) 289-2361
Facsimile: (202) 289-1060
E-mail: jdevine@nrdc.org

For Sierra Club:

ED HOPKINS
Sierra Club
408 C Street, NE
Washington, DC 20002
Telephone: (202) 675-7908
Facsimile: (202) 547-6009
E-mail: ed.hopkins@sierraclub.org

For Waterkeeper Alliance:

HANNAH CONNOR
Waterkeeper Alliance
50 South Buckhout Street, Suite 302
Irvington, NY 10533
Telephone: (914) 674-0622
Facsimile: (914) 674-4560
E-mail: hconnor@waterkeeper.org

For EPA:

BRIAN H. LYNK
Environmental Defense Section
United States Department of Justice
P.O. Box 23986
Washington, D.C. 20026-3986
Telephone: (202) 514-6187
Facsimile: (202) 514-8865
E-mail: brian.lynk@usdoj.gov

Alternate address for non-U.S. Postal Service deliveries:
601 D Street, NW
Washington, DC 20004

SYLVIA HORWITZ
U.S. Environmental Protection Agency
Office of General Counsel
1200 Pennsylvania Ave., N.W.
Washington, DC 20460
Telephone: (202) 564-5511
Fax: (202) 564-5477
E-mail: horwitz.sylvia@epamail.epa.gov

14. This Agreement may be executed in any number of original counterparts, each of which shall be deemed to constitute one agreement. The execution of one counterpart by any Settling Party shall have the same force and effect as if that Settling Party had signed all other counterparts.

15. This Agreement constitutes the entire Agreement between Environmental Petitioners and EPA with respect to the subject matter addressed herein. There are no warranties or representations, oral or written, relating to the subject matter hereof that are not fully expressed or provided for herein.

16. The undersigned representatives of each Settling Party certify that they are fully authorized by the Settling Party that they represent to bind that Settling Party to the terms of this Agreement.

For NRDC and SIERRA CLUB:

MICHAEL E. WALL
Natural Resources Defense Council
111 Sutter Street, 20th Floor
San Francisco, California 94104-4540
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Facsimile: (415) 875-6161
E-mail: mwall@nrdc.org

Dated: 25 May 2010

For WATERKEEPER ALLIANCE:

HANNAH CONNOR
Waterkeeper Alliance
50 South Buckhout Street, Suite 302
Irvington, NY 10533
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Facsimile: (914) 674-4560
E-mail: hconnor@waterkeeper.org

Dated: May 25, 2010

For EPA:

IGNACIA MORENO

Assistant Attorney General
Environment and Natural Resources Division

BRIAN H. LYNK, Trial Attorney
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Dated: May 25, 2010

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:

CONCENTRATED ANIMAL FEEDING OPERATIONS (CAFOS): PROPOSED AMENDMENTS TO 35 ILL. ADM. CODE 501, 502 AND 504	))))	R 2012-023

PRE-FILED TESTIMONY OF DR. KENDALL THU

My name is Dr. Kendall Thu and I am a Professor of Anthropology at Northern Illinois University and a co-founder of Illinois Citizens for Clean Air & Water (ICCAW). I have approximately 20 years of experience conducting and publishing scientific research on Concentrated Animal Feeding Operations (CAFOs), with particular attention to their environmental, social, and economic impacts (See Curriculum Vitae submitted as Attachment 1). In addition, I have served as an expert witness for the Environmental Division of the Illinois Attorney General's office for CAFO cases.

I offer testimony on behalf of the Environmental Groups (Prairie Rivers Network, Environmental Law and Policy Center, Illinois Citizens for Clean Air and Water, and Natural Resources Defense Council). Specifically, I offer testimony on the need for a registration program for Large CAFOs in Illinois in order to identify how many there are, where they are located, and whether they should be prioritized for investigations or subject to NPDES program requirements.

The Need for Increased Regulatory Oversight of CAFOs

In 2008, the United States Government Accountability Office (GAO) released a report based on its investigation of the United States Environmental Protection Agency's (USEPA) regulation of CAFOs (submitted as Attachment 2). The report found that USEPA's data for regulating CAFOs is "inconsistent, inaccurate, and do not provide necessary information on their characteristics."[1] It was also found that "[w]ithout a systematic and coordinated process for collecting and maintaining accurate and complete information on the number, size, and location of permitted CAFOs, EPA does not have the information that it needs to effectively regulate them."[2] The GAO concluded that "[t]he agency doesn't have the ability to assess the extent to

[1] GAO, Concentrated Animal Feeding Operations: EPA Needs More Information and a Clearly Defined Strategy to Protect Air and Water Quality from Pollutants of Concern, GAO-08-944, September 2008, *at* 5.
[2] *Id.*

which CAFOs may be contributing to water pollution nor the information it needs to ensure compliance with the Clean Water Act."[3]
The situation in Illinois reflects the GAO's report on the state level. No one in or outside the state of Illinois knows how many large CAFOs there are, nor do they know where they are located. What if the state did not know how many wastewater or industrial waste treatment plants there are or where they are located? In a 2003 letter to Senator Tom Harkin, the GAO made the problem clear: "…animal feeding operations are significant contributors to impaired water quality in the nation's rivers and lakes according to the Environmental Protection Agency…the Clean Water Act requires EPA and authorized states to regulate these operations similar to the way they regulate municipal and industrial waste treatment facilities."

The Illinois EPA's Affidavit of Bruce Yurdin, dated September 20, 2012, which was filed with the Board in response to the question posed at the August 21st hearing regarding how many Large CAFOs exist in Illinois, demonstrates the lack of data. In that response, the Illinois EPA acknowledges that CAFO construction permit data from the Illinois Department of Agriculture (IDOA) is incomplete and problematic, but nonetheless uses it to estimate the number of Large CAFOs in the state and then provides no formula for how that estimate was calculated. The very nature of their estimate range (a range of 350-400 Large CAFOs) is evidence that the state does not have adequate data on CAFOs to carry out its responsibilities to administer a regulatory program. Because Illinois does not know how many Large CAFOs there are, or the locations of such, citizens lack basic information about CAFOs in their neighborhoods and potential NDPES compliance issues should they observe a discharge. Let me reiterate, *no one within or outside the state of Illinois knows how many Large CAFOs there are, nor do they know where they are located.*

Unregulated CAFO Discharges and Water Pollution in Illinois

Members of ICCAW largely consist of citizens who live in proximity to CAFOs. Most of these citizens have had problems getting information on CAFOs from state regulatory authorities and are often frustrated in their dealings with the Illinois EPA. In particular, citizens commonly express concerns regarding a lack of follow-up by the Illinois EPA in response to their complaints regarding suspected discharges and other potential pollution problems from CAFOs. As a result, we have assisted them in monitoring for discharges. This includes aerial reconnaissance photography of CAFOs located near our members' residences. Lacking a registration data base of Large CAFOs, we can only monitor those CAFOs based on citizen observations or the incomplete records we must obtain via the Freedom of Information Act. The attached set of photos is submitted as evidence of the kind of discharge we can detect when we know where the CAFO is located (submitted as Attachment 3). We currently only fly over approximately 20-25 CAFOs two times each year. If the Illinois EPA had a registry of Large CAFOs with adequate information about their operations, these fly-overs would be less necessary and it would be easier to identify problematic facilities. It would also help identify land application areas used for waste application that pose a threat to rivers and streams already designated as impaired. This data could then be used to prioritize aerial monitoring for Large

[3] *Id.* at 48.

CAFOs that present the greatest risk. The lack of a complete Large CAFO registration inventory with adequate information means that discharges around Illinois similar to the facility identified in Attachment 3 are much less likely to be detected.

Implementation and proper enforcement of the Clean Water Act by the Illinois EPA are hampered by a lack of resources. Consequently, citizens are essential sources of information to detect and report actual or potential discharges. In fact, citizen involvement is integral to the Illinois EPA's enforcement program. The Clean Water Act definitively states that "[p]ublic participation in the development, revision, and enforcement of any regulation, standard, effluent limitation, plan, or program established by the Administrator or any state under this Act shall be provided for, encouraged, and assisted by the Administrator and the States."[4]

In order for citizens to assist and for the public to meaningfully participate in enforcement, it is critical that information in the registry include nutrient management plans and plans for off-site transfer of manure. Large CAFOs by their very nature do not have adequate land bases to absorb the excess nutrients they produce and dispose of through land application. For example, data from the United States Department of Agriculture's (USDA) 1997 Census of Agriculture suggests that a considerable portion of the nutrients from manure generated by Large CAFOs exceed crop nutrient needs, both at the facility and local county levels.[5] Given consolidation trends in the industry toward larger operations, there is greater waste produced at single facilities with less land available to spread manure. USEPA estimates show that larger operations produce the greatest amount of excess nutrients and must transport roughly 60 to 70 percent of the nitrogen and phosphorus they generate off-site.[6] Without access to facility nutrient management plans and plans for the off-site transfer of manure for Large CAFOs, it is impossible to ensure adequate cropland is available to dispose of livestock waste to avoid discharges and to prevent water quality impairment from runoff.

Unless an adequate registration program for all Large CAFOs is enacted requiring this information, vital information will continue to be shielded from neighboring citizens and the public, such that they will be unable to identify actual or potential pollution problems. Further, by requiring submittal of this information, the public will be provided the information needed to understand what constitutes appropriate waste management practices and to indentify when those practices are not being abided by. This will ensure public participation is "provided for, encouraged, and assisted" by the state and will aid the Illinois EPA in the enforcement of the NPDES program.

[4] Clean Water Act, 33 U.S.C. §1251(e) (2003).
[5] *See* EPA CAFO Final Rule Preamble, 40 C.F.R. 7176 –7181 at 7180, February 12, 2003 (*citing* USDA, Confined Animal Production and Manure Nutrients, Agriculture Information Bulletin 771 and USDA, Confined Animal Production Poses Manure Management Problems, Agricultural Outlook, September 2001), *available at* http://www.regulations.gov/contentStreamer?objectId=09000064800a971e&disposition=attachment&contentType=pdf.
[6] *See Id.* at 7180.

Illinois Should Enact a CAFO Registration Program to Avoid Withdrawal of its NPDES Program Delegation by USEPA

The Illinois EPA's regulatory proposal under Section 501.505 requires certain CAFOs to submit information to the agency if such a requirement is enacted by the USEPA under federal law. Unfortunately, the USEPA recently withdrew its proposal to adopt a regulation that would have required submittal of information from CAFOs under Section 308 of the Clean Water Act [hereafter CAFO Reporting Rule].[7] However, prior to the USEPA's contemplation of the CAFO Reporting Rule, the Illinois EPA committed to a revision of the state's Subtitle E regulations that would require livestock producers to file information with the Agency to avoid dedelegation of its NPDES permitting program.[8]

The possibility of dedelgation arose when ICCAW filed a Petition for Withdrawal of the NPDES Program Delegation from the State of Illinois on March 27, 2008 (submitted as Attachment 4). A Supplement to the Petition was filed by ICCAW and the Environmental Integrity Project (EIP) on February 20, 2009 (submitted as Attachment 5). USEPA Region 5 conducted an investigation in response to the petition and released its findings in 2010. USEPA Region 5 found that "the Illinois EPA NPDES program for CAFOs does not meet minimum thresholds for an adequate program (see Hearing Exhibit 14)."[9]

In response to the pending dedelegation petition, the Illinois EPA committed to a registration program to populate a statewide CAFO inventory and prioritize inspections and permitting decisions (see IEPA Response to USEPA Investigation submitted as Attachment 6 and IEPA/USEPA 2011-2012 Workplan Agreement submitted as Attachment 7).[10] This commitment was made to avoid dedelegation of the state's NPDES program and was unrelated to and not contingent upon the enactment of a federal CAFO Reporting Rule.

Section 403(c)(3) of the Clean Water Act requires the Administrator of the USEPA to withdraw an approved state NPDES program if it is determined that the state is not administering the

[7] USEPA, NPDES CAFO Reporting Rule Final Action, 77 Fed. Reg. 42679-42682, July 20, 2012, *available at*: http://cfpub.epa.gov/npdes/afo/aforule.cfm#withdrawal [hereafter CAFO Reporting Rule],

[8] *See* September 28, 2010 USEPA Letter from Susan Headman to Illinois EPA Director Scott regarding Petition to Withdraw the Illinois NPDES Program (stating that the Illinois EPA's CAFO program fails to comply with Section 402(c)(2) of the Clean Water Act) *and* USEPA Region 5, Initial Results of an Informal Investigation of the NPDES for CAFOs in the State of Illinois, September 2010 [hereinafter USEPA Region 5 Illinois CAFO Investigation Report] (submitted as Hearing Exhibit 14).

[9] *Id*. at 34.

[10] Illinois EPA Response to USEPA, Region 5's September 2010 "Initial Results of an Informal Investigation of the National Pollutant Discharge Elimination System Program for Concentrated Animal Feeding Operations in the State of Illinois," November 1, 2010, at 3 [hereinafter IEPA Response to USEPA Investigation] (Attachment 6). *See also* Illinois Program Work Plan Agreement Between Illinois EPA and Region 5, U.S. EPA, February 24, 2011, at 5 [hereinafter USEPA/IEPA 2011-2012 Work Plan] (Attachment 7).

program with applicable requirements and the state fails to take corrective action. The criteria for withdrawal include, among other things, failure to exercise control over activities required to be regulated;[11] failure to inspect and monitor activities subject to regulation,[12] and failure to comply with the terms of a Memorandum of Agreement with USEPA.[13] Under the Clean Water Act's NPDES regulations, a state must have a program which is capable of making comprehensive surveys of all facilities and activities subject to the Director's authority to identify persons subject to regulation who have failed to comply with permit application or other program requirements.[14]

USEPA Region 5's Illinois CAFO Investigation Report found that the Illinois EPA does not have a statewide comprehensive survey of CAFOs that may be subject to NPDES permit requirements.[15] Serious deficiencies for determining compliance with applicable program requirements were also identified.[16] In addition, the Illinois EPA was found to be in violation of its Memorandum of Agreement and corresponding Performance Partnership Agreements (PPA) to develop a comprehensive inventory of CAFOs.[17] USEPA outlined a series of required actions that Illinois EPA must take to comply with federal law, including requirements to "conduct and maintain a comprehensive survey of livestock facilities" and to "compile an inventory of CAFO facilities."[18]

In response, the Illinois EPA committed to "propose a revision in the state livestock regulations…so that livestock producers are required to file basic information with the Illinois EPA."[19] The Agency also stated that the "proposed revisions to Subtitle E will allow Illinois EPA to populate a statewide inventory, which then can be used for prioritization of inspections and permitting decisions."[20] In addition, in February of 2011 the Illinois EPA entered into a Work Plan Agreement with USEPA for the 2011/2012 fiscal year. Under the Agreement, the Illinois EPA was to "develop and maintain a comprehensive inventory of CAFOs and evaluate their regulatory status."[21] To accomplish this, a specific objective under the Agreement was to propose amendments to the state's livestock regulations requiring "all Large CAFOs to register with Illinois EPA."[22]

However, the Illinois EPA did not propose a CAFO registration program in its proposed amendments to Subtitle E. Instead, the Agency's regulatory proposal under Section 501.505 is contingent on the USEPA's adoption of reporting requirements for CAFOs. One of the reasons

[11] 40 C.F.R. § 123.63(2)(i).
[12] 40 C.F.R. § 123.63(3)(iii).
[13] 40 C.F.R. § 123.63(a)(4).
[14] 40 C.F.R. § 123.26(b)(1).
[15] USEPA Region 5 Illinois CAFO Investigation Report, *supra* note 8 at 16.
[16] *Id.* at 20.
[17] *Id*. at 31.
[18] *Id.* at 36 and 40.
[19] IEPA Response to USEPA Investigation, *supra* note 10 at 3.
[20] *Id*.
[21] USEPA/IEPA 2011-2012 Work Plan, *supra* note 10 at 2.
[22] *Id.* at 5.

USEPA chose not to promulgate the federal CAFO Reporting Rule was because it elected to work with "federal, state, and local partners to obtain existing information rather than asking CAFOs to resubmit information that they have already submitted to another governmental entity."[23] In response to the dedelegation action, the Illinois EPA committed to develop an interim list of CAFOs using currently available resources, including IDOA livestock facility construction records, Illinois Department of Public Health dairy facility data, and GIS mapping of CAFOs by Western Illinois University in a seven-county area.[24] However, this was intended to be an interim step toward developing a registration program.[25] As demonstrated by Illinois EPA's September 20th Affidavit, these existing sources of information are incomplete and have not provided the Agency with enough consistent, accurate, and adequate information to develop a comprehensive inventory of CAFOs.

USEPA Region 5 mandated the Illinois EPA to develop a comprehensive inventory in 2010 because it was found that the state did not have one and had failed to compile such with existing sources of information. Because the USEPA withdrew its proposed CAFO Reporting Rule, the regulatory proposal now before the Board clearly fails to meet commitments made by the Illinois EPA to avoid dedelegation of the state's NPDES program. The Illinois EPA and the Illinois Pollution Control Board have the responsibility and authority to enact robust information reporting requirements to ensure proper implementation of state and federal regulatory requirements.

For these reasons, the Illinois Pollution Control Board should adopt the Environmental Petitioners' Section 501.505 regulatory proposal, which would require Large CAFOs to register with the Illinois EPA and provide vital information about their operations, such as their size, location, their nutrient management plans, and the off-site transfer of waste.

Dated: October 16, 2012

Respectfully submitted:

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Dr. Kendall Thu

[23] CAFO Reporting Rule Final Action, *supra* note 7 at 42682.
[24] *See* IEPA Response to USEPA Investigation, *supra* note 10 at 3.
[25] *Id.*

Attachment 1:
Curriculum Vitae of Dr. Kendall Thu

Vitae

February, 2012

KENDALL M. THU
Professor and Chair
Department of Anthropology

Educational Background:

Ph.D.	The University of Iowa Anthropology	June 1992
	University of Oslo, Norway Intensive Language Study and Agrarian History	June-August 1987
M.A.	The University of Iowa Anthropology	June 1984
B.A.	University of California, Irvine Anthropology	June 1982
A.A.	College of the Desert Social Sciences.	June 1980

Professional Experience:

Professor and Chair, The Department of Anthropology, Northern Illinois University. July, 2010-present. Named an NIU Presidential Engagement Professor, July 2011.

Associate Professor, The Department of Anthropology, Northern Illinois University. August 2003 – 2010.

Assistant Professor, The Department of Anthropology, Northern Illinois University. August 1999 – 2003.

Associate Research Scientist, Institute for Rural and Environmental Health, College of Medicine, The University of Iowa. 1997 – 1999.

Associate Director, Iowa's Center for Agricultural Safety and Health, The University of Iowa. 1996 – 1999.

Adjunct Assistant Professor, Department of Anthropology, The University of Iowa. 1993 – 1999.

Assistant Research Scientist, Institute for Rural and Environmental Health, College of Medicine, The University of Iowa. 1993 – 1996.

Coordinator, Iowa's Center for Agricultural Safety and Health, The University of Iowa. 1993 – 1995.

Visiting Assistant Professor, Department of Anthropology, The University of Iowa. 1992.

Adjunct Lecturer, Department of Anthropology, The University of Iowa. 1988 – 1991.

Project Coordinator, National Farm Family Health Survey: Iowa, New York, Washington, and North Carolina, Institute of Agricultural Medicine and Occupational Health, The University of Iowa. 1987 – 1988.

Research Assistant, National Institute of Health, Health Heritage Ethnic Research Project, College of Nursing, The University of Iowa. 1987.

Research Assistant, Iowa State Historic Preservation Office, Des Moines, Iowa. 1986.

Consultant, Iowa Attorney General's Office, Tort Claims Division, Des Moines, Iowa. 1985.

Teaching and Research Assistantships, Department of Anthropology, The University of Iowa. 1982 – 1986.

Archaeological Field Research Assistant, Office of the State Archaeologist, The University of Iowa. 1982 – 1983.

Publications and Other Professional Contributions:

Books.

1998 Pigs, Profits, and Rural Communities. K. Thu and E. P. Durrenberger, Editors. Albany, New York: State University of New York Press.

1996 Understanding the Impacts of Large-Scale Swine Production: Proceedings from an Interdisciplinary Scientific Workshop. Editor. Iowa City, Iowa: The University of Iowa.

Articles

2009 The Centralization of Food Systems and Political Power. Culture & Agriculture 31(1):13-16.

2008 Integrating Epidemiology, Education, and Organizing for Environmental Justice: Community Health Effects of Industrial Hog Operations." American Journal of Public Health 98:1390-1397. With S. Wing, R. Avery, N. Muhammad, G. Grant, and M. Tajik.

2008 Farm activities associated with eye injuries in the Agricultural Health Study. Journal of Agromedicine 13(1):17-22. With N. Sprince, C. Zwerling, P. Whitten, C. Lynch, L. Burmeister, P. Gillette, and M. Alavanja.

2008 Impact of Odor from Industrial Hog Operations on Daily Living Activities. New Solutions: A Journal of Environmental and Occupational Health Policy 18(2):193-205. With M. Tajik, N. Muhammad, S. Wing, and G. Grant.

2008 Air Pollution and Odor in Communities Near Industrial Swine Operations. Environmental Health Perspectives 116(10):1362-1368. With S. Wing, R. Horton, S. Marshall, M. Tajik, L. Schinasi, and S. Schiffman.

2007 Assessment of Air Quality at Neighbor Residences in the Vicinity of Swine Production Facilities." Journal of Agromedicine 11(3/4): 15-24. With K. Donham, J. Lee, and S. Reynolds.

2007 Risk factors for low back injury among farmers in Iowa: A case-control study nested in the Agricultural Health Study. Journal of Occupational and Environmental Hygiene 4:10-16. With N. Sprince, P. Hyesook, C. Zwerling, P. Whitten, C. Lynch, L. Burmeister, P. Gillette, and M. Alavanja.

2006 Agriculture IN Culture. Culture & Agriculture 28(1):25-27.

2006 Industrial Agriculture: Pig Prison or Hog Hotel?" IN Encyclopedia of the Midwest. R. Sisson, C. Zacher, and A. Cayton, Editors. Pp. 1025-1026. Bloomington, Indiana: Indiana University Press.

2006 Community Health and Socioeconomic Issues Surrounding CAFOs." Environmental Health Perspectives 115(2):317-320. With K. J. Donham, S. Wing, D. Osterberg, J. L. Flora, C. Hodne, and P. Thorne.

2003 Risk factors for agricultural injury: A case-control analysis of Iowa farmers in the Agricultural Health Study. Journal of Agricultural Safety and Health 9(1):5-18. With N. Sprince, C. Zwerling, C. Lynch, P. Whitten, N. Logsden-Sackett, L. Burmeister, D. Sandler, and M. Alavanja.

2003 Risk factors for falls among Iowa farmers: A case-control study nested in the Agricultural Health Study. American Journal of Industrial Medicine 44(3):265-272. With N. Sprince, C. Zwerling, C. Lynch, P. Whitten, P. Gillette, L. Burmeister, and M. Alavanja.

2003 Risk factors for animal-related injury among Iowa livestock farmers: A case-control study nested in the Agricultural Health Study. Journal of Rural Health 19(2): 165-173. With N. Sprince, H. Park, C. Zwerling, C. Lynch, P. Whitten, L. Burmeister, P. Gillette, and M. Alavanja.

2002 Certified Safe Farm: Using Health Insurance Incentives to Promote Agricultural Safety and Health. Journal of Agromedicine 8(1): 25-36. With S. Schneiders K. Donham, P. Hilsenrath, and N. Roy.

2002 Keeping the Game Close: 'Fair Play' Among Men's College Basketball Referees. Human Organization 61(1): 1-7. With K. Hattmann, V. Hutchinson, S. Lueken, N. Davis, and E. Linboom.

2002 Public Health Concerns for Neighbors of Large-Scale Swine Production. Journal of Agricultural Safety and Health 8(2):175-184.

2002 Risk factors for machinery-related injury among Iowa farmers: A case-control study nested in the Agricultural Health Study. International Journal of Occupational and Environmental Medicine 8:332-338. With N. Sprince, H. Park, C. Zwerling, C. Lynch, P. Whitten, P. Gillette, L. Burmeister, and M. Alavanja.

2002 Chemical assessment of surface and groundwater in the environment proximal to large-scale swine and poultry feeding operations; a pilot investigation. The Science of the Total Environment. 299(1-3):89-95. With E.C. Campagnalo, A. Karpati, C.S. Rubin, D.W. Rubin, D.W. Kolpin, M.T. Meyer, J. E. Esteban, R.W. Currier, K. Smith, and M. McGeehin.

2001 Agriculture, the Environment, and Sources of State Ideology and Power." Culture & Agriculture 23(1):1-7.

2000 Development of the Farm Safety and Health Beliefs Scale. Journal of Agricultural Safety and Health 5(4):395-406. With C. Hodne, K. Donham, D. Watson, and N. Roy.

1999 Cultural Challenges in Agricultural Health. Journal of Agromedicine 5(4):85-89.

1999 A Qualitative Assessment of Farmer Responses to the Certified Safe Farm Concept In Iowa and Nebraska. Journal of Agricultural Safety and Health 4(3):161-171. With B. Pies, N. Roy, S.V. Essen, and K. Donham.

1998 Odor Problems from Large-Scale Agriculture: Nuisance or Public Health Problem? Health and Environment Digest 12(8):57-59.

1998 The Health Consequences of Industrialized Agriculture for Farmers in the

United States. Human Organization 57(3):335-341.

1997 Signals, Systems, and Environment in Industrial Food Systems. Journal of Political Ecology 4:27-40. With E.P. Durrenberger.

Received the Robert McC. Netting Prize from the Society for Political Ecology for the best article in the Journal of Political Ecology.

1997 Stress as a Risk Factor for Agricultural Injuries: Comparative Data from the Iowa Farm Family Health and Hazard Survey (1994) and the Iowa Farm and Rural Life Poll (1989). Journal of Agromedicine 4(2):181-192. With P. Lasley, M. Lewis, K.J. Donham, C. Zwerling, and R. Scarth.

1997 Air Quality Assessments in the Vicinity of Swine Production Facilities. Journal of Agromedicine 4(1):37-46. With S. Reynolds, S. Subramanian, and K. Donham.

1996 Insurance Incentives for Safe Farms. Journal of AgroMedicine 4(1):125-128. With S. V. Essen, K. Donham, and N. Roy.

1997 A Control Study of the Physical and Mental Health of Residents Living Near a Large-Scale Swine Production Facility. Journal of Agricultural Safety and Health 3(1):13-26. With K. Donham, R. Ziegenhorn, et al.

1996 Assessment of Airborne Ammonia in Swine Farming Environment by the Fluorimetric Enzyme Method. Journal of Environmental Analytical Chemistry 64:301-312. With P. Subramanian, et al.

1996 The Industrialization of Swine Production in the U.S.: An Overview. Culture & Agriculture 18(1):19-22. With E.P. Durrenberger.

1996 The Expansion of Large Scale Hog Farming in Iowa: The Applicability of Goldschmidt's Findings Fifty Years Later. Human Organization 55(4):409-415. With E. P. Durrenberger.

1996 What's a Year's Work Worth?: The Influence of the State on Cultural Constructs of Farming in Norway. Human Organization 55(3):300-308.

1996 Piggeries and Politics: Rural Development and Iowa's Multibillion Dollar Swine Industry. Culture & Agriculture 53:19-23.

1994 Our Changing Swine Industry and Signals of Discontent. Iowa Groundwater Quarterly 5(4):5-7. With E. P. Durrenberger.

1994 North Carolina's Hog Industry: The Rest of the Story. Culture and Agriculture 49:20-23. With E. P. Durrenberger.

1993 Relationships of Agricultural and Economic Policy to the Health of Farm Families, Livestock, and the Environment. Journal of the American Veterinary Medical Association 202(7):1084-1091. With K. Donham.

1990 The Farm Family Perception of Occupational Health: A Multistate Survey of Knowledge, Attitudes, and Ideas. American Journal of Industrial Medicine 18:427-431. With K. Donham, L. Ogilvie, C. Hradek, et al.

Book Chapters

2010 CAFOs are in Everyone's Backyard: Industrial Agriculture, Democracy and the Future. Pp. 206-211. IN The CAFO Reader: The Tragedy of Industrial Animal Factories. D. Imhoff, Editor. Berkeley, California: Watershed Media and University of California Press.

2003 Industrial Agriculture, Democracy, and the Future. IN Beyond Factory Farming. Pp. 9-28. A. Ervin, C Holstlander, D. Qualman, R. Sawa, Editors. Saskatoon, Saskatchewan: Canadian Centre for Policy Alternatives.

1998 Introduction. IN Pigs, Profits, and Rural Communities. With E. P. Durrenberger. Thu and Durrenberger, editors. Albany, New York: State University of New York Press.

1998 Rural Health and Large-Scale Swine Operations. In In Harmony with the Environment and Society. With E.P. Durrenberger. Ames, Iowa: SWCS.

1997 Health Problems and Disease Patterns. IN The International Labor Encyclopaedia of Occupational Health and Safety, 4th Edition. With C. Zwerling and K. Donham. Geneva, Switzerland: ILO.

1996 Social Issues. IN Understanding the Impacts of Large-Scale Swine Production: Proceedings from an Interdisciplinary Scientific Workshop. with L. DeLind, E.P. Durrenberger, C. Flora, J. Flora, W. Heffernan, and S. Padgitt. K. Thu, editor. Iowa City, Iowa: The University of Iowa.

1996 Introduction. IN Understanding the Impacts of Large-Scale Swine Production: Proceedings from an Interdisciplinary Scientific Workshop. With K. Donham. K. Thu, Editor. Iowa City, Iowa: The University of Iowa.

1995 Agricultural Medicine and Environmental Health: The Missing Component of the Sustainable Agricultural Movement. IN Human Sustainability in Agriculture. With K. Donham. H.H. McDuffie, et al., eds. Lewis Publishers.

Papers Presented

2011 Geography Department Colloquium, with Rebecca Winker, "Policy, Science, and Water Quality. March 11.

2010 A New Environmental Studies Program that links together the natural sciences, humanities, social sciences, and technology. With Lenczewski, M., et al. Annual Meeting of the Association of Environmental Studies and Science. Portland, Oregon.

2009 University Engagement Session Discussant, Society for Applied Anthropology Annual Conference. Santa Fe, New Mexico. March 20.

2008 "Contesting the Factory and Favoring the Farm." Presented in the Session: "Locating the Factory in the Farm: A Cross-Disciplinary Panel on Forms of Industrial Agriculture" Alex Blanchette and Kendall Thu, Organizers. American Anthropological Association Annual Meeting, November 19 – 23, 2008 San Francisco, California

2007 "Rooted Theory: Exploring the Role of Contemporary Agriculture in the U.S." Presented in the Session: "Theoretical Implications of Agriculture as Such" Murray Leaf, Organizer. American Anthropological Association Annual Meeting November 28 – Dec 2, Washington, D.C.

2007 Session discussant at the American Anthropological Association meetings. Culture & Agriculture Session organized by Bob Rhoades and Todd Crane. November 28 – Dec. 2, Washington, DC.

2006 "Coalition Building and Environmental Policy Advocacy in Agriculture." Presented in the Session: "Agriculture and the Environment: Challenges and Policies in the 21st Century" Kendall Thu Organizer. Society for Applied Annual Meeting March 28 – April 2. Vancouver, British Columbia.

2005 "Against the Grain: AKA the Need for Sensual Beer." Paper presented at the Society for Applied Anthropology Annual Meeting, Santa Fe, New Mexico.

2004 "Confidentiality: Protecting the Identity of Research Subjects in a Small Community." Annual Meeting of the Public Responsibility in Medicine and Research/Applied Research Ethics National Association. Lori Bross (NIU IRB Administrator) Session Organizer. With Kenneth Davidson (NIU General Counsel), Jane McBride (Illinois Assistant Attorney General). Washington, D.C. December 4-7.

2004 "Draft Plan for a Center for Human Studies and Public Policy." Public Policy Forum Sponsored by the AAA Committee on Public Policy, Organized by Kendall Thu. 102nd Annual Meeting of the American Anthropological Association. Chicago, Illinois. November 20.

2004 "Risk factors for farm work-related injuries: A nested case control study in the Agricultural Health Study Cohort." National Occupational Injury Research Conference. Pittsburgh, Pennsylvania. With N. Sprince, C. Zwerling, P.S. Whitten, C. Lynch, L. Burmeister, N. Logsden-Sackett, H. Park, P. Gillette, and M. Alavanja. October.

2003 "Environment, Resources, and Sustainability: Policy Issues for the 21st Century." Annual Meeting of the Society for Applied Anthropology. Portland, Oregon. March 19-23.

2003 Discussant for Invited Session: "Land and Trust: Applying Social, Cultural, and Ethical Principles Above Market Principles to Local Land Use Decisions. Barbara Dilly, Creighton University, Organizer. 102nd Annual Meeting of the American Anthropological Association. Chicago, Illinois. November 21.

2003 "The Science of Air Quality Studies on CAFOs: Beyond Nuisance." Midwest Environmental Enforcement Conference. Madison, Wisconsin. October 7.

2002 "Co-Opting The Family Farm Ideology In Agricultural and Environmental Politics." Paper Presented In the Session "Romancing The Farm: Growing Distance Between Idyll And Real In The U.S. Country," Nick Schorr, Carnegie Mellon, Session Organizer. Annual Meeting of the AAA. New Orleans, Louisiana. Nov. 19-24.

2002 "Anthropology and Pigs: What Does it All Mean?" National Canadian Agricultural Conference, Saskatchewan Office of the Canadian Centre for Policy Alternatives (CCPA). University of Saskatchewan, Saskatoon, Canada. November 15-17.

2002 "The Chicken: Its Biological, Social, Cultural, and Industrial History from Neolithic Middens to McNuggets. Session Discussant for: "Engineering a Verticalized Industry: Contracting Growers' Roles, Rights, Communities, and Incomes" Yale University, May 17-19.

2002 Robert F. Kennedy Jr's Water Keeper Alliance Summit. "Sound Science: Who Decides?" Clear Lake, Iowa. April 5.

2002 "Environment, Ethics, and Applied Anthropology: Legal Challenges to Research Participant Confidentiality." Annual Meeting of the Society for Applied

Anthropology. Atlanta, Georgia. March 7-11.

2002 "Development of Persuasive Evidence in CAFO Cases." National Association of Attorneys General. Baltimore, Maryland. March 5-6.

2001 "Environmental Contamination and Industrial Agriculture ion the Midwestern U.S." Presented at the session "Environmental Conflicts in the Americas," K. Thu Organizer, 100th Annual Mtg of the AAA. Washington, D.C., Nov. 28 – Dec. 2.

2001 "Public Health Issues and Neighborhood Impact." Environmental Health Sciences Research Center, University of Iowa, Des Moines, Iowa. November 16.

2001 "The Use of GIS Technology for Environmental Research on Industrial Agriculture." Paper presented in the session "Contemporary Issues in the Anthropology of Agriculture for the Postglobal Age," K Thu organizer. The Society for Applied Anthropology Annual Meeting "Conflict and Accord in the Postglobal Age." Merida, Yucatan, Mexico. March 28-April 1. With Chaya Spears.

2001 "Keeping the Game Close: Men's College Basketball Refereeing Behavior and Its' Socioeconomic Context." Poster presented at the Society for Applied Anthropology Annual Meeting "Conflict and Accord in the Postglobal Age." Merida, Yucatan, Mexico. March 28-April 1. With K. Hattmann, V. Hutchinson, S. Lueken, N. Davis, and E. Linboom.

2000 Public Policy Forum: "Social and Environmental Justice Implications of the Industrialization of Agriculture." AAA Public Policy Session Co-organized with E. P. Durrenberger. Annual meeting of the American Anthropological Association, November 15-19, San Francisco, California.

2000 "Recent Research on Neighbor Health Problems Near Swine CAFOs." Iowa's Center for Agricultural Safety and Health 10th Anniversary Conference "A Celebration of 10 Years Promoting Safety and Health of Iowa's Agricultural Workers." November 9-10, Iowa City, Iowa.

2000 "Relationships Among Farmers' Financial Stressors, Safety and Health Beliefs, and Stress Indicators." Central States Agricultural Health and Safety Conference. September 20-22, Kansas City, Kansas. With C. Hodne and K. Donham.

2000 "The Certified Safe Farm Project: An Application of Agricultural Mental Health." National Association for Rural Mental Health Conference. August 4-6, Portland, Oregon. With M. R. Rosmann, K. Donham, C. Hodne, N. Roy, L. Grafft, R. Rautiainen, and C. Sheridan.

2000 "The Farm Safety and Health Beliefs Scale: Relationships with Financial Stress and Depression." National Institute for Farm Safety Annual Conference. June 24-29, Dubuque, Iowa. With C. Hodne, K. Donham, D. Watson, and N. Roy.

2000 "Health Insurance Coverage of Farmers: Relevance to Certified Safe Farms, An Incentive-Based Safety Program." National Institute for Farm Safety Annual Conference. June 24-29, Dubuque, Iowa. With S. Schneiders and K. Donham.

2000 "Certified Safe Farm: An Overview and Results after Two Years." National Institute for Farm Safety Annual Conference. June 24-29, Dubuque, Iowa. With K. Donham, R. Rautiainen, S. Schneiders, N. Roy, C. Sheridan, and R. Rautiainen.

2000 "Incentive-Based Agricultural Health and Safety Programs: A Review and Historical Development of the Certified Safe Farms Program." Presented at the National Institute for Occupational Safety and Health conference "Agricultural Health and Safety in a New Century." Cooperstown, New York, April 28 – 30. With K. Donham, R. Rautiainen, N. Roy, S. Schneiders, and C. Sheridan.

2000 "Health Insurance Profiles of farmers in Northwest Iowa." Presented at the National Institute for Occupational Safety and Health conference "Agricultural Health and Safety in a New Century." Cooperstown, New York, April 28 – 30. With S. Schneiders, K. Donham, N. Roy, and C. Sheridan.

2000 Session Discussant: Resources, Production, and the Specter of Consumption: Reconciling Market and Non-Market Food Practices Past and Present. Stephen E. Tulley, organizer. Society for Applied Anthropology Annual Meeting "Global and Local Histories: Applied Anthropology Across the Centuries." San Francisco, California. March 21-26.

2000 "The Iowa Farmers Union and the State: A Case Study of Local Farmers, The Centers for Disease Control, and the Environmental Impact of Industrialized Swine Production in the Midwestern U.S." Paper presented at the session, Anthropology and Unions: Images and Realities, E. P. Durrenberger, organizer. Society for Applied Anthropology Annual Meeting "Global and Local Histories: Applied Anthropology Across the Centuries." San Francisco, California. March 21-26.

2000 "Agriculture and the Environment: Policy, Advocacy, and State Power." Paper presented at the Society for Applied Anthropology Policy Workshop, K. Thu, organizer. Society for Applied Anthropology Annual Meeting "Global and Local Histories: Applied Anthropology Across the Centuries." San Francisco, California. March 21-26.

1999 "Applied Anthropology and the Ethnography of Midwestern Agriculture." Paper presented at the session "Ethnography of the Midwest," E Paul Durrenberger, organizer. 98th Annual Meeting of the American Anthropological Association. November 17-21, Chicago, Illinois.

1999 "Industrialization of Agriculture." American Bar Association Conference "Environmental Challenges in Animal Feedlot Operations." Minneapolis, Minnesota. May 12.

1999 "Corporate Concentration of Food Production and Distribution in Contemporary States." Paper presented at the Annual Meeting of the Society for Applied Anthropology. April 20-25, Tuscon, Arizona.

1999 "Emerging Public Health and Social Issues with Industrialized Livestock Production." Rural Health Studies Conference, Southwest State University, Marshall, Minnesota. April 14.

1998 "Making it Relevant: Applied Anthropology in Policy and Politics." Paper presented at the 97th Annual Meeting of the American Anthropological Association. December 2-6, Philadelphia, Pennsylvania.

1998 "Preventive Health Screening Results Among Certified Safe Farm Participants." Paper presented at the Fourth International Symposium "Rural Health and Safety in a Changing World." October 18-22, Saskatoon, Saskatchewan, Canada. With N. Roy, C. Sheridan, and K. Fisher.

1998 "Iowa Certified Safe Farm On-Farm Safety Reviews." Paper presented at the Fourth International Symposium "Rural Health and Safety in a Changing World." October 18-22, Saskatoon, Saskatchewan, Canada. With L. Grafft, R. Rautiainen, K. Donham, C.V. Schwab, N. Roy, and and C. Sheridan.

1998 "Health Belief Models in the Iowa Certified Safe Farm." Paper presented at the Fourth International Symposium "Rural Health and Safety in a Changing World." October 18-22, Saskatoon, Saskatchewan, Canada. With C. Hodne K. Donham, and N. Roy.

1998 "Expanding Access to Preventive Agricultural Occupational Health Services for Iowa Farm Families." Paper presented at the Fourth International Symposium "Rural Health and Safety in a Changing World." October 18-22, Saskatoon, Saskatchewan, Canada. With N. Roy, C. Sheridan, and K. Donham.

1998 "Preliminary Results from the Iowa Certified Safe Farm System." Paper presented at the Fourth International Symposium "Rural Health and Safety in a Changing World." October 18-22, Saskatoon, Saskatchewan, Canada. With N. Roy, C.

Sheridan, K. Donham, R. Rautiainen, and L Grafft.

1998 "Who's Country is it? The Story of a Farm Family, an Anthropologist, and Politics from the Midwestern U.S." Paper presented at the Society for Applied Anthropology Annual Conference "Scholars and Activists." April 21-26, San Juan, Puerto Rico.

1997 "Walter Goldschmidt and Pig Tales." Paper presented at the 96th Annual Meeting of the American Anthropological Association Invited Session "Culture and Agriculture Honors Walter Goldschmidt." K. Thu, organizer. November 19-23, Washington, D.C.

1997 "Cultural Challenges in Agricultural Health." Keynote presentation to the 13th Congress of the International Association of Agricultural Medicine and Rural Health. Iowa City, Iowa. September 7.

1997 "Social Dimensions of Large-Scale Livestock Production." Presentation at the session "Engineering Livestock Operations to be Good Neighbors," G. E. Fromanek, organizer, for the American Society of Agricultural Engineers annual Conference. Minneapolis, Minnesota. August 12.

1997 "Insurance Incentives for Farm Health and Safety in Iowa and Nebraska." National Institute for Occupational Safety and Health Agricultural Health and Safety Conference. July 15-17, West Virginia. With K. Donham, S.V. Essen, and N. Roy.

1997 "Great Plains Community Intervention Projects: Clearinghouse—Certified Safe Farms—Engineering Intervention." National Institute for Occupational Safety and Health Agricultural Health and Safety Conference. July 15-17. Morgantown, West Virginia. With K. Donham and R. Rautiainen.

1997 "Insurance Incentives for Safer Farms: The Response of Farmers to an Iowa-Nebraska Initiative." National Institute for Farm Safety Conference "Teaming Up for Safety." June 22-26. Indianapolis, Indiana. With K. Donham, R. Rautiainen, N. Roy, R. Rautiainen, and C. Sheridan.

1997 "Understanding the Impacts of Large-Scale Swine Production: Findings of an Interdisciplinary Scientific Workshop." The Iowa Academy of Science 109th Annual Meeting. Clark College, Dubuque, Iowa. April 26.

1997 "Grassroots Community Organizing." Presentation to the National Lawyers Guild Conference. University of Iowa College of Law. April 12.

1997 "Selling the Farm and Makin' Bacon: Land Grant Institutions and Factory Hog

Production." Paper presented for the Society for Applied Anthropology Annual Meetings: "Method, Power, Change." For the session "Modeling the World: Policies for Fishers, Farmers, and Scientists" organized by S. Meltzoff, P. Weeks, and R. Ziegenhorn. March 4-9. Seattle, Washington. With E.P. Durrenberger.

1996 "The Politicized Pig: Politics and Progress in Iowa Agriculture." Paper presented at the 94th Annual Meeting of the American Anthropological Association session Power, Politics, and the Transformation of Rural America," organized by Jane Adams. November 20-24. San Francisco, California. With R. Ziegenhorn and E.P. Durrenberger.

1996 "When Does Hog Odour Stink?" Presentation at the Symposium "The Swine Industry at the Forefront of Environmental Issues." McGill University. September 19. Montreal, Canada.

1996 "The Politics of Swine Research: Examples from Iowa." Paper for the 59th Annual Meeting of the Rural Sociological Society panel "Political Dimensions of Social Science Research on Industrial Agriculture: Current Examples from the Swine Industry and an Historic Context." K. Thu, organizer. August 15-18. Des Moines, Iowa. With E.P. Durrenberger.

1996 "State Perspective Regarding the Extent of Large-scale Swine Operation Problems." Presentation to the "Centers for Disease Control Workshop on Public Health Issues Related to Concentrated Animal Feeding Operations." Washington, D.C. June 23-24. With K. Donham.

1996 "The Health Effects of Large Scale Pork Production: The Health of Workers and Neighbors." Human Health, Air Quality, and Large-Scale Swine Production. EPA Conference "Health Effects of Odors." Duke University, April 16-17. With K. Donham.

1996 "Politics and Rural Injustices of Industrial Swine Production." Presentation to "Global Environmental health, Global Environmental Justice" Conference sponsored by the Global Health Program and hosted by the College of Law, The University of Iowa. April 12-14.

1996 "Damned if You Do, Damned if You Don't." Paper for the Society for Applied Anthropology Annual Meetings: "Global-Local Articulations." March 27-31, Baltimore, Maryland. With E. P. Durrenberger.

1996 "Stress as a Risk Factor for Agricultural Injuries: Comparative Data from the Iowa Farm Family Health and Hazard Survey and the Iowa Farm and Rural Life Poll." Paper for the Great Plains Center for Agricultural Safety and Health 3rd Annual

NIOSH Conference. March 25-26. Iowa City, Iowa. With P. Lasley, M. Lewis, K.J. Donham, C. Zwerling, and R. Scarth.

1996 "A Proposal to Link a Farm Safety and Health Certification Program to Health Insurance Discounts." Paper for the Great Plains Center for Agricultural Safety and Health 3rd Annual NIOSH Conference. March 25-26. Iowa City, Iowa. With S. V. Essen and K. Donham.

1996 "Air Quality Assessments Surrounding Swine Production Facilities. Paper for the Great Plains Center for Agricultural Safety and Health 3rd Annual NIOSH Conference. March 25-26. Iowa City, Iowa. With J. Stookesberry, K. Donham, and S. Reynolds.

1995 "Rethinking Agricultural Injuries in Iowa, Part II. Presentation at the fall statewide meeting of Iowa's Center for Agricultural Safety and Health. December 12. Iowa City, Iowa.

1995 "Social Consequences of Large Scale Swine Production." Presentation for "The Impacts of Large Scale Swine Production: An Interdisciplinary Scientific Workshop." June 29-30. Des Moines, Iowa.

1995 "Rethinking Agricultural Injuries in Iowa: A Statewide Analysis." Presentation at the spring statewide meeting of Iowa's Center for Agricultural Safety and Health. May 1. Des Moines, Iowa.

1995 "Contested Commoditization: Power, Policy, Rhetoric, and Forms of Swine Production in the United States." Paper for "Rethinking Commodities," the 15th Annual Meeting of the Society for Economic Anthropology. April 21-22. Santa Fe, New Mexico. With E. P. Durrenberger.

1995 "Piggeries and Politics: Development and Iowa's Multibillion Dollar Swine Industry." Paper presented at the Society for Applied Anthropology 1995 Annual Meetings session "Rural Involution in Iowa: The Anthropology of Pigs, People and Policy." March 29 - April 2. Albuquerque, New Mexico.

1994 "Human Dimensions of Public Policy in U.S. Industrial Agriculture: A Role for Anthropology." Paper presented at the 93rd Annual Meetings of the American Anthropological Association session "Human Dimensions of Public Policy in U.S. Industrial Agriculture." November 30 - December 4. Washington, D.C. With E. P. Durrenberger.

1994 "Iowa's Swine Industry: Societal and Human Issues." Presentation to the American Society of Agricultural Engineers. September 15, Iowa State University, Ames, Iowa.

1994 "Industrial Agricultural Development: An Anthropological Review of Iowa's Swine Industry." Paper presented at the 20th Annual National Association of Rural Mental Health Conference. July 3. Des Moines, Iowa. With E.P. Durrenberger.

1994 "Anthropological Research on Industrial Agriculture and States: Implications for Understanding Agrarian Adaptations." Paper presented at the Central States Anthropological Society 71st Annual Meetings. March 17-20. Kansas City, Kansas.

1994 "The Hidden Impact of Agricultural Policy on Health: The Example of Livestock Confinement." Paper presented at the Central States Anthropological Society 71st Annual Meetings. March 17-20. Kansas City, Kansas. With K. Donham.

1993 "State and Rural Models of Agriculture in Contemporary Norway." Paper presented at the 92nd Annual Meetings of the American Anthropological Association. Washington, D.C.

1988 "The Farm Family Health Survey." Presented at the International Agricultural and Environmental Health Conference, Iowa City and Des Moines, Iowa. With L. Ogilvie, K. Donham, and C. Hradek.

1988 "The Farm Family Health Survey: Stress and the American Farmer." The American Public Health Association Meetings, Boston, Mass. With L. Ogilvie, K. Donham, and C. Hradek.

Reviews

2004 Review of "Slaughterhouse Blues: The Meant and Poultry Industry in North America" by Donald D. Stull and Michael J. Broadway. Belmont, CA: Thomson/ Wadsworth, 172 pp. Great Plains Research 14(2): 353-354.

1995 Review of "Human Behavior in the Social Environment: An Ecological View," by Carel Bailey Germain. New York: Columbia University Press, 1991. 543 pp. Contemporary Psychology 40(3):234.

Research Reports

2001 Neighbor Health and Large Scale Swine Production. A White Paper Prepared for the Conference "An Agricultural Safety and Health Conference: Using Past and Present to Map Future Action." March 4. Baltimore, Maryland

2000	Air Quality Research and Technology Transfer White Paper and Recommendations for Concentrated Animal Feeding Operations. Agricultural Air Quality Task Force Confined Livestock Air Quality Committee. With J. Sweeten, L. Erickson, P. Woodford, C. Parnell, T. Coleman, R. Flocchini, C. Reeder, J. Master, W. Hambleton, G. Bluhm, and D. Tristao. July 19. Washington, D.C.: USDA
1999	Overview of Health and Environmental Risks Associated with Industrial Agriculture. For Union of Concerned Scientists White Paper on Animal Agriculture, Washington, D.C. With K. Donham.
1988	Proceedings of the Agricultural and Environmental Health Conference. Minneapolis, Minnesota: The Northwest Area Foundation. Editor.

Grants, Fellowships, Leaves of Absence

2011-2013	The McKnight Foundation. "Clean Water Policy and Water Sampling."	7/1/11-12/1/13	$120,000
2009-2111	The McKnight Foundation. "Enforcing the Clean Water Act."	7/1/09-6/30/11	$110,000
2007-2009	The McKnight Foundation. "Enforcing the Clean Water Act in Illinois" (K. Thu, PI)	7/1/07-6/30/09	$130,000
2007-2008	Liberty Prairie Foundation. "Illinois' Local Foods Coalition." (K. Thu, PI)	11/1/07-6/30/08	$10,000
2005-2007	The McKnight Foundation. "Strengthening the Rural Organizational Infrastructure in Illinois" (K. Thu, PI)	7/1/05-6/30/07	$100,000
2002-2004	The McKnight Foundation. "Scientifically Based Outreach and Policy Education on Large-Scale Swine Facilities." (K. Thu, PI)	7/1/02-10/15/04	$100,000
2000-2002	The McKnight Foundation. "Scientifically Based Outreach and Policy Education on Large-Scale Swine Facilities." (K. Thu, PI)	3/2000-3/2002	$100,000
2001	Research & Artistry Grant, Northern Illinois University. "An Ethnographic Assessment of Local Conceptual Models of Environmental Risk."	5/2001-7/2001	$10,438

2000	Research & Artistry Grant, Northern Illinois University. "Using GIS Technology to Assess Environmental Risk in Iowa, Illinois, and Minnesota.	5/2000-7/2000	$11,466
1999-2000	Center for Disease Control, National Institute for Occupational Safety and Health, Community Partners for Health Farming Intervention. "Certified Safe Farms." (K. Thu, PI with K. Donham, et al.)	9/99-9/2000	$70,000
1999	Pioneer Hi-Bred International, Inc. Community Investment Program. "Certifed Safe Farms: A Pilot Project to Test and Evaluate an Incentive Approach to Improve the Health and Safety of Iowa Farmers." (K. Thu, PI with K. Donham, et al.)	1/99-12/99	$25,000
1999	National Pork Producers Council. "Certifed Safe Farms: A Pilot Project to Test and Evaluate an Incentive Approach to Improve the Health and Safety of Iowa Farmers." (K. Thu, PI with K. Donham et al.)	1/99-12/99	$22,000
1998-2000	USDA, Fund for Rural America. A Model Community Educational Project to Understand and Promote Community Acceptable Farming." (Co-PI with K. Donham).	1/98-1/2000	$220,000
1997-	National Pork Producers Council. "Certifed Safe Farms: A Pilot Project to Test and Evaluate an Incentive Approach to Improve the Health and Safety of Iowa Farmers." (K. Thu, PI)	12/97-12/98	$20,000
1997-2000	Department of Health and Human Services, Office of Rural Health Policy. "Sustaining Agricultural Health Services in Iowa." (Co-PI with K. Donham and C. Sheridan)	10/97-2/2000	$600,000
1997-1998	Pioneer Hi-Bred International, Inc. Community Investment Program. "Certifed Safe Farms: A Pilot Project to Test and Evaluate an Incentive Approach to Improve the Health and Safety of Iowa Farmers." (K. Thu, PI)	9/97-9/98	$30,000
1997-1998	Iowa Pork Producers Association. "Certified Safe Farms: A Pilot Project to Test and Evaluate An Incentive Approach to Improve the Health and	9/97-6/98	$5,000

	Safety of Iowa Pork Producers." (K. Thu, PI)		
1997-1998	U of Iowa, Injury Prevention Research Center. "Beliefs and Stress Factors Affecting Farm Safety." (K. Thu, PI)	9/97-7/98	$10,000
1996-1999	Center for Disease Control, National Institute for Occupational Safety and Health, Community Partners for Health Farming Intervention. "Certified Safe Farms." (K. Thu, PI)	10/96-9/99	$195,000
1996-2000	Center for Disease Control, Injury Prevention Research Center. "A Nested Cohort Study of Agriculturally Related Injuries Within the Agricultural Health Study." (N. Sprince, PI; K. Thu, Co-Investigator)	8/96-8/00	$593,137
1996-1997	Pioneer Hi-Bred International, Inc. Community Investment Program. "A Pilot Project to Develop Insurance Incentives for Safe Farms." (K. Thu Co-PI with K. Donham and S. V. Essen)	5/96-5/97	$10,000
1996	Leopold Center for Sustainable Agriculture Human Systems Team. "Networking Among Independent Swine Producers: Opportunities and Barriers for the Viability of Iowa Farms: A Supplemental Grant." (K. Thu, PI)	1/96-12/96	$4,500
1995	Leopold Center for Sustainable Agriculture Human Systems, "Networking Among Independent Swine Producers: Opportunities and Barriers for the Viability of Iowa Farms." (K. Thu, PI)	1/95-12/95	$10,200
1995-1996	Center for Health Effects of Environmental Contamination (Co-PI with K. Donham)	2/95-2/96	$4,000
1994-1995	Farm Foundation Grant. (Co-PI with K. Donham)	12/94-12/95	$4,000
1994-1995	North Central Regional Center for Rural Development. (K. Thu, PI)	12/94-9/95	$11,850
1994-	National Institute of Environmental Health Sciences Research Center Grant (Co-PI with K. Donham)	6/94-6/95	$10,000

		TOTAL	$29,850

All of the above grants for: "Toward Large Scale Swine Production: A Scientific Workshop for Considering the Sustainability of the Environment, Worker Health, Economic Development, and Rural Communities." (Co-PI and Co-Organizer with K. Donham).

1994-1996	Center for Health Effects of Environmental Contamination, "Air Quality and Health Assessments of Individuals Living in the Vicinity of Swine Confinement Operations." (K. Donham, PI; K. Thu, Co-investigator)	2/94-2/96	$15,000
1990	Marshall Fund Grant. Ethnographic Research on Farming and State Policy in Norway. (K. Thu, PI)	5/90-8/90	$1,500
1990	Thanksgiving Fund Grant, The Norway-America Association. Ethnographic Research on Farming and State Policy in Norway. (K. Thu, PI)	5/90-8/90	$1,500
1988-1990	King Olav V Research Fellowship, American-Scandinavian Foundation. Ethnographic Research on Farming and State Policy in Norway. (K. Thu, PI)	12/88-1/90	$12,000
1988	Video Production Fund Grant, The University of Iowa. Ethnographic Documentary on Farmer's Perspectives Toward Agricultural Health Problems in Iowa. (K. Thu, PI)	5/88-12/88	$10,000 (approx.)

Other

1999 Robert McC. Netting Prize in Political Ecology awarded by the Political Ecological Society for the best article in the Journal of Political Ecology in 1997. Co-award winner with E.P. Durrenberger.

1995-Present Fellow in the Society for Applied Anthropology.

Teaching and Related Activities

Teaching Responsibilities

Courses Taught:

The Environment in the Social

Sciences and Humanities	ENVS 303
Intro to Human Diversity	ANTH 120
Cultural Anthropology	ANTH 220
American Culture	ANTH 301
Environmental Anthropology	ANTH 425
Applied Anthropology	ANTH 461
Medical Anthropology	ANTH 465
Anthropology of Food	ANTH 491

Direction of Theses and Dissertations or Equivalents

NORTHERN ILLINOIS UNIVERSITY

Master's Completed

Chair

Patricia Wilson, Department of Anthropology
Angelica Lopez, Department of Anthropology
Danielle Diamond, Department of Anthropology
Paul Herrick, Department of Anthropology
Juliet Nyamuga, Department of Anthropology
Vanessa Doran, Department of Anthropology
Sandi Caldrone, Department of Anthropology
David McCaig, Department of Anthropology
Chaya Spears, Department of Anthropology

Member

Austin Sawicki, Department of Anthropology
Jennifer Weidman, Department of Anthropology
Cynthia Paralejas, Department of Anthropology
Janet Gardner, Department of Anthropology
Kim Sedara, Department of Anthropology
Scott Lueken, Department of Anthropology
Katie Lyon, Interdisciplinary Program
Sean Dolan, Department of Anthropology
Pisith Phlong, Department of Anthropology

Master's In Progress

Chair

Tonye Barango, Department of Anthropology
Rachel Drochter, Department of Anthropology

Laura Ewert, Department of Anthropology
Karly Guldan, Department of Anthropology
Kayla Haynes, Department of Anthropology
Beth Kinch, Department of Anthropology
Kathryn DeWitt, Department of Anthropology
Laura Ewert, Department of Anthropology
Stew Johnsen, Department of Anthropology
Linn Kleppe, Department of Anthropology
Sarah Phalen, Department of Anthropology
Mary Petrzilka, Department of Anthropology
Shawn Smith, Department of Anthropology
Mary Thomas, Department of Anthropology
Jackie Whelan, Department of Anthropology

Member

LeAnn Pearson, Department of Anthropology
David Mills, Department of Geology and Geosciences

UNIVERSITY OF NORTH CAROLINA

PhD Committee Member, Rachel Avery, Department of Epidemiology. Steve Wing, Committee Chair. Graduated Fall, 2007.

Honor's Student Capstone Projects

Tony Romano
Crystal Kirsch
Christy Nagel

2011, ENVS Summer Camp Teacher for High School Students

Advising Activities

I oversee the department graduate certificate program in Applied Anthropology. This involves individual consultation to ensure the 18 hours of required courses are approved and that an appropriate applied thesis project and/or internship are completed.

2003 Participated in the Workshop: "General Education, Assessment, and Scholarship of Teaching." Faculty Development and Instructional Design Center. Feb. 7

2003 Participated in the Workshop: "Juggling, Dogs, and Assessment: The Importance of Feedback, Critical Thinking, and Punctuation." Faculty Development and Instructional Design Center. Feb. 7

Professional Service

1. Professional Offices/Service

2010-2012 Elected Member of the American Anthropological Association's Committee on Ethics.

2008-2010 Editor, Culture & Agriculture. American Anthropological Association. Appointed by the Culture & Agriculture Section Board.

2007-2010 Elected Board Member, National Association of Practicing Anthropology. American Anthropological Association.

2002-2005 Elected Chairman, Committee on Public Policy, American Anthropological Association.

2002-2005 Public Policy Committee, Society for Applied Anthropology. Appointed.

2001-2003 Elected to the Executive Board, Central States Anthropological Society.

2002 American Anthropological Association Annual Meeting Program Committee Section Program Editor, Culture and Agriculture.

2000-2002 Elected President, Culture & Agriculture Section, American Anthropological Association.

2000-2001 Program Committee Member, Society for Applied Anthropology Annual Meeting "Conflict and Accord in the Postglobal Age." Merida, Yucatan, Mexico. March 28 - April 1.

1998-2001 Culture and Agriculture Executive Committee Board Member, American Anthropological Association.

1999 Member of Society for Applied Anthropology's Program Planning Committee for the 2000 Annual Meeting of the Society for Applied Anthropology. San Francisco, California. March 21-26.

1999-2000 Society for Applied Anthropology Policy Committee Program Subcommittee Chair for the Year 2000 SFAA Annual Meetings in San Francisco, California.

1998-2000 American Anthropological Association Newsletter Column editor for Culture and Agriculture section.

1998 American Anthropological Association Annual Meeting Program Committee
Section Program Editor, Culture and Agriculture.

2. Scholarly Refereeing

Journals

American Ethnologist
Atmospheric Science
Culture and Agriculture
Environmental Health Perspectives
Environment International
Human Organization
Journal of Agricultural Economics
Journal of Agricultural Safety and Health
Journal of AgroMedicine
Journal of Political Ecology
Journal of Public Health
Journal of Rural Health
Medical Anthropology Quarterly
Scandinavian Studies
Southern Rural Sociology
Urban Anthropology

Manuscripts

University of Oklahoma Press
State University of New York Press

Granting Agencies

Carnegie Mellon Dissertation Awards
Education Foundation of America
North Central Region Sustainable Agriculture Research and Education Program (USDA)
National Research Initiative Competitive Grants Program (USDA)
National Science Foundation

Other

Outside Tenure Reviewer
Elizabeth Finnis, University of Guelph, Ontario, Fall, 2010
Tom Thornton, Portland State University, Fall 2008.
Barbara Dilly, Creighton University, Fall 2006.

3. Professional Sessions Organized

2011	Co-Organized and Chaired Double Session for the American Anthropological Association Annual Meetings in Montreal, Canada. The Legacy of Walter Goldschmidt. November, 2011.
2008	"Locating the Factory in the Farm: A Cross-Disciplinary Panel on Forms of Industrial Agriculture" Alex Blanchette and Kendall Thu, Organizers. American Anthropological Association Annual Meeting, November 19 – 23, 2008 San Francisco, California
2004	"A Draft Plan for a Center for Human Studies and Public Policy." Public Policy Forum Sponsored by the AAA Committee on Public Policy, Organized by Kendall Thu. 102nd Annual Meeting of the American Anthropological Association. Chicago, Illinois. November 20.
2003-2006	International Council for Science, Scientific Committee on Problems of the Environment (Paris, France). Planning Workshop for Global Assessment of the Industrialization of Livestock Production. Stanford University, Sept. 26-27.
2002	"Environment, Resources, and Sustainability: Policy Issues for the 21st Century." Anthropology Policy Conference, Co-organizer with Pete Brosius. University of Georgia, Athens, Georgia. Sept. 7-8.
2001	"Environmental Conflicts in the Americas," K. Thu Organizer, 100th Annual Mtg of the American Anthropological Association. Washington, D.C. Nov. 28–Dec. 2.
2001	Contemporary Issues in the Anthropology of Agriculture for the Postglobal Age. Session organized for the Society for Applied Anthropology Annual Meeting Conflict and Accord in the Postglobal Age." Merida, Yucatan, Mexico. March 28-April 1. K. Thu, organizer.
2000	Policy Forum: Social and Environmental Justice Implications of the Industrialization of Agriculture." AAA Public Policy Session Co-organized with E. Paul Durrenberger. Annual meeting of the American Anthropological Association, November 15-19. San Francisco, California.
2000	Policy Workshop for the Society for Applied Anthropology Annual Meeting "Global and Local Histories: Applied Anthropology Across the Centuries." March 21-26. San Francisco, California. K. Thu, organizer.
1997	Culture and Agriculture Honors Walter Goldschmidt." Invited session organized for the 96th Annual Meeting of the American Anthropological Association. November 19-23. Washington, D.C. K. Thu, organizer.

1996 Research Frontiers in Industrial Agriculture." Culture and Agriculture roundtable organized for the 94th Annual Meetings of the American Anthropological Association. November 19-23. Washington, D.C. K. Thu, organizer.

1996 Political Dimensions of Social Science Research on Industrial Agriculture: Current Examples from the Swine Industry and an Historic Context. Panel organized for the 59th Annual Meeting of the Rural Sociological Society: "Harvest of Rural Society: Healthy Families and Communities." August 15-18, 1996, Des Moines, Iowa. K. Thu, organizer.

1996 Institutional Contexts Shaping the Production of Knowledge: A Role for Applied Anthropology. Co-organized with E. Paul Durrenberger for the Society for Applied Anthropology Annual Meetings: "Global-Local Articulations." March 27-31, Baltimore, Maryland.

1995 Networking Among Independent Swine Producers: Practical Applications of Social Science Research. Panel Organized for the Association for Farming Systems Research-Extension North American Symposium "Linkages Among Farming Systems and Communities. Co-sponsored by the North-Central Regional Center for Rural Development and the Leopold Center for Sustainable Agriculture. November 6-8. Ames, Iowa.

1994-1995 Organizer, "Toward Large Scale Swine Production" A Scientific Conference for Considering the Sustainability of the Environment, Worker Health, Economic Development, and Rural Communities." A corollary conference to "Livestock Production for Sustainable Rural Communities," with the Center for Rural Affairs and the North Central Regional Center for Rural Development. Oct. 28-30, Kansas City, Missouri, & June 29-30, Des Moines, Iowa.

1994 American Anthropological Association, 93rd Annual Meeting Session: "Human Dimensions of Public Policy in U.S. Industrial Agriculture." November 30 - December 4. Atlanta, Georgia. K. Thu, organizer.

1994 Organizer, National Association of Rural Mental Health Conference Session: Industrial Agricultural 'Development: Overt and Covert Community Health Consequences. NARMH Annual Conference "Rural Community Survival," July 1-4. Des Moines, Iowa.

Institutional Service

2011-present College Faculty Senate Ad Hoc General Education Liaison Committee

2010-present Dean Appointed Member of CLAS Interdisciplinary Task Force.

2011 CLAS Communication Director Search Committee

2010-2011	Department IRB reviewer.
2010-present	University Council Personnel Committee (Vice-chair).
2009-present	Search Committee, Environmental Studies Program Director.
2009-present	Faculty Associate, Environmental Studies Program.
2008-present	University Council.
2008-2010	Departmental Exam Committee
2008-2009	University Memorial Committee for the Campus Shooting Tragedy.
2003-present	Institutional Review Board.
2006-2008	Vice-President, Faculty Senate.
2007	College Curriculum Committee (spring semester).
2005-2008	Departmental Personnel Committee.
2005-2007	Departmental Executive/Curriculum Committee.
2006-2008	Chair, Faculty Senate Academic Affairs Committee.
2006	Departmental IRB reviewer.
2005-2008	Faculty Senate.
2004-2007	Illinois Articulation Initiative to Facilitate Interinstitutional Transfer. Member Social and Behavioral Science Panel.
2001-2004	General Education Committee.
1999-2001	Executive and Curriculum Committee. Department of Anthropology, Northern Illinois University.
2000	The Cultural Evolutionary Implications of Agriculture and Contemporary Challenges in Livestock Production. Presentation for the New Ideas in Science Program for High School Science Teachers, LAS External Programs, Northern Illinois University. April 7.

2000 Industrial-Scale Livestock Production: Recent Environmental & Public Health Research. Geography Forum, Northern Illinois University. March 31.

Public Service

Editorials and Commentary

2008 "Monitor Livestock Operations." OpEd, Chicago Tribune. April 18.

2007 "The Importance of Getting the Story Right First." In Anthropology Newsletter, May, p. 8.

2007 "On the Front Lines of War from an Anthropologist Infantryman." In Anthropology Newsletter, February, pp. 6-8. With Justin Faulkner

2005 "County Commissioners: Observations from an Outsider." Roanoke Rapids, North Carolina *Daily Herald*. August 24.

2002 "Policy and Public Engagement: Recent Developments." In Anthropology Newsletter, February. With Pete Brosius and Judith Goode.

2001 "A decisive day for American Culture." Northern Star Forum. September 18.

2001 Clarifying the Science on Public Health Risks from Hog Facilities. Des Moines Register Commentary. February 25.

1999 Anthropologists Should Return to the Roots of their Discipline. Chronicle of Higher Education ViewPoint, April 26.

1999 Save the farm: Go right there for your pork. Cedar Rapids Gazette editorial. February 7.

1999 Coming in from the Margins: A Relevant Anthropology. American Anthropological Association newsletter. With E.P. Durrenberger.

1998 Candidate is a consensus-builder. Cedar Rapids Gazette editorial. May 26.

1998 Relevant Anthropologists and Relevant Commentary. Point-Counterpoint article for the American Anthropological Association newsletter. With E.P. Durrenberger. December.

1997 Research on large-scale hog operations. Omaha World Herald editorial. With K. Donham. January.

1995 Heed what research says about large-scale hog farms. Cedar Rapids Gazette editorial. With K. Donham. December 12.

1995 Whither our Subjects--and Ourselves? Anthropology Newsletter editorial. With E. P. Durrenberger.

1995 Breathing Easier on the Farm. Iowa Farmer Today editorial. With K. Donham. December.

1995 Child Safety on the Farm. Guest Opinion Column for Iowa Farmer Today. With Lynn Yontz, Farm Safety 4 Just Kids. February.

1994 Large-Scale Hog Farming vs. Quality of Life. Des Moines Register Viewpoint. With E. P. Durrenberger. March 8.

1994-1999 Co-Editor, Quarterly Newsletter of the Iowa Center for Agricultural Safety and Health.

1993-1997 Contributing Editor, Iowa Farmer Today standing column: "Health Care Today" on Agricultural Health and Safety.

Public Service to Organizations

2008-present Founding member of the Illinois Citizens for Clean Air and Water.

2007-2008 Member of the Food, Farm, and Jobs Task Force. Led the passage of legislation entitled “The Food, Farm, and Jobs Act.”

2005-2007 Founding member of the Illinois Food and Farm Coalition.

2001-2007 Executive Board Member, Illinois Stewardship Alliance. Rochester, Illinois.

1999-2002 Founding Member, Board of Directors. Sharing Help Awareness United Network (SHAUN). Nonprofit organization dedicated to assisting farm families who have suffered serious injury or health problems. Harlan, Iowa.

1999-2000 Appointed by Secretary of Agriculture Dan Glickman to the Federal Agricultural Air Quality Task Force, Natural Resources Conservation Service, USDA.

1997 Water Quality and Human Health Issues Working Group. Participant in the Iowa Environmental Council’s statewide initiative on the Water Quality Action Plan. October 7. Iowa City, Iowa.

1995 The Iowa Agricultural Health and Safety Network: A Statewide Summit

Meeting." Co-Organizer with Carolyn Sheridan. September 21. Spencer, Iowa.

1993 W.K. Kellogg Foundation Grassroots Leadership Development Workshop. Arlington, Virginia. May.

1993 Roundtable Discussant, "Health Care Reform and Agricultural Health and Safety Services in Iowa," for Conference: "Implementing Health Care Reform in Rural America: State and Community Roles." December. Des Moines, Iowa.

Expert Witness/Consultancy

2007 Expert Witness: *Simmons v. Robert Deutsch and Tri-Oaks Foods,* Jefferson County, Iowa

2002-2005 Expert Witness: *Nickels et al.V. Burnett*. DeKalb County, Illinois.

2000-2002 Expert Witness for the Illinois Attorney General in *State V. Highlands* and *State V. Henco*.

1999-2000 Expert Witness for Plaintiffs, Rutters, et al. V. Pork Plus, Inc.

1988 Interview Methods Consultant: Sartori Hospital, Cedar Falls, Iowa, March; Mary Imogene Bassett Hospital, New York, May; East Washington State University, May.

Public Lectures

2011 "Water Quality, Policy, and Agriculture." March 28. Clock Towers, Rockford, Illinois.

2011 "Science, Agriculture, and Water Quality." March 29. Bradley University, Peoria, Illinois.

2009 "Bridging Science and the Humanities in Environmental Studies." Illinois Humanities Council. Holmes Student Center, Oct. 12.

2009 "Industrial Agriculture, Democracy, and the Future." Northwest Illinois Audubon Society. Freeport, Illinois. Feb. 14.

2008 Ethical Panel Debate: Anthropologists in Human Terrain Systems in the Military. NIU, March 20.

2008 An Anthropological and Local View of Our Midwestern Food System. Lifelong Learning Institute. Jan. 23.

2007 Discussant for Regional Student Conference on Ethnography. U of Chicago, NIU, et al. sponsors. Held at NIU April 15.

2007 Gave talk to Jefferson County Farmers and Neighbors (JFAN) on public health issues and concentrated animal feeding operations. Feb. 22, Fairfield, Iowa.

2007 Gave talk on industrial agriculture to the Churches Center for Land and People. Feb. 2, Dubuque, Iowa.

2005 "Industrialized Agriculture, Environmental Justice, and Quality of Life in Eastern North Carolina." Environmental Justice Summit, North Carolina Environmental Justice Network. October 21-22.

2004 Concerned Citizens Against Hog Factories. Speaker at town meeting. Amboy, Illinois. Amboy Community Building, January 13.

2003 Opening Remarks on U.S. Agricultural Policy for Congressman Richard Gephardt's Agricultural Summit. Cedar Rapids, Iowa. September 23.

2003 The Consequences of Industrialized CAFOs for Environmental, Public, and Social Health," City Hall Public Hearing. Ottawa, Canada. May 24.

2002 "Anthropology and Pigs: What Does it All Mean?" National Canadian Agricultural Conference, Saskatchewan Office of the Canadian Centre for Policy Alternatives (CCPA). Univesity of Saskatchewan, Saskatoon, Canada. November 15-17.

2002 Robert F. Kennedy Jr's Water Keeper Alliance Summit. "Sound Science: Who Decides?" Clear Lake, Iowa. April 5.

2002 "Development of Persuasive Evidence in CAFO Cases." National Association of Attorneys General. Baltimore, Maryland. March 5-6.

2001 "Public Health Issues and Neighborhood Impact." Environmental Health Sciences Research Center, University of Iowa, Iowa Town Meeting. Des Moines, Iowa. November 16.

2001 "The Public Health Risks of Large-Scale Swine CAFOs." Testimony before the Iron County, Utah County Commissioners. Cedar City, Utah. February 12.

2000 What Scientists Aren't Telling You About Large-Scale Swine Operations. Presentation at Robert F. Kennedy, Jr.'s Summit on Environmental Problems

from Large-Scale Livestock Operations in the U.S. New Bern, North Carolina. Jan. 11.

2000 Environmental and Public Health Challenges for Large-Scale Livestock Facilities. Sierra Club. Northern Illinois University Law School. Sept 21.

2000 Understanding Environmental Challenges in the Livestock Industry. Iowa Farmers Union Annual Conference. Ames, Iowa. August 26.

2000 Environmental and Social Impacts of Large-Scale Livestock Facilities. The Farm Crisis: How it Affects Rural Communities, Food Safety and You. Sponsored by "We the People" of LaSalle County, Illinois and the Illinois Stewardship Alliance. Streator, Illinois. March 18.

1999 The Impact of Large-Scale Swine Operations. Northern Illinois University Vegetarian Group. November 3.

1999 Recent Findings from Environmental Health Research on Large-Scale Swine Operations. Citizens' Hearing on Pork Production and the Environment. Agricultural Extension Centre, Brandon, Canada. October 29-31.

1999 Pigs, Profits, and Rural Communities. Presentation to the National Sierra Club. Washington, D.C. June 12.

1998 The Social and Environmental Consequences of Iowa's Changing Swine Industry. Rotary Club. Oelwein, Iowa. March 22.

1998 Pig, Profits, and Marketing Networks. Presentation to Practical Farmers of Iowa. Ames, Iowa. January 9.

1998 Social Impact of Corporate Hogs. Symposium on the "Impact of Large Scale Hog Production on People and the Environment," Kansas Rural Center. Great Bend, Kansas. October 10.

1998 Industrialized Swine Production: A Glimpse at Iowa's Future. Panel member at the Annual Meeting of Iowa Farmers Union. Ames, Iowa. September 18.

1998 The Future of Iowa Agriculture. Presentation to Iowa Citizens Action Network. Des Moines, Iowa. September 12.

1998 Livestock Production and the Environment: An Anthropological Perspective. University of Northern Iowa and the Sierra Club. Cedar Falls, Iowa. Jan. 26.

1997 Certified Safe Farms: An Incentive-Based Approach to Healthy Farming. 26th Annual Governor's Safety Conference. Des Moines, Iowa. November 4-7.

1997 Piggeries and Politics: What Scientists Aren't Telling You. Presentation at the PLAINS Truth: Corporate Farming in the Heartland Conference. Oklahoma City, Oklahoma. October 31-November 1.

1997 Health and Social Issues with Large-Scale Livestock Facilities. Presentation to farmers and rural residents in Muscatine County, Iowa. October 2.

1997 The Impacts of Large-Scale Swine Production. Presentation to 100 farmers and rural residents in Waukon, Iowa. June 4.

1997 The Impacts of Large-Scale Livestock Operations. Presentation at conference "Hogs and Humans: the Rest of the Story." Indiana Campaign for Family Farms and Purdue Cooperative Extension Service. Purdue University. May 10.

1997 Large-Scale Swine Production and the Environment. Presentation to the University of Iowa Environmental Coalition. Iowa City, Iowa. April 16.

1997 The Future of Iowa Farming. Presentation to the Friends of Rural America. Ames, Iowa. April 8.

1997 The Future of Iowa's Rural Communities. Presentation to the Annual Meeting of the Iowa Citizens for Community Improvement. Osawa, Iowa. April 1.

1997 The Social and Physical Well-Being of Neighbors of Concentrated Swine Production. Presentation at the conference "Forum on Environmental Impacts of Concentrated Livestock Production." Clean Water Fund, Minneapolis, Minnesota. February 22.

1997 The Swine Industry. Panelist for the Annual Meeting of the American Corn Growers' Association. Cedar Rapids, Iowa. February 8.

1996 An Overview of Swine Industry Issues for Rural Iowa. Presentation to farmers and rural residents near Williamsburg, Iowa. October 27.

1996 Community Partners for Healthy Farming Intervention: Iowa-Nebraska Certified Safe Farms. Presented to the Iowa Life and Health Insurance Association. October 17. Des Moines, Iowa. With K. Donham.

1996 Protecting Iowa Values--Supporting Family Farms. Presentation to the Annual Convention of the Iowa Farmers Union. September 4-5. Ames, Iowa.

1995 Networking Among Iowa's Swine Producers. Presentation to Iowa State University Pork Issue Team. November 10. Ames, Iowa. With R. Ziegenhorn.

1995 Changes in the U.S. Swine Industry: Implications for Local Decisions. Presentation to over 100 Winneshiek County citizens concerned with confined swine production facilities. November 2. Decorah, Iowa.

1995 Hog Wild? A Look at the Economic, Environmental and Social Implications of Very Large Scale Hog Production in Illinois. Presentation to the Illinois Stewardship Alliance, Environmental Studies Program at Sangamon State University, and concerned citizens' groups. March 11. Springfield, Illinois.

1995 "Wal-Marting" of the Hog Industry. Presentation for "Harvesting Our Potential: A Rural Women's Gathering, PrairieFire Rural Action conference. Februrary 3 – 5. Des Moines, Iowa.

1994 Community Impacts of Livestock Production. Presentation for "Livestock Production for Sustainable Rural Communities" conference organized by the Center for Rural Affairs and the North Central Regional Center for Rural Development. October 28-30. Kansas City, Missouri. With E. P. Durrenberger.

1994 North Carolina and Iowa's Swine Industry. Presentation to approximately 50 farmers, rural residents, and the grassroots organization "Citizens to Protect Our Environment" in Ringgold County, Iowa. Oct. 18. With E.P. Durrenberger.

1994 Environmental Considerations in the Industrialization of Swine Production. Presentation to the Iowa Environmental Health Association. October 5.

1994 North Carolina and Iowa's Hog Industry: The Consequences of Industrialization. Presentation to the Nebraska Agricultural Council. July 25. Lincoln, Nebraska.

1994 Summary of North Carolina Swine Industry Fact Finding Trip. Presentation to 600 farmers and rural residents in Clarion, Iowa. March 14. With E. P. Durrenberger.

1993 North Carolina and Iowa's Swine Industry. Presentation to 50 farmers and rural residents near Trenton, Missouri. With E.P. Durrenberger.

Media Appearances (partial list)

2010 "Ag Critics Heartened by Image Campaign," Peoria Journal Star. Aug. 30. Interviewed for story on Clean Water Act Permits in Illinois. WTVO, Rockford.

2010 Interviewed for story on Clean Water Act Permits in Illinois. WTVO, Rockford.

2008	National news conference on the Clean Water Act, NPDES permits, and concentrated animal feeding operations. With Environmental Integrity Project, Socially Responsible Agriculture, and Illinois Citizens for Clean Air and Water. Multiple News Outlets. May 14.
2006	Radio interview, Farm & Fiddle KOPN, 89.5, Missouri. Feb. 1
2002	College Basketball Refereeing: Print: Washington Post, UPI, Chicago Sun-Times, Daily Herald, Beacon News, Courier News; Broadcast: WREX Rockford, WTVO Rockford, WGN Radio Chicago, WBBM Radio, Illinois Information Radio Network, 670 The Score Chicago.
1998	"Iowa News and Views." Program Guest on Iowa Agriculture, IPAT. February.
1997	Expert for CBC Television Program on Iowa Agriculture, Canadian Broadcasting Corporation. Latimer, Iowa. November 25.
1997	Morning Edition, National Public Radio. Commentator for segment on the swine Industry. February 22.
1994	Nick News for Kids. Commentator on U.S. agriculture segment. Nickleodeon, Linda Ellerbee, producer. April 30.
1994	AgriTalk Syndicated Radio Talk Show. Program Guest, August 23.

Attachment 2:

Government Accountability Report, Concentrated Animal Feeding Operations: EPA Needs More Information and a Clearly Defined Strategy to Protect Air and Water Quality from Pollutants of Concern, September 2008

United States Government Accountability Office

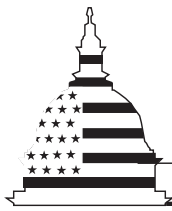
GAO

Report to Congressional Requesters

September 2008

CONCENTRATED ANIMAL FEEDING OPERATIONS

EPA Needs More Information and a Clearly Defined Strategy to Protect Air and Water Quality from Pollutants of Concern



G A O

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GAO-08-944

GAO Accountability • Integrity • Reliability

Highlights

Highlights of GAO-08-944, a report to congressional requesters

CONCENTRATED ANIMAL FEEDING OPERATIONS

EPA Needs More Information and a Clearly Defined Strategy to Protect Air and Water Quality from Pollutants of Concern

Why GAO Did This Study

Concentrated Animal Feeding Operations (CAFO) are large livestock and poultry operations that raise animals in a confined situation. CAFOs can improve the efficiency of animal production but large amounts of manure produce can, if not properly managed, degrade air and water quality. The Environmental Protection Agency (EPA) is responsible for regulating CAFOs and requires CAFOs that discharge certain pollutants to obtain a permit.

This report discusses the (1) trends in CAFOs over the past 30 years, (2) amounts of waste they generate, (3) findings of key research on CAFOs' health and environmental impacts, (4) EPA's progress in developing CAFO air emissions protocols, and (5) effect of recent court decisions on EPA's regulation of CAFO water pollutants. GAO analyzed U.S. Department of Agriculture's (USDA) data from 1982 through 2002, for large farms as a proxy for CAFOs; reviewed studies, EPA documents, laws, and regulations; and obtained the views of federal and state officials.

What GAO Recommends

To more effectively regulate CAFOs, GAO recommends that EPA complete its inventory of permitted CAFOs, reassess the current nationwide air emissions monitoring study, and establish a strategy and timetable for developing a process-based model for measuring CAFO air emissions. EPA partially agreed with GAO's recommendations.

To view the full product, including the scope and methodology, click on GAO-08-944. For more information, contact Anu Mittal (202) 512-3841, mittala@gao.gov.

What GAO Found

Because no federal agency collects consistent, reliable data on CAFOs, GAO could not determine the trends in these operations over the past 30 years. However, using USDA data for large farms that raise animals as a proxy for CAFOs, it appears that the number of these operations increased by about 230 percent, going from about 3,600 in 1982 to almost 12,000 in 2002. Also, during this 20-year period the number of animals per farm had increased, although it varied by animal type. Moreover, GAO found that EPA does not have comprehensive, accurate information on the number of permitted CAFOs nationwide. As a result, EPA does not have the information it needs to effectively regulate these CAFOs. EPA is currently working with the states to establish a new national data system.

The amount of manure generated by large farms that raise animals depends on the type and number of animals raised, but large operations can produce more than 1.6 million tons of manure a year. Some large farms that raise animals can generate more raw waste than the populations of some U.S. cities produce annually. In addition, according to some agricultural experts, the clustering of large operations in certain geographic areas may result in large amounts of manure that cannot be effectively used as fertilizer on adjacent cropland and could increase the potential of pollutants reaching nearby waters and degrading water quality.

Since 2002, at least 68 government-sponsored or peer-reviewed studies have been completed that examined air and water quality issues associated with animal feeding operations and 15 have directly linked air and water pollutants from animal waste to specific health or environmental impacts. EPA has not yet assessed the extent to which these pollutants may be impairing human health and the environment because it lacks key data on the amount of pollutants that are being emitted from animal feeding operations.

As a first step in developing air emissions protocols for animal feeding operations, in 2007, a 2-year nationwide air emissions monitoring study, largely funded by industry, was initiated. However, as currently structured, the study may not provide the scientific and statistically valid data it was intended to provide and that EPA needs to develop air emissions protocols. Furthermore, EPA has not established a strategy or timetable for developing a more sophisticated process-based model that considers the interaction and implications of all emission sources at an animal feeding operation.

Two recent federal court decisions have affected EPA's ability to regulate water pollutants discharged by CAFOs. The 2005 *Waterkeeper* case required EPA to abandon the approach that it had proposed in 2003 for regulating CAFO water discharges. Similarly, the 2006 *Rapanos* case has complicated EPA's enforcement of CAFO discharges because EPA believes that it must now gather significantly more evidence to establish which waters are subject to the Clean Water Act's permitting requirements.

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Abbreviations

CAFO	Concentrated Animal Feeding Operation
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act of 1980
EPA	Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act of 1986
NAS	National Academy of Sciences
NPDES	National Pollutant Discharge Elimination System
USDA	U.S. Department of Agriculture

United States Government Accountability Office
Washington, DC 20548

September 4, 2008

Congressional Requesters

Over the last 40 years, diversified, independent, family-owned-and-operated farms that produce a variety of crops and a few animals are becoming a smaller share of the agricultural sector and are being replaced by fewer, much larger farms. For animal production, this change has meant a movement to significantly larger operations that can raise, for example, as many as 2 million chickens or 800,000 hogs at one facility at one time.

These large-scale livestock and poultry operations are generally referred to as animal feeding operations. An animal feeding operation is one that (1) raises animals in a confined situation for a total of 45 days or more during a 12-month period and (2) brings feed to the animals rather than having the animals graze or seek feed in pastures and fields or on rangeland. Concentrated animal feeding operations (CAFO) are a subset of animal feeding operations and usually operate on a much larger scale. Generally, a CAFO is an animal feeding operation that raises enough animals to meet or exceed certain minimum thresholds, depending upon the type of livestock being raised. For example, as defined in Clean Water Act regulations, an animal feeding operation would be considered a CAFO if it raised 1,000 or more beef cattle, 2,500 hogs weighing more than 55 pounds, or 125,000 broiler chickens.[1] In addition, an animal feeding operation of any size can be designated a CAFO if it meets certain conditions, such as being a significant contributor of pollutants to federally regulated waters.[2]

While CAFOs may have improved the efficiency of the animal production industry, they have also raised environmental and health concerns because of the large amounts of manure they produce. Generally, to minimize potential environmental problems, these operations retain the manure that they produce in storage facilities onsite and periodically dispose of it by spreading it on nearby or adjacent cropland as fertilizer. If the manure is properly contained and managed, it can benefit crop production; if improperly contained and managed, it can degrade air and

[1]40 C.F.R. § 122.23(b).

[2]Federally regulated waterways include waters of the United States as defined in 33 C.F.R. § 328.3(a)(1)-(7) and may include rivers, wetlands, impoundments, the territorial seas, and waters used in interstate commerce.

water quality, thereby potentially impairing human health and damaging the environment. Specifically, these operations can potentially degrade air quality because large amounts of manure may emit unsafe quantities of ammonia, hydrogen sulfide, and particulate matter,[3] and they can potentially degrade water quality because pollutants in manure such as nitrogen, phosphorus, bacteria, and organic matter could enter nearby water bodies.

Several federal laws provide the Environmental Protection Agency (EPA) with the authority to regulate water and air pollutants from CAFOs. The Clean Water Act specifically addresses CAFOs by requiring EPA to consider CAFOs like any other industry if they discharge pollutants into federally regulated waters. As a result, CAFOs that have such discharges must obtain a permit that establishes design standards and management practices for retaining and disposing of manure in such a way as to limit the amounts and types of pollutants from manure that are released into federally regulated waters. EPA, or the states that have been authorized by EPA to administer the Clean Water Act, are responsible for issuing these permits. In contrast, three other acts provide EPA with certain authorities related to air emissions from these operations, although they do not specifically cite CAFOs as regulated entities. Under the Clean Air Act, any animal feeding operation, regardless of size, that exceeds established air emission thresholds for certain pollutants can be regulated. For example, pollutants such as particulate matter that are emitted by animal feeding operations are regulated under the Clean Air Act and other pollutants such as hydrogen sulfide or ammonia may be regulated under the act in certain circumstances. Similarly, the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) do not specifically mention CAFOs, but they do require owners or operators of these facilities to report to federal or state and local authorities when a "reportable quantity" of certain hazardous substances, such as hydrogen sulfide or ammonia,[4] is released into the environment. Together, CERCLA's and EPCRA's reporting requirements provide government authorities, emergency management agencies, and citizens the ability to

[3]Particulate matter is a complex mixture of extremely small particles and liquid droplets. Particulate matter can be made up of a number of components, including acids (such as nitrates and sulfates), organic chemicals, metals, and soil or dust particles.

[4]Each of these hazardous substances has a reportable quantity of 100 pounds in a 24-hour period.

know about the source and magnitude of hazardous releases into the environment.

In light of the growing concerns regarding the potential human health and environmental impacts of CAFOs, you asked us to determine the (1) trends in CAFOs over the past 30 years; (2) amount of waste they generate; (3) findings of recent key academic, industry, and government research on the impacts of CAFOs on human health and the environment, and the extent to which EPA has assessed the nature and severity of such impacts; (4) progress that EPA and the states have made in regulating and controlling the emissions of, and in developing protocols to measure, air pollutants from CAFOs that could affect air quality; and (5) extent to which recent court decisions have affected EPA and the states' ability to regulate CAFO discharges that impair water quality.

In conducting our work, we reviewed laws and regulations and federal and state agencies' documents; met with officials from EPA and the U.S. Department of Agriculture (USDA), industry, citizen and environmental groups, and academia. We also spoke with state officials and visited CAFOs in eight states. These states were Arkansas, California, Colorado, Iowa, Maryland, Minnesota, North Carolina, and Texas. We chose these states because they were geographically dispersed and contained numerous CAFOs representing various animal types. In addition, to determine trends in CAFOs over the past 30 years, from 1974 through 2002, we obtained the most recent data available from USDA on large farms that raise animals to use as a proxy for CAFO data. However, because of limitations in USDA's data for 1974 through 1982, we could not determine from these data which farms prior to 1982 would meet EPA's minimum size thresholds for CAFOs. Consequently, our analysis of trends in CAFOs focuses on the 20-year period between 1982 and 2002. We also obtained and reviewed the data that EPA compiled over the last 5 years from each of its regions on the number of CAFOs that were issued a permit. To identify the amount of waste CAFOs generate, we estimated the amounts of manure generated by various size farms that raise animals. To provide a perspective of the amount of waste that large farms that raise animals can generate, we selected certain cities based on their population and estimated the amount of sanitary waste generated by the human population and compared these amounts with the amount of waste generated by three different sizes of large farms.[5] To report on key research on the impacts of CAFOs on human health and the environment,

[5]Human sanitary waste includes feces and urine but does not include wastes such as water from showers, washing dishes and clothes, and flushing toilets.

we reviewed EPA's 2003 Rule regulating discharges from CAFOs under the Clean Water Act and the National Academy of Sciences study on air emissions from animal feeding operations.[6] We also conducted library and Internet searches to identify key studies completed since 2002 on air and water pollutants from waste generated by animal feeding operations. We compared the findings from these studies with EPA assessments to date and interviewed EPA officials regarding these assessments. To assess the progress that EPA and the states have made in regulating and controlling the air emissions of, and in developing protocols to measure, air pollutants from CAFOs, we reviewed relevant documents and interviewed EPA officials, as well as officials responsible for an ongoing national air emissions monitoring study. In addition, we contacted state officials in all 50 states to determine which states had developed air emission regulations applicable to CAFOs. Finally, to determine the extent to which recent court decisions have affected EPA and the states' ability to regulate CAFO discharges that impair water quality, we reviewed the results of recent federal and state court decisions. We also interviewed EPA and state officials on how the court decisions have affected their ability to regulate CAFOs. A more detailed description of our scope and methodology is presented in appendix I.

We conducted this performance audit between July 2007 and August 2008, in accordance with generally accepted government auditing standards. These standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Results in Brief

No federal agency collects accurate and consistent data on the number, size, and location of CAFOs. However, according to USDA officials, the data USDA collects for large farms that raise animals can serve as a proxy in estimating trends in CAFOs nationwide from 1982 through 2002. Using these data, we found that the number of large farms that raise animals has increased 234 percent, from about 3,600 in 1982 to almost 12,000 in 2002. We found that the number of animals raised on these large farms had also increased, but the rate of increase varied greatly by animal type. For example, the average number of hogs raised on large farms increased by 37 percent, from about 3,400 in 1982 to nearly 4,600 in 2002. In contrast,

[6]National Academy of Sciences, *Air Emissions from Animal Feeding Operations: Current Knowledge, Future Needs* (Washington, D.C.: National Academies Press, 2003).

during the same time period, the average number of broiler chickens raised on large farms only increased by about 3 percent, from approximately 155,000 to nearly 160,000. Furthermore, almost half of the livestock and poultry raised in the United States in 2002, about 43 percent, were raised on large farms. Over the last 5 years, EPA has been compiling data from its regions in an effort to develop information on the number of permitted CAFOs nationwide. However, we determined that these data are inconsistent and inaccurate and do not provide necessary information on the characteristics of these CAFOs. Without a systematic and coordinated process for collecting and maintaining accurate and complete information on the number, size, and location of permitted CAFOs, EPA does not have the information that it needs to effectively regulate these operations. EPA has indicated that it is working with the states to develop and implement a new national system to collect and maintain these data.

The amount of manure that a large farm raising animals can generate depends on the types and numbers of animals being raised at a specific operation; such farms can produce from over 2,800 tons to more than 1.6 million tons of manure annually. For example, a layer farm that meets EPA's minimum large CAFO threshold of 82,000 laying hens could produce more than 2,800 tons of manure a year, while a farm with 10,000 beef cattle (cattle fattened with feed) could produce about 117,000 tons of manure a year. In fact, some large farms can produce more raw waste than the human population of a large U.S. city. For example, a very large hog farm, with as many as 800,000 hogs, generates more than 1.6 million tons of manure annually—more than one and a half times the sanitary waste produced by the about 1.5 million residents of Philadelphia, Pennsylvania in 1 year. Furthermore, while manure is a valuable resource often used as fertilizer, agricultural experts and government officials have raised concerns about the large amounts of manure produced by animal feeding operations that are increasingly clustered within specific geographic areas within a state. For example, five contiguous North Carolina counties had an estimated hog population of over 7.5 million hogs in 2002 and the hog operations in these counties could have produced as much as 15.5 million tons of manure that year. According to agricultural experts and government officials that we spoke to, such clustering of operations raises concerns that the amount of manure produced could result in the overapplication of manure to croplands in these areas and the release of excessive levels of some pollutants that could potentially damage water quality.

At least 68 government-sponsored or peer-reviewed studies have been completed on air and water quality issues associated with animal waste since 2002 and 15 of these studies have directly linked pollutants from

animal waste to specific health or environmental impacts. Of the remaining 53 studies, 7 found no impacts, 12 made indirect linkages between these pollutants and health and environmental impacts, and 34 of the studies focused on measuring the amount of water or air pollutants emitted by animal feeding operations. However, EPA has not yet assessed the extent to which air and water pollution from CAFOs may be impairing human health and the environment because it lacks key data on the amount of pollutants that CAFOs are discharging. Of the 15 studies we found directly linking pollutants from animal waste to human health or environmental impacts, 8 focused on water pollutants and 7 on air pollutants. Most of the water studies found that nutrients or hormones released from animal feeding operations were causing environmental harm, such as reproductive disorders in fish and degraded water quality. One water study found that animal feeding operations were causing pathogens such as *E. coli* to contaminate drinking water, which were then causing gastrointestinal illnesses in humans. Similarly, all seven air studies linked air emissions from animal feeding operations to adverse human health effects. Specifically, six found exposure to these emissions caused respiratory inflammation and one found an increased incidence of headaches, eye irritation, and nausea in people working at or living near these operations. According to EPA officials, although the agency has long recognized the potential impacts that water pollutants from CAFOs can have on human health and the environment, it has not yet assessed these impacts because it lacks information on the extent to which water pollutants are actually being discharged by CAFOs. According to other officials at EPA, the agency does not have the resources needed to conduct a study that would provide this information. Likewise, EPA has not yet assessed the air quality impacts from animal feeding operation emissions because, according to agency officials, it lacks key data on the extent to which these operations are emitting pollutants. To gather this information, EPA entered into a series of agreements with animal feeding operations to implement a national air emissions monitoring study that is currently ongoing and is being funded by the industry and will measure and quantify air emissions from animal feeding operations.

The ongoing national air emissions monitoring study is considered a first step in EPA's efforts to develop protocols for measuring and quantifying air contaminants from animal feeding operations; however, it is not clear if the study will provide EPA the data that it needs to develop these protocols. EPA believes that this 2-year study, initiated in 2007, will provide a scientific basis for estimating air emissions from animal feeding operations so that the agency can develop protocols that these operations can use to more quickly determine if they exceed regulatory thresholds. However, concerns have been raised that the animal feeding operations

being monitored in the study do not represent a valid sample of all animal feeding operations and that the data collected during the early phases of the study may be incomplete. As a result, it is uncertain whether the study will ultimately provide data of sufficient quantity and quality that will enable the agency to develop its planned protocols. In addition, it is uncertain if and when EPA will develop a process-based model that considers the interaction and implications of all sources of emissions at an animal feeding operation. Furthermore, other EPA actions make it unclear at this time how the agency intends to regulate air emissions from animal feeding operations once the data collection effort is complete. For example, EPA has not yet decided if it will aggregate the emissions occurring on an animal feeding operation or if the emissions from barns and manure storage areas will be considered separately when determining if an operation has exceeded air emissions thresholds. Moreover, in December 2007, EPA proposed a rule to exempt releases to the air of hazardous substances, such as ammonia and hydrogen sulfide, from manure at farms, including animal feeding operations, which meet or exceed their reportable quantity from both CERCLA and EPCRA notification requirements. EPA stated that, in all instances, the source and nature of the release make emergency responses unnecessary, impractical, and unlikely for these operations, and hence it found notifications to be unnecessary. It is unclear to us how EPA made this determination when it has not yet completed its data collection effort and does not yet know the extent to which animal feeding operations are emitting these pollutants. In the absence of federal guidance on how to regulate air emissions from animal feeding operations, officials in six states told us that they are regulating some emissions covered under the Clean Air Act, CERCLA, and EPCRA. For example, Minnesota has established state emissions thresholds for hydrogen sulfide that apply to CAFOs and the state requires CAFO operators to develop an air emissions plan specifying how they will control these emissions.

Two recent federal court decisions have affected EPA's and some states' ability to regulate CAFOs for pollutants that may impair water quality. Specifically:

- In 2005, in *Waterkeeper Alliance Inc. v. EPA* (*Waterkeeper*), the U.S. Court of Appeals for the Second Circuit set aside key provisions of a CAFO rule EPA had issued in 2003. This rule would have provided EPA with comprehensive information on the universe of CAFOs and their operations and would have subjected large numbers of previously unregulated CAFOs to monitoring and reporting requirements, as well as periodic inspections. However, the court concluded that EPA did not have the authority under the Clean Water Act to require CAFOs that were not discharging pollutants

into federally regulated waters to apply for permits. As a result, CAFO operators currently determine for themselves whether they need to apply for a federal permit, and EPA must rely on other means of acquiring information about CAFOs that are illegally discharging pollutants, such as through citizens' reports. EPA has developed proposed revisions to its 2003 rule in response to the court's ruling. The resulting rule is currently awaiting the Office of Management and Budget's approval, but EPA is not certain when that review will be completed and the final rule issued. The *Waterkeeper* decision has had mixed impacts on states' regulation of CAFOs. Some states have not been affected by the *Waterkeeper* decision because they have used their own authorities to adopt regulations more stringent than federal regulations. As a result, these states, such as Minnesota, have continued to require all CAFOs to obtain state permits. In contrast, officials in those states, such as Colorado, that base their regulations on the Clean Water Act and federal regulations told us that their programs will remain in limbo until EPA issues its final revised rule.

- The Supreme Court's 2006 decision—*Rapanos v. United States* (*Rapanos*)—has also complicated EPA's enforcement of CAFO regulations. The Court's decision has raised questions that have not yet been resolved about which "waters" are considered federal waters and, therefore, fall under the jurisdiction of the Clean Water Act. According to EPA enforcement officials, the agency may be less likely to seek enforcement against a CAFO that it believes is discharging pollutants into a water body because it is now more difficult to prove that the water body is federally regulated. Congress is considering legislation that seeks to clearly define the scope of the Clean Water Act and resolve the questions raised by the *Rapanos* decision.

To more effectively regulate CAFOs, we are recommending that the Administrator of EPA direct the agency to complete its efforts to develop a comprehensive national inventory of permitted CAFOs that incorporates appropriate internal controls to ensure the quality of the data collected. To ensure that the national air emissions monitoring study will provide the scientific and statistically valid data that EPA needs for developing its air emissions protocols, we are recommending that EPA reassess the current data collection efforts, including its internal controls. We are also recommending that EPA establish a strategy and timetable for developing a process-based model that will provide more sophisticated air emissions estimating methodologies for animal feeding operations. In commenting on a draft of this report, EPA partially agreed with our recommendations.

Background

The livestock and poultry industry is vital to our nation's economy, supplying meat, milk, eggs, and other animal products; however, the past several decades have seen substantial changes in America's animal production industries. As a result of domestic and export market forces, technological changes, and industry adaptations, food animal production that was integrated with crop production has given way to fewer, larger farms that raise animals in confined situations. These large-scale animal production facilities are generally referred to as animal feeding operations. CAFOs are a subset of animal feeding operations and generally operate on a larger scale. While CAFOs may have improved the efficiency of the animal production industry, their increased size and the large amounts of manure they generate have resulted in concerns about the management of animal waste and the potential impacts this waste can have on environmental quality and public health.

Animal manure can be, and frequently is, used beneficially on farms to fertilize crops and to restore nutrients to soil. However, if improperly managed, manure and wastewater from animal feeding operations can adversely impact water quality through surface runoff and erosion, direct discharges to surface water, spills and other dry-weather discharges, and leaching into the soil and groundwater. Excess nutrients in water can result in or contribute to low levels of oxygen in the water and toxic algae blooms, which can be harmful to aquatic life. Improperly managed manure can also result in emissions to the air of particles and gases, such as ammonia, hydrogen sulfide, and volatile organic compounds, which may also result in a number of potentially harmful environmental and human health effects.

Most agricultural activities are considered to be nonpoint sources of pollution because the pollution that occurs from these activities is in conjunction with soil erosion caused by water and surface runoff of rainfall or snowmelt from diffuse areas such as farms and rangeland. However, section 502(14) of the Clean Water Act specifically defines point sources of pollution to include CAFOs, which means that under the act, CAFOs that discharge into federally regulated waters are required to obtain a federal permit called a National Pollutant Discharge Elimination System (NPDES) permit. These permits generally allow a point source to discharge specified pollutants into federally regulated waters under specific limits and conditions. These permits are issued by EPA or a state agency authorized by EPA to implement the NPDES program for that state. Currently, 45 states are authorized to administer the NPDES permit program, and their programs must be at least as stringent as the federal

program.[7] In 1976, in accordance with the Clean Water Act's designation of CAFOs as point sources, EPA defined which poultry and livestock facilities constituted a CAFO and established permitting regulations for CAFOs. According to EPA regulations issued in 1976, to be considered a CAFO a facility must first be considered an animal feeding operation. Animal feeding operations are agricultural operations where the following conditions are met:

- animals are fed or maintained in a confined situation for a total of 45 days or more in any 12-month period, and
- crops, vegetation, forage growth, or post harvest residues are not sustained during normal growing seasons over any portion of the lot.

If an animal feeding operation met EPA's criteria and either met or exceeded minimum size thresholds based on the type of animals being raised, EPA considered the operation to be a CAFO. For example, an animal feeding operation would be considered a CAFO if it raised 1,000 or more beef cattle, 2,500 pigs weighing more than 55 pounds, or 125,000 chickens. In addition, EPA could designate an animal feeding operation of any size as a CAFO under certain circumstances. For example, if an animal feeding operation was a significant contributor of pollutants to federally regulated water, EPA could designate the operation as a CAFO. Appendix II lists the full text of EPA's current CAFO definition, including the size thresholds established for small, medium, and large CAFOs.

Under EPA's 1976 CAFO regulations, certain animal feeding operations did not require permits. These included (1) those animal feeding operations that only discharged during a 25-year, 24-hour storm event—which is the amount of rainfall during a 24-hour period that occurs on average once every 25 years or more and (2) chicken operations that use dry manure-handling systems—systems that do not use water to handle their waste. In addition, EPA generally did not regulate animal waste that was applied to cropland or pastureland.

In January 2003, we reported that although EPA believed that many animal feeding operations degrade water quality, it had placed little emphasis on its permit program and that exemptions in its regulations allowed as many as 60

[7]EPA has retained program authority for Alaska, Idaho, Massachusetts, New Hampshire, and New Mexico. Oklahoma has been authorized to issue permits for most sources but not for CAFOs.

percent of the largest operations to avoid obtaining permits.[8] In its response to our 2003 report, EPA acknowledged that the CAFO program was hampered by outdated regulations and incomplete attention by EPA and the states. EPA pointed out that it had revised its permitting regulations for CAFOs to eliminate the exemptions that allowed most animal feeding operations to avoid regulation. The revisions, issued in February 2003 and known as the 2003 CAFO rule, resulted, in part, from the settlement of a 1989 lawsuit by the Natural Resources Defense Council and Public Citizen, in which these groups alleged that EPA had failed to comply with the Clean Water Act. EPA's 2003 CAFO rule included the following key provisions:

- *Duty to apply*. All CAFOs were required to apply for an NPDES permit unless the permitting authority determined that the CAFO had no potential to discharge to federally regulated waters.

- *Expanded CAFO definitions to include all poultry operations and stand-alone operations raising immature animals.* The previous rule had applied only to poultry operations that used a liquid manure-handling system. The 2003 rule expanded the CAFO definition to all types of poultry operations, and EPA officials estimated that this revision could result in almost 2,200 additional poultry operations requiring a permit.

- *More stringent design standard for new facilities in the swine, poultry, and veal categories.* Under the previous rule, facilities were to be designed, constructed, and operated to contain runoff from a 25-year, 24-hour rainfall event; this continues to be the rule for existing facilities. For new facilities, the 2003 rule established a no-discharge standard that can be met if the facilities are designed, constructed, and operated to contain the runoff from a 100-year, 24-hour storm event.

- *Best management practices*. Operations would be required to implement best management practices for applying manure to cropland and for animal production areas. The rule required, among other things, specified setbacks from streams, vegetated buffers, depth markers in lagoons, and other impoundments for production areas to prevent or reduce pollution from the operation.

- *Nutrient management plans.* CAFO operations would be required to develop a plan for managing the nutrient content of animal manure as well

[8]GAO, *Livestock Agriculture: Increased EPA Oversight Will Improve Environmental Program for Concentrated Animal Feeding Operations*, GAO-03-285 (Washington, D.C.: Jan. 16, 2003).

as the wastewater resulting from CAFO operations, such as water used to flush manure from barns.

- *Compliance schedule*. The 2003 rule required newly defined CAFOs to apply for permits by April 2006 and existing CAFOs to develop and implement nutrient management plans by December 31, 2006.[9]

According to EPA officials, the 2003 rule was expected to ultimately lead to better water quality because the revised regulations would extend coverage to more animal feeding operations that could potentially discharge and contaminate water bodies and subject these operations to periodic inspections.

Three laws provide EPA with certain authorities related to air emissions from animal feeding operations: the Clean Air Act,[10] the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), and the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA).[11] Although these laws provide EPA with authority related to air emissions from various sources, they do not expressly identify animal feeding operations as a regulated entity. Specifically:

- The Clean Air Act authorizes EPA to regulate stationary and mobile sources of air pollution and emphasizes controlling sources that emit more than threshold quantities of regulated pollutants. Livestock producers and other agricultural sources whose emissions meet or exceed specific statutory or regulatory thresholds are therefore subject to Clean Air Act requirements. Although EPA has authorized states and local governments to carry out certain portions of the act, EPA retains concurrent enforcement authority.

- Taken together, CERCLA and EPCRA require owners or operators of a facility to report to federal or state authorities the release of hazardous substances that meet or exceed their reportable quantities so as to alert federal, state, and local agencies, as well as the public, to the release of these substances. Section 103 of CERCLA requires that the person in charge of a facility notify the National Response Center of any non-permitted release of "hazardous

[9]In July 2007, EPA extended these deadlines to February 27, 2009.

[10]The Clean Air Act, 42 U.S.C. §§7401-7671q.

[11]CERCLA, Pub. L. No. 96-510, 94 Stat. 2767 (codified as amended at 42 U.S.C. §§9601-9675) and EPCRA, Pub. L. No. 99-499, Tit. III, 100 Stat. 1728 (codified as amended at 42 U.S.C. §§11001-11050).

substances" in a reportable quantity as soon as he or she has knowledge of that release. Section 304 of EPCRA requires that the owner or operator of a facility at which a hazardous chemical is produced, used, or stored give immediate notice of a release of any "extremely hazardous substance" to the community emergency coordinator. Among the reportable substances that could be released by livestock facilities are hydrogen sulfide and ammonia. The reportable quantity for each of these hazardous substances is 100 pounds in a 24-hour period. Under these acts, EPA can assess civil penalties for failure to report releases of hazardous substances or extremely hazardous substances that equal or exceed their reportable quantities—up to $32,500 per day or $32,500 per violation for first time offenders.

EPA is also working with USDA to address the impacts of animal feeding operations on air and water quality and public health. In 1998, EPA entered into a memorandum of understanding with USDA that calls for the agencies to coordinate on air quality issues relating to agriculture and share information. In addition, in 1999, the two agencies issued a unified national strategy aimed at having the owners and operators of animal feeding operations take actions to minimize water pollution from confinement facilities and land application of manure and in 2001 adopted an agreement to develop a process for working together constructively. To help minimize water pollution from animal feeding operations and meet EPA's regulatory requirements, USDA, through its Natural Resources Conservation Service, provides financial and technical assistance to CAFO operators in developing and implementing nutrient management plans.

The Number of Large Farms Raising Animals Has Increased, but Specific Data on CAFOs Are Not Available

Because no federal agency collects accurate and consistent data on the number, size, and location of CAFOs nationwide, it is difficult to determine precise trends in CAFOs over the last 30 years. According to USDA officials, the data USDA collects for large farms raising animals can be used as a proxy for estimating trends in CAFOs nationwide. Using these data, we determined that between 1982 and 2002, the number of large farms raising animals has increased sharply, from about 3,600 to almost 12,000. Moreover, EPA has compiled some data from its regions on the number of CAFOs that have been issued permits; however, these data are inconsistent and inaccurate. As a result, EPA does not have a systematic way of identifying and inspecting all of the CAFOs nationwide that have been issued permits.

Since 1982 the Number of Large Farms Raising Animals Has Increased as Has the Average Number of Animals on Farms

We found that the number of large farms raising animals for all animal types increased by 234 percent between 1982 and 2002. Table 1 shows the changes in the number of large farms by animal type for 1982 through 2002.

Table 1: Nationwide Trends in the Number of Large Farms Raising Animals for All Animal Types, 1982 through 2002

Type of animal farm	1982	1987	1992	1997	2002	Percentage change, 1982-2002
Beef cattle[a]	966	1,014	1,004	958	982	2
Dairy cow	541	712	1,009	1,445	1,939	258
Hog[b]	916	1,257	2,061	4,170	5,571	508
Layer	720	808	788	788	706	(2)
Broiler	173	357	737	1,331	2,227	1,187
Turkey	278	437	504	577	570	105
Total of all animal types[c]	**3,594**	**4,585**	**6,103**	**9,269**	**11,995**	**234**

Source: GAO analysis of USDA data.

Notes: The phrase “all animal types” refers to the following animals: beef cattle, dairy cows, hogs, layers, broilers, and turkeys.

The criteria for a large farm varied by animal type, consistent with EPA’s CAFO thresholds, and represent the average number of animals on a farm per day.

[a]Beef cattle includes only cattle on feed, not grazing on pasture, and sold weighing 500 pounds or more.

[b]Hogs include swine of all sizes from birth to market size.

[c]The number of large farms for all animal types is the total of large farms for each animal type and may include some farms multiple times if they were considered large for more than one animal type.

As table 1 shows, large broiler and hog farms experienced the largest increase, with large farms raising broilers increasing by 1,187 percent and large farms raising hogs increasing by 508 percent. Large farms raising layers and large farms raising beef cattle remained relatively stable over these 20 years, while layer farms were the only farms that experienced an overall decrease in number over the period, declining by 2 percent. In contrast, while the number of large farms raising animals has increased, the number of all farm raising animals has decreased. Appendix III presents trends in the number of all farms raising animals, from 1982 to 2002.

Just as the number of large farms for almost all animal types increased between 1982 and 2002, so did the size of these farms as illustrated by the

median number of animals raised on each farm.[12] Table 2 shows the trends in the median number of animals raised on large farms for all animal types from 1982 through 2002.

Table 2: Median Number of Animals Raised on Large Farms, by Animal Type, 1982 through 2002

Animal type	1982	1987	1992	1997	2002	Percentage change, 1982-2002
Beef cattle[a]	2,820	2,950	2,919	3,308	3,424	21
Dairy cows	910	988	1,020	1,100	1,200	32
Hogs[b]	3,350	3,500	3,778	4,334	4,588	37
Layers	131,530	146,383	155,319	168,000	180,000	37
Broilers	154,830	168,593	159,840	161,820	159,840	3
Turkeys	80,000	79,500	81,000	79,697	80,491	1

Source: GAO's analysis of USDA data.

Note: We used the median number of animals raised on large farms to represent the average concentration of animals raised on large farms per day.

The criteria for a large farm varied by animal type, consistent with EPA's CAFO thresholds, and represent the average number of animals on a farm per day.

The median is the point above and below which half of the cases exist. For large animal farms, half of the farms of a particular animal type have more animals than the median farm and half have fewer animals. For example, in the table above, half of large layer farms in 2002 have more than 180,000 layers and half have less than 180,000 layers.

[a]Beef cattle includes only cattle on feed, not grazing on pasture, and sold weighing 500 pounds or more.

[b]Hogs include swine of all sizes from birth to market size.

The layer and hog sectors had the largest increases in the median number of animals raised per farm, both growing by 37 percent between 1982 and 2002. Specifically, for layers, large farms increased the number of birds they raised from 131,530 in 1982 to 180,000 in 2002 and for hogs, large farms increased the number of animals they raised from 3,350 in 1982 to 4,588 in 2002. In contrast, large farms that raised either broilers or turkeys only increased slightly in size with an overall increase of 3 and 1 percent, respectively, from 1982 to 2002.

[12]The median is the point above and below which half of the cases exist. For large farms that raise animals, half of the farms of a particular animal type have more animals than the median farm and half have fewer animals.

The increases in the number of large farms for almost all animal types, as well as the increases in the median number of animals raised on these farms, are also reflected in the percentage of animals raised on large farms as compared with animals raised on all farms. Specifically, the number of animals raised on large farms increased from over 257 million in 1982 to over 890 million in 2002—an increase of 246 percent. In contrast, the number of animals raised on all farms increased from over 1,145 million in 1982 to 2,072 million in 2002—an increase of 81 percent. This is particularly noteworthy because the number of animals raised on large farms only accounted for 22 percent of animals raised on all farms in 1982; yet, the number of animals raised on large farms accounted for 43 percent of animals raised on all farms in 2002. Table 3 shows the trends in the number of animals raised on large farms and the number of animals raised on all farms from 1982 to 2002.

Table 3: Nationwide Trends in the Number of Animals Raised on Large Farms as a Proportion of the Number of Animals Raised on All Farms, by Animal Type, 1982 and 2002

Animal type	Number of animals raised on all animal farms		Percent change, 1982-2002	Number of animals raised on large farms		Percent change, 1982-2002	The number of animals raised on large farms as a percentage of the number of animals raised on all animal farms	
	1982	2002		1982	2002		1982	2002
Beef cattle[a]	11,064,096	11,264,122	2	6,601,928	8,677,892	31	60	77
Dairy cows	10,849,880	9,103,959	(16)	632,583	3,183,086	403	6	35
Hogs[b]	45,944,318	66,318,763	44	4,176,477	47,789,951	1,044	9	72
Layers	386,638,856	420,742,205	9	160,005,126	304,500,225	90	41	72
Broilers	612,092,410	1,440,501,856	135	52,140,827	457,461,691	777	9	32
Turkeys	78,550,564	124,152,525	58	33,443,754	68,417,853	105	43	55
Total of all animal types[c]	**1,145,140,124**	**2,072,083,430**	**81**	**257,000,695**	**890,030,698**	**246**	**22**	**43**

Source: GAO analysis of USDA data.

Note: The phrase “all animal types” refers to the following animals: beef cattle, dairy cows, hogs, layers, broilers, and turkeys.

A farm was included in all farms, for a particular animal type, only if it had one or more animals of that type. For example, if a farm had broilers only, it would not be counted in all farms for other animal types. If a farm raised no animals of any type, then it would also not be included in all farms.

Reported percentages have been rounded to the nearest whole number but calculations involving percentages used non-rounded percentages.

[a]Beef cattle includes only cattle on feed, not grazing on pasture, and sold weighing 500 pounds or more.

[b]Hogs include swine of all sizes from birth to market size.

[c]The number of large farms for all animal types is the total number of large farms for each animal type and may include some farms multiple times if they were considered large for more than one animal type.

As table 3 shows, most of the beef cattle, hogs, and layers raised in the United States in 2002 were raised on large farms. Specifically, 77 percent of beef cattle and 72 percent of both hogs and layers were raised on large farms.

EPA Does Not Have a Systematic Means of Identifying Permitted CAFOs Because It Lacks Accurate Data

EPA does not have its own data collection process to determine the number, size, and location of CAFOs that have been issued permits nationwide. Since 2003, the agency has compiled quarterly estimates from its regions on the number of permits that have been issued to CAFOs. These data are developed by EPA's regional offices or originates with the state permitting authority. However, we determined that these data are inconsistent and inaccurate and do not provide EPA with the reliable data that it needs to identify and inspect permitted CAFOs nationwide. For example, according to EPA some uncertainty in the data exists because some states may be using general permits to cover more than one operation. In addition, EPA has not established adequate internal controls to ensure that the data are correctly reported. For example, officials from 17 states told us that data reported by EPA for their states were inaccurate. In one case, when we asked a state official for the number of CAFOs in his state, the official realized that the CAFO numbers reported by EPA's regional office were incorrect because of a clerical error, which resulted in some CAFO statistics for the state being doubled. After the state official discovered this error the state's data were corrected and resubmitted to EPA. Without a systematic and coordinated process for collecting and maintaining accurate and complete information on the number, size, and location of permitted CAFOs nationwide, EPA does not have the information it needs to effectively regulate these operations.

In commenting on a draft of this report, EPA stated that the information from permit files is available to EPA upon request; however, the information is currently not readily compiled in a national database. EPA is currently working with the states to develop and implement a new national data system to collect and record operation-specific information. As part of this effort, the agency plans to develop national requirements for data that should be collected and entered into the database by the states. According to EPA, it may require the states to provide data that identifies operations that have been issued or applied for a CAFO permit

as well as operations that should have applied for a permit based on an inspection or enforcement action.

Large Farms That Raise Animals Can Produce Thousands of Tons of Manure Each Year, and Regional Clustering of Farms Can Exacerbate Manure Management Problems

The amount of manure a large farm that raises animals can generate primarily depends on the types and numbers of animals raised on that farm, and the amount of manure produced can range from over 2,800 tons to more than 1.6 million tons a year. To further put this in perspective, the amount of manure produced by large farms that raise animals can exceed the amount of waste produced by some large U.S. cities. In addition, multiple large farms that raise animals may be located in a relatively small area, such as two or more adjacent counties, which raises additional concerns about the potential impacts of the manure produced, stored, and disposed of by these farms.

Table 4 shows the estimated number of animals and the typical amounts of manure produced each year, by type of animal, for three different sizes of large farms: (1) large farms that meet EPA's thresholds for each animal type, (2) large farms that raise the median number of animals according to our analysis of USDA farm census data, and (3) large farms that fell into the 75th percentile based on our analysis. As table 4 shows, a dairy farm that meets the minimum threshold of 700 dairy cows could produce almost 17,800 tons of manure a year; a median-sized dairy farm with 1,200 dairy cows could produce about 30,500 tons of manure a year; and a larger dairy farm with 1,900 dairy cows could produce almost 48,300 tons of manure a year.

Table 4: Estimated Typical Manure Production for Three Different Sizes of Large Farms That Raise Animals, 2002

Animal type	EPA's minimum thresholds for large CAFOs[a]	Estimated tons of manure produced annually by large CAFOs meeting EPA's minimum threshold	Median number of animals raised on large farms[b]	Estimated tons of manure produced annually by large farms that raised median number of animals	Number of animals raised on large farms in the 75th percentile[c]	Estimated tons of manure produced annually by large farms in the 75th percentile
Beef cattle[d]	1,000	11,690	3,424	40,025	10,000	116,895
Dairy cows	700	17,793	1,200	30,502	1,900	48,295
Hogs[e]	2,500	5,100	4,588	9,360	7,700	15,708
Layers	82,000	2,843	180,000	6,242	400,000	13,870
Broilers	125,000	4,125	159,840	5,275	195,383	6,448
Turkeys	55,000	3,633	80,491	5,317	124,500	7,719

Source: GAO analyses based on EPA CAFO definitions, USDA data, and standards for manure production cited by the American Society of Agricultural and Biological Engineers, "Manure Production and Characteristics," March 2005.

Note: The amounts of manure reported are estimates. The actual amount of manure produced by an animal will vary based on, among other things, feeding programs, feeds used, climatic conditions, production techniques, and animal genetics.

EPA reports its minimum thresholds for large CAFOs in terms of inventory data for all the animal types included in table 4. To be able to compare the annual manure estimates for EPA's thresholds, the median, and 75th percentile animal counts, we used USDA data on animal sales, inventories, and production cycles, and adjusted these to determine typical inventory during a year.

The criteria for a large farm varied by animal type, consistent with EPA's CAFO thresholds, and represent the average number of animals on a farm per day.

[a]This category captures the minimum inventory threshold that an animal feeding operation must meet to be designated as a large CAFO by EPA and the Clean Water Act.

[b]This column represents the median-sized animal farm in 2002, for each animal type. The median is the point above and below which half of the cases exist. For large farms that raise animals, half of the farms of a particular animal type have more animals than the median farm and half have fewer animals. For example, in table 4, half of large layer farms have more than 180,000 layers and half have less than 180,000 layers.

[c]This column represents the farms ranked in the 75th percentile for the amount of animals raised per farm in 2002, for each animal type. The 75th percentile is the point where 25 percent of the cases are larger and 75 percent are smaller. For large farms that raise animals, the 75th percentile indicates the larger of the large farms. The 75th percentile gives a more complete picture of how big a large farm can be. For example, for beef cattle the 75th percentile farm is about 3 times larger than the median-size farm and 25 percent of the beef cattle farms are larger than 10,000 cattle.

[d]Beef cattle includes only cattle on feed, not grazing on pasture, and sold weighing 500 pounds or more. The beef cattle manure estimates are for cattle fed from about 700 pounds to about 1,200 pounds.

[e]Hogs include swine of all sizes from birth to market size. The hog manure estimates are for hogs fed from about 27 pounds to about 260 pounds.

Additionally, individual large farms that raise animals can generate as much waste as certain U.S. cities.[13] For example, a dairy farm meeting EPA's large CAFO threshold of 700 dairy cows can create about 17,800 tons of manure annually, which is more than the about 16,000 tons of sanitary waste per year generated by the almost 24,000 residents of Lake Tahoe, California. Likewise, a median-sized beef cattle operation with 3,423 head of beef cattle can produce more than 40,000 tons of manure annually, which is more than the almost 38,900 tons of sanitary waste per year generated by the nearly 57,000 residents of Galveston, Texas. Similarly, some larger farms can produce more waste than some large U.S. cities. For example, a large farm with 800,000 hogs could produce over 1.6 million tons of manure per year, which is one and a half times more than the annual sanitary waste produced by the city of Philadelphia, Pennsylvania—about 1 million tons—with a population of almost 1.5

[13]Human sanitary waste includes urine and feces only; it does not include any other household sewage wastes such as water from washing dishes or clothes or water used for showers or flushing.

million.[14] Moreover, a beef cattle farm with 140,000 head of cattle could produce over 1.6 million tons of manure annually, more than the almost 1.4 million tons of sanitary waste generated by the more than 2 million residents of Houston, Texas.[15]

Although manure is considered a valuable commodity, especially in states with large amounts of farmland, like Iowa, where it is used as fertilizer for field crops, in some parts of the country, large farms that raise animals are clustered in a few contiguous counties. This collocation of large farms that raise animals has resulted in a separation of animal production from crop production because many of these operations purchase feed rather than grow it on adjacent cropland. As a result, there is much less cropland on which the manure can be applied as fertilizer. This clustering of large farms that raise animals has occurred because of structural changes in the farming sector. According to agricultural experts and USDA officials, the overall decrease in the number of farms and increase in the average number of animals raised on a farm may have occurred because these operations wanted to achieve economies of size. To achieve these economies, operators often need significant amounts of capital, which they obtain through production contracts with large processing companies.

A USDA report identified this concern as early as 2000 when it found that between 1982 and 1997 as livestock production became more spatially concentrated that when manure was applied to cropland, crops were not fully using the nutrients in manure and this could result in ground and surface water pollution from the excess nutrients.[16] According to the report, the number of counties where farms produced more manure nutrients, primarily nitrogen and phosphorus, than could be applied to the land without accumulating nutrients in the soil increased. Specifically, the numbers of counties with excess manure nitrogen increased by 103 percent, from 36 counties in 1982 to 73 counties in 1997. Similarly, the number of counties with excess manure phosphorous increased by 57 percent, from 102 counties in 1982 to 160 counties in 1997. As a result, the potential for runoff and leaching of these nutrients from the soil was high, and water quality could be impaired, according to USDA. Agricultural

[14]EPA officials told us that the agency has identified a hog farm of this size.

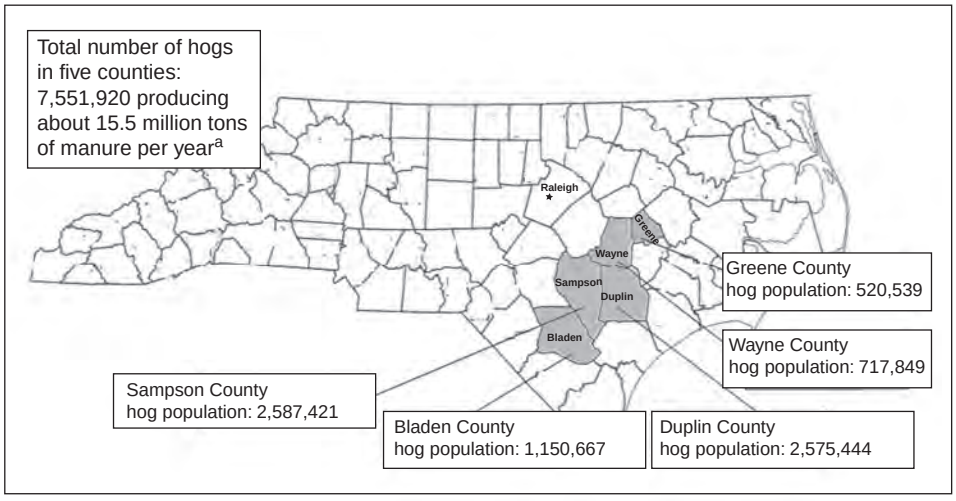
[15]EPA officials told us that the agency has identified a cattle farm of this size.

[16]R. L. Kellogg, C.H. Lander, D. C. Moffitt, and N. Gollehon. *Manure Nutrients Relative to the Capacity of Cropland and Pastureland to Assimilate Nutrients: Spatial and Temporal Trends for the United States*. (Washington, D.C.: December 2000).

experts and government officials who we spoke to during our review echoed the findings of USDA's report and provided several examples of more recent clustering trends that have resulted in degraded water quality, including the following:

- As a result of adopting the poultry industry's approach of developing close ties between producers and processors,[17] North Carolina experienced a rapid growth in the number of hog CAFOs, primarily in five contiguous counties. Based on our analysis of 2002 USDA data, we estimated that the hog population of the five North Carolina counties was more than 7.5 million hogs in 2002 and that hog operations in these counties produced as much as 15.5 million tons of manure that year. Figure 1 shows the geographic concentration of hog farms in North Carolina in 2002.

Figure 1: Geographic Concentration of Hogs in Five Contiguous North Carolina Counties, 2002



Source: GAO analysis of USDA data.

Note: Hog populations are the number of hogs on a typical day per county in 2002. The number of hogs was estimated by dividing hogs-to-market sales by two production cycles and adjusting for inventory on hand at the end of the year.

[17]GAO, *Animal Agriculture: Information on Waste Management and Water Quality Issues*, GAO/RCED-95-200BR (Washington, D.C.: June 1995).

[a]This is the amount of manure that would be produced if all of these hogs were in the feeder-finish production phase where they start at about 27 pounds and are marketed at about 260 pounds. The amount of manure would be less if a large percentage of these hogs were nursery pigs (up to about 27 pounds). Although we were unable to determine what percentage of hogs in these counties was not in the feeder-finish production cycle, we adjusted our estimates based on 1997 USDA data that showed that 25 percent of swine sold were not in the feeder-finish production cycle.

According to North Carolina agricultural experts, excessive manure production has contributed to the contamination of some of the surface and well water in these counties and the surrounding areas. According to these experts, this contamination may have occurred because the hog farms are attempting to dispose of excess manure but have little available cropland that can effectively use it. According to state officials, partly out of concern for the potential contamination of waterways and surface water from manure, in 1997, North Carolina placed a moratorium on new swine farms and open manure lagoons, which was subsequently continued through 2007. While the moratorium included exceptions that could allow a new swine farm to begin operations in this area, according to state officials, the requirements for these exceptions are so stringent that they effectively have prevented the construction of new swine operations or the expansion of existing operations.

- Similarly, a California water official told us that the geographic clustering of large farms that raise animals is causing concern in his state as well. Our analysis of USDA data shows that in 2002 two counties in the San Joaquin Valley in California had 535,443 dairy cows that produced about 13.6 million tons of manure that year. According to the official, because of the limited flow of water through the Valley, once pollutants reach the water, they do not dissipate, resulting in a long-term accumulation of these pollutants.

- Regional clustering is also occurring in Arkansas. Two counties in northwest Arkansas, located on the Arkansas-Oklahoma border, raised 14,264,828 broiler chickens that produced over 471,000 tons of manure that year. According to EPA Region 6 officials, the Arkansas-Oklahoma border is an area of concern due to the number of poultry operations (primarily broilers, but also turkeys and layers) within this area. Furthermore, region 6 officials identified numerous water bodies in northwest Arkansas and northeast Oklahoma that have been impaired by manure from animal feeding operations and identified these locations as "areas of general ground water concern."

  While USDA officials acknowledge that regional clustering of large animal feeding operations has occurred, they told us that they believe the nutrient management plans that they have helped livestock and poultry producers develop and implement have reduced the likelihood that pollutants from manure are entering ground and surface water. They also believe that as a

result of new technologies such as calibrated manure spreaders, improved animal feeds, and systems that convert manure into electricity, large animal feeding operations are able to more effectively use the manure being generated. However, USDA could not provide information on the extent to which these techniques are being utilized or their effectiveness in reducing water pollution from animal waste.

Studies Have Identified Impacts of Pollutants from Animal Waste, but EPA Has Not Assessed the Extent of Such Impacts

Since 2002, at least 68 government-sponsored or peer-reviewed studies have been completed on air and water pollutants from animal feeding operations. Of these 68 studies, 15 have directly linked pollutants from animal waste generated by these operations to specific health or environmental impacts, 7 have found no impacts, and 12 have made indirect linkages between these pollutants and health and environmental impacts. In addition, 34 of the studies have focused on measuring the amount of certain pollutants emitted by animal feeding operations that are known to cause human health or environmental impacts at certain concentrations. Appendix IV presents information, including the sponsor, the pollutants, and impacts, identified for each of the 68 studies we reviewed.[18] Although EPA is aware of the potential impacts of air and water pollutants from animal feeding operations, it lacks data on the number of animal feeding operations and the amount of discharges actually occurring. Without such data, according to EPA officials, the agency is unable to assess the extent to which these pollutants are harming human health and the environment.

Some Recent Studies Directly Link Pollutants from Animal Waste to Health and Environmental Impacts

Of the 15 studies completed since 2002 that we reviewed that directly link pollutants from animal waste to human health or environmental impacts, 8 focused on water pollutants and 7 on air pollutants. Academic experts and industry and EPA officials told us that only a few studies directly link CAFOs with health or environmental impacts because the same pollutants that CAFOs discharge also often come from other sources including smaller livestock operations; row crops using commercial fertilizers; and wastes from humans, municipalities, or wildlife, making it difficult to distinguish the actual source of pollution. Table 5 shows the eight government-sponsored or peer-reviewed studies completed since 2002 that found direct links between water pollutants from animal waste and impacts on human health or the environment.

[18]Sponsors are agencies, organizations, or universities responsible for conducting the study and not necessarily the group funding the study.

Table 5: Studies Completed Since 2002 Linking Water Pollutants from Animal Feeding Operations with Impacts on Human Health or the Environment

Study title	Sponsor[a]	Pollutant(s) studied	Impact identified
Effects of the Feedlot Contaminant 17α-Trenbolone on Reproductive Endocrinology of the Fathead Minnow	EPA	Hormones	Adverse effects to reproductive system of aquatic life
Endocrine-Disrupting Effects of Cattle Feedlot Effluent on an Aquatic Sentinel Species, the Fathead Minnow	University of Florida, St. Mary's College of Maryland, University of Nebraska, EPA, Tufts University	Hormones	Adverse effects to reproductive system of aquatic life
Effects of the Androgenic Growth Promoter 17ß-Trenbolone on Fecundity and Reproductive Endocrinology of the Fathead Minnow	EPA, University of Minnesota	Hormones	Adverse effects to reproductive system of aquatic life
In Vitro and in Vivo Effects of 17ß-Trenbolone: A Feedlot Effluent Contaminant	EPA	Hormones	Reproductive malformations in laboratory rats and human cells
Characterization of Waterborne Outbreak-associated *Campylobacter jejuni*, Walkerton, Ontario	Health Canada	Bacteria	Gastrointestinal illness and death in humans
Impact of Animal Waste Application on Runoff Water Quality in Field Experimental Plots	Jackson State University, National Institutes of Health-Center for Environmental Health, Louisiana State University	Nutrients, bacteria	Water degradation
Nutrient Loading Patterns on an Agriculturally Impacted Stream System in Huntingdon County Pennsylvania over Three Summers	Juniata College	Nutrients	Water degradation; unable to sustain aquatic life
Concentrated Animal Feeding Operations, Row Crops, and Their Relationship to Nitrate in Eastern Iowa Rivers	University of Iowa	Nutrients	Water degradation

Source: GAO's analysis of identified studies.

[a]Sponsor refers to the organization under whose auspices the research was conducted or with whom the primary researchers were affiliated.

As table 5 shows, EPA sponsored four of the water quality studies that identified reproductive alterations in aquatic species caused by hormones in discharges from animal feeding operations. Two of these studies found that hormones from these discharges caused a significant decline in the fertility of female fish in nearby water bodies. Similarly, three other studies found water bodies impaired by higher nitrogen and phosphorus levels from manure runoff from animal feeding operations. For example, the study by Juniata College found that the runoff resulted in nutrient

concentrations in the water that were too high to sustain fish populations. Only one of the eight water pollutant studies linked pollutants from animal feeding operations to human health effects. This study, conducted by Health Canada, directly linked water discharges from a cattle farm to bacteria found in nearby waters. These bacteria, which included *Campylobacter* and *E. coli*, caused gastrointestinal illnesses in more than 2,300 residents and 7 deaths in a nearby community.

Table 6 shows the seven government-sponsored or peer-reviewed studies completed since 2002 that we reviewed that directly link air pollutants from animal feeding operations with human health effects.

Table 6: Studies Completed Since 2002 Directly Linking Air Pollutants from Animal Feeding Operations to Impacts on Human Health

Study title	Sponsor[a]	Pollutant(s) studied	Impact identified
Feedlot Dust Stimulation of Interleukin-6 and 8 Requires Protein Kinase C-Epsilon Human Bronchial Epithelial Cells	Nebraska Medical Center, Department of Veterans Affairs Medical Center, Texas A&M	Dust	Respiratory inflammation
Farm Residence and Exposures and the Risk of Allergic Diseases In New Zealand Children	University of Otago, New Zealand	Dust	Greater prevalence of allergies in children living on farms
Exhaled Nitric Oxide and Bronchial Responsiveness in Healthy Subjects Exposed to Organic Dust	National Institute of Environmental Medicine, Sweden	Dust	Respiratory inflammation (occupational)
Hog Barn Dust Extract Augments Lymphocyte Adhesion to Human Airway Epithelial Cells	Department of Veterans Affairs Medical Center, University of Nebraska Medical Center	Dust	Respiratory inflammation (occupational)
Hog Barn Dust Extract Stimulates IL-8 And IL-6 Release in Human Bronchial Epithelial Cells Via PKC Activation	Department of Veterans Affairs Medical Center, University of Nebraska Medical Center	Dust	Respiratory inflammation (occupational)
Experimental Human Exposure to Inhaled Grain Dust and Ammonia: Towards a Model of Concentrated Animal Feeding Operations	University of Iowa	Dust, ammonia	Tightening of airway in asthmatics (occupational)
Symptomatic Effects of Exposure to Diluted Air Sampled from a Swine Confinement Atmosphere on Healthy Human Subjects	Duke University	Hydrogen sulfide, ammonia, endotoxin, dust, odor	Headaches, eye irritation, nausea

Source: GAO's analysis of identified studies.

[a]Sponsor refers to the organization under whose auspices the research was conducted or with whom the primary researchers were affiliated.

As table 6 shows, six of these studies identified airway inflammation or wheezing in people working at or living on an animal feeding operation.

For example, the studies conducted by the Department of Veterans Affairs show that the dust of hog confinement facilities induces airway inflammation in workers. The seventh study, completed by Duke University in a laboratory setting, exposed healthy volunteers to air emissions consistent with those that would occur downwind from animal feeding operations. These volunteers reported headaches, eye irritation, and nausea following this exposure. According to experts who we spoke with, the effects of air emissions from animal feeding operations on workers are well known, but the impacts of these emissions on nearby communities are still uncertain, and more research is needed to identify these impacts. Additionally, experts said it is difficult to determine which specific contaminant or mixture of contaminants causes particular health symptoms. For example, while hydrogen sulfide causes respiratory and other health problems, other contaminants emitted from animal feeding operations, such as ammonia, can also cause similar symptoms.

Some Studies Found No Links between Pollutants from Animal Feeding Operations and Harm to Human Health or the Environment

We found seven government-sponsored or peer-reviewed studies that have been completed since 2002 that found no impact on human health or the environment from pollutants released by animal feeding operations. These seven studies are shown in table 7.

Table 7: Studies Completed Since 2002 Finding No Links between Pollutants from Animal Feeding Operations and Impacts on Human Health or the Environment

Study title	Sponsor[a]	Pollutant(s) studied	Finding(s)
Prevalence of *Escherichia coli O157:H7* Bacterial Infections Associated with the Use of Animal Wastes in Louisiana for the Period 1996-2004	Grambling State University, Louisiana State University, Jackson State University	*Escherichia coli*	No clear indication that any cases of *E. coli* infection are related to animal waste
Prevalence of Selected Bacterial Infections Associated with the Use of Animal Waste in Louisiana	Jackson State University, Louisiana State University	*Escherichia coli*	No clear indication that any cases of *E. coli* infection are related to animal waste
Impacts of Swine Manure Pits on Groundwater Quality	Illinois State Geological Survey, University of Illinois, Illinois Department of Agriculture	Chloride, ammonium, phosphate, potassium, nitrate, bacteria	Manure seepage from swine facilities has had limited impacts on groundwater

Study title	Sponsor[a]	Pollutant(s) studied	Finding(s)
Ground-Water Quality and Effects of Poultry Confined Animal Feeding Operations on Shallow Ground Water, Upper Shoal Creek Basin, Southwest Missouri, 2000	U.S. Geological Survey	Nutrients, bacteria	The results do not indicate that poultry CAFOs are affecting the shallow ground water with respect to nutrients and fecal bacteria
Environmental Exposure to Endotoxin and Its Relation to Asthma in School-Age Children	Institute of Social and Preventive Medicine (Switzerland), Children's Hospital (Austria), Philipps University (Germany), Ruhr University (Germany), University Children's Hospital (Switzerland), University of Munich (Germany	Dust	Decreased risk of hay fever, asthma, and wheeze in children exposed to high levels of endotoxin in dust
Ecological Associations between Asthma Prevalence and Potential Exposure to Farming	University of North Carolina	Farm air	Farm exposures may be protective against childhood asthma.
Atmospheric Pollutants and Trace Gases: Atmospheric Ammonia, Volatile Fatty Acids, and Other Odorants near Beef Feedlots	Research Centre, Agriculture and Agri-Food Canada	Ammonia, odor, organic compounds, dust	Odorants from feedlots were effectively dispersed. Emitted ammonia was deposited to the soil downwind.

Source: GAO's analysis of identified studies.

[a]Sponsor refers to the organization under whose auspices the research was conducted or with whom the primary researchers were affiliated.

As table 7 shows, the results of a U.S. Geological Survey study did not indicate that poultry animal feeding operations were causing an increase of nutrient concentrations and fecal bacteria in groundwater. Similarly, another study by Agriculture and Agri-Food Canada found that odorants, including ammonia and dust emitted by animal feeding operations, never exceeded the established irritation threshold. According to EPA and academic experts we spoke with, the concentrations of air pollutants and water pollutants emitted by animal feeding operations can vary, which may account for the differences in the findings of these studies. These variations may be the result of numerous factors, including the type of animals being raised, feed being used, and manure management system being employed, as well as the climate and time of day when the emissions occur.

Some Recent Studies Indirectly Link Pollutants from Animal Feeding Operations with Human Health and Environmental Impacts

We also identified 12 government-sponsored or peer-reviewed studies completed since 2002 that indirectly link pollutants from animal feeding operations to human health or environmental impacts. While these studies found that animal feeding operations were the likely cause of human health or environmental impacts occurring in areas near the operations, they could not conclusively link waste from animal feeding operations to the impacts, often because other sources of pollutants could also be contributing. For example, 5 of these 12 studies found an increased incidence of asthma or respiratory problems in people living or attending school near animal feeding operations, compared with a control group. These studies hypothesized that the pollutants emitted from animal feeding operations were likely the cause of the increased incidence of asthma, but some of these studies acknowledged that pollutants from other sources could also be contributing to the increased incidence. Table 8 lists the 12 studies that have been completed since 2002 that made indirect links between emissions from animal feeding operations and human health and environmental impacts.

Table 8: Studies Completed Since 2002 That Found an Indirect Link between Pollutants from Animal Feeding Operations and Human Health or Environmental Impacts

Study title	Sponsor[a]	Impact(s)
Associations between Indicators of Livestock Farming Intensity and Incidence of Human Shiga Toxin-Producing *Escherichia coli* Infection	University of Guelph; Université de Montréal; Centre for Infectious Disease Prevention and Control – Health Canada	The strongest associations with human *Escherichia coli* infection were the ratio of beef cattle to human population and the application of manure to the surface of agricultural land by a solid spreader and by a liquid spreader.
The Potential Impact of Flooding on Confined Animal Feeding Operations in Eastern North Carolina	University of North Carolina	Flood events have a significant potential to degrade environmental health because of dispersion of wastes from industrial animal operations in areas with vulnerable populations.
Odor from Industrial Hog Farming Operations and Mucosal Immune Function in Neighbors	University of North Carolina, Duke University	This study suggests that malodor from industrial swine operations can affect the secretory immune system, although the reduced levels reported are still within normal range.
Environmental Stressors, Perceived Control, and Health: The Case of Residents Near Large-Scale Hog Farms in Eastern North Carolina	University of North Carolina Wilmington	Residents living near large-scale hog farms in eastern North Carolina report symptoms related to respiratory, sinus, and nausea problems.

Study title	Sponsor[a]	Impact(s)
Asthma Prevalence and Morbidity Among Rural Iowa Schoolchildren	University of Iowa, EPA	Among children who wheeze, farm and nonfarm children were equally likely to have been given a diagnosis of asthma and had comparable morbidity. Asthma in rural schoolchildren was comparable to schoolchildren in large cities.
Occupational Asthma in Newly Employed Workers in Intensive Swine Confinement Facilities	Institute of Agricultural Rural and Environmental Health, University of Saskatchewan, Laval University	Newly employed workers in intensive swine confinement facilities reported development of acute onset of wheezing and cough suggestive of asthma.
Asthma and Farm Exposures in a Cohort of Rural Iowa Children	University of Iowa, EPA, Colorado State University, Kaiser Permanente	There was a high prevalence of asthma health outcome among farm children living on farms that raise swine and raise swine and add antibiotics.
Asthma Symptoms among Adolescents Who Attend Public Schools That Are Located Near Confined Swine Feeding Operations	University of North Carolina, RTI International	Estimated exposure to airborne pollution from confined swine feeding operations is associated with adolescents' wheezing symptoms.
Airway Responses of Healthy Farmers and Nonfarmers to Exposure in a Swine Confinement Building	National Institute of Environmental Medicine (Sweden), National Institute for Working Life (Sweden)	Altered lung function and bronchial responsiveness was found in nonfarming subjects. Only minor alterations were found in the farmers.
Environmental Exposure to Confined Animal Feeding Operations and Respiratory Health of Neighboring Residents	Institute for Occupational and Environmental Medicine (Germany), National Research Centre for Environment and Health (Germany), Boston University, Municipal Health Service Amsterdam	Respiratory disease was found among residents living near confined animal feeding operations.
School Proximity to Concentrated Animal Feeding Operations and Prevalence of Asthma in Students	University of Iowa Carver College of Medicine, University of Iceland	Children in the study school, located one-half mile from a CAFO, had a significantly increased prevalence of physician-diagnosed asthma.
Lung Function and Farm Size Predict Healthy Worker Effect in Swine Farmers	University of Saskatchewan (Canada)	Some swine workers are less affected by swine air and continue in the profession. Other workers are more affected.

Source: GAO's analysis of identified studies.

[a]Sponsor refers to the organization under whose auspices the research was conducted or with whom the primary researchers were affiliated.

Many Recent Studies Have Measured the Level of Pollutants Emitted by Animal Feeding Operations

Thirty-four government-sponsored or peer-reviewed studies completed since 2002 have focused on measuring the amounts of water or air pollutants emitted by animal feeding operations that are known to cause harm to humans or the environment. Specifically:

- Nineteen of the 34 studies focused on water pollutants. Four studies found increased levels of phosphorus or nitrogen in surface water and groundwater near animal feeding operations. According to EPA, excessive amounts of these nutrients can deplete oxygen in water, which could result in fish deaths, reduced aquatic diversity, and illness in infants. The other 15 studies measured water pollutants such as pathogens, hormones, and antibiotics.

- Fifteen of the 34 studies focused on measuring air emissions from animal feeding operations. Seven of the 15 studies found high levels of ammonia surrounding animal feeding operations. EPA considers ammonia a hazardous substance that may harm human health or the environment, and that must be reported when emissions exceed its reportable quantity. The other eight studies measured the levels of other air pollutants, such as hydrogen sulfide, particulate matter, and carbon dioxide.

Appendix IV provides additional details about each of the 34 studies.

EPA Has Not Yet Assessed the Extent of the Human Health and Environmental Impacts of Pollutants from Animal Feeding Operations

While EPA recognizes the potential impacts that water and air pollutants from animal feeding operations can have on human health and the environment, it lacks the data necessary to assess how widespread these impacts are and has limited plans to collect the data it needs.

Water quality. EPA has long recognized the impacts of pollution from CAFOs on water quality. For example, almost a decade ago, in its 1998 study on feedlot point sources, EPA documented environmental impacts that may be attributed to these operations.[19] This report identified pollutants from animal feeding operations and listed about 300 spills and runoff events that were attributable to animal feeding operations from 1985 through 1997. More recently when developing the 2003 CAFO rule, EPA documented the potential water quality impacts from CAFOs. It reported that contaminants in manure will have an impact on water quality if significant amounts reach surface water or groundwaters. Moreover, as discussed above, numerous studies completed since 2002 have provided

[19]EPA, Office of Water, *Feedlots Point Source Category Study* (Washington, D.C.: 1999).

additional information on the direct and indirect impacts of discharges from animal feeding operations on human health and the environment, and many more studies have been completed that have measured the amounts of pollutants being discharged.

EPA officials we spoke with acknowledged that the potential human health and environmental impacts of some CAFO water pollutants, such as nitrogen, phosphorus, and pathogens, are well known. They told us that the agency has recently focused its research efforts on obtaining more information on emerging pollutants, such as hormones and antibiotics, and on how the concentrations of nutrients and pathogens differ among the various types of animal feeding operations. However, these officials also stated that EPA does not have data on the number and location of CAFOs nationwide and the amount of discharges from these operations. Without this information and data on how pollutant concentrations vary by type of operation, it is difficult to estimate the actual discharges occurring and to assess the extent to which CAFOs may be contributing to water pollution. According to agency officials, because of a lack of resources, the agency currently has no plans for a national study to collect information on CAFO water discharges. However, the agency has recently taken the following three steps that may help gather additional data on CAFO pollutants that affect water quality:

- EPA has begun research to determine (1) how the concentration of pathogens and nutrients vary in manure on the basis of certain characteristics, such as animal type and animal feed, and (2) how manure management techniques can reduce the amount of pathogens and nutrients in runoff.

- EPA has set a long-term research goal, as part of its *Multi-Year Plan for Endocrine Disruptors (FY2007-2013)*, to characterize the magnitude and extent of the impact of hormones released by CAFOs and to determine the impact of management strategies on the fate and effects of hormones. At the time of our review, according to an EPA official, the agency had only limited preliminary findings because it has just recently begun this work.

- EPA and the U.S. Geological Survey have discussed a joint project to identify (1) the location of CAFOs nationwide and (2) those watersheds where many CAFOs might be located. According to EPA officials, this project is still in the discussion phase.

Air quality. More recently, EPA has recognized concerns about the possible health impacts from air emissions produced by animal feeding operations. Prompted in part by public concern, EPA and USDA

commissioned a 2003 study by the National Academy of Sciences (NAS) to evaluate the scientific information needed to support the regulation of air emissions from animal feeding operations.[20] The NAS report identified several air pollutants from animal feeding operations and their potential impacts. For example, the study identified ammonia and hydrogen sulfide as two air pollutants emitted from animal feeding operations that can impair human health. According to the study, ammonia can cause eye, nose, and throat irritation at certain concentrations, and hydrogen sulfide can cause respiratory distress. While such effects are known to occur, the study noted that additional research is warranted to determine if air emissions from animal feeding operations are occurring in high enough concentrations to cause these effects. The NAS report also concluded that in order to determine the human health and environmental effects of air emissions from animal feeding operations, EPA and USDA would first need to obtain accurate estimates of emissions and their concentrations from animal feeding operations with varying characteristics, such as animal type, animal feed, manure management techniques, and climate.

Since the NAS report was issued, EPA has conducted one hypothetical assessment of the impacts of air emissions from animal feeding operations. In 2004, EPA updated a preliminary analysis to estimate the levels of emissions of ammonia and hydrogen sulfide that occur downwind from a manure lagoon and that could pose a risk to human health. EPA found that ammonia would not reach levels associated with respiratory irritation if emitted at the reportable quantity of 100 pounds per day.[21] On the other hand, the agency found that hydrogen sulfide could cause respiratory irritation and central nervous system effects about one mile downwind if emitted at the reportable quantity of 100 pounds per day.[22] EPA officials who conducted this analysis told us that there have been no documented cases of hydrogen sulfide emissions from animal feeding operations exceeding the reportable quantity. However, other officials noted that the agency does not know exactly what type of species and what size of operations are likely to have emissions above the reportable quantity, and, as noted in the NAS report, accurate measurements of the

[20]National Academies of Sciences, *Air Emissions from Animal Feeding Operations: Current Knowledge, Future Needs* (Washington, D.C.: National Academies Press, 2003).

[21]Section 302.4 of title 40 of the Code of Federal Regulations notes that the reportable quantity for ammonia is 100 pounds per 24 hours.

[22]Section 302.4 of title 40 of the Code of Federal Regulations notes that the reportable quantity for hydrogen sulfide is 100 pounds per 24 hours.

air pollutants being emitted by animal feeding operations are currently not known.

In 2007, a national air emissions monitoring study to collect data on air emissions from animal feeding operations was undertaken as part of a series of consent agreements EPA entered into with individual animal feeding operations. This study, funded by industry and approved by EPA, is intended to help the agency determine how to measure and quantify air emissions from animal feeding operations. The data collected will in turn be used to estimate air emissions from animal feeding operations with varying characteristics, and, according to EPA officials, it is only the first step in a long-term effort to accurately quantify air emissions from animal feeding operations. According to agency officials, until EPA can determine the actual level of emissions occurring, it will be unable to assess the extent to which these emissions are affecting human health and the environment. Progress in conducting the national air emissions monitoring study is discussed in greater detail in the following section.

It Is Unclear If EPA's Efforts to Develop Air Emissions Protocols for Animal Feeding Operations Will Be Effective and How EPA Intends to Regulate These Emissions in the Future

The National Air Emissions Monitoring Study—a 2-year effort to collect data on air emissions from animal feeding operations—is intended to provide a scientific basis for estimating air emissions from these operations. The results of this study were intended to help EPA develop protocols that will allow it to determine which operations do not comply with applicable federal laws. As currently structured, however, the study may not provide the quantity and quality of data needed for developing appropriate methods for estimating emissions. Furthermore, it is uncertain if and when EPA will develop a process-based model that considers the interaction and implications of all sources of emissions at an animal feeding operation. Also, other more recent decisions suggest that the agency has not yet determined how it intends to regulate air emissions from animal feeding operations. In the absence of federal guidance on how to regulate air emissions from animal feeding operations, a few states have developed their own regulations.

A National Air Emissions Monitoring Study Has Begun, but the Study May Not Provide the Data EPA Needs to Develop Air Emissions Protocols

According to EPA, although it has the authority to require animal feeding operations to monitor their emissions and come into compliance with the Clean Air Act on a case-by-case basis, this approach has proven to be time and labor intensive. As an alternative to the case-by-case approach, in January 2005, EPA offered animal feeding operations an opportunity to sign a voluntary consent agreement and final order, known as the Air Compliance Agreement. To participate in the agreement, animal feeding operations were required to take the following actions:

- Pay a civil penalty ranging from $200 to $1,000 per animal feeding operation, depending on the number of animals at the operation and the number of operations that each participant signed up.[23]
- Pay up to $2,500 per farm to help fund a nationwide emissions monitoring study and make their facilities available as a monitoring site for emissions testing.
- Once emission protocols are published, apply for all applicable air permits and comply with permit conditions, if deemed necessary.
- Once emission protocols are published, report any releases of ammonia and hydrogen sulfide above the threshold levels established by CERCLA and EPCRA.[24, 25]

[23]The total penalty is capped at $10,000 for a participant having 10 or fewer farms to $100,000 for a participant having over 200 farms.

[24]Since announcing the Air Compliance Agreement, EPA has proposed exempting such releases from the CERCLA and EPCRA reporting requirements. The exemption, proposed in December 2007, has not been finalized.

[25]Any farm more than 10 times larger than EPA's established size thresholds for CAFOs must, within 120 days of receiving an executed copy of the agreement, provide the National Response Center with a written statement noting the facility's location, estimating air emissions of ammonia, and stating that it will notify the Center of reportable releases when emission rates are determined by the monitoring study.

In return for meeting these requirements, EPA agreed not to sue participating animal feeding operations for certain past violations or violations occurring during the emissions monitoring study.[26]

Almost 13,900 animal feeding operations were approved for participation in the agreement, representing the egg, broiler chicken, dairy, and swine industries. Some turkey operations volunteered but were not approved because there were too few operations to fund a monitoring site, and the beef cattle industry chose not to participate. EPA collected a total of $2.8 million in civil penalties from participating animal feeding operations and deposited these funds into the U.S. Treasury. An additional $14.8 million was collected by a nonprofit, industry-established organization to fund the national air emissions monitoring study. Industry groups representing the participating operations provided the funding for the study as was called for under the agreement. Table 9 shows the level of participation by type of operation and the amount of funding provided by different industry groups for the national air emissions monitoring study.

Table 9: Number of Participants in the Air Compliance Agreement, Funding Provided by Animal Type, and Source of the Funding for the National Air Emissions Monitoring Study

(Dollars in millions)

	Air Compliance Agreement		National Air Emissions Monitoring Study	
Animal type	Number of participants	Number of animal feeding operations	Funding provided	Funding source
Swine	1,878	4,865	$6.0	National Pork Board
Dairy	474	573	5.0	National Milk Producers Council
Layers	218	2,693	2.8	United Egg Producers
Broilers	41	5,752	1.0	National Chicken Council
Total	**2,611**	**13,883**	**$14.8**	

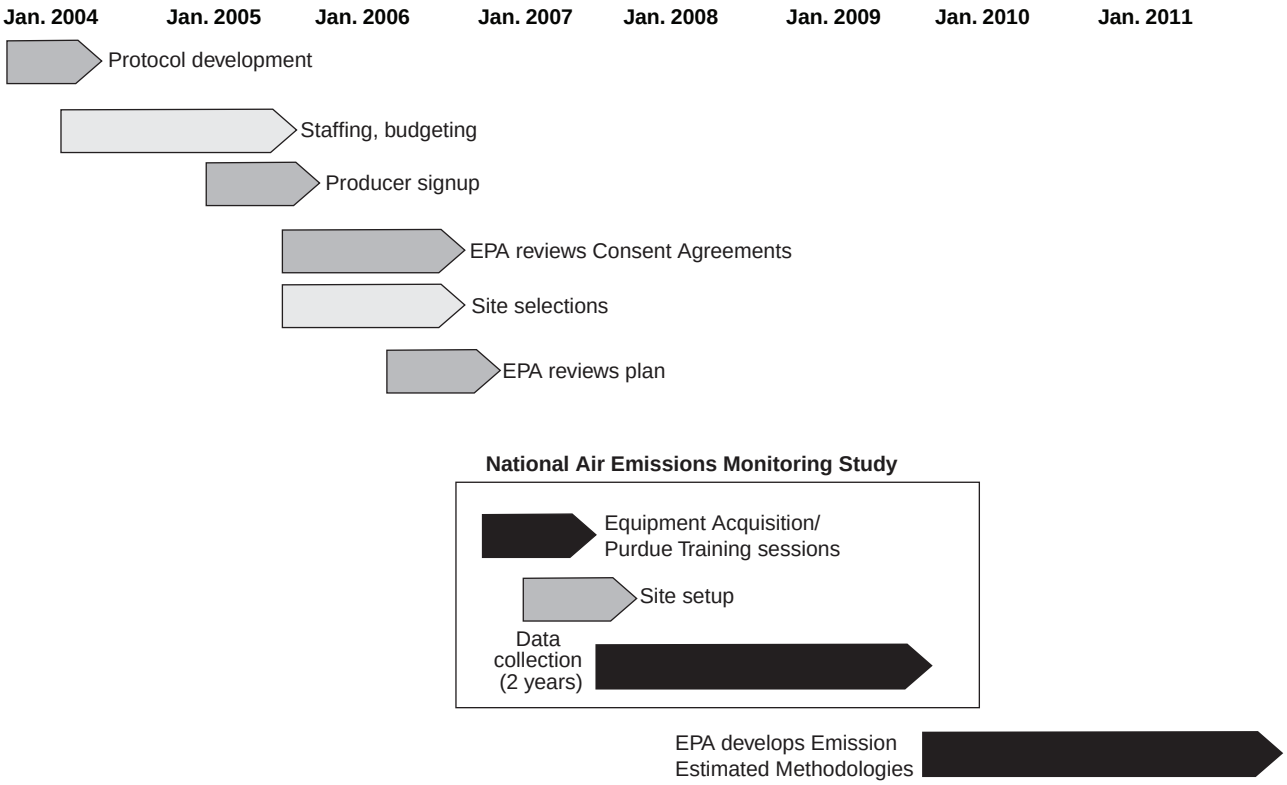
Source: EPA.

The purpose of the National Air Emissions Monitoring Study is to collect data that will provide a scientific basis for measuring and estimating air

[26]EPA placed certain conditions and limits on its agreement not to sue animal feeding operations participating in the Air Compliance Agreement. For example, EPA can continue to pursue cases that present an imminent and substantial endangerment to public health, welfare, or the environment. In addition, EPA's agreement not to sue only covers emissions from agricultural livestock and livestock waste and does not extend to generators or land application of animal waste.

emissions from animal feeding operations and will help EPA to determine operations' compliance status. To provide a framework for the monitoring study and develop a sampling plan that was representative of animal feeding operations in the United States, in 2003 EPA convened a panel of industry experts, university and government scientists, and other stakeholders knowledgeable in the field. In 2004, the nonprofit organization founded by the various livestock sectors selected an independent science adviser to oversee the data collection at 20 of the 13,883 animal feeding operations that were selected to participate in the study. Their selection was submitted to and approved by EPA. Data collection began in May 2007. Once 2 years of data has been collected, EPA will use these data to develop air emissions protocols. Figure 6 shows EPA's expected timeline for the development of air emissions protocols.

Figure 2: EPA Timeline for Development of Air Emission Protocols for Animal Feeding Operations



Source: EPA.

However, the National Air Emissions Monitoring Study may not provide the data that EPA needs to develop comprehensive protocols for quantifying air emissions from animal feeding operations for a variety of reasons. First, the monitoring study does not include the 16 combinations of animal types and geographic regional pairings recommended by EPA's expert panel. The panel recommended this approach so that the study sample would be representative of the vast majority of participating animal feeding operations, accounting for differences in climatic conditions, manure-handling methods, and density of operations. However, EPA approved only 12 of the 16 combinations recommended by the expert panel, excluding southeastern broiler, eastern layer, midwestern turkey, and southern dairy operations. Second, site selection for the study has been a concern since the plan to select monitoring sites for the monitoring study was announced in 2005. At that time, many agricultural experts, environmental groups, and industry and state officials disagreed with the site selection methodology. In commenting on EPA's *Federal Register* notice of the Animal Feeding Operation Consent

Agreement and Final Order, these experts and officials stated that the study did not include a sufficient number of monitoring sites to establish a statistically valid sample. Without such a sample, we believe that EPA will not be able to accurately estimate emissions for all types of operations. More recently, in June 2008, the state of Utah reached an agreement with EPA to separately study animal feeding operations in the state because of the state's continuing concerns that the National Air Emissions Monitoring Study will not collect information on emissions from operations in Rocky Mountain states and therefore may not be meaningful for those operations that raise animals in arid areas. Finally, agricultural experts have raised concerns that the National Air Emissions Monitoring Study does not include other sources that can contribute significantly to emissions from animal feeding operations. For example, these experts have noted that the monitoring study will not capture data on ammonia emissions from feedlots and manure applied to fields. According to these experts, feedlots and manure on fields, as well as other excluded sources, account for approximately half of the total ammonia emissions from animal feeding operations.

Furthermore, USDA's Agricultural Air Quality Task Force has also recently raised concerns about the quantity and quality of the data being collected during the early phases of the study and how EPA will eventually use the information.[27] In particular, the task force expressed concern that the technologies used to collect emissions data were not functioning reliably. For example, according to data provided by EPA, almost one-third of the preliminary data from one site were incomplete during a 2-month data collection period. The task force was also concerned about EPA's plans to extrapolate the data across a variety of CAFO operating configurations. At its May 2008 task force meeting, the members requested that the Secretary of Agriculture ask EPA to review the first 6 months of the study's data to determine if the study needs to be revised in order to yield more useful information.

EPA acknowledged that emissions data should be collected for every type of animal feeding operation and practice, but EPA officials stated that such an extensive study is impractical. According to EPA officials, the industry identified those monitoring sites that they believed best represented the type of operations and manure management practices that

[27]The Agricultural Air Quality Task Force, created in accordance with the 1996 farm bill, is charged with advising the Secretary of Agriculture with respect to providing oversight and coordination related to agricultural air quality, and consists of leaders in farming, industry, health, and science.

are in their various animal sectors. EPA reviewed and approved these site selections. According to EPA, it believes that the selected sites provide a reasonable representation of the various animal sectors. EPA has also indicated that it plans to use other relevant information to supplement the study data and has identified some potential additional data sources. For example, a study conducted at two broiler facilities in Kentucky has been accepted as meeting the emissions study's requirements. However, according to agricultural experts, until EPA identifies all the supplemental data that it plans to use, it is not clear if these data, together with the emissions study data, will enable EPA to develop comprehensive air emissions protocols.

Furthermore, EPA has also indicated that completing the National Air Emissions Monitoring Study is only the first step in a multiyear effort to develop a process-based model for predicting overall emissions for animal feeding operations. A process-based model would capture emissions data from all sources and use these data to assess the interaction of all sources and the impact that different manure management techniques have on air emissions for the entire operation. For example, technologies are available to decrease emissions from manure lagoons by, among other things, covering the lagoon to capture the ammonia. However, if an operation spreads the lagoon liquid as fertilizer for crops, ammonia emissions could increase on the field. According to NAS, a process-based model is needed to provide scientifically sound estimates of air emissions from animal feeding operations that can be used to develop management and regulatory programs. Although EPA plans to develop a process-based model after 2011, it has not yet established a timetable for completing this model and, therefore, it is uncertain when EPA will have more sophisticated approaches that will more accurately estimate emissions from animal feeding operations.

Recent EPA Decisions Suggest That the Agency Has Not Yet Determined How It Plans to Regulate Air Emissions from Animal Feeding Operations

Two recent decisions by EPA suggest that the agency has not yet determined how it intends to regulate air emissions from animal feeding operations. EPA's first decision in this context was made in December 2007. At that time EPA proposed to exempt releases to the air of hazardous substances from manure at farms that meet or exceed the reportable quantities from both CERCLA and EPCRA notification requirements. According to EPA, this decision was in response to language that was contained in congressional committee reports related to EPA's appropriations legislation for 2005 and 2006. EPA was directed to promptly and expeditiously provide clarification on the application of these laws to poultry, livestock, and dairy operations. In addition, the agency received a petition from the National Chicken Council, the

National Turkey Federation, and the U.S. Poultry and Egg Association seeking an exemption from the CERLA and EPCRA reporting requirements for ammonia emissions from poultry operations. The petition argued that ammonia emissions from poultry operations pose little or no risk to public health, and emergency response is inappropriate. In proposing the rule, EPA noted that the agency would not respond to releases from animal wastes under CERCLA or EPCRA nor would it expect state and local governments to respond to such releases because the source and nature of these releases are such that emergency response is unnecessary, impractical, and unlikely. It also noted that it had received 26 comment letters from state and local response agencies supporting the exemption for ammonia from poultry operations. However, during the public comment period ending on March 27, 2008, a national association representing state and local emergency responders with EPCRA responsibilities questioned whether EPA had the authority to exempt these operations until the agency had data from its monitoring study to demonstrate actual levels of emissions from animal feeding operations. This national association further commented that EPA should withdraw the proposal because it denied responders and the public the information necessary to protect themselves from dangerous releases.[28] The timing of this proposed exemption, before the National Air Emissions Monitoring Study has been completed, we believe calls into question the basis for EPA's decision.

The second decision that EPA has recently made that calls into question how the agency intends to regulate air emissions from animal feeding operations involves the timing of key regulatory decisions. EPA has stated that it will not make key regulatory decisions on how federal air regulations apply to animal feeding operations until after 2011, when the monitoring study is completed. According to EPA, the agency will issue guidance defining the scope of the term "source" as it relates to animal agriculture and farm activities. As a result, EPA has not decided if it will aggregate the emissions occurring on an animal feeding operation as one source or if the emissions from the barns, lagoons, feed storage, and fields will each be considered as a separate source when determining if an operation has exceeded air emissions' reportable quantities. Depending on the approach EPA takes, how emissions are calculated could differ significantly. For example, according to preliminary data EPA has received from an egg-laying operation in Indiana, individual chicken barns may

[28]The National Association of SARA Title III Program Officials. The Superfund Amendments and Reauthorization Act (SARA) amended CERCLA on October 17, 1986, after the first 6 years of the program.

exceed the CERCLA reportable quantities for ammonia. Moreover, if emissions from all of the barns on the operation are aggregated, they might be more than 500 times the CERCLA reportable quantities. In addition, EPA does not intend to issue guidance to address emissions, and sources of emissions, that cannot reasonably pass through a stack, chimney, or other functionally equivalent opening, i.e., fugitive emissions, until after the conclusion of the monitoring study.

EPA has already been asked to clarify what it considers a source on an animal feeding operation but has declined to do so. In a 2004 ruling on an appeal of a civil suit against a swine operation, the U.S. Court of Appeals for the 10th Circuit overturned a 2002 federal district court ruling that a farm's individual barns, lagoons, and land application areas could be considered separate "sources" for purposes of CERCLA reporting requirements.[29] The Court of Appeals ruled that the whole farm site was the proper entity to be assessed for purposes of CERCLA reporting. The Court invited EPA to file a friend-of-the-court brief in order to clarify the government's position on this issue, but EPA declined to do so within the court-specified time frame.[30] Another court reached similar conclusions in 2003.[31] Despite these court rulings, EPA has indicated that it will not decide on what it considers a source until the National Air Emissions Monitoring Study is completed.

Lacking Federal Guidance, Some States Have Begun to Regulate Air Emissions from Animal Feeding Operations

In the absence of federal guidance on how to regulate air emissions from animal feeding operations, officials in 6 states, out of the 47 states that responded to our survey, are regulating some emissions covered under the Clean Air Act, CERCLA and EPCRA. As table 10 shows, state officials in California, Idaho, Minnesota, Missouri, Nebraska, and North Dakota reported that they have developed state air regulations for certain pollutants that are emitted by CAFOs.

[29]*Sierra Club v. Seaboard Farms Inc.*, 387 F.3d 1167 (10th Cir. 2004).

[30]In commenting on a draft of this report, EPA noted that it had a very limited time to respond to the court's request.

[31]*Sierra Club v. Tyson Foods, Inc.*, 299 F. Supp. 2d 693 (W.D. Ky. 2003).

Table 10: States That Reported Having Regulations for Air Emissions from Animal Feeding Operations, 2008

	Hydrogen sulfide	Ammonia	Particulate matter	Volatile organic compounds
California	X	X	X	X
Idaho		X		
Minnesota	X			
Missouri	X		X	
Nebraska	X			
North Dakota	X			

Source: State officials, as reported to GAO.

Specific examples of the types of regulations that the states have developed include the following:

- Minnesota has established state emissions thresholds for hydrogen sulfide that apply to CAFOs. CAFO operators in the state must develop an air emissions control plan and must implement it if the Minnesota Pollution Control Agency detects elevated levels of hydrogen sulfide. According to state officials, once an operator reduces emissions, the agency re-monitors to ensure the emission levels remained below the state-established threshold.[32] Minnesota may take legal action against CAFO operators violating this standard. For example, in June 2008, monitoring by the Minnesota Pollution Control Agency at a dairy operation recorded hydrogen sulfide levels above the state threshold and in cooperation with the State Attorney General, the agency, using state authorities, filed a lawsuit against the dairy's operator.

- In 2003, California passed a law that authorized the state and local air districts to require animal feeding operations above a certain size to apply for clean air permits and develop a plan to decrease air emissions. For example, one air district in California—the San Joaquin Valley Air Pollution Control District with large clusters of animal feeding operations—developed a rule in 2006 to implement the law that required large animal feeding operations to apply for a permit that includes a plan for mitigating their emissions. According to air district officials, the district

[32]The standard is: 50 ppb average over 1/2 hour not to be exceeded more than two times per year; 30 ppb average over 1/2 hour not to be exceeded more than two times in any 5 consecutive days.

has implemented specific regulations for dairy animal feeding operations that require these operations to obtain five separate permits for components of their operations, including barns and land application of manure. The officials told us that these regulations were put in place, in part because the area is designated as a severe nonattainment area under the Clean Air Act and they are required to regulate a broader range of emission sources. According to state officials we spoke with, as a result of these more stringent state regulations, CAFOs in California may be relocating to other states—such as Texas and Iowa.

Two Federal Court Decisions Have Affected EPA's and Some States' Ability to Regulate Water Pollutants Discharged by CAFOs

Two federal court decisions have affected EPA and some states' abilities to regulate CAFOs for water pollutants. The 2005 *Waterkeeper Alliance Inc. v. EPA* decision forced EPA to revise its 2003 rule for permitting CAFOs and abandon its approach of requiring all CAFO operators to obtain a permit. Although this court decision affected EPA's ability to regulate CAFOs, states' reaction to the *Waterkeeper* decision has varied: some states such as Minnesota continue to require all CAFOs to obtain permits while others such as Colorado have delayed developing new rules until EPA issues its final revised rule. In addition, the Supreme Court's 2006 decision—*Rapanos v. United State*s—has made determination of Clean Water Act jurisdiction over certain types of waters more complex. According to EPA, this has required the agency to gather significantly more evidence to establish Clean Water Act jurisdiction in some enforcement cases.

The *Waterkeeper* Decision Has Impacted EPA's Ability to Regulate CAFOs, but Has Not Had a Similar Impact on Some States

In its 2005 *Waterkeeper* decision, the U.S. Court of Appeals for the Second Circuit set aside a key provision of EPA's 2003 CAFO rule requiring every CAFO to apply for a NPDES permit. Under the 2003 rule, large numbers of previously unregulated CAFOs were required to apply for permits and would have been subject to monitoring and reporting requirements imposed by the permit as well as periodic inspections. According to EPA, the 2003 rule would have expanded the number of CAFOs requiring permits from an estimated 12,500 to an estimated 15,300, an increase of about 22 percent. According to EPA officials, when fully implemented, this requirement for all CAFOs with a potential to discharge to apply for permits would have provided EPA with more comprehensive information on the number and location of CAFOs and how they are operated and managed, thus allowing EPA to more effectively locate and inspect CAFOs nationwide.

However, in 2003, both environmental and agricultural groups challenged EPA's 2003 rule. In the *Waterkeeper* case, environmental groups argued,

among other things, that EPA's 2003 rule did not adequately provide for (1) public review and comment on a CAFO's nutrient management plan and (2) permitting authorities to review the CAFO's nutrient management plan. The court agreed with the environmental groups and instructed EPA to revise the rule accordingly. The agricultural groups challenged the 2003 rule's CAFO permitting requirement, arguing that the agency exceeded its authority under the Clean Water Act by requiring CAFOs that were not discharging pollutants into federally regulated waters to apply for permits or demonstrate that they had no potential to discharge. The court also agreed with the agricultural groups and set aside the permitting requirements for CAFOs that did not actually discharge. Following the court's decision, many aspects of the 2003 rule remained in effect, including EPA's revised regulatory definition of CAFOs and the expansion of the number of CAFOs needing permits by deleting a significant exception.

In effect, the *Waterkeeper* decision returned EPA's permitting program to one in which CAFO operators are not required to apply for a NPDES permit unless they discharge, or propose discharging, into federally regulated waters. As a result, EPA must identify and prove that an operation has discharged or is discharging pollutants in order to require the operator to apply for a permit. To help identify unpermitted discharges from CAFOs, EPA officials stated that they have to rely on other methods that are not necessarily all-inclusive, such as citizens' complaints, drive-by observations, aerial flyovers, and state water quality assessments that identify water bodies impaired by pollutants associated with CAFOs. According to EPA officials, these methods have helped the agency identify some CAFOs that may be discharging as well as targeting inspections to such CAFOs.

In response to the *Waterkeeper* decision, EPA proposed a new rule in June 2006 requiring that (1) only CAFO operators that discharge, or propose to discharge, apply for a permit; (2) permitting authorities review CAFO nutrient management plans and incorporate the terms of these plans into the permits; and (3) permitting authorities provide the public with an opportunity to review and comment on the nutrient management plans. According to EPA officials, the final rule is currently being reviewed by the Office of Management and Budget before it is formally published in the *Federal Register*. These officials said it is uncertain when the OMB review will be completed and the final rule issued. Estimates vary on how this rule, when implemented, will affect the number of CAFOs that will obtain a permit. EPA estimates that 25 percent fewer CAFOs will need to apply for a permit under the new rule than would have been required to apply for a permit under the 2003 rule. In contrast, an association representing

state water program officials believes that many fewer CAFOs than EPA estimates will voluntarily apply for a permit under the new 2006 rule, when it is finalized.

The need to develop and implement a new rule that meets the *Waterkeeper* requirements has also resulted in delays in implementing the provisions of the 2003 rule that the Court upheld. Specifically, EPA has not yet implemented, among other things the expanded CAFO definitions, which cover operations such as dry-manure poultry operations. This is particularly significant since, according to a USDA official with extensive knowledge of the poultry industry and another agricultural expert that we spoke to, at least 90 percent of poultry operations use a dry-manure management system. An EPA Region 6 official told us that in Texas alone this expanded definition would result in about 1,500 additional dry-manure poultry operations being covered under the new CAFO definition.

Although the *Waterkeeper* decision has affected EPA's ability to regulate CAFOs' water pollutant discharges, this decision has not had the same impact on the ability of some of the states to regulate these operations. According to officials in the 47 states responding to our survey, the impact of the *Waterkeeper* decision on their ability to regulate water pollution from CAFOs has been mixed. As table 11 shows, the impacts of the *Waterkeeper* decision ranged from having little impact on state regulation of CAFOs to impairing state CAFO programs.

Table 11: State Officials' Views of the Impact of the *Waterkeeper* Decision on Their CAFO Programs

Impact of *Waterkeeper*	Number of states reporting impact
Waterkeeper had little or no impact	16
Reduced the number of CAFOs with permits	15
Impaired state program	10
Waiting for EPA to issue revised rule	9
Prompted state legislation to require permits for CAFOs	1

Source: GAO analysis of state official responses.

Note: Some state officials identified more than one impact.

Officials from several of the states that told us that the *Waterkeeper* decision had little impact on their regulation of CAFOs, saying that this was primarily because their states had implemented CAFO regulations that were more stringent than those required under the Clean Water Act. For example, Minnesota officials stated that the *Waterkeeper* decision had

no impact on their state's regulations because the state used its own authority to adopt regulations more stringent than EPA's regulations. Moreover, according to Minnesota officials, even after the *Waterkeeper* decision, the state has continued to require all CAFOs to obtain permits from the state environmental agency. Similarly, Kansas officials stated that the *Waterkeeper* decision had only minimal effects because the state has regulated CAFOs since the 1960s.

However, 34 states indicated that the *Waterkeeper* decision directly affected their state programs. Officials from 15 states told us that the number of CAFOs that had obtained permits since the *Waterkeeper* decision had decreased although none provided us with numbers on what this decrease had been. Similarly, officials in 10 states told us that the *Waterkeeper* decision had impaired their state's ability to regulate CAFOs because it discredited the program, created confusion or uncertainty, or made it difficult for them to determine which operations needed a permit. For example, according to the state official responsible for Indiana's CAFO permitting program, although the state has had a CAFO permitting program since 1971, it adopted EPA's 2003 CAFO Rule because the rule was more protective. However, when the *Waterkeeper* decision set aside portions of the 2003 rule, this official told us that the decision, in effect, discredited the state's regulatory program. In addition, officials from nine states who are responsible for their state's permitting program told us that their programs remain in limbo while they wait for EPA to issue its final revised rule. These state officials, including officials in Colorado, said that they will update their state rules once EPA's final rule is issued.

Finally, state water pollution control officials have expressed some concerns that EPA's new 2006 rule will place a greater administrative burden on states than the 2003 rule would have. In an August 2006 letter to EPA, the Association of State and Interstate Water Pollution Control Administrators noted that the "reactive" enforcement that EPA will now follow will require permitting authorities to significantly increase their enforcement efforts to achieve the level of environmental benefit that would have been provided by the 2003 rule. These officials believe that requiring EPA and the states to identify CAFOs that actually discharge pollutants into federally regulated water bodies will consume more resources than requiring all CAFOs to apply for a permit.

The *Rapanos* Decision Has Affected EPA's Overall Ability to Regulate Pollutants Entering Federally Regulated Waters

The Supreme Court's 2006 *Rapanos* decision has also affected EPA's enforcement of the Clean Water Act because the agency believes that it must gather significantly more evidence to establish which waters are subject to the act's permitting requirements. At issue in the *Rapanos* decision was whether the Clean Water Act's wetlands permitting program applied to four specific wetlands that were adjacent to non-navigable tributaries of traditional navigable waters. The Court rejected the standards applied by the lower courts in determining whether wetlands at issue fell under the act's jurisdiction and, therefore, could be subject to permitting requirements. Although a majority of the justices rejected the standards applied by the lower courts, a majority could not agree on how to determine which waters would fall under the act's jurisdiction, and thus how far EPA could reach to regulate discharges of pollutants under the act.

Although the *Rapanos* case arose in the context of a different permit program, the scope of EPA's pollutant discharge permit program originates in the same Clean Water Act definition that was discussed in the decision. According to EPA enforcement officials, the agency may now be less likely to seek enforcement against a CAFO that it believes is discharging pollutants into a water body because it may be more difficult to prove that the water body is federally regulated. According to EPA officials, as a result of the *Rapanos* decision, the agency must now spend more resources developing an enforcement case because the agency must gather proof that the CAFO not only has illegally discharged pollutants, but that those discharges ultimately entered a federally regulated water body. These officials told us that the farther a CAFO is from a regulated water body, the more evidence they will need to prove that the discharges entered that water body. To ensure "nationwide consistency, reliability, and predictability in their administration of the statute," EPA has issued national guidance to clarify the agency's responsibilities in light of the Supreme Court's decision. However, in a March 4, 2008, memorandum, EPA's Assistant Administrator for Enforcement and Compliance Assurance stated that the *Rapanos* decision and EPA's guidance has resulted in significant adverse impacts to the clean water enforcement program. According to the memorandum, the *Rapanos* decision and guidance negatively affected approximately 500 enforcement cases, including as many as 187 cases involving NPDES permits. In May 2007, Members of Congress, in both the House and Senate, introduced a bill entitled the Clean Water Restoration Act of 2007 to clearly define the scope of the Clean Water Act. As of August 2008, neither bill had been reported out of committee.

Conclusions

For more than 30 years, EPA has regulated CAFOs under the Clean Water Act and during this time it has amassed a significant body of knowledge about the pollutants discharged by animal feeding operations and the potential impacts of these pollutants on human health and the environment. Despite its long-term regulation of CAFOs, EPA still lacks comprehensive and reliable data on the number, location, and size of the operations that have been issued permits and the amounts of discharges they release. As a result, EPA has neither the information it needs to assess the extent to which CAFOs may be contributing to water pollution, nor the information it needs to ensure compliance with the Clean Water Act. More recently, EPA has also begun to address concerns about air pollutants that are emitted by animal feeding operations. The Nationwide Air Emissions Monitoring Study, along with EPA's plans to develop air emissions estimating protocols, are important steps in providing much needed information on the amount of air pollutants emitted from animal feeding operations. However, questions about the sufficiency of the sites selected for the air emissions study and the quantity and quality of the data being collected could undermine EPA's efforts to develop air emissions protocols by 2011 as planned. Finally, while the study and resulting protocols are important first steps, a process-based model that more accurately predicts the total air emissions from an animal feeding operation is still needed. While EPA has indicated it intends to develop such a model, it has not yet established a strategy and timeline for this activity.

Recommendations for Executive Action

In order to more effectively monitor and regulate CAFOs, we recommend that the Administrator of the Environmental Protection Agency should complete the agency's effort to develop a national inventory of permitted CAFOs and incorporate appropriate internal controls to ensure the quality of the data.

In order to more effectively determine the extent of air emissions from animal feeding operations, the Administrator of the Environmental Protection Agency should

- reassess the current data collection efforts, including its internal controls, to ensure that the National Air Emissions Monitoring Study will provide the scientific and statistically valid data that EPA needs for developing its air emissions protocols;
- provide stakeholders with information on the additional data that it plans to use to supplement the National Air Emissions Monitoring Study; and

- establish a strategy and timetable for developing a process-based model that will provide more sophisticated air emissions estimating methodologies for animal feeding operations.

Agency Comments and Our Evaluation

We provided a draft of this report for review and comment to the EPA and the Secretary of USDA. We received written comments from EPA. USDA did not provide written comments, but did provide technical comments and clarifications, which we incorporated, as appropriate.

EPA partially concurred with our conclusions and recommendations. In its written comments, EPA acknowledged that currently no national inventory of permitted CAFOs exists. The agency stated that it is currently working with its regions and the states to develop and implement a new national data system to collect and record facility-specific information on permitted CAFOs. We have revised our recommendation to reflect the actions that EPA has underway. In response to our recommendations that EPA reassess the current data collection effort, EPA stated that the agency has developed a quality assurance plan for the study and is continuously evaluating the National Air Emissions Monitoring Study. We are aware that EPA has developed a quality assurance plan for the data collected during the study. However, our recommendation also reflects other concerns with the study. For example, the monitoring sites selected may not represent a statistically valid sample or animal feeding operations that account for the differences in climatic conditions, manure-handling methods, and density of operations; and the study does not address other sources that can contribute significantly to emissions from animal feeding operations. EPA did not address these issues in its comments. Therefore, we continue to believe that EPA should reassess the ongoing effort to ensure that the study, as currently structured, will provide the data that EPA needs.

In response to our recommendation that the agency identify the information that it plans to use to supplement the National Air Emissions Monitoring Study, EPA stated that it cannot yet identify the data that it will use to augment the data collected during the monitoring study. However, the agency indicated that it has begun discussions with USDA to identify ongoing research that is focused on agricultural air emissions and gaps that may still exist, but did not provide any additional information on when it plans to identify the supplemental data that it plans to use to augment the monitoring study. Until it does so, neither EPA nor stakeholders can be assured that these data, in combination with the emissions study data, will enable EPA to develop the planned protocols. The agency also agreed with our recommendation to establish a strategy

and timetable for developing a process-based model and said that it has begun to evaluate what is needed to develop such a model. However, the agency did not provide any information on when it expects to complete plans for developing a process-based model. EPA also provided technical comments, which we have incorporated, as appropriate. EPA's written comments are provided in appendix V.

As agreed with your offices, unless you publicly announce the contents of this report earlier, we plan no further distribution until 30 days from the report date. At that time, we will send copies to interested congressional committees, the Administrator of the Environmental Protection Agency, the Secretary of the United States Department of Agriculture and other interested parties. We also will make copies available to others upon request. In addition, the report will be available at no charge on GAO's Web site at http://www.gao.gov.

If you or your staff have any questions regarding this report, please contact me at (202) 512-3841 or mittala@gao.gov. Contact points for our Office of Congressional Relations and Public Affairs may be found on the last page of this report. Key contributors to this report are listed in appendix VI.

Anu Mittal
Director, Natural Resources
and Environment

List of Requesters

The Honorable John D. Dingell
Chairman
Committee on Energy and Commerce
House of Representatives

The Honorable James L. Oberstar
Chairman
Committee on Transportation and Infrastructure
House of Representatives

The Honorable Gene Green
Chairman
Subcommittee on Environment and Hazardous Materials
Committee on Energy and Commerce
House of Representatives

The Honorable Eddie Bernice Johnson
Chairwoman
Subcommittee on Water Resources and Environment
Committee on Transportation and Infrastructure
House of Representatives

The Honorable Hilda L. Solis
House of Representatives

Appendix I: Objectives, Scope, and Methodology

For this report we were asked to determine the (1) trends in concentrated animal feeding operations (CAFOs) over the past 30 years; (2) amount of waste they generate; (3) findings of recent key academic, industry, and government research of the potential impacts of CAFOs on human health and the environment, and the extent to which the Environmental Protection Agency (EPA) has assessed the nature and severity of these identified impacts; (4) progress that EPA and states have made in regulating and controlling the air emissions of, and in developing protocols to measure, air pollutants from CAFOs that could affect air quality; and (5) extent to which recent court decisions have affected EPA and the states' ability to regulate CAFO discharges that impair water quality.

In conducting our work, we reviewed laws and regulations and federal and state agencies' documents. We met with officials from EPA, the U.S. Department of Agriculture (USDA), the National Pork Producers Council, the National Pork Board, the National Cattlemen's Beef Association, the Environmental Integrity Project (a nonpartisan, nonprofit environmental advocacy group), the Sierra Club, California Association of Irritated Residents, Waterkeeper Alliance, Iowa Citizens for Community Improvement, Environmental Defense, National Association of Clean Air Agencies, Association of State and Interstate Water Pollution Control Administrators, as well as state officials. The National Chicken Council did not respond to our requests for information. Additionally, we visited CAFOs in eight states: Arkansas, California, Colorado, Iowa, Maryland, Minnesota, North Carolina, and Texas. We chose these states because they were geographically dispersed and contained numerous CAFOs representing multiple types of animals.

For our analysis of trends in CAFOs over the past 30 years, we used USDA's Census of Agriculture data. We assessed the reliability of these data by reviewing USDA's documentation on the development, administration, and data quality program for the Census of Agriculture. We also electronically tested the data used in this study to determine if there were any missing data or anomalies in the dataset. Furthermore, we compared the results of our nationwide results for each year by animal sector to USDA's published reports. On the basis of these assessments, we determined the data to be sufficiently reliable for the purposes for which it was used in this report. In addition, respecting USDA's requirement to protect the privacy of individual farmers responding to the Census of Agriculture surveys, we conducted these analyses at USDA and worked

with USDA to review our results and verify that no single operation could be identified from our analysis.[1]

From USDA's Census of Agriculture data, we analyzed the most recent data available for large farms raising animals from 1974 through 2002.[2] We used these data on large farms as a proxy for CAFOs because no federal agency collects consistent data on these types of operations. USDA has periodically collected data on farms nationwide using the Census of Agriculture survey. Prior to 1982, these surveys were conducted every four years; whereas since 1982, the agency has administered the survey every five years (the most recent survey results, conducted in 2007, will not be available until February 2009). In analyzing Census data prior to 1982, we found that the categories reported by USDA were not consistent with EPA's minimum size threshold for large CAFOs: 2,500 hogs, 700 dairy or milk cows, 55,000 turkeys, 1,000 beef cattle, 82,000 layers, and 125,000 broilers.[3] For instance, the largest farm categories USDA reported for broilers prior to 1982 was farms with sales of 100,000 and more. Since sales data must be converted to an inventory number, we had to make adjustments for production cycles to determine the number of animals on a farm per day.[4] Broiler farms complete six production cycles per year therefore, when we divided the USDA provided number of 100,000 in broiler sales by 6 to account for the total number of possible production cycles, the USDA reported broiler sales represent a farm with an inventory of about 17,000 broilers. Farms of this size are much smaller than the

[1]In order to adjust the data for survey undercoverage and nonresponse, we used the official USDA statistical weights. However, we were unable to calculate the confidence intervals around the reported estimates because the Census of Agriculture's documentation does not provide the necessary information to determine the statistical error associated with subpopulation estimates.

[2]We included a farm, for the purposes of calculating the number of farms overall and for each animal type, only when it reported, on the Census of Agriculture survey, either sales or inventory numbers for a particular animal type.

[3]By minimum size threshold, we mean the minimum number of animals required for classification as a large CAFO without consideration of other factors, such as whether the animal feeding operation is a significant contributor of pollutants to federally regulated waters, or whether pollutants are discharged into federally regulated waters from the operation through a manmade ditch.

[4]A production cycle is the length of time an animal is fed before being sold plus time between "crops." For example, the feeding period for a broiler is about 48 days. Including time for cleaning barns between cycles, restocking, etc., a broiler farm has about 6 production cycles per year. We used the number of cycles per animal type provided in "Manure Nutrients Relative to the Capacity of Cropland and Pastureland to Assimilate Nutrients," USDA, December 2000.

125,000 broiler CAFO threshold defined by EPA. Similarly, categories for farms raising other types of animals, in the pre-1982 USDA data, were also different than the EPA CAFO definitions for these types of operations. As a result, we used the time frame of 1982 through 2002 because USDA could provide us with detailed electronic data that allowed us to apply EPA's CAFO thresholds to determine the trends in the overall number of large farms that raised animals and could be potentially considered a CAFO. For broilers and layers/pullets,[5] we used EPA's CAFO minimum size threshold for dry-litter manure handling systems because these systems represent the majority of poultry operations. These thresholds are larger than for those poultry operations that have liquid manure handling systems.

Because USDA does not report the average number of animals on a farm, we used USDA Census of Agriculture inventory, sales, and inventory plus sales data for this purpose. The choice of using inventory only, sales only, or inventory and sales data for a particular animal type depended on the wording of Census survey questions during the years we analyzed. When only sales data or inventory plus sales data were used, we adjusted these data using the appropriate USDA formulas to determine the average number of animals on a farm.[6] When both inventory and sales were used for an animal type, we applied an approved USDA approach to determine the average number of animals on a farm. As a result, we made the following adjustments for each animal type:

- For beef cattle, USDA only collected sales data for 1982 through 1997. As a result, for beef cattle, we used sales of cattle on feed (2002 survey) or sales of fattened cattle (1982 through 1997 surveys) adjusted for the number of production cycles. This increased the likelihood that we were including cattle raised on CAFOs instead of operations that allow the cattle to graze on pastureland.

- For dairy cows, we used the inventory of animals as of December 31 for each Census year since these animals are maintained to produce milk and not specifically for slaughter. For dairy cows, we included the categories: lactating and nonlactating cows.

[5]A pullet is a replacement hen for laying eggs that is less than 1 year of age.

[6]"Manure Nutrients Relative to the Capacity of Cropland and Pastureland to Assimilate Nutrients," USDA, December 2000.

- For hogs, the Census of Agriculture reported both inventory and sales data for hogs and pigs.[7] These data were not reported by either the weight or age, so we used the total for all hogs and pigs of all ages. We used both the inventory and sales data for hogs and adjusted for the number of production or finish cycles. Hogs may be sold more than once because of the practice of selling feeder pigs at about 10-12 weeks of age to producers to be grown to typical slaughter size. For example, in 1997, about 25 percent of all hog and pig sales reported on the Census of Agriculture were feeder pigs.[8] We adjusted the hog data to factor out these multiple sales.

- For layers, we used survey responses of inventory as of December 31 for layers 20 weeks old and older plus pullets for laying flock replacement.

- For broilers, we used inventory and sales data from the categories: broilers, fryers, capons, roaster and other chickens raised for meat.

- For turkeys, both inventory and sales data were used and included both hens and tom turkeys.

We also reviewed EPA's data on the number of CAFOs that had been issued permits—these data are either collected by EPA's regional offices or from the states—for the period 2003 to 2008. We assessed the accuracy and reliability of these data by interviewing officials in 47 states and we asked them to verify the information that EPA had for the numbers of CAFOs permitted in their state.[9] Based on the information we obtained from the state officials, we determined that EPA's data for permitted CAFOs was not reliable and could not be used to identify trends in permitted CAFOs over the 5-year period.

To identify the amount of manure, including urine, a large CAFO is estimated to generate for each animal type, we used EPA's thresholds for the minimum number of animals that constitute a CAFO. To illustrate the size of a "typical" large farm for each animal type, we used the median for

[7]The term "hogs" includes all production stages unless otherwise stated.

[8]1997 was the last Census of Agriculture survey that asked for sales of feeder pigs. The 2002 survey asked for hogs "sold or moved from this operation, including feeder pigs." In many hog contract operations, the farmer does not own the pigs being fed. GAO did not determine what effect changing the survey wording had on the change in total hogs sold between 1997 and 2002 nor whether the sales of feeder pigs as a percentage of total swine sales changed from 1997 to 2002.

[9]The three states that did not provide information on their state CAFO programs were Connecticut, Nevada, and Vermont.

a large-sized farm. We used the median instead of the mean because we believe it provides a more representative measure for a typical large farm. We also present information on farms at the 75th percentile of all large farms for a particular animal type to represent larger farms.[10]

To estimate the amount of manure produced by each type of animal, we used engineering standards for manure production cited by the American Society of Agricultural and Biological Engineers (ASABE).[11] These standards report the total amount of manure over the production cycle for hogs, beef cattle, turkeys, and broilers. In order to estimate the average pounds of manure per day, we divided the total manure produced over the production cycle by the number of days in the production cycle. Further, we converted the pounds of manure into tons of manure per farm per year. We adjusted the manure calculations for the following animal types:

- For layers, the standards provided the average daily pounds of manure produced by layers. We multiplied the average pounds of manure per day times the average number of animals times 365 days to get manure produced per year.
- For broilers, we determined the average daily pound of manure from the information provided in the standards. We multiplied the average pound of manure per day times the average number of animals times 365 days to get manure per year.
- For dairy cows, the standards provided the average daily pounds of manure produced by dairy cows. We multiplied the average pounds of manure per day times the average number of animals times 365 days to get manure per year. However, we adjusted the data to take into account the typical percentage of cows that are either lactating or dry (nonlactating) and applied the different amounts of manure produced by each type of dairy cow.
- For turkeys, we adjusted the turkey statistics based on the ratio of hens to tom turkeys raised on farms and applied different amounts of manure due to the different sizes of the animals.

[10]We do not report the largest farm for each particular animal type to avoid disclosing information that would allow the identification of the person who supplied the particular information to USDA. Federal law prohibits such disclosure.

[11]"Manure Production and Characteristics" (St. Joseph, Mich.: March 2005). Manure is "as-excreted" and excludes bedding, waste feed, dilution water, biochemical degradation of solids, or dissipation of gases.

- For hogs, the manure standards report manure produced by hogs covering a specific stage of production: feeder-pig-to-finish pigs—beginning with a pig weighing on average about 27 pounds and resulting in a hog weighing 154 pounds. Estimates for other hog operation types such as nursery, farrow to feeder, and farrow to finish would therefore differ. Census of Agriculture data for 2002 indicate that about a third of all hogs sold were from the grow-to-finish (called finish only on the survey) operation type. The ASABE manure standards for this type of operation use 154 pounds as the finish weight. However, USDA reports that typical hog finish (slaughter) weights at the time of the 2002 Census were about 260 pounds. For hogs only, we adjusted the ASABE manure estimates by 1.7 to account for the larger finish weights reported by USDA. We believe this is a conservative adjustment because manure produced by hogs weighing 154 to 260 pounds will be the maximum amount per day that ASABE used to calculate the average pounds produced for the hogs growing from about 27 pounds to 154 pounds.

- For beef cattle, we used the manure standard for "beef-finishing cattle." This standard is for cattle fattened from about 740 pounds to about 1,200 pounds at marketing. Beef cattle (listed as cattle on feed) data from the Census are for cattle sold for slaughter and thus similar in weight to those for the standard. The reported manure results for beef cattle are for operations of this type only.

  In addition, the number of days on feed for hogs, turkeys, and broilers used for the ASABE manure standards does not take into account time between herds or flocks entering and leaving an operation; therefore, we adjusted the manure generated to account for the time between cycles.

  We recognize that all amounts of manure reported are estimates because amounts of manure per animal type vary by feeding programs, feeds used, climatic conditions, production techniques, and animal genetics, among other things. As feeds, animal genetics, and production techniques change in the future, these estimates might change—and may have changed since 2002—but USDA did not provide specific information on what changes have occurred and how those changes may have impacted the manure production on farms. We did not estimate the ability of the farm or surrounding farms to assimilate the manure if applied to pastures and crop land nor did we take into account various technologies to process and/or convert manure. Reported estimates of manure are for amounts produced. We did not determine whether these amounts were discharged into the air or streams and wetlands. Manure harvested from CAFOs for application to land might be less than that excreted by animals because of shrinkage due to evaporation.

To provide a perspective of the amount of wastes generated by these large farms, we compared them with the amount of human sanitary waste generated in various cities. We selected certain cities on the basis of their population, as reported by the U.S. Census Bureau's Population Estimates for 2002, and calculated the amount of sanitary waste generated by the human population of those cities by applying estimates for human sanitary waste production. Human sanitary waste includes feces and urine but does not include wastes such as water from showers, washing dishes and clothes, and flushing toilets. We found two sources of information for average daily human sanitary waste.[12] Because these sources provided different estimates (2.68 and 4.76 pounds per person per day), we averaged the two amounts to use in our calculations of human sanitary waste produced for cities (3.72 pounds per person per day). All amounts of human sanitary waste reported are estimates because amounts will vary based on differences in age, dietary habits, activity levels, and climatic conditions, among other things. Human sanitary waste is a small portion of human discharge into sewage systems. Our reported estimates of human sanitary waste for a city are illustrative only and are not intended to be estimates of actual human sanitary waste entering a particular city's waste treatment system. These estimates are for a population the size of selected cities assuming that the residents do not commute outside the city boundaries and that nonresidents do not enter the city for work or other reasons.

To identify the findings of recent key academic, industry, and government research on the potential impacts of CAFOs on human health and the environment, and the extent to which EPA has assessed the nature and severity of such impacts, we reviewed EPA's 2003 CAFO rule (for water impact studies) and the findings and supporting documents of the National Academy of Sciences study on air emissions from animal feeding operations (for air impact studies).[13] In addition, we

- conducted library, online journal and Internet searches to identify recent studies;

[12]Metcalf and Eddy, Inc., "Wastewater Engineering: Treatment, Disposal, and Reuse," 3rd Edition, (New York, N.Y..: 1991) and Parker, D. and Gallagher, S. K., "Distribution of Human Waste Samples in Relation to Sizing Waste Processing in Space," in "Second Conference on Lunar Bases and Space Activities of the 21st Century," Volume 2 (NASA Conferences Publication 3166: 1992).

[13]National Academy of Sciences, *Air Emissions from Animal Feeding Operations: Current Knowledge, Future Needs* (Washington, D.C.: National Academies Press, 2003).

- consulted with EPA, USDA, state agencies, industry groups, environmental groups, and academia to help identify additional studies; and
- identified studies through citations in previously identified studies.

We only included in our review studies that (1) were peer-reviewed or produced by a federal agency, (2) were new and original research completed since 2002, (3) had a clearly defined methodology, and (4) identified pollutants found in animal waste and/or their impacts. Through this effort, we found over 200 studies and identified 68 studies that examined air and water quality issues associated with animal waste and met our criteria. We also classified these studies according to whether they

- found a direct link between pollutants from animal waste and impacts on human health or the environment;
- did not find any impacts on human health or the environment from pollutants from animal waste;
- found an indirect link between animal waste and human health or environmental impacts; or
- measured pollutants from animal waste otherwise known to cause human health or environmental impacts.

The classification for each study involved two reviewers. If the reviewers disagreed on the classification, they turned to a third reviewer for resolution. Finally, we compared the findings from these studies with EPA assessments to date and interviewed EPA officials regarding these assessments.

To determine the progress that EPA and states have made in regulating and controlling the air emissions of, and in developing protocols to measure, air pollutants from CAFOs, we reviewed relevant documents, interviewed officials responsible for the ongoing air monitoring study and visited several National Air Emissions Monitoring Study sites in North Carolina. Additionally, we interviewed industry and environmental groups, the umbrella association for state and local clean air agencies, and citizen groups about how EPA air emissions protocols affect them. Finally, we contacted state CAFO officials in all 50 states to determine which states had developed air emission regulations applicable to CAFOs. Officials in

47 states responded.[14] These 47 states account for an estimated 99 percent of large animal feeding operations that could be defined as CAFOs under EPA's 2003 rule.

Finally, to determine the extent to which recent court decisions have affected EPA and the states' ability to regulate CAFO discharges that impair water quality, we examined recent federal decisions, including the *Waterkeeper Alliance Inc. v. EPA* (*Waterkeeper*), and the Supreme Court's 2006 decision in *Rapanos v. United State*s. We interviewed EPA officials about how these court decisions have affected their regulations. To better understand the bases for the lawsuits and what has occurred since the court decisions, we contacted plaintiffs and defendants involved in *Waterkeeper* and other court cases, including industry and environmental groups. To identify the impact of these cases on states regulations, we contacted state CAFO officials in all 50 states to determine how the *Waterkeeper* decision affected their regulations. We asked the states if the *Waterkeeper* decision had affected their state's CAFO program. Using the responses we received from 47 states, we conducted content analyses and classified them into six categories, including if the decision (1) had little impact on the state program, (2) caused the state to wait for EPA guidance (3) impaired the state program, (4) proactively changed legislation, (5) reduced the number of CAFOs with permits, or (6) other. Some officials identified more than one impact. The responses in the "other" category included such responses as "not applicable," "because the state does not have delegated authority," and "we have spent a large amount of time studying the ruling and commenting on EPA proposed rules that were developed to satisfy the ruling."

We conducted this performance audit between July 2007 and August 2008, in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

[14]The three states that did not provide information on their CAFO programs were Connecticut, Nevada, and Vermont.

Appendix II: EPA's Definition of Concentrated Animal Feeding Operations

EPA's National Pollutant Discharge Elimination System (NPDES) permit program regulates the discharge of pollutants from point sources to waters of the United States. The Clean Water Act defines point sources to include CAFOs. To be considered a CAFO, a facility must first be defined as an animal feeding operation, which is a lot or facility (other than an aquatic animal production facility) where the following conditions are met:

- Animals have been, are, or will be stabled or confined and fed or maintained for a total of 45 days or more in any 12-month period.
- Crops, vegetation, forage growth, or post-harvest residues are not sustained in the normal growing season over any portion of the lot or facility.

Generally CAFOs must meet the above definition of an animal feeding operation and stable or confine a certain minimum number of animals at the operation. EPA classifies CAFOs as large, medium, or small, based on size. Table 12 shows the number of animals at a farm that meet EPA's definition of a large, medium, and small CAFO.

Table 12: EPA Designation of Large, Medium, and Small CAFOs for Various Size Thresholds by Animal Type

	Size thresholds (number of animals)		
Animal type	**Large CAFOs**	**Medium CAFOs[a]**	**Small CAFOs[b]**
Cattle or cow/calf pairs	1,000 or more	300 - 999	less than 300
Mature dairy cows	700 or more	200 - 699	less than 200
Veal calves	1,000 or more	300 - 999	less than 300
Swine (weighing over 55 pounds)	2,500 or more	750 - 2,499	less than 750
Swine (weighing less than 55 pounds)	10,000 or more	3,000 - 9,999	less than 3,000
Horses	500 or more	150 - 499	less than 150
Sheep or lambs	10,000 or more	3,000 - 9,999	less than 3,000
Turkeys	55,000 or more	16,500 - 54,999	less than 16,500
Laying hens or broilers (liquid manure handling systems)	30,000 or more	9,000 - 29,999	less than 9,000
Chickens other than laying hens (other than a liquid manure handling system)	125,000 or more	37,500 - 124,999	less than 37,500
Laying hens (other than a liquid manure handling system)	82,000 or more	25,000 - 81,999	less than 25,000
Ducks (other than a liquid manure handling system)	30,000 or more	10,000 - 29,999	less than 10,000
Ducks (liquid manure handling systems)	5,000 or more	1,500 - 4,999	less than 1,500

Source: EPA.

[a]Must also meet one of two "method of discharge" criteria to be defined as a CAFO or may be designated.

[b]May be designated as a CAFO on a case-by-case basis.

In addition to size, EPA uses the following criteria to determine if a CAFO operator needs to apply for a NPDES permit.

- A large CAFO confines at least the number of animals described in table 12.
- A medium CAFO falls within the size range in table 12 and either:
  - discharged pollutants into federally regulated waters through a manmade ditch, flushing system, or similar manmade device;
  - discharged pollutants directly into federally regulated waters that originate outside of and pass over, across, or through the facility or otherwise come into contact with animals confined in the operation; or
  - is designated as a CAFO by the permitting authority as a significant contributor of pollutants.
- A small CAFO confines the number of animals described in table 12 and has been designated as a CAFO by the permitting authority as a significant contributor of pollutants.

Appendix III: Nationwide Trends in the Number of All Animal Farms and the Number of Animals Raised on Large Farms, 1982-2002

This appendix provides our analysis of USDA's data for trends on the number of all animal farms and the number of animals raised on large farms per day for all animal types for the period from 1982 through 2002.

Table 13: Nationwide Trends in the Number of All Farms That Raise Animals for All Animal Types, 1982 through 2002

Type of animal farm	1982	1987	1992	1997	2002	Percentage change, 1982-2002
Beef cattle[a]	215,465	173,961	133,795	99,654	98,061	(54)
Dairy cow	277,762	202,068	155,339	116,874	91,989	(67)
Hog[b]	347,699	256,595	202,811	114,289	89,542	(74)
Layer	218,114	146,056	89,507	74,073	104,974	(52)
Broiler	52,890	41,097	31,427	30,979	41,572	(21)
Turkey	24,701	19,195	13,767	12,129	16,999	(31)
Total of all animal farms[c]	**1,136,631**	**838,972**	**626,646**	**447,998**	**443,137**	**(61)**

Source: GAO analysis of USDA data.

Notes: The phrase "all animal types" refers to the following animals: beef cattle, dairy cows, hogs, layers, broilers, and turkeys.

The criteria for a large farm varied by animal type, consistent with EPA's CAFO thresholds, and represent the average number of animals on a farm per day.

[a]Beef cattle includes only cattle on feed, not grazing on pasture, and sold weighing 500 pounds or more.

[b]Hogs include swine of all sizes from birth to market size.

[c]The number of large farms for all animal types is the total of large farms for each animal type and may include some farms multiple times if they were considered large for more than one animal type.

Table 14: Nationwide Trends in the Number of Animals Raised on Large Farms per Day for All Animal Types, 1982 through 2002

Type of animal farm	1982	1987	1992	1997	2002	Percentage change, 1982-2002
Beef cattle[a]	6,601,928	7,368,109	7,533,708	8,598,508	8,677,892	31
Dairy cow	632,583	860,878	1,300,616	2,049,814	3,183,086	403
Hog[b]	4,176,477	6,275,200	12,133,231	32,412,839	47,789,951	1,044
Layer	160,005,126	212,871,326	229,959,901	263,660,262	304,500,225	90
Broiler	52,140,827	102,198,894	170,873,560	298,222,567	457,461,691	777
Turkey	33,443,754	52,905,796	62,042,552	73,029,156	68,417,853	105
Total of all animal types[c]	**257,000,695**	**382,480,203**	**483,843,568**	**677,973,146**	**890,030,698**	**246**

Source: GAO analysis of USDA data.

Appendix III: Nationwide Trends in the Number of All Animal Farms and the Number of Animals Raised on Large Farms, 1982-2002

Notes: The phrase “all animal types” refers to the following animals: beef cattle, dairy cows, hogs, layers, broilers, and turkeys.

The criteria for a large farm varied by animal type, consistent with EPA’s CAFO thresholds, and represent the number of animals on a farm per production day.

[a]Beef cattle include only cattle on feed, not grazing on pasture, and sold weighing 500 pounds or more.

[b]Hogs include swine of all sizes from birth to market size.

[c]The number of large farms for all animal types is the total of large farms for each animal type and may include some farms multiple times if they were considered large for more than one animal type.

Appendix IV: Government-Sponsored or Peer-Reviewed Studies Completed Since 2002 on the Impacts of Pollutants from Animal Waste

Study	Sponsor[a]	Medium	Pollutant(s)	Impact
Studies showing a direct impact				
Ankley, Gerald T., Kathleen M. Jensen, Elizabeth A. Makynen, Michael D. Kahl, Joseph J. Korte, Michael W. Hornung, Tala R. Henry, Jeffrey S. Denny, Richard L. Leino, Vickie S. Wilson, et al. "Effects of the Androgenic Growth Promoter 17β-trenbolone on Fecundity and Reproductive Endocrinology of the Fathead Minnow." Environmental Toxicology and Chemistry. Vol. 22, no. 6 (2003):1,350–1,360.	EPA, University of Minnesota	Water	Hormones	Fertility of fish was significantly reduced by hormones and female fish developed male sex characteristics.
Clark, Clifford G., Lawrence Price, Rafiq Ahmed, David L. Woodward, Pasquale L. Melito, Frank G. Rodgers, Frances Jamieson, Bruce Ciebin, Aimin Li, and Andrea Ellis. "Characterization of Waterborne Outbreak–Associated Campylobacter jejuni, Walkerton, Ontario." Emerging Infectious Diseases. Vol. 9, no. 10 (2003):1,232-1,241.	Health Canada, Ontario Ministry of Health	Water	Bacteria	Cattle manure from a nearby farm entered the groundwater system and caused gastrointestinal illness and death in residents.
Diesel, Elizabeth A., Melissa L. Wilson, Ryan Mathur, Evan Teeters, David Lehmann, and Caitlan Ziatos. "Nutrient Loading Patterns on an Agriculturally Impacted Stream System in Huntingdon County Pennsylvania Over Three Summers." Northeastern Geology & Environmental Sciences. Vol. 29, no. 1 (2007):25-33.	Juniata College	Water	Nutrients	Excess nutrients from CAFO manure contributed significantly to impaired water quality and resulted in the inability to sustain fish populations.
Hill, Dagne D., William E. Owens, and Paul B. Tchounwou. "Impact of Animal Application on Runoff Water Quality in Field Experimental Plots." International Journal of Environmental Research and Public Health. Vol. 2, no. 2 (2005):314–321.	Jackson State University, NIH-Center for Environmental Health, Louisiana State University	Water	Nutrients, bacteria	Nutrients from manure spread on fields contributed to water pollution.
Jensen, Kathleen M., Elizabeth A. Makynen, Michael D. Kahl, and Gerald T. Ankley. "Effects of the Feedlot Contaminant 17α-Trenbolone on Reproductive Endocrinology of the Fathead Minnow." Environmental Science & Technology. Vol. 40, no. 9 (2006): 3,112-3,117.	EPA	Water	Hormones	Fertility of fish was significantly reduced by hormones and female fish developed male sex characteristics.

Appendix IV: Government-Sponsored or Peer-Reviewed Studies Completed Since 2002 on the Impacts of Pollutants from Animal Waste

Study	Sponsor[a]	Medium	Pollutant(s)	Impact
Orlando, Edward F., Alan S. Kolok, Gerry A. Binzcik, Jennifer L. Gates, Megan K. Horton, Christy S. Lambright, L. Earl Gray, Jr., Ana M. Soto, and Louis J. Guillette, Jr. "Endocrine-Disrupting Effects of Cattle Feedlot Effluent on an Aquatic Sentinel Species, the Fathead Minnow." Environmental Health Perspectives. Vol. 112, no. 3 (2004):353–358.	University of Florida; St. Mary's College of Maryland, University of Nebraska, EPA, Tufts University.	Water	Hormones	Male fish were demasculinized and there was defeminization of female fish.
Weldon, Mark B. and Keri C. Hornbuckle. "Concentrated Animal Feeding Operations, Row Crops, and Their Relationship to Nitrate in Eastern Iowa Rivers." Environmental Science & Technology. Vol. 40, no. 10 (2006): 3,168-3,173.	University of Iowa	Water	Nitrogen	High concentrations of nutrients in waters are a result of CAFO manure and degrade water quality.
Mathisen, T., S. G. Von Essen, T. A. Wyatt, and D. J. Romberger. "Hog Barn Dust Extract Augments Lymphocyte Adhesion to Human Airway Epithelial Cells." Journal of Applied Physiology. Vol. 96, no. 5 (2004):1,738–1,744.	Department of Veterans Affairs Medical Center, University of Nebraska Medical Center	Air	Dust	Dust from hog confinement facilities induces airway inflammation.
Romberger, D. J., V. Bodlak, S. G. Von Essen, T. Mathisen, and T. A. Wyatt. "Hog Barn Dust Extract Stimulates IL-8 And IL-6 Release in Human Bronchial Epithelial Cells Via PKC Activation." Journal of Applied Physiology. Vol. 93, no. 1 (2002):289–296.	Department of Veterans Affairs Medical Center, University of Nebraska Medical Center	Air	Dust	Dust from hog confinement facilities induces airway inflammation.
Schiffman, Susan S., Clare Studwell, Lawrence R. Landerman, Katherine Berman, and John S. Sundy. "Symptomatic Effects of Exposure to Diluted Air Sampled from a Swine Confinement Atmosphere on Healthy Human Subjects." Environmental Health Perspectives. Vol. 113, no. 5 (2005):567-576.	Duke University	Air	Hydrogen sulfide, ammonia, total suspended particulates, endotoxin, odor, dust	Short-term exposure to emissions expected downwind from a swine confinement facility can induce headaches, eye irritation, and nausea.
Sigurdarson, Sigurdur T., Patrick T. O'Shaughnessy, Janet A. Watt, and Joel N. Kline. "Experimental Human Exposure Inhaled Grain Dust and Ammonia: Towards a Model of Concentrated Animal Feeding Operations." American Journal of Industrial Medicine.Vol. 46, issue 5 (2004):345:348.	University of Iowa	Air	Dust, ammonia	Exposure to endotoxin-rich dust from CAFOs causes airflow obstruction in subjects with mild asthma.
Sundblad, B-M., B-M. Larsson, L. Palmberg, and K. Larsson. "Exhaled Nitric Oxide and Bronchial Responsiveness in Healthy Subjects Exposed to Organic Dust." European Respiratory Journal. Vol. 20, no. 2 (2002): 426–431.	National Institute of Environmental Medicine, Sweden	Air	Dust	Airway inflammation is induced by exposure to a farming environment.

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Study	Sponsor[a]	Medium	Pollutant(s)	Impact
Wickens, K., et. Al. "Farm Residence and Exposures and the Risk of Allergic Diseases in New Zealand Children." Allergy. Vol. 57, no. 12 (2002): 1,171-1,179.	University of Otago (New Zealand) Utrecht University (The Netherlands)	Air	Dust	There was a greater prevalence of allergic disease for children on farms.
Wilson, Vickie S., Christy Lambright, Joe Ostby, and L.E. Gray, Jr. "In Vitro and in Vivo Effects of 17β-Trenbolone: A Feedlot Effluent Contaminant." Toxicological Sciences. Vol. 70, no. 2 (2002): 202-211.	EPA	Water	Hormones	Hormones found in feedlot effluent caused reproductive malformations in laboratory rats and human cells.
Wyatt, Todd A., Rebecca E. Slager, Jane DeVasure, Brent W. Auvermann, Michael L. Mulhern, Susanna Von Essen, Tracy Mathisen, Anthony A. Floreani, and Debra J. Romberger. "Feedlot Dust Stimulation of Interleukin-6 And 8 Requires Protein Kinase C-Epsilon Human Bronchial Epithelial Cells." American Journal of Physiology-Lung Cellular and Molecular Physiology. Vol. 293, no. 5 (2007):1,163-1,170.	Nebraska Medical Center, Department of Veterans Affairs Medical Center, Texas A&M	Air	Dust	Dust extract from cattle feedlots stimulates airway inflammation at concentrations found downwind from the operation.
Studies indicating no impact				
Hill, Dagne D., William E. Owens, and Paul B. Tchounwou. "Prevalence of *Escherichia coli O157:H7* Bacterial Infections Associated With the Use of Animal Wastes in Louisiana for the Period 1996-2004." International Journal of Environmental Research and Public Health. Vol. 3, no. 1 (2006): 107-113.	Grambling State University, Louisiana State University, Jackson State University	Water	*Escherichia coli* (not measured)	Although some of the parishes surveyed had large amounts of animal waste generated each year, statistics did not show a correlations with *Escherichia coli 0157:H7* bacterial infections.
Hill, Dagne D., William E. Owens, and Paul B. Tchounwou. "Prevalence of Selected Bacterial Infections Associated with the Use of Animal Waste in Louisiana." International Journal of Environmental Research and Public Health. Vol. 2, no. 1 (2005): 84–93.	Jackson State University, Louisiana State University,	Water	*Escherichia coli* (not measured)	Although the four parishes surveyed had large amounts of animal waste generated, statistics does not show a correlation between this and bacterial infections.
Krapac, I.G., W.S. Dey, W.R. Roy, C.A. Smyth, E. Storment, S.L. Sargent, and J.D. Steele. "Impacts of Swine Manure Pits on Groundwater Quality." Environmental Pollution. Vol. 120, issue 2 (2002): 475-492.	Illinois State Geological Survey, University of Illinois, Illinois Department of Agriculture	Water	Chloride, ammonium, phosphate, potassium, nitrate, bacteria	Groundwater near swine CAFOs has not been significantly impacted.
Mugel, Douglas N. "Ground-Water Quality and Effects of Poultry Confined Animal Feeding Operations on Shallow Ground Water, Upper Shoal Creek Basin, Southwest Missouri, 2000." U.S. Geological Survey Water-Resources Investigations Report 02-4125 (2002).	United States Geological Survey	Water	Nutrients, bacteria	The results do not indicate that poultry CAFOs are affecting the shallow ground water with respect to nutrients and fecal bacteria.

Appendix IV: Government-Sponsored or Peer-Reviewed Studies Completed Since 2002 on the Impacts of Pollutants from Animal Waste

Study	Sponsor[a]	Medium	Pollutant(s)	Impact
Braun-Fahrlander, Charlotte, Josef Riedler, Udo Herz, Waltraud Eder, Marco Waster, Leticia Grize, Soyoun Maisch, David Carr, Florian Gerlach, Albrecht Bufe. "Environmental Exposure to Endotoxin and its Relation to Asthma in School-Age Children." The New England Journal of Medicine. Vol. 347, no. 12 (2002): 869-877.	Institute of Social and Preventive Medicine (Switzerland), Children's Hospital (Austria), Philipps University (Germany), Ruhr University (Germany), University Children's Hospital (Switzerland), University of Munich (Germany)	Air	Dust	Decreased risk of hay fever, asthma, and wheeze in children exposed to high levels of endotoxin in dust.
Elliott, L., K. Yeatts, and D. Loomis. "Ecological Associations Between Asthma Prevalence And Potential Exposure to Farming." European Respiratory Journal. Vol. 24, no. 6 (2004): 938–941.	University of North Carolina, Chapel Hill	Air	N/A	Findings are consistent with the hypothesis that certain farm exposures are protective against childhood asthma.
McGinn, S. M., H. H. Janzen, and T. Coates. "Atmospheric Pollutants and Trace Gases: Atmospheric Ammonia, Volatile Fatty Acids, and Other Odorants near Beef Feedlots." Journal of Environmental Quality. Vol. 32, no. 4 (2003):1,173–1,182.	Research Centre, Agriculture and Agri-Food Canada	Air	Ammonia, odor, organic compounds, total suspended particulates, dust	Odorants from feedlots were effectively dispersed. Emitted ammonia was deposited to the soil downwind.
Studies showing an indirect link between pollutants and impacts				
Valcour, James E., Pascal Michel, Scott A. McEwen, and Jeffrey B. Wilson. "Associations between Indicators of Livestock Farming Intensity and Incidence of Human Shiga Toxin-Producing *Escherichia coli* Infection." Emerging Infectious Diseases. Vol. 8, no. 3 (2002): 252-257.	University of Guelph; Université de Montréal; Centre for Infectious Disease Prevention and Control-Health Canada	Water	*Escherichia coli* (not measured)	The strongest associations with human *Escherichia coli* infection were the ratio of beef cattle to human population and the application of manure to the surface of agricultural land by a solid spreader and by a liquid spreader.
Wing, Steve, Stephanie Freedman, and Lawrence Band. "The Potential Impact of Flooding on Confined Animal Feeding Operations in Eastern North Carolina." Environmental Health Perspectives. Vol. 110, no. 4 (2002): 387–391.	University of North Carolina	Water	N/A	Flood events have a significant potential to degrade environmental health because of dispersion of wastes from industrial animal operations in areas with vulnerable populations.
Avery, Rachel C., Steve Wing, Stephen W. Marshall, and Susan S. Schiffman. "Odor from Industrial Hog Farming Operations and Mucosal Immune Function in Neighbors." Archives of Environmental Health. Vol. 59, no. 2 (2004): 101-108.	University of North Carolina, Duke University	Air	N/A	This study suggests that malodor from industrial swine operations can affect the secretory immune system, although the reduced levels reported are still within normal range.

Appendix IV: Government-Sponsored or Peer-Reviewed Studies Completed Since 2002 on the Impacts of Pollutants from Animal Waste

Study	Sponsor[a]	Medium	Pollutant(s)	Impact
Bullers, Susan. "Environmental Stressors, Perceived Control, and Health: The Case of Residents Near Large-Scale Hog Farms in Eastern North Carolina." Human Ecology. Vol. 33, no. 1 (2005): 1-16.	University of North Carolina Wilmington	Air/Water	N/A	Residents living near large-scale hog farms in eastern North Carolina report symptoms related to respiratory and sinus problems and nausea.
Chénard, Liliane, Ambikaipakan Senthilselvan, Vaneeta K. Grover, Shelley P. Kirychuk, Joshua A. Lawson, Thomas S. Hurst, and James A. Dosman. "Lung Function and Farm Size Predict Healthy Worker Effect in Swine Farmers." Chest. Vol. 131, no. 1 (2007): 245-254.	Institute of Agriculture Rural and Environmental Health, University of Saskatchewan (Canada), University of Alberta (Canada), Canadian Institute of Health Research	Air	N/A	Some swine workers are less affected by swine air and continue in the profession. Other workers are more affected.
Chrischilles, Elizabeth, Richard Ahrens, Angela Kuehl, Kevin Kelly, Peter Thorne, Leon Burmeister, and James Merchant. "Asthma Prevalence and Morbidity Among Rural Iowa Schoolchildren." Journal of Allergy and Clinical Immunology. Vol. 113, no. 1 (2004): 66-71.	University of Iowa, EPA	Air	N/A	Among children who wheeze, farm and nonfarm children were equally likely to have been given a diagnosis of asthma and had comparable morbidity.
Dosman, J.A., J.A. Lawson, S.P. Kirychuk, Y. Cormier, J. Biem, and N. Koehncke. "Occupational Asthma in Newly Employed Workers in Intensive Swine Confinement Facilities." European Respiratory Journal. Vol. 24, no. 6 (2004): 698–702.	Institute of Agricultural Rural and Environmental Health, University of Saskatchewan (Canada), Laval University (Canada)	Air	N/A	Newly employed workers in intensive swine confinement facilities reported development of acute onset of wheezing and cough suggestive of asthma.
Merchant, James A., Allison L. Naleway, Erik R. Svendsen, Kevin M. Kelly, Leon F. Burmeister, Ann M. Stromquist, Craig D. Taylor, Peter S. Thorne, Stephen J. Reynolds, Wayne T. Sanderson, and Elizabeth A. Chrischilles. "Asthma and Farm Exposures in a Cohort of Rural Iowa Children." Environmental Health Perspectives. Vol. 113, No. 3 (2005): 350-356.	University of Iowa, EPA, Colorado State University, Kaiser Permanente	Air	N/A	There was a high prevalence of asthma health outcome among farm children living on farms that raise swine and raise swine and add antibiotics.
Mirabelli, Maria C., Steve Wing, Stephen W. Marshall, and Timothy C. Wilcosky. "Asthma Symptoms Among Adolescents Who Attend Public Schools That Are Located Near Confined Swine Feeding Operations." Pediatrics. Vol. 118, no. 1 (2006): 66-75.	University of North Carolina, RTI International	Air	N/A	Estimated exposure to airborne pollution from confined swine feeding operations is associated with adolescents' wheezing symptoms.
Palmberg, Lena, Britt-Marie Larsson, Per Malmberg, and Kjell Larsson. "Airway Responses of Healthy Farmers and Nonfarmers to Exposure in a Swine Confinement Building." Scandinavian Journal of Work, Environment, and Health. Vol. 28, no. 4 (2002): 256-263.	National Institute of Environmental Medicine (Sweden), National Institute for Working Life (Sweden)	Air	N/A	Altered lung function and bronchial responsiveness was found in nonfarming subjects. Only minor alterations were found in the farmers.

Appendix IV: Government-Sponsored or Peer-Reviewed Studies Completed Since 2002 on the Impacts of Pollutants from Animal Waste

Study	Sponsor[a]	Medium	Pollutant(s)	Impact
Radon, Katja, Anja Schulze, Vera Ehrenstein, Rob T. van Strien, Georg Praml, and Dennis Nowak. "Environmental Exposure to Confined Animal Feeding Operations and Respiratory Health of Neighboring Residents." Epidemiology. Vol. 18, no. 3 (2007): 300-308.	Institute for Occupational and Environmental Medicine (Germany), National Research Centre for Environment and Health (Germany), Boston University, Municipal Health Service Amersterdam	Air	N/A	Respiratory disease was found among resident living near confined animal feeding operations.
Sigurdarson, Sigurdur T. and Joel N. Kline. "School Proximity to Concentrated Animal Feeding Operations and Prevalence of Asthma in Students." Chest. Vol. 129, no. 6 (2006):1,486–1,491.	University of Iowa Carver College of Medicine, University of Iceland	Air	N/A	Children in the study school, located one-half mile from a CAFO, had a significantly increased prevalence of physician-diagnosed asthma.
Studies measuring pollutants				
Anderson, M.E. and M.D. Sobsey. "Detection And Occurrence of Antimicrobially Resistant E. Coli In Groundwater on or Near Swine Farms In Eastern North Carolina." Water Science & Technology. Vol. 54, no. 3 (2006): 211-218.	University of North Carolina	Water	Antibiotics	Antibiotic-resistant *E. coli* strains are present in groundwaters of swine farms.
Batt, Angela L., Daniel D. Snow, and Diana S. Aga. "Occurrence of Sulfonamide Antimicrobials in Private Water Wells in Washington Country, Idaho, USA." Chemosphere. Vol. 64, issue 11 (2006): 1,963-1,971.	State University of New York at Buffalo, University of Nebraska	Water	Antimicrobials, nitrate, ammonium	All six sampled wells were contaminated by veterinary antimicrobials and had elevated concentrations of nitrate and ammonium. Three wells had nitrate levels exceeding EPA thresholds.
Campagnolo, Enzo R., Kammy R. Johnson, Adam Karpati, Carol S. Rubin, Dana W. Kolpin, Michael T. Meyer, J. Emilio Esteban, Russell W. Currier, Kathleen Smith, Kendall M. Thu, and Michael McGeehin. "Antimicrobial Residues in Animal Waste and Water Resources Proximal to Large-Scale Swine and Poultry Feeding Operations." The Science of the Total Environment. Vol. 299, no. 1 (2002): 89-95.	CDC, U.S. Geological Survey, Iowa Department of Public Health, Ohio Department of Health, University of Iowa	Water	Antimicrobials	Multiple classes of antimicrobial compounds were detected in surface and groundwater samples collected proximal to the swine and poultry farms.
Durhan, Elizabeth J., Christy S. Lambright, Elizabeth A. Makynen, James Lazorchak, Phillip C. Hartig, Vickie S. Wilson, L. Earl Gray, and Gerald T. Ankley. "Identification of Metabolites of Trenbolone Acetate in Androgenic Runoff from a Beef Feedlot." Environmental Health Perspectives. Vol. 114, supp. 1 (2006):65–68.	EPA	Water	Hormones	Whole-water samples from the discharge contained detectible concentrations of hormones.

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Study	Sponsor[a]	Medium	Pollutant(s)	Impact
Gessel, Peter D., Neil C. Hansen, Sagar M. Goyal, Lee J. Johnston, and Judy Webb. "Persistence Of Zoonotic Pathogens in Surface Soil Treated With Different Rates of Liquid Pig Manure." Applied Soil Ecology. Vol. 25, issue 23 (2004): 237-243.	University of Minnesota	Water	Pathogens	Manure application rate was correlated positively with the persistence of fecal indicators but did not relate to survival of indicators with short survival times.
Haggard, Brian E. , Paul B. DeLaune, Douglas R. Smith, and Philip A. Moore, Jr. "Nutrient and B17-Estradiol Loss in Runoff Water From Poultry Litters." Journal of the American Water Resources Association. Vol. 41, no. 2 (2005):245-256.	USDA, University of Arkansas	Water	Nutrients, hormones	In general, poultry litter applications increased nutrient and hormone concentrations in runoff water.
Hutchins, Stephen R., Mark V. White, Felisa M. Hudson, and Dennis D. Fine. "Analysis of Lagoon Samples from Different Concentrated Animal Feeding Operations for Estrogens and Estrogen Conjugates." Environmental Science & Technology. Vol. 41, no. 3 (2007): 738-744.	EPA, Shaw Environmental and Infrastructure	Water	Hormones	Estrogen conjugates contribute significantly to the overall estrogen load, even in different types of CAFO lagoons.
Koike, S., I.G. Krapac, H.D. Oliver, A.C. Yannarell, J.C. Chee-Sanford, R.I. Aminov, and R.I. Makie. "Monitoring and Source Tracking of Tetracycline Resistance Genes in Lagoons and Groundwater Adjacent to Swine Production Facilities over a 3-Year Period." Applied and Environmental Microbiology. Vol. 73, no. 15 (2007): 4,813-4,823.	University of Illinois, USDA, Illinois State Geological Survey, Rowett Research Institute (UK)	Water	Antibiotics	Antibiotic resistance genes in groundwater are affected by swine manure and also part of the indigenous gene pool.
Miller, David H. and Gerald T. Ankley. "Modeling Impacts On Populations: Fathead Minnow (Pimephales Promelas) Exposure to the Endocrine Disruptor 17ß-Trenbolone as a Case Study." Ecotoxicology and Environmental Safety. Vol. 59, issue 1 (2004): 1-9.	EPA	Water	Hormones	Model shows that if fathead minnow is exposed to continuous concentrations of hormone, there will be a risk of extinction.
Nelson, Nathan O., John E. Parsons, and Robert L. Mikkelsen. "Field-Scale Evaluation of Phosphorus Leaching in Acid Sandy Soils Receiving Swine Waste." Journal of Environmental Quality. Vol. 34, no. 6 (2005): 2,024-2,035.	USDA, North Carolina State University	Water	Phosphorus	The results show that substantial quantities of phosphorus can be leached through soils with low phosphorus sorption capacities.
Peak, Nicholas, Knapp, Charles W, Richard K. Yang, Margery M. Hanfelt, Marilyn S. Smith, Diana S. Aga, and David W. Graham. "Abundance of Six Tetracycline Resistance Genes in Wastewater Lagoons at Cattle Feedlots With Different Antibiotic Use Strategies." Environmental Microbiology. Vol. 9, no. 1 (2007): 143-151.	University of Kansas, Kansas State University, State University of New York at Buffalo	Water	Antibiotic resistant genes	CAFOs using larger amounts of antibiotics had significantly higher detected resistance gene levels.

Appendix IV: Government-Sponsored or Peer-Reviewed Studies Completed Since 2002 on the Impacts of Pollutants from Animal Waste

Study	Sponsor[a]	Medium	Pollutant(s)	Impact
Sapkota, Amy R., Frank C. Curriero, Kristen E. Gibson, and Kellogg J. Schwab. "Antibiotic-Resistant Enterococci and Fecal Indicators in Surface Water and Groundwater Impacted by a Concentrated Swine Feeding Operation." Environmental Health Perspectives. Vol. 115, no. 7 (2007):1,040–1,045.	Johns Hopkins Bloomberg School of Public Health; University of Maryland	Water	Antibiotic resistant bacteria, fecal indicators	Detected elevated levels of fecal indicators and antibiotic-resistant bacteria in water sources down gradient from a swine facility.
Soto, Ana M., Janine M. Calabro, Nancy V. Prechtl, Alice Y. Yau, Edward F. Orlando, Andreas Daxenberger, Alan S. Kolok, Louis J. Guillette, Jr., Bruno le Bizec, Iris G. Lange, and Carlos Sonnenschein. "Androgenic and Estrogenic Activity in Water Bodies Receiving Cattle Feedlot Effluent in Eastern Nebraska, USA." Environmental Health Perspectives. Vol. 112, no. 3 (2004):346–352.	Tufts University; Southwest Research Institute; St. Mary's College of Maryland; Universität München-Weihenstephan, Germany; University of Nebraska; University of Florida; Ecole Nationale Vétérinaire de Nantes, France	Water	Hormones	Feedlot effluents contain sufficient levels of hormonally active agents to warrant further investigation of possible effects on aquatic ecosystem health.
Thorsten, Christiana, Rudolf J. Schneider, Harald A. Farber, Dirk Skutlarek, Michael T. Meyer, and Heiner E. Goldbach. "Determination of Antibiotic Residues in Manure, Soil, and Surface Waters." Acta hydrochimica et hydrobiologica. Vol. 31, no. 1 (2003):36–44.	University of Bonn, Germany; U.S. Geological Survey	Water	Antibiotics	In each of the surface waters tested antibiotics could be detected.
Thurston-Enriquez, Jeanette A., John E. Gilley, and Bahman Eghball. "Microbial Quality of Runoff Following Land Application of Cattle Manure And Swine Slurry." Journal of Water and Health. vol. 3, no. 2 (2005): 157-171.	University of Nebraska	Water	Microbials	Large microbial loads could be released via heavy precipitation events and could have a significant impact on water bodies.
Toetz, Dale. "Nitrate in Ground and Surface Waters in the Vicinity of a Concentrated Animal Feeding Operation." Archives of Hydrobiology. Vol. 166, no. 1 (2006): 67-77.	Oklahoma State University	Water	Nitrogen	Drinking water was contaminated with CAFOs as the suspected source.
U.S. Department of Interior. U.S. Geological Survey. In cooperation with U.S. Environmental Protection Agency, National Exposure Research Laboratory. Geochemistry and Characteristics of Nitrogen Transport at a Confined Animal Feeding Operations in a Coastal Plain Agricultural Watershed, and Implications for Nutrient Loading in the Neuse River Basin, North Carolina, 1999-2002. Scientific Investigations Report 2004-5283, Reston, Va.: (2004).	U.S. Geological Survey, EPA	Water	Nitrogen	Large amounts of nitrogen moving in the estuary as a result of extreme events may potentially cause algal growths.

Appendix IV: Government-Sponsored or Peer-Reviewed Studies Completed Since 2002 on the Impacts of Pollutants from Animal Waste

Study	Sponsor[a]	Medium	Pollutant(s)	Impact
United State Geological Survey in cooperation with Virginia Department of Health. Water-Quality Data from Ground- and Surface-Water Sites near Concentrated Animal Feeding Operations (CAFOs) and non-CAFOs in the Shenandoah Valley and Eastern Shore of Virginia, January-February, 2004. Reston, Va (2005).	United State Geological Survey in cooperation with Virginia Department of Health	Water	Bacteria, antibiotics, trace metals, biological oxygen demand, nitrogen	N/A
United States Geological Survey. Fractionation and Characterization of Organic Matter in Wastewater from a Swine Waste-Retention Basin. Scientific Investigations Report 2004-5217 (2004).	United States Geological Survey	Water	Organic matter	The bulk of the organic matter consists of microbial cellular constituents and their degradation products.
Chapin, Amy, Ana Rule, Kristen Gibson, Timothy Buckley, and Kellogg Schwab. "Airborne Multidrug-Resistant Bacteria Isolated from a Concentrated Swine Feeding Operation." Environmental Health Perspectives. Vol. 113, no. 2 (2005):137-142.	Johns Hopkins University	Air	Antibiotic resistant bacterial pathogens	Multidrug-resistant bacterial pathogens were detected in the air of a swine CAFO.
Donham, Kelley. J., Joung Ae Lee, Kendall Thu, and Stephen J. Reynolds. "Assessment of Air Quality at Neighbor Residences in the Vicinity Of Swine Production Facilities." Journal of Agromedicine. Vol. 11, no. 3-4 (2006): 15-24.	University of Iowa, Northern Illinois University, and Colorado State University	Air	Hydrogen sulfide, ammonia, carbon dioxide, particulate matter	Average concentration of hydrogen sulfide exceeded EPA recommended community standards in all three areas assessed.
Gibbs, Shawn G., Christopher F. Green, Patrick M. Tarwater, Linda C. Mota, Kristina D. Mena, and Pasquale V. Scarpino. "Isolation of Antibiotic-Resistant Bacteria from the Air Plume Downwind of a Swine Confined or Concentrated Animal Feeding Operation." Environmental Health Perspectives. Vol. 114, no. 7 (2006):1,032–1,037.	University of Texas, University of Cincinnati	Air	Antibiotic-resistant bacteria	Bacterial concentrations with multiple antibiotic resistances or multidrug resistance were recovered inside and outside to 150 m downwind of a facility, even after antibiotic use was discontinued.
Harper, Lowry A., Ron R. Sharpe, Tim B. Parkin, Alex De Visscher, Oswald van Cleemput, and F. Michael Byers. "Nitrogen Cycling through Swine Production Systems: Ammonia, Dinitrogen, and Nitrous Oxide Emissions." Journal of Environmental Quality. Vol. 33, no. 4 (2004): 1,189-1,201.	USDA, Ghent University (Belgium)	Air	Nitrogen	In contrast with previous and current estimates of ammonia emissions from CAFOs, this study found smaller ammonia emissions from animal housing, lagoons, and fields.
Hamscher, Gerd, Heike Theresia Pawelzick, Silke Sczesny, Heinz Nau, and Jörg Hartung. "Antibiotics in Dust Originating from a Pig-Fattening Farm: A New Source of Health Hazard for Farmers?" Environmental Health Perspectives. Vol. 111, no. 13 (2003):1,590–1,594.	School of Veterinary Medicine Hannover, Germany	Air	Antibiotics	Five different antibiotics were detected in dust samples swine feeding operation.

Appendix IV: Government-Sponsored or Peer-Reviewed Studies Completed Since 2002 on the Impacts of Pollutants from Animal Waste

Study	Sponsor[a]	Medium	Pollutant(s)	Impact
Hoff, Steven J., Dwaine S. Bundy, Minda A. Nelson, Brian C. Zelle, Larry D. Jacobson, Albert J. Heber, Jinqin Ni, Yuanhui Zhang, Jacek A. Koziel, and David B. Beasley. "Emissions of Ammonia, Hydrogen Sulfide, and Odor before, during, and after Slurry Removal from a Deep-Pit Swine Finisher." Journal of the Air & Waste Management Association. Vol. 56, no. 5 (2006): 581-590.	Iowa State University, University of Minnesota, Purdue University, University of Illinois, North Carolina State University	Air	Ammonia, hydrogen sulfide, odor	Emissions of ammonia, hydrogen sulfide, and odor had large increases during slurry removal. A slurry removal even will result in acute exposure for animals and workers.
O'Connor, Rod, Mark O'Connor, Kurt Irgolic, Justin Sabrsula, Hakan Gurleyuk, Robert Brunette, Crystal Howard, Jennifer Garcia, John Brien, June Brien, and Jessica Brien. "Transformations, Air Transport, and Human Impact of Arsenic from Poultry Litter." Environmental Forensics. Vol. 6, no. 1 (2005): 83-89.	Chenard Consulting Services, Karl-Franzeas University (Austria), University of North Carolina, Frontier Geosciences, Aqua-Tech Laboratories	Air	Arsenic	Levels of arsenic found in homes. This could represent a significant health risk.
Radon, Katja, Brigitta Danuser, Martin Iversen, Eduard Monso, Christoph Weber, Jorg Hartung, Kelley J. Donham, Urban Palmgren, and Dennis Nowak. "Air Contaminants in Different European Farming Environments." Annals of Agriculture and Environmental Medicine. Vol. 9, no. 1 (2002): 41-48.	Ludwig-Maximilians-University (Germany), Swiss Federal Institute of Technology, Aarhus University Hospital (Denmark), Hospital Germans Trial I Pujol (Spain), School of Veterinary Medicine (Germany), University of Iowa, Pegasus Labor GmbH (Germany)	Air	Dust, endotoxin, fungi	The exposure level found in this study might put the farmers at risk from respiratory diseases.
Razote, E.B., R.G. Maghirang, B.Z. Predicala, J.P. Murphy, B.W. Auvermann, J.P. Harner III, and W.L. Hargrove. "Laboratory Evaluation of the Dust-Emission Potential of Cattle Feedlot Surfaces." Transactions of the ASABE. Vol. 49, no. 4 (2006): 1,117-1,124.	Kansas State University, Prairie Swine Center, Inc. (Canada), Texas A&M University	Air	Particulate Matter	N/A
Robarge, Wayne P., John T. Walker, Ronald B. McCulloch, and George Murray. "Atmospheric Concentrations of Ammonia and Ammonium at an Agricultural Site in the Southeast United States." Atmospheric Environment. Vol. 36, no. 10 (2002): 1,661-1,674.	North Carolina State University, EPA, URS Corporation, North Carolina Department of Environmental and Natural Resources	Air	Ammonia	Elevated ambient ammonia concentrations near an agricultural site.
United State Environmental Protection Agency. National Emission Inventory – Ammonia Emissions from Animal Husbandry Operations, Draft Report. Washington, D.C. (2004).	EPA	Air	Ammonia	N/A

Appendix IV: Government-Sponsored or Peer-Reviewed Studies Completed Since 2002 on the Impacts of Pollutants from Animal Waste

Study	Sponsor[a]	Medium	Pollutant(s)	Impact
Walker, J.T., W.P. Robarge, Y. Wu, and T.P. Meyers. "Measurement of Bi-Directional Ammonia Fluxes Over Soybean Using Themodified Bowen-Ratio Technique." Agricultural and Forest Meteorology. Vol. 138, no. 1-4 (2006): 54-68.	EPA, North Carolina State University, NASA, NOAA	Air	Ammonia	In general, the net deposition flux was lower than expected.
Walker, John T., Wayne P. Robarge, Arun Shendrikar, and Hoke Kimball. "Inorganic Pm2.5 at a U.S. Agricultural Site." Environmental Pollution. Vol. 139, no. 2 (2006): 258-271.	EPA, North Carolina State University, North Carolina Department of Environment and Natural Resources	Air	Particulate matter	Model results show that reductions in atmospheric ammonia will have minimal effect on organic PM2.5 during summer and a moderate effect during winter.
Walker, J.T., Dave R. Whitall, Wayne P. Robarge, and Hans W. Pearl. "Ambient Ammonia and Ammonium Aerosol Across a Region of Variable Ammonia Emission Density." Atmospheric Environment. Vol. 38, no. 9 (2004): 1,235-1,246.	EPA, NOAA, North Carolina State University, University of North Carolina	Air	Ammonia, ammonium	Agricultural ammonia emissions influence local ambient concentrations of ammonia and PM2.5.
Wilson, Sacoby M. and Marc L. Serre. "Examination of Atmospheric Ammonia Levels Near Hog Cafos, Homes, and Schools In Eastern North Carolina." Atmospheric Environment. Vol. 41, issue 23 (2007): 4,977–4,987.	University of Michigan, Ann Arbor; University of North Carolina at Chapel Hill	Air	Ammonia	Distance to one or more CAFOs is the key variable in controlling atmospheric ammonia at the community level in Eastern N.C.
Muller-Suur, C., P.H. Larsson, K. Larsson, J. Grunewald. "Lymphocyte Activation After Exposure to Swine Dust: A Role Of Humoral Mediators and Phagocytic Cells." European Respiratory Journal. Vol. 19, issue 1 (2002): 104-107.		Air	Dust	About immune system response.
Charavaryamath, Chandrashekhar, Kyathanahalli S Janardhan, Hugh G Townsend, Philip Willson, and Baljit Singh. "Multiple Exposures to Swine Barn Air Induce Lung Inflammation and Airway Hyper-Responsiveness." Respiratory Research. Vol. 6, no. 1 (2005):50-66.	University of Saskatchewan, Canada	Air	Endotoxin	Does not address human impacts.
Eduard, Wijnand, Ernst Omenaas, Per Sigvald Bakke, Jeroen Douwes, and Dick Heederik. "Atopic and Non-atopic Asthma in a Farming and a General Population." American Journal of Industrial Medicine. Vol. 46, issue 4 (2004): 396-399.	National Institute of Ocupational Health (Norway), University of Bergen (Norway), University of Wellington (New Zealand)	Air	N/A	Protective effect of the farm environment on asthma.

Source: GAO's analysis of identified studies.

[a]Sponsor refers to the organization under whose auspices the research was conducted or with whom the primary researchers were affiliated.

Appendix V: Comments from the Environmental Protection Agency

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

AUG 26 2008

OFFICE OF
AIR AND RADIATION

Ms. Anu K. Mittal
Director, Natural Resources and Environment
U. S. Government Accountability Office
Washington, DC 20548

Dear Ms. Mittal:

The U. S. Environmental Protection Agency (EPA) appreciates the opportunity to review and comment on the Government Accountability Office (GAO) draft report, "*Concentrated Animal Feeding Operations: EPA Needs More Information and a Clearly Defined Strategy to Protect Air and Water Quality from Pollutants of Concern*" (GAO-08-944). EPA agrees in part with the conclusions and recommendations in the draft report. Below I provide brief comments and clarification on EPA's position regarding the recommendations. Additional technical comments and clarifications on draft report language have been provided in a separate document.

Recommendation 1:

In order to more effectively monitor and regulate CAFOs, we recommend that the Administrator of the Environmental Protection Agency develop a comprehensive inventory of CAFOs nationwide and incorporate appropriate internal controls to ensure the quality of data. The inventory should be periodically updated to capture changes that have occurred in the animal production industry.

In Waterkeeper Alliance v. EPA, the Second Circuit Court of Appeals found that EPA did not have the authority to permit non-discharging CAFOs. EPA is finalizing amendments to a rule that would require CAFOs that discharge to apply for National Pollutant Discharge Elimination System (NPDES) permits. EPA's Office of Water has supported the Office of Enforcement and Compliance Assurance in working with EPA Regions and States to develop and implement a new national NPDES data system to collect and record facility-specific information on permitted CAFOs. This data system, called the Integrated Compliance Information System (ICIS), allows EPA to have an updated national inventory of permitted CAFOs, including number, location, size, and permitted discharges. National data on inspections, enforcement actions, and other NPDES program information will also be collected. Although this information is currently collected by permitting authorities for permitted CAFOs, there is no

comprehensive national database where the information is stored. While ICIS-NPDES has the functionality to provide complete data on the CAFO universe, the data must be consistently collected and entered into ICIS by states and EPA regions. Thus, EPA is developing a proposed rule package that would set national requirements for certain NPDES program information being provided by authorized states to ICIS. This information may include an obligation for authorized states to provide national data for identifying facilities that have been issued, or applied for, a CAFO permit, as well as facilities that should have applied for a CAFO permit based on an inspection or enforcement action.

Recommendation 2:

In order to more effectively determine the extent of air emissions from animal feeding operations, the Administrator of the Environmental Protection Agency should:

a. reassess the current data collection efforts, including its internal controls, to ensure that the national air emissions monitoring study will provide the scientific and statistically valid data that EPA needs for developing its air emissions protocols;

The Agency is continuously evaluating the national air monitoring study, both the data that are being collected, and the methods that are being used to collect these data. This continuous evaluation has resulted in changes being made and documented in numerous Standard Operating Procedures and also to the overall project Quality Assurance Plan. These changes range from items such as utilization of a different instrument than originally intended to changes in the maintenance schedule for certain items. All these changes have been identified through discussions with the monitoring contractor or through the audits described below.

The Agency is currently involved in a program of conducting Technical Systems Audits at each monitoring site to ensure the contractor is performing according to the approved Quality Assurance Project Plan. Each site is scheduled to be audited once during the first year of data collection and once during the second year. To date, the Agency has performed the first year audits at all but six of the monitoring sites with those remaining sites scheduled to be audited by the end of September 2008.

b. Provide information to stakeholders on the additional data that it plans to use to supplement the national air emissions monitoring study

With respect to the supplemental data that will be used to augment the data collected from the national air emissions monitoring study, we are not able to identify at this time which individual studies we plan to use. However, the Agency has been meeting with the Department of Agriculture (USDA), with representatives from their offices of Agricultural Research Service, Cooperative State Research, Education, and

Extension Service, and the Economic Research Service to help identify what research is ongoing and where gaps may still exist. We recently held a two-day workshop in Research Triangle Park, North Carolina with USDA representatives that focused on agricultural air emissions. Day 2 of the workshop focused exclusively on CAFO research.

c. Establish a strategy and timetable for developing a process-based model that will provide more sophisticated air emissions estimating methodologies for animal feeding operations.

The Agency has begun to evaluate what is necessary to develop a process-based model for estimating emissions from animal feeding operations. The emissions estimating methodology that will be developed from the monitoring study will assess the wide range of process information that is being collected in the monitoring study. To the extent that these parameters have a significant and logical impact on emissions, they will be included in the development of a process-based model. This will be performed through the use of a statistical software application that performs a multiple regression analysis of the process parameters and the measured emissions.

As part of the joint EPA/USDA workshop, there were several presentations on process based models that are currently being developed throughout the country and discussions on what data needs still exist to complete these models. These discussions with both USDA and modeling experts will continue as we flesh out our plans for developing a process based model.

Once again, thank you for the opportunity to respond.

Sincerely,

for Elizabeth Craig

Robert J. Meyers
Principal Deputy Assistant Administrator

Appendix VI: GAO Contact and Staff Acknowledgments

GAO Contact

Anu Mittal (202) 512-3841 or mittala@gao.gov

Staff Acknowledgments

In addition to the individual named above, Sherry L. McDonald, Assistant Director; Kevin Bray; Yecenia C. Camarillo; Wendy Dye; Paul Hobart; Cathy Hurley; Holly L. Sasso; James W. Turkett; and Greg Wilmoth made key contributions to this report. Also contributing to this report were Elizabeth Beardsley, Ben N. Shouse, and Carol Herrnstadt Shulman.

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Attachment 3:
Illinois Citizens for Clean Air & Water (ICCAW) Photos of CAFO Discharges

Dr. Kendall Thu Testimony
Attachment 3

Attachment 4:
ICCAW Petition for Withdrawal of the NPDES Program Delegation From the State of Illinois, March 27, 2008

ILLINOIS CITIZENS FOR CLEAN AIR & WATER

March 27, 2008

Via email and certified mail

Administrator Stephen Johnson
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PETITION FOR WITHDRAWAL OF THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PROGRAM DELEGATION FROM THE STATE OF ILLINOIS

Illinois Citizens for Clean Air & Water (ICCAW)[1] respectfully petition the U.S. Environmental Protection Agency (EPA) to initiate formal proceedings to withdraw the National Pollutant Discharge Elimination System (NPDES) permit program from the State of Illinois. This Petition is made because the Illinois Environmental Protection Agency (IEPA) has failed to fully implement the NPDES program for Concentrated Animal Feeding Operations (CAFOs).

BACKGROUND

Since the IEPA received authority to implement and enforce the Federal Clean Water Act (CWA) NPDES permit program in 1977,[2] its program has failed to keep stride with rapid changes in Illinois' livestock industry. The industry has steadily moved from small, widespread, family farms to large, investor owned, industrialized operations. According to the United States Department of Agriculture's 2002 Census of Agriculture, Illinois is now ranked as having the

1 ICCAW is a state-wide coalition of individuals and community groups concerned with the environmental, human health, and quality of life impacts of large-scale, industrialized livestock production facilities. The organization has over 70 members from various counties throughout the State. The majority of its members are family farmers and rural residents that live near large-scale livestock facilities and have been adversely impacted by the problems they create.

2 National Pollutant Discharge Elimination System Memorandum of Agreement between the Illinois Environmental Protection Agency and the United States Environmental Protection Agency Region V (May 12, 1977).

fourth largest concentration of large-scale hog confinements in the United States.[3] As of 2005, nearly 80 percent of the 4.5 million hogs produced annually in Illinois came from large-scale operations.[4]

According to the EPA's 2002 National Water Quality Inventory, agricultural operations such as Animal Feeding Operations (AFOs) are among the leading sources of water pollution in the United States.[5] According to the IEPA's 2004 Water Quality Report, over 85 percent of the total public lake acreage in Illinois is impaired.[6] Agriculture is identified as one of the leading causes.[7] Agriculture is also responsible for 73 percent of Illinois' river and stream impairment.[8] This is nearly double the percentage of pollution from municipal point sources and almost three times more than from urban runoff.[9] Further, although the percentage of fish kills in Illinois due to industrial point sources has declined in the last 30 years (and now represents only 10 percent of total fish kills); fish kills attributable to agriculture have steadily increased.[10] Since 1997, 22 fish kills attributable to manure related pollution have been documented.[11] Consequently, the IEPA's failure to fully implement the NPDES program for CAFOs is of particular concern.

Despite these figures, the State is failing to require NPDES permits of CAFOs that discharge into waters of the State. Unlike the other Region 5 States, the IEPA has not even determined which CAFOs do, in fact, discharge and therefore require NPDES permits. Further, the Agency has not issued coverage to facilities that have submitted NPDES permit applications, and all of the NPDES permits issued by the Agency to date are presently expired.[12] As a result, not one facility in the State has an active NPDES permit.[13] Because unpermitted facilities are not subject to regular reporting and inspection requirements, the Agency cannot adequately determine which

---

3 United States Department of Agriculture National Agricultural Statistics Service, The Census of Agriculture 2002 Census Publication, available at: http://www.agcensus.usda.gov/Publications/2002/index.asp; see also Food & Water Watch, Turning Farms into Factories: How the Concentration of Animal Agriculture Threatens Human Health, the Environment, and Rural Communities, Companion Map (July 2007), available at: <http://www.foodandwaterwatch.org>.

4 Illinois Environmental Council Education Fund, Illinois Environmental Briefing Book 2005-2006 (2006), at 20-21, available at: <http://www.ilenviro.org/publications/files/2005 briefingbook.pdf>.

5 EPA, National Water Quality Inventory: Report to Congress, 2002 Reporting Cycle, available at: < http://www.epa.gov/305b/2002report/>.

6 Illinois EPA, Illinois Water Quality Section 305(b) Report, Appendix D (2004), at 2, available at: <http://www.epa.state.il.us/water/water-quality/305b/305b-2004.pdf>.

7 Id. at 4.

8 Green Media Toolshed, Scorecard: Pollution Locator, Leading Sources of Water Quality Impairment (January 2008), available at: <http://www.scorecard.org/env-releases/water/cwa-sources>.

9 Id.

10 Clean Water Network, Spilling Swill: A Survey of Factory Farm Water Pollution in 1999 (December 1999), at 14; see also Izaak Walton League, Fish Kill Advisory Network: Pollution Events by Known General Source (June 2004), available at: http://66.155.8.209/graphics/fishkill/ag_evnts_vsothers.pdf>.

11 Isaak Walton League, Fish Kill Advisory Network Online Database (visited March 13, 2008), available at: <http://66.155.8.209/fishkill/fk_search.asp>.

12 Documents obtained from the IEPA via the Freedom of Information Act, February 2008; see also Diamond, Danielle, Illinois Failure to Regulate Concentrated Animal Feeding Operations in Accordance with the Federal Clean Water Act, 11 Drake Journal of Agricultural Law 2, 185-224 (Summer 2006), at 210 (citing a communication with Bruce Yurdin, IEPA Permits Division, March 11, 2005).

13 Id.

CAFOs are operating in accordance with the NPDES program. As such, the NPDES program is not being properly implemented since Large CAFOs are virtually unregulated.

Although citizens have attempted to spur the IEPA into action, the Agency has resisted making any meaningful progress to regulate large industrial CAFOs under the NPDES program.[14] Because the IEPA is not requiring facilities that discharge to have NPDES permits, is not actively assessing which CAFOs discharge and need NPDES permits, is not issuing coverage to CAFOs which apply for permits, is not conducting compliance inspections to determine if CAFOs are complying with NPDES permit requirements, and is not therefore enforcing NPDES permit requirements, EPA should initiate proceedings to withdraw the NPDES program authority from the State.

According to 40 C.F.R. ' 123.63, the Administrator may withdraw program approval when a State program no longer complies with NPDES requirements, and the State fails to take corrective action. As outlined below, Illinois' failures warrant withdrawal of the State's NPDES program delegation.

PETITIONER'S ARGUMENT

ILLINOIS' FAILURE TO MEET ITS NPDES OBLIGATIONS REGARDING CAFOs JUSTIFIES WITHDRAWAL OF ITS NPDES DELEGATION

40 C.F.R. ' 123.63 sets forth the criteria for State program withdrawal as follows:

> 40 C.F.R. ' 123.63 (a)
>
> (1) Where the State's legal authority no longer meets the requirements of this part, including:
>
> (i) Failure of the State to promulgate or enact new authorities when necessary; or
> (ii) Action by a State legislature or court striking down or limiting State authorities.
>
> (2) Where the operation of the State program fails to comply with the requirements of this part, including:
>
> (i) Failure to exercise control over activities required to be regulated under this part, including failure to issue permits;

14 For example, in an April 9, 2007 meeting between concerned citizens and the IEPA, the IEPA declined citizen requests to develop an inventory of Illinois CAFOs and require NPDES permits of known dischargers.

(ii) Repeated issuance of permits which do not conform to the requirements of this part; or
(iii) Failure to comply with the public participation requirements of this part.

(3) Where the State's enforcement program fails to comply with the requirements of this part, including:

(i) Failure to act on violations of permits or other program requirements;
(ii) Failure to seek adequate enforcement penalties or to collect administrative fines when imposed; or
(iii) Failure to inspect and monitor activities subject to regulation.

(4) Where the State program fails to comply with the terms of the Memorandum of Agreement required under '123.24 (or, in the case of a sewage sludge management program, '501.14 of this chapter).

(5) Where the State fails to develop an adequate regulatory program for developing water quality-based effluent limits in NPDES permits.

(6) Where a Great Lakes State or Tribe (as defined in 40 CFR 132.2) fails to adequately incorporate the NPDES permitting implementation procedures promulgated by the State, Tribe, or EPA pursuant to 40 CFR part 132 into individual permits.

Illinois meets the applicable criteria for withdrawal of authority to administer the NPDES program based on its failure to meet its regulatory obligations under ' 123.63 (a)(2), (3) and (4) listed above. Additional concerns relating to the conduct of the State of Illinois regarding the regulation of CAFOs are also included in the conclusion of this Petition.

I. ILLINOIS' NPDES PROGRAM OPERATION FAILS TO COMPLY WITH FEDERAL REQUIREMENTS.

Pursuant to ' 123.63(a)(2), a State's program qualifies for withdrawal when: i) the State fails to exercise control over activities required to be regulated, including failure to issue permits; ii) the State repeatedly issues permits which do not conform to federal requirements, and iii) the State fails to comply with public participation requirements. This petition satisfies the second criterion

for State program withdrawal because the State has failed to exercise control over activities to be regulated, including failure to issue permits under ' 123.63(a)(2)(i) and the State fails to conform to the CWA's public participation requirements under ' 123.63(a)(2)(iii).

A. Illinois fails to exercise control over activities required to be regulated, including failure to issue permits.

This Petition satisfies the second criterion for State program withdrawal pursuant to ' 123.63(a)(2)(i) because the IEPA is not exercising control over activities required to be regulated. This is because: i) the Agency has not conducted comprehensive inspections to determine which large industrial CAFOs discharge and therefore need permits; ii) the Agency is not issuing coverage under their General NPDES permit or individual permits; and iii) the Agency is not issuing permits to known dischargers. Since it is not issuing NPDES permits, it can not do inspections to determine whether NPDES permit requirements are being met. As a result, the State is failing to meet its legal obligation to protect waters of the State from CAFO related water pollution.

i) The IEPA has not conducted comprehensive inspections to determine which CAFOs need permits.

The CWA requires all point source dischargers to obtain and comply with an NPDES permit.[15] It prohibits the "discharge of a pollutant" by "any person" from any "point source" into waters of the United States except when authorized by a permit issued under the NPDES program.[16] The CWA specifically defines the term "point source" to include CAFOs.[17] Despite this clear mandate, Illinois has failed to issue permits to CAFOs that discharge into waters of the United States.

As of October 2001, there were an estimated 35,000 livestock facilities operating in Illinois.[18] It is unknown exactly how many of these meet the defining criteria of a CAFO under the NPDES program. To date, the State has not made a comprehensive survey of Illinois Animal Feeding Operations (AFOs) to determine which ones are point source dischargers. The IEPA only has an inventory of 30 percent of the estimated 500 Large CAFOs in the State[19] and conversations with EPA Region 5 officials have revealed that neither they, nor IEPA staff, have knowledge of the

15 33 U.S.C. § 1342(a).

16 Id. §§ 1311(a), 1342.

17 Id. § 1362(14). To be considered a CAFO, a facility must first be defined as an Animal Feeding Operation (AFO). 40 C.F.R. § 122.23(b) (2). An AFO means a lot or facility where the following conditions are met: "1) animals have been, are, or will be stabled or confined and fed or maintained for a total of 45 days or more in any 12 month period, and 2) crops, vegetation, forage growth, or post harvest residues are not sustained in the normal growing season over any portion of the lot or facility." Id. § 122.23(b) (1). An AFO may be considered a CAFO depending on its size and/or whether or not it discharges. Id. §122.23(b) (3).

18 Environmental Law Institute, State Regulation of Animal Feeding Operations: Seven State Summaries (2003), at 23, available at: <http://www.elistore.org/Data/products/d13-02a.pdf>.

19 EPA, Permitting for Environmental Results, NPDES Profile: Illinois (2004) at 11, available at: <http://www.epa.gov/npdes/pubs/illinois/_final_profile.pdf>.

actual whereabouts of the majority of AFOs in Illinois.[20] Without knowing where the facilities are located, the Agency cannot identify and inspect facilities to determine which ones discharge and therefore are subject to NPDES regulations. As such, the Agency is not exercising control over activities required to be regulated.

ii) The IEPA is not issuing coverage under Illinois' General NPDES Permit or individual permits.

In addition to the IEPA's failure to determine which facilities are subject to NPDES regulations, the Agency has failed to issue CAFO NPDES permits. Since 1977 the IEPA has only issued approximately 40 NPDES permits to CAFOs, all of which are presently expired.[21] Although some of the previously permitted facilities have been required to have permits because they either caused significant environmental harm as a result of large manure spills or they were cited for repeat violations, the Agency appears to have failed to renew their permits, reissue these permits, or grant coverage under the General Permit for CAFOs.[22] If these facilities are still operating, they are now doing so without being subject to NPDES permit monitoring and reporting requirements. Further, although the IEPA issued a revised General Permit in 2004,[23] not one facility has been issued coverage under it.[24] This is despite the fact that a number of facilities submitted permit applications.[25] Hence, as of this date, not one CAFO in Illinois has an active IEPA issued NPDES permit.

iii) The IEPA is not issuing individual or General Permit coverage to known dischargers and, as a result, not requiring regular inspections to determine compliance with NPDES program requirements and therefore can not conduct compliance inspections at large industrial CAFOs.

Beyond not issuing NPDES permits, the Agency has failed to require permits of known dischargers. According to the IEPA's 2001 Annual Livestock Investigation Report, 52 percent of the 240 livestock facilities surveyed by the Agency had one or more regulatory violations.[26] Of the facilities contacted/visited, the following sources of water pollution were documented:

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20 See Diamond supra note 12, at 190-191 (citing a communication with Steve Jann and Arnie Leder, Region 5 United States Environmental Protection Agency, January 5, 2006).

21 Documents obtained from the IEPA via the Freedom of Information Act (February 2008); see also Environmental Law Institute, supra note 18, at 23; Diamond, supra note 12, at 210 (citing a communication with Bruce Yurdin, IEPA Permits Division, March 11, 2005); .

22 Documents obtained from the IEPA via the Freedom of Information Act (February 2008).

23 IEPA, NPDES Permit No. ILA01 (2004).

24 Documents obtained from the IEPA via the Freedom of Information Act (February 2008).

25 Email message from Bruce Yurdin, IEPA Permits Division (October 30, 2007).

26 IEPA Bureau of Water, Illinois EPA Livestock Program, 2001 Livestock Facility Investigation Annual Report (2001), at 4, available at: <http://www.epa.state.il.us/water/cafo/reports/2001-livestock-annual.pdf>.

feedlots (63), pit discharges (8), lagoon overflows (16), intentional discharge/dumping (7), tile connections (2), manure stacks (13), field application (18), equipment failure (3) and other identified sources (22).[27] Although specific water pollution statistics are not available in the report, the identification of the actual sources of water pollution is indicative of the fact that that Illinois' CAFOs do discharge and that the CWA's goal of zero discharge has not been met. In fact, IEPA reports show that, on average, over 50 percent of the facilities that were either contacted or visited by the Agency from 1999 to 2005 had one or more regulatory violations.[28] A number of these facilities were found to be in violation for not having required NPDES permits and at least 23 facilities had discharges that resulted in documented fish kills. It is unknown exactly how many facilities had repeat violations; however, a two million gallon manure spill at a 1,200 head dairy in 1999 marked the fourth pollution violation by the same facility.[29]

When these facilities discharged, they were required to apply for NPDES permits as a matter of law. Despite this, the IEPA failed to issue any permits. As a result, these facilities are not subject to regular NPDES compliance inspection, monitoring, and reporting requirements. Further, they are not subject to the types of operation, maintenance and management requirements as they would be if they had effective NPDES permits. As such, the IEPA cannot adequately assess or ensure these facilities are operating in compliance with NPDES permit requirements.

The IEPA has improperly stated its intent to wait until EPA finalizes its 2003 CAFO Rule revisions in response to the Second Circuit's *Waterkeeper* decision before requiring CAFO dischargers to have NPDES permits.[30] Illinois is the only State in Region 5 that has not identified large industrial CAFOs that discharge and therefore require NPDES permits.[31] The CWA definitively prohibits all point source discharges unless the discharge is in compliance with an NPDES permit.[32] It should be noted that, although the *Waterkeeper* decision vacated the requirement in the EPA CAFO Rule that required CAFOs with the "potential to discharge" seek permit coverage,[33] the requirement that CAFOs with actual discharges seek NPDES coverage has never been questioned. The IEPA, however, has consistently failed to issue and maintain viable permits for CAFOs that have documented discharges.

Further, although the *Waterkeeper* decision invalidated the duty to apply requirement for "potential discharges," there remains in the NPDES regulations the duty to apply provision for point sources that "propose to discharge."[34] This duty applies to all point sources, including

27 Id. at 6.

28 See IEPA Bureau of Water, Illinois EPA Livestock Program, Livestock Facility Investigation Annual Reports (1999-2005), available at: <http://www.epa.state.il.us/water/cafo/reports/index.html>.

29 Clean Water Network, Spills & Kills: Manure Pollution and America's Livestock Feedlots (2000), at 20.

30 Statement made by IEPA officials at an April 9, 2007 meeting with concerned citizens.

31 See Diamond, supra note 12, at 213-219.

32 33 U.S.C. §§ 1311(a), 1342.

33 Waterkeeper Alliance, Inc. v. EPA, 399 F.3d 486 (2nd Cir. 2005).

34 40 C.F.R. § 122.21(a).

CAFOs. The EPA's 2006 proposed NPDES CAFO Rule revisions, which responded to the *Waterkeeper* decision, identified circumstances in which a CAFO may "propose to discharge."[35] These circumstances include: when production areas and containment structures are not designed, operated, and maintained to contain the discharge from a 25 year, 24 hour storm event, when a CAFO is located in close proximity to waters, and when a CAFO has had a discharge in the past and has not corrected the factors that caused the discharge to occur.[36]

It is unknown exactly how many facilities in Illinois "propose to discharge." However, it may be inferred from the IEPA's Annual Livestock Facility Investigation Reports noted above, that a significant number of CAFOs could fall under this category. A large percentage of facilities have had one or more regulatory violations, and a number of them were identified as sources of water pollution. If a facility is not designed, operated, or maintained to prevent discharges it may be defined as "proposing to discharge." Facilities that "propose to discharge" have a duty to apply for NPDES permits and the IEPA has a duty ensure they comply with permit requirements.

In summary, Illinois has failed assess how many CAFOs in Illinois are required to have NPDES permits, failed to issue permit coverage to CAFOs applying for NPDES permits, and failed to issue permits to those identified as requiring permits. Because unpermitted facilities are not subject to regular reporting and inspection requirements, the Agency can not adequately determine which CAFOs, if any, are operating in compliance with the NPDES program. As such, the State can not adequately exercise control over activities required to be regulated. Illinois' CAFO NPDES program operation thus fails to comply with federal requirements, satisfying the second criterion for withdrawal of its delegated authority under ' 123.63(a)(2)(i).

B. Illinois fails to comply with public participation requirements.

This Petition also satisfies the second criterion for State program withdrawal because Illinois' CAFO NPDES program operation fails to comply with the CWA's public participation requirements under ' 123.63(a)(2)(iii).

The CWA definitively states that "public participation in the development, revision, and enforcement of any regulation, standard, effluent limitation, plan, or program established by the Administrator or any State under this Act shall be provided for, encouraged, and assisted by the Administrator and the States."[37] The Act further provides that there be an "opportunity for public

35 EPA, Revised National Pollutant Discharge Elimination System Permit Regulation and Effluent Limitation Guidelines for Concentrated Animal Feeding Operations in Response to Waterkeeper Decision, 71 Fed. Reg. 37,749, 37,784 (proposed June 30, 2006) (to be codified at 40 C.F.R. pts. 122 and 412).

36 Id.

37 33 U.S.C. § 1251(e).

hearing" before any NPDES permit issues,[38] and that a "copy of each permit application and each permit issued under this section shall be available to the public,"[39] and that "any citizen" may bring a civil suit for violations of the Act.[40]

Because Illinois fails to issue and maintain viable NPDES permits for CAFOs it, by default, does not provide the public an opportunity to participate in the regulatory process. NPDES permits are critical to the CWA because they define discharger obligations and effluent limitation standards and, in the case of CAFOs, various management practices necessary to insure that discharges of manure and other pathogens to waters of the Unites States and the State of Illinois are minimized. Because the IEPA is not requiring facilities to apply for, or issuing viable permits, the public is being deprived of essential NPDES program implementation and enforcement data. By refusing to regulate CAFOs, the IEPA is denying the public reasonable access to information which should be made available under the provisions of the CWA.

Further, the CWA mandates that a "copy of each permit application…shall be available to the public."[41] Presently, the IEPA has a policy where the public has access to permitting information via the Freedom of Information Act (FOIA). On September 12, 2007 concerned citizens submitted a FOIA request to the IEPA seeking, among other documents, all pending CAFO NPDES permit applications. The IEPA responded to the request in a letter dated September 24, 2007. The letter provided a list of permit applicants and stated that the records would be made available to the requestor for inspection and/or copying at the IEPA headquarters by appointment. At the appointment, the IEPA FOIA Officer verbally denied the requestor access to the pending permit applications. The Officer stated that because the applications had not been approved by the Agency, they were not subject to the FOIA.

As noted, the CWA mandates that a "copy of each permit application…shall be available to the public."[42] Because the FOIA Officer verbally denied the requestor access to the pending permit applications, the IEPA violated this requirement. This account demonstrates that citizens have been denied reasonable access to permitting documents.

Because Illinois is not regulating CAFOs which discharge, it denies the public an opportunity to participate in the regulatory process. Furthermore, the State has denied citizens reasonable access to permit applications. The State is thus failing to "provide for, encourage, and assist the public" in participating in the NPDES CAFO program as required by the CWA. Because Illinois' CAFO program violates the public participation requirements of the CWA, the State's program operation meets the second criterion for withdrawal as set forth in ' 123.63(a)(2)(iii).

38 Id. § 1342(a)-(b).

39 Id. § 1342(j).

40 Id. § 1365(a).

41 Id. § 1342(j).

42 Id.

In summary, this Petition satisfies the second criterion for State program withdrawal pursuant to ' 123.63(a)(2) because the State of Illinois is failing to exercise control over activities required to be regulated and is failing to comply with the CWA's public participation requirements.

II. ILLINOIS' ENFORCEMENT PROGRAM FAILS TO COMPLY WITH FEDERAL REQUIREMENTS.

Pursuant to ' 123.63 (a)(3) a State program qualifies for withdrawal when its enforcement program fails to comply with federal requirements. Circumstances justifying withdrawal under this part include: i) failure to act on violations of permits or other program requirements; ii) failure to seek adequate enforcement penalties or to collect administrative fines when imposed, and iii) failure to inspect and monitor activities subject to regulation. This Petition satisfies the third criterion for State program withdrawal because the State has failed to monitor and inspect activities subject to regulation under ' 123.63(a)(3)(iii).

A. Illinois fails to inspect and monitor activities subject to regulation.

This Petition satisfies the third criterion for State program withdrawal because the IEPA fails to monitor and inspect activities subject to regulation under ' 123.63(a)(3)(iii).

A strong regulatory presence establishes a deterrent, which is a cornerstone of effective NPDES program implementation. To ensure regulations are abided by, authorized States must have and use means of monitoring and inspecting CAFOs for compliance. Accordingly, States are required to have "inspection and surveillance procedures to determine compliance or noncompliance with applicable NPDES permit requirements."[43] Specifically, federal law requires Illinois to maintain a program which is capable of making comprehensive surveys of all facilities and activities subject to the State Director's authority, and "a program for periodic inspections of the facilities and activities subject to regulation."[44] Illinois fails to comply with these requirements because the IEPA has not made a comprehensive survey of all AFOs to determine which ones are CAFOs which discharge and are therefore subject to regulation. As a result, the Agency has failed to inspect and monitor CAFOs subject to NPDES requirements. Further, by not issuing required permits the Agency by default is not monitoring and inspecting activities subject to regulation.

43 40 C.F.R. § 123.26(b)(1).

44 Id. § 123.26(b)(2).

The IEPA has not properly assessed all CAFOs in Illinois. The IEPA only has about four staff members conducting inspections of the estimated 35,000 livestock facilities in the State.[45] The IEPA does not know where the majority of these facilities are located, nor do they know which ones are polluting. Illinois has inventory information for only about 30 percent of the estimated 500 Large CAFOs in the State.[46] Conversations with EPA Region 5 officials have revealed that neither they, nor IEPA staff, have knowledge of the actual whereabouts of the majority of the facilities located throughout Illinois.[47] Inspections of non-permitted facilities are typically conducted in response to complaints.[48] Without knowing the location of the vast majority of livestock facilities in Illinois, the IEPA's surveillance procedures can not determine which facilities need to be regulated, let alone their compliance with the CWA. Accordingly, it is impossible for the Agency to adequately monitor and inspect facilities subject to NPDES requirements.

Illinois' enforcement program also fails to comply with the CWA because the IEPA is not issuing required permits, which by default means the Agency is not monitoring and inspecting activities subject to regulation.

Because the IEPA is unaware of the location of the vast majority of livestock operations in Illinois, the Agency is unable to assess which facilities are subject to regulation. Further, by not issuing required permits, the Agency is by default not adequately monitoring and inspecting facilities in accordance with NPDES requirements. Based on this, Illinois' enforcement program meets the third criterion for withdrawal under ' 123.63 (a)(3)(iii).

In summary, this Petition satisfies the third criterion for State program withdrawal pursuant to ' 123.63(a)(3) because the State of Illinois fails to inspect and monitor activities subject to regulation.

III. ILLINOIS' NPDES PROGRAM FAILS TO COMPLY WITH THE TERMS OF THE MEMORANDUM OF AGREEMENT REQUIRED UNDER '123.24.

Pursuant to ' 123.63 (a)(4) a State's NPDES program qualifies for withdrawal when it fails to comply with the terms of the Memorandum of Agreement required under '123.24. Illinois' NPDES program for CAFOs meets this criterion for withdrawal because the State has failed to comply with the Memorandum of Agreement between the IEPA and EPA Region 5.[49]

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45 See Diamond, supra note 12, at 208 (The IEPA affirmed this finding in a meeting with concerned citizens on April 9, 2007).

46 EPA, IL NPDES Profile, supra note 19, at 11.

47 See Diamond supra note 12, at 190-191 (citing a communication with Steve Jann and Arnie Leder, Region 5 United States Environmental Protection Agency, January 5, 2006).

48 Clean Water Network, supra note 29, at 20

49 National Pollutant Discharge Elimination System Memorandum of Agreement between the Illinois Environmental Protection Agency and the United States Environmental Protection Agency Region V (May 12, 1977).

Pursuant to the Memorandum of Agreement, the State is required to "[e]xpeditiously process and issue all required NPDES permits and provide ongoing, timely and adequate review of permits." Further, the corresponding Performance Partnership Agreements from 2005/2006 and 2006/2007 required the IEPA to review all CAFO permit applications and act upon those applications.[50] IEPA has failed to abide by these agreements.

According to a list of CAFO NPDES permit applicants included in the IEPA's response to the September 12, 2007 FOIA request, at least 16 facilities have submitted permit applications.[51] Because the IEPA failed to provide the requestor with these applications, it is unknown exactly when these permit applications were submitted and which ones have been acted upon. However, according to the documents received, four facilities that applied for permits from October 27, 2004 thru August 8, 2005 did not receive notice that their applications were determined to be incomplete submissions until April 16, 2007.[52] On average, it took the Agency between two and three years to begin to process these applications. It is unknown how many of the submitted applications are for facilities that discharge and/or propose to discharge. Hence, it is unknown how many facilities are presently operating and discharging without required permits. However, to date not one CAFO has active permit coverage. Thus, it is clear that the IEPA has failed to expeditiously process and issue permits as required under the Memorandum of Agreement. The Agency has also failed to meet its obligations under its corresponding Performance Partnership Agreements by failing to review and act upon all CAFO permit applications.

Because the IEPA has failed to expeditiously process and issue permits as required under the Memorandum of Agreement, and has failed to review and act upon all CAFO permit applications as required under the corresponding Performance Partnership Agreements, Illinois' NPDES program meets the fourth criterion for withdrawal under ' 123.63 (a)(4).

In summary, this Petition satisfies the fourth criterion for State program withdrawal pursuant to ' 123.63(a)(4) because Illinois' CAFO NPDES program fails to comply with the terms of the Memorandum of Agreement required under '123.24.

50 IEPA, FY 2006/2007 Performance Partnership Agreement Between Illinois EPA and Region 5, USEPA, at 55, available at: <http://www.epa.state.il.us/ppa/ppa-fy2006.pdf.> (visited January 25, 2008); IEPA, FY 2005/2006 Performance Partnership Agreement Between Illinois EPA and Region 5, USEPA, at 68, available at: <http://www.epa.state.il.us/ppa/ppa-fy2005.pdf.> (visited January 25, 2008).

51 Documents obtained from the IEPA via the Freedom of Information Act (September 2007).

52 Documents obtained from the IEPA via the Freedom of Information Act (February 2007).

CONCLUSION

For the forgoing reasons, Illinois Citizens for Clean Air and Water request that EPA take immediate action to notify the State of Illinois of its ongoing violations of the CWA, and request that EPA withdraw its approval of Illinois' NPDES program and take other actions as are necessary and appropriate.

ADDITIONAL CONCERNS

ILLINOIS WILL NEED TO REVISE ITS CAFO NPDES PERMITTING SCHEME TO COMPLY WITH THE CWA.

Illinois will need to revise its CAFO NPDES permitting scheme to comply with the CWA. The terms of nutrient management plans must be made part of Illinois' General Permit for CAFOs, as well as any individual permits. Nutrient management plans must also be made available to the public.

The CWA unequivocally provides that all applicable effluent limitations must be included in each NPDES permit.[53] The *Waterkeeper* decision held that the terms of nutrient management plans constitute effluent limitations and thus, by failing to require that the terms of the nutrient management plans to be included in NPDES permits, the EPA CAFO Rule violated the CWA.[54] At present, Illinois' General Permit is not in compliance with the CWA because the nutrient management plan is not incorporated into its terms. Although the permit requires a nutrient management plan as a condition for application,[55] the nutrient management plan is not incorporated into the permit itself. The terms of nutrient management plans must be made part of the General Permit, as well as any individual permit, in order to be consistent with the requirements of the CWA.

Further, the CWA definitively states that "[p]ublic participation in the development, revision, and enforcement of any regulation, standard, effluent limitation, plan, or program established by the Administrator or any state under this Act shall be provided for, encouraged, and assisted by the Administrator and the States."[56] The Act further provides that there be an "opportunity for public hearing" before any NPDES permit issues,[57] and that a "copy of each permit application and each permit issued under this section shall be available to the public,"[58] and that "any citizen" may bring a civil suit for violations of the Act.[59]

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53 33 U.S.C. §§ 1311(a)-(b), 1342(a).

54 Waterkeeper Alliance, Inc. v. EPA, 399 F.3d 486, 502 (2d Cir. 2005).

55 IEPA, NPDES Permit No. ILA01, Special Condition 5(e)(iv) (2004).

56 33 U.S.C. § 1251(e).

57 Id. § 1342(a)-(b).

58 Id. § 1342(j).

59 Id. § 1365(a).

Illinois' permitting scheme provides no assurance that the public will have a meaningful role in the implementation of the CWA because it not only fails to incorporate the terms of nutrient management plans into actual permits, but it fails to provide the public with any other means of access to them. The General Permit merely requires that a copy of the CAFOs site-specific nutrient management plan be included with the facility's best management practices plan, which is to be maintained on site for the term of the permit and for a period of five years after its expiration.[60] The permit does not require that copies of the nutrient management plans be made available to the public. In order for the public participation requirements to be in compliance with the CWA, Illinois will have to include the terms of nutrient management plans in NPDES permits and allow the public to assist in the development, revision, and enforcement of such effluent limitations.[61]

Respectfully submitted,

Illinois Citizens for Clean Air & Water

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60 IEPA, NPDES Permit No. ILA0, Special Condition 5(e) (2004).

61 33 U.S.C. § 1251(e).

Attachment 5:
Supplement to the Petition was filed by ICCAW and the Environmental Integrity Project, February 20, 2009

ILLINOIS CITIZENS FOR CLEAN AIR AND WATER/
ENVIRONMENAL INTEGRITY PROJECT

February 20, 2009

Via certified mail and email
Tinka Hyde, Director
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RE: Supplement to the Petition to Withdraw the Illinois NPDES Program

Dear Director Hyde:

This letter is intended to supplement evidence for the Illinois Citizens for Clean Air & Water (ICCAW)/Environmental Integrity Project (EIP) Petition for Withdrawal of the National Pollutant Discharge Elimination System (NPDES) Program Delegation from the State of Illinois, which was filed on March 27, 2008. We appreciate the opportunity to provide the U.S. EPA with this additional information which has come to our attention subsequent to filing the original Petition.

We direct your attention to ongoing official neglect by the State of Illinois to adequately administer the Federal Clean Water Act's (CWA) NPDES program for Concentrated Animal Feeding Operations (CAFOs). This official neglect is evidenced by continued water pollution and fish-kills caused by unregulated discharges from CAFOs.

For example, this past April, the Dennis Anderson Swine Farm in Bureau County illegally discharged 750,000 gallons of waste into the Bureau Creek, killing untold numbers of fish. Additionally, CAFO discharges have caused at least three separate fish-kills in Henderson County alone in the past year. *See* Bergin, Nick, Burlington Iowa Hawkeye (September 1, 2008), *available at*: <http://www.thehawkeye.com>. In August, a discharge from SF Ventures, LLC, a newly constructed 10,000-head hog facility, resulted in a fish-kill and the contamination of the Deep Run Creek, a tributary to the Mississippi.

In addition to continued pollution events, there are concerns that the State of Illinois is allowing the operation of many new and expanding CAFOs that do not meet CWA NPDES standards. For example, a number of newly constructed facilities are suspected to have the same design as the facility that caused the fish-kill in the Deep Run Creek. At least three additional facilities under SF Ventures LLC ownership have been identified as having the same "obvious design flaw" in their manure holding ponds. *See* Illinois Attorney General, Press Release (October 3, 2008), *available at*: <http://www.illinoisattorneygeneral.gov>. This has raised concerns that their manure ponds could soon fail in a similar manner. There may also be a number of additional new facilities of the same design now in operation in Henderson County under different ownership. These facilities propose to discharge because they lack sufficient containment to comply with CWA and NPDES program requirements.

Once a CAFO has a discharge, or a proposed discharge, it is required to have an NPDES permit as a matter of law. *See* 33 U.S.C. §§ 1311(a), 1342(a), *see also* 40 C.F.R. § 122.21(a). This is an obligation under the CWA's existing 30+ year old requirements, as well as under revised NPDES standards for CAFOs. *Id.*, *see also* 73 Fed. Reg. 70418 at 70480 (November 20, 2008) (to be codified at 40 C.F.R. § 122.23 (d) (1)). Despite this clear mandate, it is suspected that none of the above described CAFOs are operating with required NPDES permits. This includes CAFOs that discharge, as well as those with inadequate designs that propose to discharge.

We assert that continued pollution events are the direct result of the Illinois Environmental Protection Agency's (IEPA) failure to exercise proper NPDES regulatory oversight over CAFOs. This problem has been exacerbated by the IEPA's ongoing neglect to adequately respond to citizen concerns. The Agency has historically neglected to address CAFOs which can discharge, waiting instead until they do discharge and cause a fish-kill or other pollution incident. The Agency also fails to adequately respond to citizen complaints regarding discharging facilities. Specific instances of these are discussed below.

The IEPA's Failure to Exercise Proper Regulatory Oversight over CAFOs

The IEPA continues to neglect its responsibilities under the CWA by not exercising proper regulatory oversight over CAFOs. Even since the filing of the ICCAW/EIP Petition on March 27, 2008, the Agency has failed to make a comprehensive survey of livestock facilities in Illinois to determine which ones are subject to CWA NPDES requirements. In fact, there appears to be no standard in place whereby the IEPA reviews the siting and design of new and expanding facilities to determine if they require NPDES permits. The Agency has also failed to issue permits to those facilities that require them. As a result, virtually all existing and new CAFOs in Illinois are unregulated. This problem has been exacerbated by the Agency's continued neglect to adequately respond to citizen complaints and concerns. The result has been continued illegal discharges and increased water pollution from CAFOs.

Failure by the IEPA to Adequately Respond to Citizen Concerns

The IEPA has continually failed to adequately respond to citizen concerns. This is evidenced by: 1) the Agency's neglect to meaningfully evaluate "proposed discharges" from CAFOs in response to citizen requests, and 2) the Agency's neglect in adequately responding to citizen complaints regarding "discharging" facilities.

Neglect to Meaningfully Evaluate
"Proposed Discharges" in Response to Citizen Requests

The IEPA has neglected to meaningfully evaluate "proposed discharges" from CAFOs in response to citizen requests. The proposed Traditions South Dairy of Jo Daviess County is a case in point. As noted by Helping Others Maintain Environmental Standards (HOMES) in their letter submitted to EPA on November 11, 2008, the Illinois Department of Agriculture (IDOA) approved construction plans for the 5,000+ head dairy facility despite serious

concerns over the risks it posed to surface and related ground water. Sam Panno, a senior geochemist and groundwater geology expert with the Illinois State Geological Survey, as well as many other experts, warned of the risks posed by the facility. Of significant concern is: 1) the location of 40+ acres of clay lined earthen waste holding ponds (with an anticipated leakage rate of 400 to 600 gallons per acre per day when half full) atop a spring fed creek leading to waters of the United States, and 2) the location of the facility in a sensitive karst aquifer with a direct hydrological connection to adjacent surface waters.

Although Illinois law provides certain environmental safeguards for the siting of large-scale livestock facilities in such locations, the IDOA approved plans for the facility, which failed to meet these standards:

- In violation of 35 Ill. Adm. Code 501.402 (a), the proposed facility contains a stream within its boundaries;

- In violation of 35 Ill. Adm. Code 506.312 (a), the facility is not designed to prevent seepage into groundwater, and

- In violation of 35 Ill. Adm. Code 506.312 (b), the facility is not designed to utilize a rigid material such as concrete or steel.

While the IDOA failed to consider these apparent violations in issuing the construction permit for the facility, the IEPA has the responsibility "to *prevent* (emphasis added) pollution caused by failure to plan the construction, location and operation of [livestock operations] with regard to proper environmental safeguards." Ill. Admin. Code tit. 35 § 501.102(e) (1991). Despite this responsibility, the IEPA has failed to adequately respond to, and appropriately deal with, concerns relating to the water pollution risks posed by the facility.

For example, HOMES member, Ken Turner, submitted a series of requests to the IEPA asking that the facility be required to apply for an NPDES permit on April 30, 2008, May 11, 2008, and June 14, 2008. *See* Exhibit A, parts 1-3 (attached). The IEPA denied his initial request on May 5, 2008, stating that the Agency was awaiting clarity on the federal level as to which CAFOs should be required to have NPDES permits in response to the Second Circuit's decision in *Waterkeeper Alliance, Inc., v. EPA*, 399 F.3d 486 (2d Cir. 2005). *See* Exhibit B (attached). It was further stated that the Agency was focusing its resources on discharging facilities discovered mainly through complaint investigations. *Id.*

The IEPA's position that it must await clarity on the federal level holds little weight. Applicable 30+ year old permitting requirements, which require dischargers and "proposed" dischargers to apply for NPDES permits, have never been called into question, and have remained in effect. *See* 40 C.F.R. § 122.21(a). Furthermore, the *Waterkeeper* Court pointed out that there is "ample reason to consider imposing a mandatory duty to apply upon Large CAFOs...to effectively regulate water pollution...given that they are important contributors and that they have, historically at least, improperly tried to circumvent the permitting process." *Waterkeeper*, at footnote 22.

Regardless of the IEPA's reasoning for denying the requests, it appears that the IEPA's determination to not require an NPDES permit was made absent any meaningful evaluation of the plans for the proposed facility. According to an IEPA response to a Freedom of Information Act (FOIA) request, submitted by HOMES member, Bern Colleran, on August 1, 2008, the Agency had no records or documents whatsoever on file relating to the Traditions South proposal. *See* Exhibit C, parts 1-5 (attached).

Assuming that the IEPA wasn't improperly withholding information from the public in violation of the FOIA, the absence of any records, documents, or correspondence relating to the facility, indicates that the determination ***not*** to require Traditions South to apply for an NPDES permit was a decision made without even a basic factual investigation of the proposal.

The IEPA's determination not to require an NPDES permit application from Traditions South should be considered in light of the U.S. EPA's newly issued 2008 CAFO Rule enacted in response to the *Waterkeeper* decision. *See* 73 Fed. Reg. 70418 at 70480 (November 20, 2008) (to be codified at 40 C.F.R. § 122.23 (d)(1)). The Rule provides additional clarification as to when a CAFO "proposes to discharge" and should be required to apply for an NPDES permit. This includes when a CAFO is not "designed" or "constructed" for zero discharge. *Id.*, at 70480-01.

In applying this standard, the IEPA should be evaluating construction and design plans for CAFOs to evaluate whether or not they should be required to apply for NPDES permits. Thus, there appears to be little justification for the IEPA's failure to review the proposed construction site and design plans for Traditions South in response to citizen concerns.

This account demonstrates Illinois' failure to exercise proper regulatory oversight over CAFOs under the NPDES program, which has been exacerbated by the IEPA's failure to adequately respond to citizen concerns. Although the IEPA should be evaluating proposed new and expanding facilities to determine if they require NPDES permits, the Agency has refused to do this in at least one case without even a basic factual investigation of the facility.

It is unreasonable for the IEPA to ignore concerns by the public and to wait until catastrophic damage occurs before evaluating the necessity of a discharge permit. By only pursuing enforcement actions for "discharging" facilities, the IEPA is doing nothing to "prevent" water pollution, the stated purpose of both Illinois' federally approved NPDES implementing regulations and the CWA. Further, by not requiring NPDES permit applications from "proposed dischargers," the public has limited access to important permit information such as nutrient management plans to ensure the CWA's effluent limitation guidelines are met.

Neglect to Adequately Respond to
Citizen Complaints Regarding "Discharging" Facilities

The IEPA's failure to adequately respond to citizen concerns is also evidenced by the Agency's neglect to appropriately respond to citizen complaints regarding "discharging"

facilities. Although the IEPA has stated that it is "focusing its resources on discharging CAFOs discovered mainly through complaint investigations" (*See* Exhibit B), this does not appear to be the case.

If the IEPA is "focusing" its resources on discharging CAFOs discovered through complaints, it might be assumed that this focus would include routine follow-up investigations of facilities in response to such complaints. The following accounts suggest that this is not occurring.

Take for example the previously mentioned SF Ventures, LLC discharge into the Deep Run Creek that caused the fish-kill in August of 2008. According to reports from citizens, an anonymous complaint about the facility was actually filed ten days prior to the fish-kill. Although this complaint alerted the IEPA to the problems at the facility well in advance, an investigation of the facility was not conducted by the IEPA until after the fish-kill occurred. This kind of retroactive action is unacceptable. Had the IEPA adequately responded to the initial complaint ten days prior, the fish-kill may have been avoided.

Another example is the IEPA's response to a complaint that was filed on September 15, 2008 by Schuyler County citizens. The complaint warned of suspected discharges into the Sugar Creek from a 6,000 to 8,000-head farrow to finish hog CAFO. The complaint provided compelling evidence that run-off from dead hog carcasses located in the facility's production area was discharging into the Sugar Creek. *See* Exhibit D (attached). (The Sugar Creek is located just west of the facility and approximately 1000 feet down-slope from the production area where the carcasses were located.)

The IEPA's response to this complaint, involved reviewing "the dead animal handling procedures that the facility utilizes with a facility representative." *See Id.*, Exhibit D. By "reviewing" these procedures with a facility representative, the IEPA was apparently able to make a determination that a follow-up investigation was unnecessary. According to the individual that filed the complaint, there was no further investigation of the facility or enforcement action taken.

Although the IEPA has claimed that it is "focusing its resources on discharging facilities discovered mainly through complaints" (*see* Exhibit B), the Agency does not appear to be conducting timely complaint investigations on a routine basis. So long as the IEPA continues to implement its CWA regulations for CAFOs in an "after-the-fact" manner by only stepping in after discharges occur, widespread pollution problems from CAFOs will persist. The August 2008 discharge from the Henderson County CAFO demonstrates this.

Conclusion

ICCAW and EIP maintain that Illinois is not administering and enforcing the CWA effectively, and that the action sought by the Petition for Withdrawal of the State of Illinois' NPDES Program Delegation is justified. The IEPA continues to fail to exercise proper NPDES regulatory oversight over CAFOs. This problem has been exacerbated by the Agency's ongoing neglect to adequately respond to citizen concerns. (*The attached Exhibits provide specific examples of this.*) So long as these inadequate regulatory policies remain,

CAFO pollution problems in Illinois will persist.

It is unreasonable for the IEPA to wait until the State completely revises its CWA regulations in response to the *Waterkeeper* decision before regulating CAFOs with NPDES permit requirements. These requirements have been in place, and have remained unchanged, for 30+ years. Further, regardless of the rule changes in the 2008 CAFO Rule, the IEPA's position can't be that the CWA doesn't apply unless citizens can show repeated discharges from the same facility. This position is untenable because it places everyone in the position of having to wait until groundwater, rivers, and streams are irreparably damaged before permit requirements kick in. This is essentially "closing the barn door after the manure is already out."

The facilities identified herein should be required to have permits that comply with NPDES requirements. If the State of Illinois will not see to this, the U.S. EPA should take enforcement action and require permit applications and compliance.

Thank you for your consideration.

Respectfully,

Danielle Diamond, Counsel
Illinois Citizens for Clean Air & Water
181 Illinois Street
Crystal Lake, IL 60014
ddiamond@iccaw.org
815-403-0278

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Encl.

Cc: *via email*
Matthew Gluckman, USEPA Region 5
Eric Schaeffer, Executive Director EIP
Dr. Kendall Thu, Representative ICCAW
Karen Hudson, Representative ICCAW
Douglas P. Scott, IEPA Director
Marcia Willhite, IEPA Bureau of Water Chief

ICCAW/EIP PETITION SUPPLEMENT
LIST OF EXHIBITS

Exhibit

A Series of requests to the IEPA asking that the Traditions South facility be required to apply for an NPDES permit

Part 1 – Letter to Douglas P. Scott, Director of IEPA from Ken Turner, H.O.M.E.S., April 30, 2008

Part 2 – Letter to Douglas P. Scott, Director of IEPA from Ken Turner, H.O.M.E.S., May 11, 2008

Part 3 – Letter to Douglas P. Scott, Director of IEPA from Ken Turner, H.O.M.E.S., June 14, 2008

B Response Letter from IEPA Director Douglas P. Scott to Ken Turner regarding the Traditions South NPDES permit request, May 9, 2008

C FOIA request submitted to IEPA by Mr. Bern Colleran, H.O.M.E.S., regarding the Traditions South facility and IEPA responses

Part 1 – FOIA request, submitted to IEPA by Bern Colleran, H.O.M.E.S, August 1, 2008

Part 2 – IEPA response from Janet Christer, FOIA Coordinator, Records Unit, Bureau of Water, August 6, 2008

Part 3 – IEPA response from Michael J. McCabe, Freedom of Information, Division of Legal Counsel, August 19, 2008

Part 4 – IEPA response from Ed Bakowski, Manager Permit Section-Acting, Division of Air Pollution Control, August 4, 2008

Part 5 – IEPA response from Carolyn Wright, Office of Emergency Response, FOIA Coordinator, August 4, 2008

D Email complaint filed by Schuler County citizens regarding suspected production area discharges from Large CAFO into the Sugar Creek, September 15, 2008, and IEPA response, September 16, 2008

To: douglas.scott@illinois.gov, dan.heacock@illinois.gov, al.keller@illinois.gov
From: Kenneth Turner/D211
Date: 04/30/2008 09:25AM
cc: gluckman.matthew@epa.gov, berman.michail@epa.gov, jmcbride@atg.state.il.us, lmadigan@atg.state.il.us, kturner@d211.org
Subject: NPDES Permit application required, megadairy

Director, IEPA

Douglas Scott,
The attached letter was sent to members of your department, April 21, 2008, requesting that an NPDES permit application be requested from the Traditions Dairies, North and South Facilities, proposed for Jo Daviess County. The attached letter demonstrates clearly that such a permit is required for the proposed facility. It is my most sincere hope that you will use the authority of your office to facilitate an urgent request to those responsible at these facilities.

I urge you to send a registered letter reminding AJ Bos (owner) and Terry Feldmann (project engineer) that they are required to submit an application for an NPDES permit 180 days prior to commencing operations. Their addresses are below:

A.J. Bos
10600 Rycroft Way , Bakersfield , CA 93311

Terry Feldmann, Project engineer,
Maurer Stutz, Inc
7615 N. Harker Drive , Peoria , IL 61615

I hope you will see the need to require application for an NPDES permit immediately. Please let me know if there is any further information that you require. I thank you for your urgent attention and effort in this required task of the IEPA.

Sincerely,
Ken Turner
415 Park
Warren , IL

(see letter on next page)

Illinois Environmental Protection Agency

Dear IEPA,
As a clear and certain part of your duty to "safeguard environmental quality" thereby "protecting health, welfare, property, and the quality of life" in Illinois (IEPA Mission Statement), I ask that you require the application for an NPDES permit from the Traditions Dairies LLC, North and South Facilities; the large CAFO's proposed for Jo Daviess County in Northwestern Illinois. As you may know, this proposed megadairy will be the largest of its kind in Illinois. Certainly that fact alone warrants caution on the part of those who would permit this facility in Illinois. But beyond that, there are three compelling reasons for requiring the application for an NPDES permit.

First, IEPA requires all new large CAFO's to apply for an NPDES permit. "If you are a completely new CAFO, you must apply for a NPDES permit 180 days prior to operating. Example: You open new facilities on a new site." (IEPA regulations) Testimony given at the public hearing in Warren on January 10, 2008 clearly stated that both facilities were going to exceed the amount required to qualify for the EPA designation as "large CAFO". The Clean Water Act requires this permitting process. As the IEPA is the local body that bears this authority, the IEPA is required to act. Thus the IEPA shall require the application for an NPDES permit from the proposed facility.

Secondly, any facility that proposes to discharge to waters of the US is required to apply for an NPDES permit. Both facilities are in the watershed of the Apple River, as the Wolf Creek which leads to the Apple River is present in both sites, furthermore, the proposed North facility will position its waste lagoons on top of Wolf Creek. Wolf Creek meets the definition of "waters of the US", as these include "All other waters such as intrastate lakes, rivers, streams (including intermittent streams), ... the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including and such waters: 1) which are or could be used by interstate of foreign travelers for recreational or other purposes..." The Apple River Canyon State Park will be affected by any waste discharged to Wolf Creek. Apple River Canyon State Park has tens of thousands of visitors per year. Many of those are out-of-state visitors who use the park for fishing, etc. Some might claim that there will be no discharge. That is a false claim, and the people who make it should be chastised either for their ignorance, or for their willful efforts to hide the truth. In "Do Earthen Structures Leak?", Manure Matters, 1998 by Dennis Schulte of the UNL Department of Biological Systems Engineering , Schulte states, "the simple answer is yes." and goes on to discuss the how, the why, the etc. of the leaks. In "Field Performance of Compacted Clay Liners" by Craig H. Benson, 1999, the author shows that <u>all</u> of the 85 waste lagoons studied leak and he compares their field performance with the design expectations. It was expected that they would leak. The unexpected part was that only 74% of the 85 met the performance standard designed for the lagoons. In "Seepage Losses From Animal Waste Lagoons: A Summary of a Four-Year Investigation in Kansas" by J. M. Ham in 2002, the author studies 20 lagoons and measures the rate at which they leak. It is not surprising to the author that they leak. <u>They all leak</u>. Furthermore, the average leak from the cattle feedlots surveyed is 385 kg/Ha/yr. That is the same as 155.804 kg/acre/yr, or for each of the two proposed facilities, more than 11,678 pounds of waste per year. Certainly, this qualifies as a

discharge! Each of these studies is done on the same type of manure storage lagoon that has been proposed for the megadairies in Jo Daviess County. These storage facilities are actually designed to discharge. These facilities propose to discharge to waters of the US. Again, the IEPA must require these facilities to apply for an NPDES permit.

Finally, if a facility should "threaten to cause pollution" the facility must apply for an NPDES permit, again, quoting the statute,

> "No person shall: (a) Cause or threaten or allow the discharge of any contaminants into the environment ...so as to cause or tend to cause water pollution in Illinois...(f) Cause, threaten or allow the discharge of any contaminant into the waters of the State, as defined herein...without an NPDES permit for point source discharges issued by the Agency under Section 39(b) of this Act." (A CAFO is defined as a point source discharge.)

As so many of these large CAFO's have spills, leaks, and other mishaps; this proposed CAFO is a threat to cause pollution. There was a spill at Stone Ridge Dairy in 2004, the only other large dairy CAFO in the state. There was a spill at the Country Aire Farms Dairy in Wisconsin in 2008. Documented problems in Oregon go back for years, including the fine imposed in 1999 by the EPA. The spill in Walkersville, Maryland in 2008 contaminated the municipal drinking water for months. The EPA has records of many, many of these episodes, all over the country. No one expected or anticipated these spills. But when they occur with so great a frequency, it is time to anticipate their consequences. These facilities threaten to cause discharge of contaminants into the environment. They are required to apply for an NPDES permit.

Each of these three cases requires the proposed projects to apply for an NPDES permit. When you consider that the State Geologist has stated that the proposed site is located on "Karst" and "It is the aquifer that is key. Groundwater flowing through a karst aquifer can travel miles per hour, whereas, groundwater flowing through a sand and gravel aquifer may travel feet per year. In a karst aquifer, surface-borne pollutants (e.g., a spill or seepage of animal waste) can contaminate wells miles away from the source in a matter of hours.", you must conclude that not requiring an NPDES permit would be an omission with grave consequences.

In summary, the proposed facilities are new, large CAFO's, and are therefore required to apply for an NPDES permit. They propose to discharge to waters of the US, and are therefore required to apply for an NPDES permit. They threaten to cause water pollution in Illinois and are therefore required to apply for an NPDES permit. As the State of Illinois NPDES permitting arm of the United States Environmental Protection Agency, it is your job, but as the arm of government that will ensure the protection of the environment and the safety of its citizens, it is an obligation you must pursue with vigor. It is a mandate given to your place in the government for the benefit of us today, and our children tomorrow. After all, "Each of us has the responsibility to protect the environment- not just for our quality of life today, but for the generations to come." Douglas P Scott, Director IEPA. You must require an application for an NPDES permit from the proposed Traditions Dairies facilities, North and South.

I anticipate hearing from you immediately on the status of requiring these applications. It is a matter of utmost urgency and critical in its implications for the environment and the citizens of Illinois.

Sincerely,
Ken Turner
Warren, IL
H: 815-745-9013
W: 847-755-4816

To: doug.scott@illinois.gov, lisa.bonnett@illinois.gov, karen.a.cox@illinois.gov
From: Kenneth Turner/D211
Date: 05/11/2008 07:57PM
cc: gluckman.matthew@epa.gov, berman.michael@epa.gov, jmcbride@atg.state.il.us
Subject: proposed megadairy, Jo Daviess

Mr. Scott,
Please find an attached letter that documents my continuing concerns with the proposed megadairy.

Thank you for your continuing efforts,
Sincerely,
Ken Turner
Warren, IL

(see letter on next page)

Douglas P. Scott
Director
Illinois Environmental Protection Agency

May 11, 2008

Dear Mr. Scott,

Thank you so much for your letter of May 9, in response to my e-mail of April 30. I certainly appreciate your efforts to bring further resolution to the required NPDES permit application from Traditions Dairies LLC, a facility proposed for Jo Daviess County and that is currently being reviewed by the Illinois Department of Agriculture for compliance with design/construction requirements of the Livestock Management Facilities Act (LMFA).

Thanks to your efforts, I see that although the facility is designed to contaminate the groundwater, that by itself is no reason to require an application for the NPDES permit. Apparently, pollution and/or contamination of the surface water, waters of the United States, would require an NPDES permit; whereas pollution and/or contamination of groundwater has no such requirement. To re-state what you wrote, groundwater contamination will become a matter for the Illinois EPA's enforcement program after it occurs. No need or requirement for an NPDES permit before that contamination occurs. (Please remember that the USDA Natural Resources Conservation Services standard for this kind of lagoon allows a seepage rate of more than 0.25 inches/day. This translates to 6,800 gallons/acre/day, or for the total area of the proposed site, **462,400** gallons/day! This is NOT "zero discharge".) You stated in your letter, "Any failure of the lagoon system and release into groundwater would become a matter for Illinois EPA's enforcement program." Failure...? The 462,400 gallons/day will not be a failure- it is allowed by the standard of the USDA. The lagoons are permitted this rate of contamination of the groundwater. According to your statements, then, you are saying that no compliance with an NPDES permit application is required because they are releasing up to 462,400 gallons/day into the groundwater, not "waters of the United States". It seems to me that the statement in 415 ILCS 5/39 (b), "the agency may issue an NPDES permit... within the jurisdiction of the state, or into any well" applies. It would be hard to convince people that the IEPA were doing its job if they were unable to prevent a specific point source pollution of a well from occurring. Also, 415 ILCS 5/11 (c) , states, "The provisions of this act... pursuant to an NPDES program shall not be construed to limit, affect, impair, or diminish the authority... of the agency... to regulate and control pollution of any kind." There is comfort in those words. The cool, calm, and collected comfort that the IEPA has the authority, even the obligation, to control this pollution of the wells and ground water in the area of the proposed megadairy. I am certain you did not mean to state that the agency was powerless to request an application from the project. Surely you did not mean that the agency must wait for the pollution to happen. Such convoluted reasoning would be incredible and possibly illegal. I find it extremely difficult to believe that this kind of certain contamination can only be stopped after it happens. I would think a "Protection" agency would have some means to actually protect the citizens and environment from this pollution before it occurred, that is why the NPDES permitting regulations were written.

Still, if the NPDES permit is only required if the CAFO is discharging or proposing to discharge to "waters of the United States", then the NPDES permit is still required. This part of the act still

stands. As I stated in my previous letter, the Wolf Creek, which leads to the Apple River is present in both sites. Furthermore, the proposed North facility will position its waste lagoons on top of Wolf Creek. Wolf Creek leads to Apple River. Apple River is the central feature of Apple River Canyon State Park with many, many visitors, hikers, campers, and fishermen from this state and others. Wolf Creek is a "waters of the United States". Furthermore, there is a permanent spring in the site that feeds groundwater from the site directly into the creek. I believe this is what is considered a "significant nexus" to waters of the United States. The seepage, leakage, spillage into groundwater will contaminate the wells, the spring, and the Wolf Creek. The Traditions Dairies proposes to discharge to them. Not all of the seepage, run-off, etc. is going into groundwater. Some of the South facility contamination and much of the North facility is going to the surface water, the "waters of the United States". The Traditions Dairies LLC proposes to discharge to waters of the United States. I think that is very clear. It is unsettling that this very clear point was not even mentioned in your letter of May 9, 2008. If Traditions Dairies proposes to discharge to waters of the United States, they are required to submit an application for an NPDES permit.

Furthermore, if a facility should "threaten to cause pollution", the facility must apply for an NPDES permit. Again, "No person shall: (a) Cause or threaten or allow the discharge of any contaminant into the environment... so as to cause or tend to cause water pollution in Illinois...(f) Cause threaten or allow the discharge of any contaminant into the waters of the State, as defined herein... without an NPDES permit for point source discharges issued by the Agency under Section 39(b) of this Act" (A CAFO is defined as a point source discharge.) Allow me to describe the threat. Any state that has a history with these facilities will provide ample description- I have chosen Iowa. Between 1992 and 2004 there were more than 450 manure spills from CAFO's. 2/3 of those reached surface waters of the state, killing over 2.6 million fish. IDNR estimated that the volume of manure released from just 23 of the total documented spills exceeded a staggering 4.4 million gallons. Mr. Scott, the threat to cause pollution is real and documented. This is the kind of documentation that will hold in a court of law. The Traditions Dairies project is a threat to cause pollution and must apply for an NPDES permit.

As an aside, I am glad that the IEPA worked closely with the IDOA as they established the design standards for these structures in the LMFA and suggested protective construction requirements for lagoons placed in areas known to contain karst. Yes, the IDOA has the statutory responsibility to assure that the proposed design and construction meet these requirements. What a pity the IDOA is choosing to ignore these standards. But this is all the more reason for the IEPA to play a more active role than that currently chosen.

Traditions Dairies proposes to discharge to waters of the United States and threatens to cause water pollution in Illinois. They are required by law to apply for an NPDES permit. You are the director of the Illinois Environmental Protection Agency, and it is your responsibility to require this application. I hope you will immediately require the application of an NPDES permit for the proposed megadairies. Your dereliction of this duty will have the most severe of consequences.

Very truly yours,
Ken Turner
Warren, IL

To: doug.scott@illinois.gov, al.keller@illinois.gov
From: Kenneth Turner/D211
Date: 06/14/2008 01:37PM
cc: gluckman.matthew@epa.gov, berman.michael@epa.gov, lmadigan@atg.state.il.us, jmcbride@atg.state.il.us
Subject: mega dairy woes and NPDES

Dear Director Doug Scott,

I have still had no response to my request for further clarification on whay an NPDES permit had not been required from the Traditions Dairies group in Jo Daviess County (May 11). If you were waiting for the Department of Agriculture to grant them permission, that happened on May 30. It is time to require application for the NPDES permit. They propose to discharge to "waters of the United States".

Please read the attached letter and act as swiftly as possible. I await your response.

Thanks for your time and efforts!
Ken Turner

(see letter on next page)

Douglas P. Scott
Director
Illinois Environmental Protection Agency

Dear Mr. Scott,

Thank you so much for your letter of May 9, in response to my e-mail of April 30. I certainly appreciate your efforts to bring further resolution to the required NPDES permit application from Traditions Dairies LLC, a facility proposed for Jo Daviess County and that is currently being reviewed by the Illinois Department of Agriculture for compliance with design/construction requirements of the Livestock Management Facilities Act (LMFA). I still have not heard your response to my letter of May 11.

Apparently a facility that will contaminate the groundwater, is no reason to require an application for the NPDES permit. Pollution and/or contamination of the surface water, waters of the United States, would require an NPDES permit; whereas pollution and/or contamination of groundwater has no such requirement. (Please remember that the USDA Natural Resources Conservation Services standard for this kind of lagoon allows a seepage rate of more than 0.25 inches/day. This translates to 6,800 gallons/acre/day, or for the total area of the proposed site, **462,400** gallons/day! This is NOT "zero discharge".) I know that, "Any failure of the lagoon system and release into groundwater would become a matter for Illinois EPA's enforcement program." Failure...? The 462,400 gallons/day will not be a failure- it is allowed by the standard of the USDA. The lagoons are permitted this rate of contamination of the groundwater. They may only leak 1,000 – 1,300 gallons/acre/day. According to an engineer I have correspondence with, that would be a typical seepage rate for the type of pond plan that has been submitted. I can easily enough give you my sources for any of the information I have written. According to your statements, then, you are saying that no compliance with an NPDES permit application is required because they are releasing up to 462,400 gallons/day into the groundwater, not "waters of the United States". It seems to me that the statement in 415 ILCS 5/39 (b), "the agency may issue an NPDES permit... within the jurisdiction of the state, or into any **well**" applies. The nearby community of Nora is on well and septic. There are several wells there that are less than 100 feet deep. These will certainly be compromised. It would be hard to convince people that the IEPA were doing its job if they were unable to prevent a specific point source pollution of a well from occurring. Also, 415 ILCS 5/11 (c) , states, "The provisions of this act... pursuant to an NPDES program shall not be construed to limit, affect, impair, or diminish the authority... of the agency... to regulate and control pollution of any kind." There is comfort in those words. The cool, calm, and collected comfort that the IEPA has the authority, even the obligation, to control this pollution of the wells and ground water in the area of the proposed megadairy. I am certain you did not mean to state that the agency was powerless to request an application from the project. Surely you did not mean that the agency must wait for the pollution to happen?!

Still, if the NPDES permit is only required if the CAFO is discharging or proposing to discharge to **"waters of the United States"**, then the NPDES permit is still required. This part of the act still stands. As I stated in my previous letter, the Wolf Creek, which leads to the Apple River is

present in both sites. Wolf Creek leads to Apple River. Apple River is the central feature of Apple River Canyon State Park with many, many visitors, hikers, campers, and fishermen from this state and others. Wolf Creek is a "waters of the United States". Furthermore, there is a permanent spring in the site that feeds groundwater from the site directly into the creek. I believe this is what is considered a **"significant nexus"** to waters of the United States. The seepage, leakage, spillage into groundwater will contaminate the wells, the spring, and the Wolf Creek. The Traditions Dairies proposes to discharge to them. Not all of the seepage, run-off, etc. is going into groundwater. Some of the South facility contamination is going to the surface water, the **"waters of the United States"**. The Traditions Dairies LLC proposes to discharge to waters of the United States. I think that is very clear. If Traditions Dairies proposes to discharge to waters of the United States, they are required to submit an application for an NPDES permit.

Furthermore, if a facility should "threaten to cause pollution", the facility must apply for an NPDES permit. Again, "No person shall: (a) Cause or threaten or allow the discharge of any contaminant into the environment… so as to cause or tend to cause water pollution in Illinois…(f) Cause threaten or allow the discharge of any contaminant into the waters of the State, as defined herein… without an NPDES permit for point source discharges issued by the Agency under Section 39(b) of this Act" (A CAFO is defined as a point source discharge.) Allow me to describe the threat. Any state that has a history with these facilities will provide ample description- I have chosen Iowa. Between 1992 and 2004 there were more than 450 manure spills from CAFO's. 2/3 of those reached surface waters of the state, killing over 2.6 million fish. IDNR estimated that the volume of manure released from just 23 of the total documented spills exceeded a staggering 4.4 million gallons. Mr. Scott, the threat to cause pollution is real and documented. This is the kind of documentation that will hold in a court of law. The Traditions Dairies project is a threat to cause pollution and must apply for an NPDES permit.

As an aside, I am glad that the IEPA worked closely with the IDOA as they established the design standards for these structures in the LMFA and suggested protective construction requirements for lagoons placed in areas known to contain karst. Yes, the IDOA has the statutory responsibility to assure that the proposed design and construction meet these requirements. What a pity the IDOA is choosing to ignore these standards. But this is all the more reason for the IEPA to play a more active role than that currently chosen.

Traditions Dairies proposes to pollute wells, discharge to waters of the United States, and threatens to cause water pollution in Illinois. They are required by law to apply for an NPDES permit. You are the director of the Illinois Environmental Protection Agency, and it is your responsibility to require this application. I hope you will immediately require the application of an NPDES permit for the proposed megadairies.

I require a response to this message of utmost importance.

Very truly yours,
Ken Turner
Warren, IL
815-745-9013

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 - (217) 782-2829
JAMES R. THOMPSON CENTER, 100 WEST RANDOLPH, SUITE 11-300, CHICAGO, IL 60601 - (312) 814-6026

ROD R. BLAGOJEVICH, GOVERNOR DOUGLAS P. SCOTT, DIRECTOR

May 9, 2008

Mr. Ken Turner
Warren, IL

Dear Mr. Turner:

This responds to the e-mail you sent on April 30, 2008 that urges Illinois EPA to seek an NPDES permit application from Traditions Dairies LLC, a facility that is proposed for Jo Daviess County and that is currently being reviewed by the Illinois Department of Agriculture for compliance with design/construction requirements of the Livestock Management Facilities Act (LMFA).

The issue of which CAFOs must be permitted under NPDES in Illinois is not as clear as your letter suggests. While it is true that 35 Ill.Adm.Code Section 502.103 requires that operations that have a certain number of animals must obtain an NPDES permit, Section 501.102 does not require a permit when the facility discharges only as a result of a 25-year, 24-hour storm event. Illinois EPA is also bound by Section 12(f) of the Illinois Environmental Protection Act. This section states, in part: "No permit shall be required under this subsection and under Section 39(b) of this Act for any discharge for which a permit is not required under the Federal Water Pollution Control Act, as now or hereafter amended, and regulations pursuant thereto." USEPA promulgated a CAFO rule in 2003 that required NPDES permits for large CAFOs. In 2004, a federal appeals court struck down this requirement, stating that USEPA could not require an NPDES permit for a large CAFO unless the CAFO was discharging or proposed to discharge. Since federal rules pursuant to the Clean Water Act (the new name for the Federal Water Pollution Control Act) do not require an NPDES permit for a facility simply because of the number of animals confined, Illinois may not require an NPDES permit for Traditions Dairies solely based on the number of animals it plans to confine.

Similarly, Illinois EPA may not require an NPDES permit if the sole discharge is to groundwater. You stated your belief that the proposed lagoons would leak to groundwater both because "lagoons always leak" and because of the karst geology in the area. However, since "waters of the United States" presently do not include groundwater, Illinois EPA again faces the statutory restriction against issuing an NPDES permit that would not be required by the Clean Water Act.

Illinois EPA certainly understands the risks to groundwater that can be posed by manure storage lagoons that are improperly designed or located. This is why we worked very closely with the Illinois Department of Agriculture (IDOA) as they established the design

standards for these structures in the LMFA and suggested protective construction requirements for lagoons placed in areas known to contain karst. IDOA has the statutory responsibility to assure that the proposed design and construction meet these requirements. Although you request that the Illinois EPA require a permit for the facility because lagoons leak and the lagoon is proposed for construction in a karst area, this is not a permitting issue. Any failure of the lagoon system and release into groundwater would become a matter for Illinois EPA's enforcement program.

USEPA is in the process of developing a new CAFO rule that is consistent with the court decision. While Illinois EPA awaits clarity at the federal level about which CAFOs are required to be permitted under NPDES, we are focusing our resources on addressing discharging CAFOs that are discovered mainly through complaint investigations. We are using our enforcement program to eliminate the discharge and/or require the CAFO to apply for an NPDES permit.

I appreciate your help in focusing the attention of Illinois EPA on a potential water pollution source. If the facility receives approval from IDOA and is constructed, we stand ready to assure that it is operated in compliance with the Illinois Environmental Protection Act.

Very truly yours,

Douglas P. Scott

Douglas P. Scott
Director

Verification of FOIA Submittal

FOIA Request submitted by: Mr. Bern Colleran
Automated reply sent to: stagecoachtrail@sbcglobal.net

Subject: FOIA Request - Bern Colleran 8/1/2008 4:23:53 PM - 8/1/2008-506403

If you provided a valid return email address, the summary of your request will be sent. For addidtional questions, please feel free to use the contact information below:
Bureau of Air - Marilyn Clardy - 217/782-2113 - 217/524-5023(FAX)
Bureau of Land - Jan Ogden - 217/557-2482 - 217/782-9290(FAX)
Bureau of Water - Janet Christer 217/782-8482 - 217/782-9891(FAX)
Office of Emergency Response - Carolyn Wright - 217/558-1677 - 217/782-1431(FAX)
Division of Legal Counsel - Michael McCabe - 217/782-5544 - 217/782-9807(FAX)

Thank you.
To submit another FOIA request, click the "New Request" button below.

New Request

Please do not refresh your browser or navigate backwards during the form request process. To cancel and begin a new application, use the cancel button below.

I. Requester Information *(completed)* 8/1/2008-50

II. Facility/Location/Subject Matter *(if no bureau, incident, permit, or USEPA ID is known, at a minimum, please include the street address in addition to the city)*

Identification Number
Name: Traditions Dairy and or A. J. Bos and or M
Address: Nora
City/Township: Nora Township
County: Jo Daviess

Or

Subject Matter

III. Routing of the Request *Check only the areas below from which you want information (must select at least 1).*

☑ (BOA)	☑ (BOL)	☑ (BOW)	☑ (DLC/Other)	☑ (OER)
Bureau of Air	Bureau of Land	Bureau of Water	Division of Legal	Office of
Air Quality Data	*L.U.S.T.*	*Drinking Water*	Counsel	Emergency
Asbestos	*Groundwater*	*Wastewater*	*Enforcement*	Response

Air Emission Sources | *Site Remediation Waste Disposal* | *Release and Spills Incidents*

Any documents pertaining to or generated in the matter of the application or status of the application, or correspondence between or within State of Illinois departments or agencies on any aspect relating to the application made by A. J. Bos of Bakersfield, CA, for permits or clearances or permissions in his attempt to operate factory farm facilities known as Traditions Dairies near the town of Nora, Illinois. This should include documents of any type described below generated in the above matter. These documents include but should not be confined to the following:

- Applications, including any IEPA notations on the paperwork or other internal communication pertaining to it;
- Mail correspondence sent by and received by IEPA to and from any party or representative involved in the case;
- E-mail correspondence, also in both directions, between the applicant or his representatives and any official of the Ill. EPA or any other state official, as forwarded by other state official to Ill. EPA;
- Memorandums and notes regarding phone conversations on the case generated by EPA personnel or other state officials
- Transcripts, or notes if no transcript is made, of all meetings between the Applicant and/or his representatives and employees of Illinois EPA or parties engaged by Illinois EPA in any capacity in connection with this case.

FOIA Request Form

Please do not refresh your browser or navigate backwards during the form request process.
To cancel and begin a new application, use the cancel button below.
Continue to complete section IV (Information Requested), then click the Submit Request button (when enabled).

I. Applicant Information *(completed)*

II. Facility Information *(completed)*

III. Routing Information *(completed)*

IV. Information Requested

Click on each enabled button (below) to enter/edit specific information you would like. The Submit button will be enabled once you've entered data from the area (Bureau/Division/Office) requested.

Updated 4:07:30 PM | Updated 4:15:45 PM | Updated 4:17:52 PM | Updated 4:19:17 PM | Updated 4:19:50 PM

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 - (217) 782-2829
JAMES R. THOMPSON CENTER, 100 WEST RANDOLPH, SUITE 11-300, CHICAGO, IL 60601 - (312) 814-6026

8/6/2008

ROD R. BLAGOJEVICH, GOVERNOR

DOUGLAS P. SCOTT, DIRECTOR
Phone: 217/782-8482
Fax: 217/782-9891
Email: foia@illinois.gov

Bern Colleran
H.O.M.E.S.
2704 N. St. Louis Av
Chicago, IL 60647

RE: Request regarding information concerning property(s) in IL: **2008-2935**
Traditions Dairy/AJ Bos/Maurer-Stutz Engineering, Nora, IL

Dear Bern Colleran:

The FOIA Sector, Bureau of Water, has processed your FOIA request **2008-2935** dated 8/1/2008 for public records pursuant to the Freedom of Information Act ("FOIA") (5 ILCS 140/1 et. Seq.). The Bureau of Water, Water Pollution Control Division has no information regarding the subject of your request, as referenced above.

For the DMR Data, go to: http://www.epa.gov/echo/. At this screen pick Related Links from the list on the left hand side. On the next screen, pick the EPA Envirofacts Warehouse. In the middle of the screen under advanced capabilities, pick queries and pick PCS from the drop down box. At the query form, you must enter the information needed for the site.

The Bureau of Water, Division of Public Water Supplies' file's are structured around community water systems and would not have information regarding the referenced property(s) in your request. If you wish to receive any well data relative to particular community water supplies or facilities proximate to the site(s) in question the Bureau of Water respectfully requests that you resubmit this request with additional details. Specifically, the Division of Public Water Supplies will need the exact location of the site in question including a map of the site, at an appropriate scale, and the legal description of the property down to the ¼, ¼,¼ of the Section. Furthermore, the Division of Public Water Supplies needs to know the size or extent of the area of concern (e.g., "x" distance from the site in question).

Please contact me at the above referenced number, if you require further assistance.

Sincerely,

Janet Christer

Janet Christer
FOIA Coordinator, Records Unit
Bureau of Water
cc: File

217/782-5544

August 19, 2008

Bern Colleran
H.O.M.E.S.
2704 N. St. Louis Av
Chicago, IL. 60647

RE: Freedom of Information Act Request
Traditions Dairy and or A.J. Bos and or Maurer-Stutz Engineering
Nora Township

Dear Mr. Colleran:

This letter is in response to your Freedom of Information Act ("FOIA") request, to the Illinois Environmental Protection Agency ("Illinois EPA"), for information pertaining to the above location, address, individual, facility, or entity.

Please be advised no records were located in the Division of Legal Counsel files responsive to your information request. Thank you for your patience in this matter.

Should you have any questions, please do not hesitate to call me at 217/782-5544.

Sincerely,

Michael J. McCabe

Michael J. McCabe
Freedom of Information
Division of Legal Counsel
Illinois Environmental Protection Agency

Cc: file

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19506, SPRINGFIELD, ILLINOIS 62794-9506 – (217) 782-2113

ROD R. BLAGOJEVICH, GOVERNOR DOUGLAS P. SCOTT, DIRECTOR

(217) 782-2113

Monday, August 04, 2008

H.O.M.E.S.
Attn: Bern Colleran
2704 N. St. Louis Ave
Chicago, IL 60647-

Re: FOIA Request Received 8/1/2008

Dear Mr. Colleran:

The IEPA Bureau of Air does not have any files or permits for the facility(s) listed below.

Traditions Dairy/A.J. Bros./Maurer-Stutz Engineering
Nora, IL

If you have any questions, please feel free to contact the FOIA Coordinator at the number indicated above.

Sincerely,

Edward C Bakowski

Ed Bakowski
Manager, Permit Section - Acting
Division of Air Pollution Control

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 – (217) 782-339
JAMES R. THOMPSON CENTER, 100 WEST RANDOLPH, SUITE 11-300, CHICAGO, IL 60601 – (312) 814-6026

ROD R. BLAGOJEVICH, GOVERNOR DOUGLAS P. SCOTT, DIRECTOR

8/4/2008

Bern Colleran
H.O.M.E.S.
2704 N St Louis Ave
Chicago, IL 60647

Re: FREEDOM OF INFORMATION ACT (FOIA) REQUEST - OER # 0019601
NO INFORMATION FOUND

This letter is in response to your request for public records pursuant to the Freedom of Information Act ("FOIA") (5 ILCS 140/1 et.seq.) processed by the Office of Emergency Response.

Your request was received: 8/1/2008.
You requested information about: Traditions Dairy/ AJ Bos/ Maurer-Stutz Engineering- Nora Twp, Jo Daviess County (Jan 1 2007 - present).

A search of our file index databases identified that there are no public records contained therein which match the parameters of your request.

Please contact me at 217/558-1677 for further assistance.

Sincerely,

Carolyn Wright

Carolyn Wright
FOIA Coordinator
Office of Emergency Response

From: Ginder, David
To: Karen
Sent: Tuesday, September 16, 2008 10:51 AM
Subject: RE: PICTURES OF HILLTOP CONFINEMENT...

Mrs. Hopkins,

I have viewed the digital photographs that you forwarded. I reviewed the dead animal handling procedures that the facility utilizes with a facility representative and have determined that the dead animal handling procedures are acceptable and meet the requirements of the Illinois Dead Animal Disposal Act.

The submitted photographs do not show livestock waste or leachate/runoff from a dead animal building, from a dead animal composting structure, from a livestock feed storage area or from a livestock bedding storage area reaching waters of the State but rather show slightly turbid surface runoff from the facility which one would expect from such a facility as well as numerous other types of facilities and properties including residential properties after a 4.5" precipitation event. The photograph of Sugar Creek shows turbid water that one would expect in rural Illinois after such a precipitation event. One can also determine from the photograph of Sugar Creek that properties in the entire watershed tributary to Sugar Creek at the location where the photograph was taken, not just Hilltop Farm, contribute to the turbidity observed in Sugar Creek.

Please contact the Agency with any future concerns that you have when observing the livestock waste, dead animal, livestock feed and livestock bedding material handling and storage practices at Hilltop Farm.

David P. Ginder
Environmental Protection Engineer
Field Operations Section
Division of Water Pollution Control

As of 1/1/08 my email address is: David.Ginder@illinois.gov

As of 4/7/08 my contact information is:

Illinois EPA
Springfield Field Office Staff, MC #10
1021 North Grand Avenue East, P.O. Box 19276
Springfield, Illinois 62794-9276
Phone: 217/557-8761

From: Karen [mailto:jk4ranch@frontiernet.net]
Sent: Monday, September 15, 2008 3:54 PM
To: Ginder, David
Subject: PICTURES OF HILLTOP CONFINEMENT...

WE TOOK A DRIVE OVER TO THE HILLTOP HOG CONFINEMENT YESTERDAY 9/14/08 SINCE THE RAINS HAS BEEN SO BAD AND THIS IS WHAT WE FOUND...

DEAD HOGS OUTSIDE HILLTOP CONFINEMENT DOOR OAKLAND TWP SCHUYLER CO

CULVERT NEXT TO THE HILLTOP ENTRANCE RAIN RUN OFF DRAINING INTO DITCH

WATER RUNNING OUT OF THE HILLTOP CONFINEMENT DRIVEWAY NEXT TO CULVERT RUNNING DOWN THE ROAD TO SUGARCREEK IN ABOVE PICTURE

DONNIE WARD TAKING WATER SAMPLE FROM RUN OFF AT DRIVEWAY OF HILLTOP CONFINEMENT

GRAY WATER IN DITCH AT SAME SITE AS ABOVE

SUGARCREEK OUT BELOW HILLTOP CONFINEMENT AT HOPKINS FARM [JK4 RANCH] GAUGE SHOWS 4 1/2" OF RAIN

KAREN & JIM HOPKINS
JK4 RANCH
RUSHVILLE,IL
http://www.avg.com

Attachment 6:

Illinois EPA Response to USEPA, Region 5's September 2010 "Initial Results of an Informal Investigation of the National Pollutant Discharge Elimination System Program for Concentrated Animal Feeding Operations in the State of Illinois," November 1, 2010

Illinois EPA Response to USEPA, Region 5's September 2010 *"Initial Results of an Informal Investigation of the National Pollutant Discharge Elimination System Program for Concentrated Animal Feeding Operations in the State of Illinois"* November 1, 2010

This document contains the Illinois Environmental Protection Agency (Illinois EPA or Agency) responses to the findings, required actions and recommendations made by Region 5 of the United States Environmental Protection Agency (USEPA-Region 5 or Region 5) in "*Initial Results of an Informal Investigation of the National Pollutant Discharge Elimination System Program for Concentrated Animal Feeding Operations in the State of Illinois."* The Initial Results Report reflects a review of Illinois EPA's Concentrated Animal Feeding Operation (CAFO) program activities and statistics for the period of December 2008 to September 2009. The responses below provide evidence of progress in administering the CAFO program, as well as our commitments for continued improvements in CAFO permitting, inspection and enforcement programs.

Permitting

As of November 1, 2010, the Illinois EPA has issued 14 NPDES permits for CAFOs, and two additional CAFO permit applications are on public notice.

The Initial Report reflected 76 CAFO applications filed with the Agency. At the time Region 5 queried the Illinois EPA's files, there were approximately 40 newer applications, most of which were incomplete, plus an additional 45 older applications that the Agency had determined to be from facilities that were no longer in service or did not require permits.

- Current Applications

  To compel additional information from applicants who had failed to submit complete applications, Illinois EPA has requested that Region 5 issue Administrative Orders (AO) under Sections 308 and 309 of the Clean Water Act (CWA). This process began in July 2010. In addition, the Agency is using Violations Notices to compel applicants to respond with complete applications.

  Illinois EPA has made significant progress on the 40 incomplete applications. Under the FY10-11 Performance Partnership Agreement (the PPA is an agreement that contains work items for all Agency programs to be performed as part of the grant agreement between Illinois EPA and USEPA); Illinois EPA has until September 30, 2011 to complete the review and issuance of these 40 applications. Of those 40 applications:
  - Nine have been referred to Region 5 for issuance of administrative orders seeking necessary documents to complete those applications.
  - Two have been issued Violation Notices (VNs) for the same reason.
  - 18 are under review (several of those applications were received within the last 60 days),
  - Two are now on public notice.
  - Nine have completed for public notice and are in the process of being issued permits.

Illinois EPA expects to receive six new applications in December 2010 and 13 more in March 2011, all from a single livestock producer. Illinois EPA intends to address these 19 new applications with existing staff, completing each review within 60 days of receipt.

Illinois EPA will seek an amendment to the EPAct in the next legislative session for administrative order authority to enforce against facilities that fail to apply or fail to submit complete applications. Until administrative order authority is enacted, the Illinois EPA must continue to rely on the EPAct's Section 31 process for enforcement purposes and on referrals to Region 5 for issuance of administrative orders, as appropriate.

Currently, Illinois EPA is following the schedule outlined in the FY 2010—2011 PPA. Illinois EPA is willing to adjust the time frame for permit issuance in consultation with Region 5.

The Illinois EPA will use criteria established in USEPA's CAFO guidance in determining whether an NPDES permit is required. CAFOs that meet these criteria will be required to seek a permit from Illinois EPA.

In order to increase the number of permits issued and the efficiency with which permit applications will be reviewed, Illinois EPA will seek approval to hire three new permit staff. As is currently the practice, USEPA and Illinois EPA will hold conferences calls at frequent intervals to review the status of CAFO applications.

The Initial Report recommends that Illinois EPA consider establishing an unambiguous requirement for CAFOs to apply for a permit. Currently, Illinois EPA is constrained by Section 11 of the EPAct to issue an NPDES permit for only those circumstances for which USEPA would issue an NPDES permit. Since there is no "duty to apply" for all CAFOs in the federal 2008 CAFO rule and Illinois has no separate state program, the Illinois EPA has no statutory authority to require all CAFOs to apply for a CAFO permit. However, Illinois EPA will attempt to amend the EPAct to add such a requirement.

- <u>Old Applications</u>
  Illinois EPA has investigated and identified the 45 old applications as facilities that are no longer in existence or in need of a permit. Of those 45, we have inspected approximately 40 between 2007 and 2009, finding that nine no longer needed permits and were subsequently issued letters to that effect, five were abandoned or did not exist and two were never built.

  The Initial Results report requires Illinois EPA to either issue or deny permit for these 45 applications. Illinois EPA does not believe responding to these applications with a permit denial for a facility that does not now exist or that does not need a permit is appropriate and is consistent with Section 39(a) of the Illinois Environmental Protection Act (EPAct or Act). Under this section, the Agency cannot issue or deny a permit if such permit is not required by the EPAct or the Illinois Pollution Control Board regulations.

Illinois EPA cannot lawfully deny permits unless the application in some fashion violates a provision of the EPAct or the Illinois Pollution Control Board regulations (see 415 ILCS 5/1 *et seq.*). To confirm our initial findings, Illinois EPA is committing to re-investigate these 45 facilities. Illinois EPA will by August 1, 2011: 1) provide documentation of those facilities that no longer exist, 2) attempt to re-contact existing facilities that do not propose to discharge and advise them that withdrawing their application is an option, and 3), in those cases in which Region 5 argues that permits might be required under the 2008 CAFO rule, advise owners to obtain an NPDES permit, including filing a complete application within a specified period of time of Illinois EPA's notification.

Compliance Evaluation/Inspection Program

- Inventory

  The Illinois EPA will meet the commitment in the FY 2010—2011 PPA to complete the final CAFO inventory within 12 to 18 months of finalizing the pilot.

  In the interim, by May 1, 2011, Illinois EPA will develop an interim list of CAFOs using currently available resources, such as the current permit application list, the list of facilities for which complaints were received, IDOA approved facilities and IDPH approved/inspected sites. From this interim list, the Agency will develop a prioritized inspection strategy.

  In order to have a complete, uniform inventory, Illinois EPA has contracted with Western Illinois University (WIU) to provide a seven (7) county pilot survey that can be updated as necessary. The inventory now in development by WIU will provide readily updateable, Geographic Information System (GIS)-based documents (e.g., maps and photos) of each site. This GIS-based methodology will use shape files from IDOA livestock facilities' and Illinois Department of Public Health (IDPH) dairy facilities' data. The initial pilot of the GIS-based inventory will be ready for field verification by January 31, 2011. Illinois EPA will seek assistance from Region 5 in the funding and review of the statewide inventory.

  Further, Illinois EPA will propose a revision in the state livestock regulations (a draft of which will be sent to Region 5 by December 1, 2010) so that livestock producers are required to file basic information with the Illinois EPA. The proposed revisions to Subtitle E will allow Illinois EPA to populate a statewide inventory, which then can be used for prioritization of inspections and permitting decisions.

- Inspection SOPs

  Illinois EPA is committed to developing standard operating procedures (SOPs) for inspections and reports. However, the Agency believes the underlying problems associated with CAFO inspections (i.e., lack of resources and an adequate, centralized inventory) have little to do with the lack of SOPs for inspections and report drafting. The Agency's CAFO inspections are rigorous and complete. The Initial Results report assumes that all Illinois EPA inspections were conducted for purposes of determining NPDES compliance. Many inspections conducted by the Agency staff were for more targeted reasons, often based on citizen complaints regarding specific incidents or were in response to emergencies at livestock facilities. Because of the specific scope of these inspections, they should not be compared to routine monitoring and compliance inspections at permitted facilities.

By August 1, 2011, Illinois EPA will develop and train staff in the use of SOPs for CAFO inspections. The SOP will be provided to Region 5.

By August 1, 2011, Illinois EPA will develop and train staff in the use of an inspection checklist that aligns with the requirements of the CAFO general permit. The checklist will be provided to Region 5.

In the past, only NPDES permitted facilities were loaded into ICIS. Illinois EPA has the capability to load past and future CAFO inspections, whether permitted or not. By May 1, 2011, Illinois EPA will enter all CAFO inspections into ICIS.

- Citizen's Complaints
  The Initial Results report found that "it is not clear that they [Illinois EPA] consistently provide a timely response to the complainant." A further review of the Illinois EPA's complaint logs and, more importantly, follow up discussions with the staff who investigate these complaints would have addressed the matter. While no log is kept of the follow up and written response is not always given, staff do follow up with the complainants via phone and email. As each investigation is subject to its own complexity and timeframe, the staff follows up with the complainants when the investigation has been concluded.

  By February 1, 2011, Illinois EPA will establish a process for providing written responses when requested by complainants to describe actions taken by the Illinois EPA in response to that complaint.

  By February 1, 2011, Illinois EPA will establish appropriate procedures for responding to complainants.

Enforcement Program

- Enforcement Response Guide
  Illinois EPA must take timely and effective enforcement and therefore must revise its Enforcement Management System (EMS), specifically, the Bureau of Water's Enforcement Response Guide, to include a time frame for making enforcement decisions**.**

  In order to address these concerns, by January 1, 2011, the Illinois EPA will modify our Enforcement Response Guidance (ERG) to assure that escalation of CAFO enforcement is consistent with enforcement responses for other, similar NPDES violations. In addition, the ERG will require that where a CAFO has a discharge or is designed, constructed, operated and maintained to have a discharge, a permit will be required. This modified ERG will assure that all CAFO violations are evaluated against set criteria so that consistent, timely and appropriate enforcement actions are taken. This ERG will include a requirement that all CAFOs which had a discharge or are designed, constructed, maintained or operated to have a discharge, will be required to apply for and obtain an NPDES permit.

  The Illinois EPA must adhere to the statutory deadline requirements of Section 31 of the Act as described below. However, the Illinois EPA anticipates referring more cases to USEPA

for prosecution. In addition, Illinois EPA will seek administrative order authority that will include penalties. Should the Illinois EPA be successful in obtaining this authority, much more timely enforcement actions will be achieved.

Section 31 of the EPAct sets the basic framework for environmental compliance assurance/enforcement in Illinois. Illinois EPA in pursuing enforcement cases must adhere to the Section 31 process as outlined below.

Within 180 days of the Agency becoming aware of a violation of the Act, a regulation or a permit, it issues a VN informing the person of the facts related to the alleged violation. The person has the opportunity to meet with the Illinois EPA and explain the violation. The person may also submit a written proposed Compliance Commitment Agreement (CCA) which sets forth time lines for returning to compliance with the EPAct and correcting any environmental harm. The individual may also meet with the Illinois EPA compliance and inspection staff. No penalties are sought at this stage and environmental compliance is expected to be promptly achieved.

If the Illinois EPA determines that the CCA is inadequate (e.g., the alleged violation is not sufficiently addressed or a civil penalty is needed) or that the environmental harm is significant, the Illinois EPA may reject the CCA and proceed to formal enforcement by issuing a Notice of Intent to Pursue Legal Action (NIPLA) letter to the person. The person is given another opportunity to meet with the Illinois EPA personnel and discuss in detail mechanisms for resolving the violation short of referral to the Attorney General's Office (AGO) or the appropriate State's Attorney's Office (SAO). Several matters are resolved at this stage.

If the person does not reach resolution after the NIPLA meeting, the matter is referred to the Attorney General's office or the SAO for litigation, penalties, and an enforceable order. The only exception in this procedure is set forth in Section 43 of the EPAct. Specifically, if there is a substantial danger to the environment or public health, an immediate referral of the matter to the AGO or SAO is allowed without need of a VN or NIPLA.

In addition, the Initial Report requires the Illinois EPA to maintain a Compliance Monitoring Strategy (CMS) consistent with current regulatory policy. By November 1, 2011, the Illinois EPA will develop a state-specific CMS for Region 5's approval.

- <u>Penalties</u>
  In addressing CAFO violations in 2008 and 2009, Illinois EPA sent 54 Noncompliance Advisories (NCAs), issued 39 VNs, issued 10 NIPLAs and referred 23 cases to the Attorney General.

  The Initial Results report cites (page 27) that "62.5% of the Violation Notices reviewed did not, or will not, return the facility to compliance." VNs alone—without implementation of an acceptable CCA or further action via a NIPLA or referral to the Attorney General or SAO—are not expected to resolve all violations. Illinois EPA must follow enforcement procedures as outlined above.

Currently, Illinois EPA considers a CCA completed and resolved when information is obtained and the agreed upon actions have been taken. A "completed" CCA means that the alleged violation has been satisfactorily resolved pursuant to the Act. However, USEPA does not recognize this current procedure as formal enforcement action resolving the violations. Illinois EPA will require a signed certification be submitted from the VN recipient certifying that all CCA milestones have been completed and that the facility has returned to compliance. This additional documentation will be placed in the paper files. In cases when the CCA is accepted, Illinois EPA will conduct follow-up inspections on a portion of these facilities to ensure that compliance has actually been achieved. The failure of a facility to be in compliance with the CCA will result in immediate escalated enforcement, and providing false information to Illinois EPA (e.g., a fraudulent certification) is now a felony offense.

USEPA has concerns that the penalty amount recovered is not achieving deterrence and that an insufficient number of agricultural pollution matters are being referred, and that the penalty amount recovered is too low. Illinois EPA does not have authority to impose and collect penalties; it makes a penalty recommendation to the prosecuting authority. As the Illinois EPA does not assess penalties, it will continue to urge the prosecuting authority to assess penalties which will obtain deterrence.

Illinois EPA will revise the ERG as necessary to ensure that penalty recommendations to the Illinois Attorney General are appropriate and consistent, but in general, will continue to follow the USEPA guidance and State law factors on penalty calculation. In addition, the Illinois EPA will continue to maintain documentation of its calculations and worksheets.

- Response to Citizen Requests for Information

  The Illinois EPA currently administers the Illinois Freedom of Information Act (FOIA) under rules adopted on April 15, 2002 and more recently amended in response to changes made to the FOIA. The rules may be found in 2 Ill Adm Code, Subtitle E, Parts 1825 and 1828 (see attachment). These rules establish the procedures by which the Illinois EPA responds to public requests for its documents. In addition, the Illinois EPA uses an internal Document Screening Manual (March 2005) (see attachment) that addresses the issues of exemptions from FOIA, document screening processes and procedures. Illinois EPA believes these rules and the Manual adequately address the question of how and when Illinois EPA provides documents, including NPDES applications, to the public.

  Since the Illinois EPA has existing and up-to-date FOIA rules and procedures, we propose to take no further actions in this matter.

Compliance with the Performance Partnership Agreement

Since the signing of the FY 2010--2011 PPA in November 2009, Illinois EPA has made significant progress in issuing permits, completing review of applications and acquiring additional information for incomplete applications through Illinois EPA/Region 5 cooperative efforts, and through inspections to determine if facilities existed and needed CAFO permits. For further details, please refer to the Agency's response to 1.

The Illinois EPA believes that it has been closely following the milestones outlined in the PPA. Illinois EPA is 1) requiring nutrient management plans (NMPs) (including stormwater and emergency management plans and controls), 2) posting the notices of applications and intent to issue coverage under the CAFO general permit, and 3)Illinois EPA will share the complete draft of the CAFO rule with Region 5 by December 1, 2010.

Organization and resources

In 2008 and 2009, Illinois EPA inspectors surveyed a total of 312 livestock facilities of which 118 facilities were contacted for the first time. The total number of on-site visits conducted during 2008 and 2009 was 542 (this includes multiple visits to the same sites). The inspections included livestock facilities that housed beef, dairy, swine, poultry, sheep and horses. These inspections covered livestock facilities that had animal units less than 50 and as many as 5000. For more details on the livestock inspection program for the last decade, please refer to the Illinois EPA Livestock Facility Investigation Annual Reports at http://www.epa.state.il.us/water/cafo/reports/index.html .

The Illinois EPA currently uses approximately five full time employees (FTEs) for the CAFO program. These FTEs are responsible for the inspections and CAFO permit applications. They are also responsible for responding to citizen complaints involving CAFOs. While these FTEs spend most of their time on the CAFO program, they also are responsible for other NPDES related inspections and responding to non-CAFO complaints.

In the interim, all CAFO staff will be responsible for reviewing permit applications, conducting CAFO inspections and responding to citizen complaints. The interim list (as described in 2(A) above) will be used by the CAFO staff prior to the actual development of a GIS-based inventory. New inspections will be used to populate the list and inventory.

By May 1, 2011 Illinois EPA will prepare a workload assessment consistent that will address the use of the interim list and the GIS-based inventory for purposes of inspection and permitting prioritization. As new FTEs are added, both new and current staff will be required to attend training via available resources through the internet (web-based USEPA training) and through classroom type training sessions with Region 5 staff. Illinois EPA will also use USEPA contractual assistance in setting up necessary training.

Legal authority

The Illinois EPA has been working with a stakeholder group (CAFO Workgroup) to revise Illinois CAFO rules to ensure consistency with the 2008 federal CAFO rule. The Illinois EPA first met with various stakeholders in December 2009. The CAFO Workgroup is comprised of representatives from the several livestock sectors, citizens and environmental interest groups, National Resources Conservation Service (NRCS), the University of Illinois-Cooperative Extension Service and the IDOA. The objective of forming the CAFO Workgroup was to seek complete and thorough input of stakeholders on key issues early in the rule development process.

Illinois EPA sent out a complete initial draft on October 15, 2010, to the CAFO workgroup for review and comment. The CAFO Workgroup has been asked to provide comments by

November 10, 2010. After reviewing comments from these stakeholders, by December 1, 2010 the Illinois EPA will send a revised draft of Illinois' CAFO rules to Region 5 for its review. On October 15, 2010 Illinois EPA sent a draft of the Subtitle E revisions to the CAFO Workgroup for their review and comment. The Illinois EPA believes that the draft revisions to Subtitle E ensure that Illinois CAFO rules are consistent with the federal 2008 rule. The CAFO Workgroup's comments are due to Illinois EPA by November 10, 2010. Illinois EPA will revise the draft rule, if necessary, prior to sending the revised rule to Region 5 by December 1, 2010. Following any comments and revisions by Region 5's review, Illinois EPA will submit the Subtitle E revisions to the Illinois Pollution Control Board for consideration and adoption.

Attachment 7:
Illinois Program Work Plan Agreement Between Illinois EPA and Region 5, U.S. EPA, February 24, 2011

Illinois Program Work Plan

Agreement Between

Illinois EPA and Region 5, U.S. EPA

The Illinois EPA and Region 5, U.S. EPA work together to implement federally authorized, delegated and/or approved environmental programs within Illinois in a timely, appropriate and effective manner. We establish priorities, negotiate program commitments and work sharing, and evaluate program performance.

Illinois EPA and Region 5 are executing this Agreement as a means to strengthen Illinois' implementation of several federally authorized, delegated and/or approved environmental programs. This work plan contains activities and commitments for both Agencies relating to the Clean Water Act NPDES and Clean Air Act Title V permitting and enforcement programs; the work plan generally spans federal fiscal year (FFY) 2011 and 2012. In the event of a conflict between this work plan and the November 1, 2010, Memorandum of Agreement (MOA) between the U.S. EPA and the Illinois EPA, this document supersedes the MOA.

Illinois EPA and Region 5 will monitor progress under this Agreement via existing program to program communications, as well as during our annual joint senior management planning meeting. Work plan elements may be adjusted by mutual agreement. As part of our joint planning for FFY13, Illinois EPA and Region 5 will formally assess the need to negotiate a revised Agreement and work plan for these program areas.

The execution of this Agreement demonstrates our continuing commitment to environmental improvement through a strong partnership and shared responsibility for meeting our regulatory obligations.

Entered into on 2/24/11.

For Illinois EPA:

Douglas P. Scott

Director

For Region 5, U.S. EPA

Susan Hedman

Regional Administrator

Illinois Program Work Plan
February 2011
Water Programs

In March 2008, the Illinois Citizens for Clean Air & Water (Illinois Citizens) submitted a petition for withdrawal of Illinois' authorized National Pollutant Discharge Elimination System (NPDES) program. Illinois Citizens contend that the Illinois Environmental Protection Agency (Illinois EPA) is not properly administering the NPDES program for concentrated animal feeding operations (CAFOs). In February 2009, Illinois Citizens, joined by the Environmental Integrity Project, provided additional information in a supplementary petition to the U.S. Environmental Protection Agency (U.S. EPA).

U.S. EPA conducted an informal investigation of the petitioners' allegations and issued a report in September 2010[1]. The report discusses U.S. EPA's initial findings for the various program areas, and the actions that Illinois EPA must take to comply with Clean Water Act requirements for authorized state NPDES programs. In particular, Illinois EPA must accomplish the following:

NPDES Permitting for CAFOs

- Issue NPDES permits to CAFOs that are required to be permitted under NPDES regulations.
- Develop and maintain a comprehensive inventory of CAFOs and evaluate their regulatory status.
- Establish technical standards for nutrient management by Large CAFOs and revise title 35 of the Illinois Administrative Code, Subtitle E, as necessary to be consistent with the federal CAFO rules.
- Ensure that sufficient resources are maintained to issue or deny permits.

NPDES Compliance Monitoring and Enforcement for CAFOs

- Revise the inspection process for livestock and poultry facilities to enable Illinois EPA to determine and track whether inspected facilities are CAFOs that are required to have NPDES permits and whether they are in compliance with NPDES requirements,
- Develop standard operating procedures and properly investigate, track, and respond to citizen complaints reporting potential violations of NPDES requirements.

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[1] *See* the *Initial Results of an Informal Investigation of the National Pollutant Discharge Elimination System Program for Concentrated Animal Feeding Operations in the State of Illinois* (*Initial Results*), available at: http://epa.gov/region5/illinoiscafo.

- Take timely and appropriate enforcement action to address noncompliance by CAFOs.
- Require that Illinois EPA enforcement actions address CAFOs failing to apply for an NPDES permit, where a facility has discharged, is discharging, or is designed, constructed, operated, or maintained such that it will discharge.
- Ensure that sufficient resources are maintained for inspections and enforcement of NPDES requirements for CAFOs.

The following outlines the specific actions that Illinois EPA will take to address the initial findings in U.S. EPA's report. Actions that U.S. EPA will take to assist Illinois EPA are provided below as well.

NPDES Permitting for Concentrated Animal Feeding Operations

Objective 1: **All Large CAFOs that discharge or propose to discharge possess NPDES permits.** This objective addresses U.S. EPA's CAFO program review findings related to issuance of NPDES permits to CAFOs as required under the NPDES regulations[2]. It also addresses U.S. EPA's finding related to resources for the CAFO NPDES program[3].

Approach:

1. By February 2011, Illinois EPA CAFO permit managers will confer with all Region 5 States, including Minnesota and Michigan, to learn about the systems and staffing those States employ to authorize CAFOs under general permits.

2. Illinois EPA has posted job announcements for three new field positions and three new permit positions to work full time on the NPDES CAFO program. Illinois EPA will use best efforts to fill the positions by August 2011. By August 2011, Illinois EPA will provide a preliminary workload assessment to U.S. EPA. The assessment will identify the number of full-time employees required to implement an effective CAFO permitting, compliance evaluation, and enforcement program for a range of estimates of the regulated universe. Illinois EPA will provide the draft assessment to U.S. EPA for review. Illinois EPA will prepare a final workload assessment in conjunction with production of the statewide CAFO inventory discussed below[4]. The final assessment will identify staff distribution by function and geographic area of responsibility.

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[2] See the *Initial Results*, Section VI. 1, page 35.
[3] See the *Initial Results*, Section VI. 6, page 40.
[4] Compliance Monitoring and Enforcement Objective 1, approach 1.b.

3. Newly-hired Illinois EPA CAFO permit writers will complete the NPDES Permit Writers' Course and the Nutrient Management Plan (NMP) Training for Federal and State Permit Writers, Inspectors, and Technical Assistance Providers within six months after their start date. Existing permit writers will complete the NMP Training within 30 days after it becomes available on-line. By March 2011, U.S. EPA will train existing permit writers on the Clean Water Act and federal regulations prohibiting unpermitted discharges and requiring CAFOs that discharge or propose to discharge to apply for a permit. U.S. EPA will train newly-hired permit writers within six months after their start date.

4. Illinois EPA established a schedule for making a completeness determination and taking preliminary and final action on all permit applications that were pending as of November 30, 2010. In January 2011, Illinois EPA provided a draft of the schedule to U.S. EPA for approval or approval with modification. Subsequent to the approval, Illinois EPA will provide a monthly status report on each application to U.S. EPA. The frequency of such reports may be adjusted after the initial six months by mutual agreement.

5. Illinois EPA will establish a standard operating procedure, with timelines, for making a completeness determination and taking preliminary and final action on permit applications received on and after December 1, 2010. The SOP will provide for final action not more than 180 days after receipt of an application. Under the SOP, Illinois EPA will respond to all incomplete applications with a notice of incompleteness (NOI) delineating the deficiencies in the application and requiring a response within 30 days. Illinois EPA will copy U.S. EPA on all NOIs. The SOP will provide that Illinois EPA will issue a violation notice (VN) under section 31 of the Illinois Environmental Protection Act or request U.S. EPA to issue an information collection order under section 308 of the Clean Water Act for any applicant who has not responded or when Illinois EPA finds that the application is still incomplete after issuance of the NOI. By February 2011, Illinois EPA will provide a draft of the SOP to U.S. EPA for review and approval or approval with modification.

6. By August 2011, Illinois EPA will report on the outcome of a re-investigation of the 45 cases in which Illinois EPA determined that an applicant did not require a permit. The report will include conclusions and, as appropriate, recommendations for further action.

7. U.S. EPA will issue information collection orders to CAFOs that have submitted incomplete applications to Illinois EPA and are not subject to federal enforcement. Illinois EPA will refer such CAFOs to U.S. EPA within 30 days after the deadline Illinois EPA sets in a NOI letter or VN to the applicant. U.S. EPA will issue the information collection orders within 60 days after receipt of a complete referral from Illinois EPA.

8. Within 60 days following publication of amendments to 35 Ill. Adm. Code, subtitle E, Illinois EPA and U.S. EPA will jointly identify permit conditions that Illinois EPA could modify and practices that Illinois EPA could adopt, consistent with the 2003 and 2008 federal rules for CAFOs, to streamline the process for review of NMPs and incorporation of NMP terms into permits. Such methods include, but are not limited to, use of Manure Management Planner or other nutrient management planning software. For any conditions or practices so identified, Illinois EPA will act to modify the conditions or adopt the practices in accordance with the schedule set in Objective 2, approach 7, of this section. Illinois EPA may request support for implementation of the streamlining actions.

Indicia of Progress: For applications submitted prior to March 31, 2011, Illinois EPA completes the following by June 30, 2011: issue permits to the applicants, post draft permits or notices of coverage for public comment, or refer the CAFO to the Illinois Attorney General's office for formal enforcement or U.S. EPA for an information collection order. For other applicants, Illinois EPA takes final action as detailed in the SOP contemplated in Approach 5 in this section.

Objective 2: **U.S. EPA approves amendments to 35 Ill. Adm. Code, subtitle E, which (1) reflect the 2003 and 2008 revisions to the federal regulations for CAFOs and (2) require the owners or operators of all Large CAFOs to register with Illinois EPA.** This objective addresses U.S. EPA's CAFO program review findings related to administrative rules for CAFOs as well as technical standards for nutrient management by Large CAFOs[5].

Approach:

1. Illinois EPA provided draft amendments to 35 Ill. Adm. Code, subtitle E, to U.S. EPA for review on December 1, 2010. U.S. EPA provided comments and recommendations on January 14, 2011. Illinois EPA will revise the draft to resolve U.S. EPA's comments and provide the revised draft to U.S. EPA by April 15, 2011. U.S. EPA will provide any remaining comments and recommendations within 15 days of receipt.

2. Within 90 days after receipt of U.S. EPA's comments and recommendations on the revised draft, Illinois EPA will resolve U.S. EPA's comments and file the amendments as a proposed amendatory rulemaking with the Illinois Pollution Control Board. Illinois EPA and U.S. EPA program managers will elevate issues to agency water directors or higher as may be required to resolve U.S. EPA's comments within the 90-day period contemplated here.

[5] See the *Initial Results*, Section VI. 7, page 41.

3. As appropriate given the content of the draft amendments and other considerations, U.S. EPA will recommend that the Board propose the amendments for the purpose of requesting public comment.

4. If Illinois EPA requests, U.S. EPA will provide support to Illinois EPA as the Board considers the amendments.

5. Within 30 days after publication of amendments to 35 Ill. Adm. Code, subtitle E, Illinois EPA will inform the owner of each Large CAFO in the State's inventory, in writing, about the duty to apply for a permit and the potential consequences for failing to apply. Illinois EPA will provide a draft of the letter to U.S. EPA for review and approval or approval with modification.

6. Within 45 days after the amendatory rulemaking becomes effective, Illinois EPA will submit the final amendments to U.S. EPA for action under 40 C.F.R. §123.62.

7. Within 120 days after the effective date of the amendatory rulemaking, Illinois EPA will revise its permit application forms and formally ask the public to comment on draft modifications to general permit ILA01, as appropriate, based on the amendments and the federal regulations.

Indicia of Progress: U.S. EPA finds the amended rules to be consistent with federal regulations. Illinois EPA implements the amended rules upon becoming effective. U.S. EPA acts on the amendments within 90 days of receipt.

NPDES Compliance Monitoring and Enforcement for CAFOs

Objective 1: To detect, report, and sufficiently document all violations in order to support enforcement of the federal regulations. This objective addresses U.S. EPA's CAFO program review findings related to developing and maintaining a comprehensive inventory of CAFOs and evaluating their regulatory status, revising the inspection processes to determine and track CAFOs requiring NPDES permits, and developing and implementing SOPs for responding to CAFO-related citizen complaints[6].

Approach:

1. Illinois EPA will implement a short-term strategy for evaluating facilities that are likely to be Large CAFOs. The strategy includes the following:

a. The creation of an interim NPDES inspection list of 25 likely Large CAFOs using existing lists of known and potential CAFO sites developed by Illinois EPA regional offices,

[6] See the *Initial Results*, Section VI. 2, pages 36-38.

permit applications, citizen tips and complaints, and information from U.S. EPA, the Illinois Department of Agriculture, and the Illinois Emergency Management Agency. Illinois EPA will provide the list to U.S. EPA, including location data, no later than February 28, 2011.

b. By February 28, 2011, Illinois EPA will develop a plan to create and maintain a comprehensive inventory of Large CAFOs. Under the plan, Illinois EPA will seek commitments whereby the Illinois Department of Agriculture and Illinois Department of Public Health will routinely provide information about potential Large CAFOs to Illinois EPA. Illinois EPA will enter and maintain the inventory in the Integrated Compliance Information System (ICIS). The inventory will include potential CAFO sites identified by Illinois EPA regional offices, permit applications, citizen tips and complaints, U.S. EPA, the Illinois Department of Agriculture, the Illinois Department of Public Health, and the Illinois Emergency Management Agency. The plan may make use of a Geographic Information System-based pilot inventory currently being developed for seven high profile counties. Illinois EPA will provide the plan to U.S. EPA for review and approval or approval with modification.

c. Illinois EPA will develop a CAFO NPDES inspection/evaluation standard operating procedure by February 28, 2011. The SOP will enable the inspector to determine whether CAFOs discharge or propose to discharge. The SOP should include pre-inspection preparation, access procedures, site visit conduct, and inspection timing, sampling, and post inspection procedures including report timing, format, and content (including discharge documentation). Illinois EPA will provide the SOP to U.S. EPA for review and approval or approval with modification.

d. Illinois EPA will organize an initial training for all of its field inspectors and office enforcement staff so they can effectively evaluate CAFOs that are on the interim NPDES inspection list. In January 2011, Illinois EPA provided a proposed agenda to U.S. EPA for approval or approval with modifications. U.S. EPA will review training materials. Training will cover the approved SOP identified above in Paragraph 1(c) and will include pre-inspection preparation, inspection conduct, post-inspection follow-up and documentation, review of compliance data (i.e., overflow reports, discharge monitoring reports, Single Event Violations (SEVs), wet weather significant noncompliance (SNC) determinations, and complaints), new violation processing procedures instituted under this program work plan, and identification of new facilities/discharges. By March 2011, U.S. EPA and Illinois EPA compliance and enforcement staff will conduct this training. The Illinois Attorney General's office staff will be invited to participate.

e. Illinois EPA will perform 25 initial NPDES evaluations by June 1, 2011, to determine whether the facilities discharge or propose to discharge, including during wet weather. Illinois EPA will perform an additional 25 NPDES evaluations by June 1, 2012.

f. At its existing Compliance Group monthly meetings, Illinois EPA will review the findings and documentation of all NPDES evaluations for: a determination as to whether the facility meets the definition of a CAFO, areas of non-compliance, wet weather SNC determinations, violations detected, documentary evidence, and recommendations for correcting

the violations. Beginning in May 2011, Illinois EPA and U.S. EPA will confer monthly to review the findings and documentation of all CAFO noncompliance cases beginning with those initiated in 2009.

2. By June 1, 2011, Illinois EPA will develop and provide to U.S. EPA a long-term CAFO NPDES training curriculum for all staff conducting CAFO NPDES inspections. The curriculum will be completed by all existing CAFO inspectors and their first-line supervisors by August 2011. New staff will complete the curriculum within six months of their start date, and prior to conducting inspections independently. The curriculum will cover all State and federal Clean Water Act-related matters, including CAFO inspector training requirements specified in U.S. EPA internal order 3500.1.

3. By June 2011, Illinois EPA will develop a citizen complaint SOP and database for facilities that are potential CAFOs. The SOP will provide for a written report on investigation results to the complainant. The database will include a field recording the response to the complaint. The SOP will also provide instruction for ensuring 24-hour spill/release response capability which includes on-site presence of an NPDES trained inspector, sampling capability, and equipment to ensure that spills/releases from facilities are documented and assessed to determine if the facilities are CAFOs and require NPDES permits. The SOP will describe laboratory capabilities and services necessary to complete data analysis within prescribed holding times for pollutants of concern. The SOP must specifically address maintenance of those capabilities for those events which occur at night, on weekends, and on holidays.

4. Illinois EPA will develop an annual site-specific CAFO inspection plan which ensures NPDES inspection at a minimum of 20 percent of all permitted CAFOs, consistent with U.S. EPA's National NPDES Compliance Monitoring Strategy. Illinois EPA will provide the plan to U.S. EPA by September 1 of each year for approval.

5. During federal fiscal year 2011, U.S. EPA will conduct oversight inspections of a minimum of five Illinois EPA NPDES CAFO inspections to evaluate the effectiveness of the Illinois EPA inspection program. U.S. EPA inspectors will document their findings, and evaluate the thoroughness and scope of prior Illinois EPA inspections as well as the appropriateness of the record-keeping and reporting associated with the inspections. U.S. EPA will provide copies of these inspection reports to Illinois EPA within 60 days of completion. U.S. EPA will also conduct independent inspections at additional CAFOs with suspected wet weather discharges. U.S. EPA will invite Illinois EPA participation. U.S. EPA will initiate any appropriate follow-up enforcement consistent with existing State/U.S. EPA enforcement communication agreements and the Environmental Performance Partnership Agreement.

Indicia of Progress: Illinois EPA creates and maintains in ICIS a consolidated inventory of Large CAFOs. The inventory is easily accessible to all Illinois EPA staff and the public. Illinois EPA conducts NPDES evaluations at 25 potential Large CAFOs by June 1, 2011, and a total of 50 by June 1, 2012, consistent with approved SOPs. Illinois EPA implements approved annual inspection plans for permitted CAFOs consistent with the National Compliance Monitoring Strategy. Illinois EPA implements a satisfactory training program for inspectors. Illinois EPA responds to all citizen complaints and emergency CAFO-related discharges in a timely manner. Illinois EPA identifies and records 100 percent of Single Event Violations and all wet weather Significant Non-Compliance (SNC) in ICIS.

Objective 2: To properly track and efficiently resolve newly-identified violations. This objective focuses on newly-identified violators and addresses U.S. EPA's CAFO program review findings related to timely and appropriate enforcement addressing noncompliance by CAFOs and the requirement that all CAFOs that discharge or propose to discharge must apply for an NPDES permit.[7]

Approach:

1. Illinois EPA's Bureau of Water will revise its Enforcement Response Guide (ERG) in a manner designed to assure timely and appropriate response to violations detected at CAFOs and ensure a prompt return to compliance[8]. Illinois EPA will submit the revised ERG to U.S. EPA by February 28, 2011. The ERG will require all Large CAFOs to apply for and obtain an NPDES permit where the CAFOs discharge or propose to discharge. The ERG will require all Medium livestock and poultry facilities to apply for and obtain a permit where the facility meets the definition of a CAFO. In addition, the ERG will reflect the wet weather SNC policy in the determination of SNC as well as the appropriate enforcement response. Illinois EPA will submit the ERG to U.S. EPA for review and approval or approval with modifications. Illinois EPA will fully adopt and implement the ERG within 30 days of U.S. EPA approval or approval with modifications. All staff working on livestock and poultry issues will be trained and the revised ERG will be implemented by May 31, 2011.

2. By May 1, 2011, Illinois EPA will issue violation notices (VNs) for all significant noncompliance detected at CAFOs, within 180 days of Illinois EPA becoming aware of the alleged violation, pursuant to Section 31(a) of the Illinois Environmental Protection Act (Act). The VN will contain a recommended remedy and schedule for implementation as appropriate. Compliance Commitment Agreements (CCAs) will be accepted when they bind the respondent to the requirements and timeframes recommended in the VNs. If Illinois EPA is unable to

[7] See the *Initial Results*, Section VI. 3, pages 38-39.
[8] The ERG should include systems and procedures which assure timely and appropriate response to violations detected at other sources as well.

negotiate an acceptable CCA within 120 days of issuing the VN, Illinois EPA will refer the matter to the Illinois Attorney General's office. For conditions that constitute an imminent or substantial endangerment to human health, the environment or property, Illinois EPA will immediately refer the matter to the Illinois Attorney General's office pursuant to Section 43 of the Act.

3. In cases where the facility does not respond to the VN or proposes a remedy that is less effective than the remedy proposed by Illinois EPA, Illinois EPA will immediately complete the necessary actions under Section 31 to allow Illinois EPA to formally refer the matter to the Illinois Attorney General's office or the State's Attorney of the county in which the alleged violation occurred. Simultaneously, Illinois EPA will refer the case to its existing Enforcement Decision Group for pre-referral consideration of the case.

Indicia of Progress: Illinois EPA consistently follows the approved ERG. All CCAs are finalized within 120 days of the VN. No State-lead enforcement cases result in U.S. EPA taking additional action to resolve the same violations.

Objective 3: To assure that unresolved enforcement matters are properly tracked and efficiently resolved. This objective focuses on existing matters and addresses U.S. EPA's CAFO program review findings related to timely and appropriate enforcement addressing noncompliance by CAFOs[9].

Approach:

1. Beginning with the first quarter of calendar year 2011, Illinois EPA program and legal managers, Illinois Attorney General's Environmental Division managers, and U.S. EPA program and legal managers will conduct a quarterly docket review of all referred CAFO matters and all open federal enforcement cases. Participants will agree on the lead agency, path to resolution (including target dates), appropriate penalty resolution, and desired results. Illinois EPA will document decisions.

2. By July 2011, U.S. EPA legal staff and management will meet with the Illinois Attorney General's office and Illinois EPA's legal staff and management to discuss legal issues and strategy with respect to CAFO litigation and enforcement, including U.S. EPA penalty policies.

3. Illinois EPA will provide a report by no later than the 15th of each month to the U.S. EPA Water Enforcement Branch Chief. The report will reflect the activities completed during the preceding month. The reports will include the following:

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[9] See the *Initial Results*, Section VI. 3, pages 38-39.

- a list and electronic copy of the report for each facility evaluated under Objective 1, approach 1(e), to determine whether the facility is subject to NPDES permitting requirements;
- results of the Compliance Group's determinations under Objective 1, approach 1(f);
- a list of all potential CAFO-related citizen complaints/spills/releases received in the preceding month under Objective 1, approach 3, and the disposition of the cases;
- a list of potential CAFO facilities evaluated by the Enforcement Decision Group and a description of actions taken with regard to those facilities, including copies of any referrals to the Illinois Attorney General's office or written compliance determinations; and
- a list of all potential CAFO NPDES enforcement matters referred to the Illinois Attorney General's office or that are before the Illinois Pollution Control Board and a written summary of the status of the cases.

The frequency of reports may be adjusted after the initial six months by mutual agreement by Illinois EPA and U.S. EPA.

Indicia of Progress: All pending matters meet agreed-upon schedules for action and resolution. Decisions affecting case progress are made expeditiously, and barriers are removed. Newly-referred matters placed on the docket progress appropriately. Monthly reports are submitted timely and contain all required information.

Illinois Program Work Plan

February 2011

CAA Title V Permitting

The Illinois Environmental Protection Agency (Illinois EPA) implements the requirements of Title V of the Clean Air Act via its Clean Air Act Permit Program (CAAPP), which was approved by U.S. EPA on December 4, 2001 (66 Fed. Reg. 62946). Through regular program interactions, our annual planning process, and periodic program reviews, U.S. EPA and Illinois EPA discuss program progress and implementation barriers. On September 30, 2010, U.S. EPA provided Illinois EPA a Title V program review report which raised several concerns, most notably with the Illinois EPA's permit issuance rates. On January 18, 2011, Illinois EPA issued a response to the report. Since then, Illinois EPA and U.S. EPA have developed this work plan to strengthen the CAAPP, focusing on the following objectives:

- Issue CAAPP permits pursuant to the Clean Air Act and Section 39.5 of the Illinois Environmental Protection Act, 415 ILCS 5/39.5 (Section 39.5) .
- Significantly reduce issuance backlogs of CAAPP permit renewals and federally enforceable state operating permits, as identified in U.S. EPA's Title V Operating Permit System (TOPS) data base (FESOPs).

Both parties have agreed to approaches and commitments designed to address these objectives, as outlined in detail below.

Objective 1: **Issue CAAPP permits pursuant to the Clean Air Act and Section 39.5.**

In consideration of the entire permitting sequence, from application to drafting and review, Illinois EPA and U.S. EPA have identified the following approaches to support this objective:

Approach:

<u>Effective use of the application completeness process:</u>

1. Illinois EPA will continue to review each incoming CAAPP application to determine whether the application meets technical requirements and all administrative requirements of Section 39.5.

The Illinois EPA will continue to provide an application shield to only those sources for which the application has been deemed complete in accordance with 39.5(5). Illinois EPA will continue to request additional information as necessary during processing of the application.

2. Illinois EPA will continue to evaluate CAAPP application completeness by utilizing the existing completeness checklist, revising it as necessary. The CAAPP application forms require that an application must include a justification for non-applicability determinations and periodic monitoring requests, and that applicants certify that the information provided is complete and correct. Illinois EPA will review the application forms to assess whether they should be revised to make clear that applicants must include proposed methods for monitoring compliance with emissions limitations; the frequency of the proposed measurements; and, if the measurements are indirect (parametric), an explanation of how the measured values relate to actual emissions from the source. By March 31, 2011, Illinois EPA will provide U.S. EPA with the contents of its completeness checklist, highlighting any revisions. By July 1, 2011, U.S. EPA will assess Illinois EPA's completeness review process and will identify areas for improvement, if any. Illinois EPA will implement any agreed-to revisions as soon as practicable.

Effective and efficient permit drafting:

3. An Illinois EPA manager will continue to review all draft permits and statements of basis before they are publicly noticed to ensure that the CAAPP permits and statements of basis include, at a minimum, the following elements required by the CAAPP: all applicable requirements, periodic monitoring sufficient to assure compliance, compliance assurance monitoring where applicable, compliance schedules where appropriate, origin and authority for all permit terms, and practicably enforceable terms.

4. Effective immediately, U.S. EPA will, at a minimum, review and comment on one draft permit and accompanying Statement of Basis per month, if available. Illinois EPA will work with U.S. EPA to address U.S. EPA's comments.

5. U.S. EPA will support Illinois EPA with training and help with permit-specific issues, and assist with applicability determinations where appropriate. In addition to U.S. EPA's data base of Title V petitions, orders and other guidance documents, which is accessible by states, U.S. EPA commits to provide the following on-going assistance:

a. U.S. EPA will provide all recently-issued responses to petitions to object to Title V permits, policy statements and Title V guidance documents once they are publicly available, and will be available at least once a month to discuss how these policies and orders will impact, and should be implemented by, Illinois EPA. U.S. EPA will assist Illinois EPA, as necessary, to search and extract examples of application of guidance. Although many such permit decisions and other documents may be case-specific, U.S. EPA will provide Illinois EPA examples of acceptable periodic monitoring for common emission units. U.S. EPA will provide Illinois EPA with any tools it develops that will aid in the issuance of permits that meet the most up-to-date guidance.

b. As detailed elsewhere in this document, U.S. EPA will provide permit-specific assistance on the development of statements of basis and responses to comments. U.S. EPA will

also assist or conduct, where appropriate, MACT and NSPS applicability reviews and single source determinations. Typically, U.S. EPA will provide these reviews and determinations within 60 days of a request by Illinois EPA.

6. Illinois EPA will continue to offer training to ensure that its permit analysts understand and are equipped to fully implement the requirements of the Clean Air Act, Section 39.5, and U.S. EPA's guidance and policies, as appropriate. This includes the on-going productivity initiative discussed in the April 2010 Title V program review[10], regular CAAPP Unit meetings to discuss recent U.S. EPA comments on draft and proposed permits, applicability determinations, and responses to petitions to object to Title V permits; informal training on topics such as effective permit writing (e.g., periodic monitoring justification, writing techniques, etc.) and permit-specific issues; and formal training that U.S. EPA can provide or help Illinois EPA develop. Illinois EPA will have the Construction Unit manager and appropriate staff also participate when appropriate. U.S. EPA will be available to attend these meetings and answer permit-specific questions in Springfield at least monthly. Additionally, U.S. EPA will interact directly with permit analysts concerning draft permits and Statements of Basis.

Addressing and documenting responses to public comments:

7. By April 2011, U.S. EPA and Illinois EPA will re-open and revise the existing Title V implementation memorandum of understanding (MOU) to provide that Illinois EPA will make available to U.S. EPA its draft response to comments identified by U.S. EPA prior to the start of U.S. EPA's 45-day period to review a proposed permit. U.S. EPA's 45-day review will occur sequentially under this revised process, rather than being concurrent with the public review as per the existing MOU. This provision will not prevent U.S. EPA from waiving any portion of the 45-day review period remaining after it has completed its review. U.S. EPA's 45-day review period will begin when Illinois EPA provides U.S. EPA with the requested draft response to those comments identified by U.S. EPA and a proposed permit revised as necessary to address public comments. If requested by Illinois EPA, U.S. EPA will assist Illinois EPA in addressing comments prior to the start of the 45-day review period. Illinois EPA will continue to respond to all significant comments in the process of issuing CAAPP permits.

Indicia of Progress: U.S. EPA will see more thorough documentation of decision-making (e.g., Statements of Basis, Responses to Comments), resulting in fewer objections on this basis.

[10] See September 30, 2010 program evaluation report, page 16

Objective 2: **Significantly reduce permit issuance backlogs of CAAPP renewals and FESOPs.**

Illinois EPA and U.S. EPA agree that there is a large backlog of applications that Illinois EPA must process. Illinois EPA and U.S. EPA have identified the following approaches to reduce this backlog:

Approach:

1. As soon as practicable, but no later than July 1, 2011, Illinois EPA will temporarily assign two to five additional FTE to process CAAPP permit applications, to help replace staff reductions that have occurred over the past several years.

2. Illinois EPA senior management will continue to reinforce to staff, in writing, that issuing CAAPP operating permits is a high priority. Illinois EPA senior management will take every opportunity to identify issuance of CAAPP permits as a priority, such as through e-mails, staff meetings, presentations, and the identification of priorities in performance objectives.

3. By March 2011, Illinois EPA will clearly lay out for appropriate Illinois EPA staff expectations for CAAPP permit issuance. Illinois EPA senior management will develop and post in the office visual or virtual displays of the targets and expectations along with a measure of Illinois EPA's success in meeting the targets.

4. By June 2011, Illinois EPA will identify and implement a strategy to increase the permit issuance rate of FESOPs.

Indicia of Progress: The following table summarizes Illinois EPA's and U.S. EPA's permitting goals for FFY 2011 and 2012 for the current CAAP backlog. Thereafter, Illinois EPA will continue to public notice and issue CAAPP permits from the backlog.

Date	Cumulative Total of Draft Backlogged Permits Sent to Public Notice	Targeted Cumulative Total of Final Backlogged Permits Issued[11]
May 2011	6	
November 2011	10	6
May 2012	24	10
November 2012	48	24

[11] The word "targeted" is used in relation to final permit issuance in recognition that third parties can impact "final" permit issuance and/or effective dates through petitions to object filed with the Administrator and permit appeals filed with the State by permittees.

Illinois Program Work Plan
February 2011
Air Enforcement

Illinois EPA and U.S. EPA collectively ensure that facilities comply with applicable provisions of the CAA and associated State laws, permits and requirements. Illinois EPA's implementation of its CAA enforcement program is monitored by U.S. EPA through data input to U.S. EPA's Air Facility System (AFS), regular discussions of ongoing case status, a joint annual planning process, and periodic audits under U.S. EPA's State Review Framework. Through these mechanisms, program progress is tracked, and barriers to further progress are addressed. Illinois EPA and U.S. EPA have agreed through this work plan to work together to strengthen the State's enforcement program, focusing on the following three objectives:

- To detect all federally reportable violations and document them in order to support formal enforcement.
- To track and efficiently resolve newly identified violations.
- To assure that existing, unresolved enforcement matters are tracked and efficiently processed.

Both parties have agreed to approaches and commitments designed to address these objectives, as outlined in detail below.

Objective 1: To detect all federally reportable violations and document them in order to support formal enforcement.

Approach:

1. Illinois EPA will continue to organize training for its field inspectors and office compliance staff. Training will cover pre-inspection preparation, inspection conduct, post-inspection follow-up and documentation, review of compliance data (i.e., stack tests, continuous emission monitoring, continuous opacity monitoring reports, deviation reports). By March 2011, Illinois EPA will provide U.S. EPA a summary of existing and proposed training, including agendas and materials, to be offered to Illinois EPA Bureau of Air (BOA) field inspectors and compliance staff during 2011. U.S. EPA will provide feedback as appropriate. A similar process will occur for any new training program topics. U.S. EPA will review training opportunities and from time to time, but at least quarterly, provide Illinois EPA's BOA Training Coordinator with a list of federally-sponsored training opportunities relevant to field inspections (inspection quality, inspection conduct, post-inspection follow-up, etc.), NSR and PSD compliance, specific source sector compliance, compliance with recent NESHAPs or NSPS, and other federal regulations or

requirements relevant to Illinois EPA's Compliance Monitoring Strategy. U.S. EPA will also share other non-federal training opportunities and materials it finds to be effective.

2. From time to time, U.S. EPA Headquarters develops specific source-sector enforcement initiatives that focus on PSD/NSR noncompliance. U. S. EPA has Section 114 authority that allows it to gather information or documents from the targeted source-sector that may be necessary to assess whether a PSD/NSR violation exists. When Illinois EPA has identified a modification at a source that may be a major modification, and cannot support an enforcement action with information available, Illinois EPA will provide to U.S. EPA the inspection report and any other documentation that may support a PSD/NSR noncompliance inquiry. U. S. EPA will then use its Section 114 authority to gather additional evidence relevant to the PSD/NSR inquiry.

3. Illinois EPA Bureau of Air (BOA) staff has developed a new Compliance Monitoring Report (CMR), which is currently being field-tested, and once perfected, will be used for each BOA inspection. The final CMR will standardize the pre-inspection, inspection, and post-inspection practices, and will include checklists to ensure that the field inspector has identified the necessary elements for each type of inspection (e.g., full compliance evaluation (FCE), partial compliance evaluation (PCE), complaint response, etc.). A draft of the CMR has been field tested on two FCE inspections. The comments on the initial draft of the CMR are currently being reviewed and the initial draft CMR is being revised. By March 15, 2011, the revised draft CMR will be field-tested by one or more inspectors in each regional field office. By April 15, 2011, comments on the draft CMR by the regional field staff involved in the next phase of testing will be received and any necessary changes to the draft CMR will be made. By May 1, 2011, the proposed CMR will be sent to U.S. EPA ARD program and legal managers for review and comment. U.S. EPA will provide comments to Illinois EPA BOA staff on the proposed CMR by June 1, 2011. In July, August and September 2011, Illinois EPA BOA will conduct training on the final CMR to ensure that each field inspector and compliance engineer is familiar with the CMR and its requirements. Beginning October 1, 2011, the CMR will be used for each field inspection.

4. By March 15, 2011, Illinois EPA will compose three (3) regional Meeting in Region (MIR) committees, consisting of Illinois EPA's field staff in that region, and compliance and legal staff assigned to that region, as well as the FOS Section Manager. Each of the committees will consult with their assigned field inspectors on scheduled inspections for the upcoming quarter to review methods of evaluation, applicable regulatory requirements, and necessary documentation specific to that investigation. Post inspection, each of the three regional MIR committees will meet with each of their assigned inspectors to review their findings and documentation, and identify areas of non-compliance and possible remedies.

Indicia of Progress: Documentation supporting violations is sufficient to ultimately resolve most of the violations through negotiation or litigation. The number of cases that the Compliance Decision Group (CDG) (see below) refers back to technical staff due to insufficient information will be tracked to measure progress.

Objective 2: To track and efficiently resolve newly identified violations.

Approach:

1. Illinois EPA will continue to use a Compliance Decision Group (CDG) composed of the BOA Permit Section Manager, the Field Operations Section (FOS) Manager, the Compliance Section Manager and the Manager of the Division of Legal Counsel-Air Enforcement. The CDG will analyze each violation detected during the previous month, detailing supporting evidence, desired corrective action, and expected environmental benefits. The CDG will prioritize ongoing or recurring violations for expedited Violation Notices (VNs), preliminarily identify violations that may require formal resolution, and direct insufficiently supported cases back to the technical staff for follow-up. Decisions will be documented and maintained.

2. Beginning in March 2011, where the appropriate technical remedy is known, the Illinois EPA will issue VNs containing a recommended technical remedy and schedule for implementation. Where the appropriate technical remedy is not known, Illinois EPA will generally describe a remedy(s) believed by Illinois EPA to be applicable to the particular case and a schedule for resolution.

3. Non-responses to VNs or responses without a commitment to a technical remedy that is at least as effective as that proposed by Illinois EPA will be immediately referred to the CDG.

4. The CDG will meet monthly to dispose of matters referred to them. Most matters referred to the CDG following step 3 above where High Priority Violators (HPVs) have been identified will be referred to the Illinois Attorney General's office unless that office declines. If the Attorney General's office declines referral, the CDG can consider other options for resolution. Decisions of the CDG will be documented and maintained.

5. Beginning in March 2011, Illinois EPA legal enforcement staff will utilize its regular calls with the Illinois Attorney General's office to discuss the status of existing active cases, including information needs, affirm agreement on settlement terms and path to resolution, etc., as well as review the backlogged cases for next opportunities and necessary actions.

Indicia of Progress: No extended periods of negotiation for Compliance Commitment Agreements where HPVs have been identified in a VN. Time frames between case milestones

will be tracked to monitor progress. A twenty-five (25%) percent increase in HPV cases referred to the Illinois Attorney General's Office over FFY 2010 levels in both FFY 2011 and FFY 2012.

Objective 3: To assure that existing, unresolved enforcement matters are tracked and efficiently processed.

Approach:

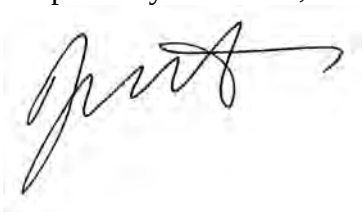
Beginning in March 2011, Illinois EPA BOA program and legal managers and U.S. EPA ARD program and legal managers will conduct a semi-annual review of cases where a HPV has been identified in a VN (prior to referral), or in a referral to the AGO. Participants will review the status of each unresolved, state-initiated, HPV (post VN); agree upon the lead agency, path to resolution (including target dates), and appropriate penalty resolution; and affirm desired results. Decisions will be documented.

Indicia of Progress: All pending matters will be closely monitored through ultimate resolution, decisions affecting case progress will be expeditiously made, and barriers will be identified and a path to address the barrier will be agreed upon.

CERTIFICATE OF SERVICE

I, Jessica Dexter, hereby certify that I have filed the attached **NOTICE OF FILING** and **PRE-FILED TESTIMONY OF ARNOLD LEDER, PRE-FILED TESTIMONY OF STACY JAMES, PH.D.** and **PRE-FILED TESTIMONY OF DR. KENDALL THU** upon the attached service list by depositing said documents in the United States Mail, postage prepaid, in Chicago, Illinois on October 16, 2012.

Respectfully submitted,



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