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THE IMPACT OF FEEDLOT WASTE ON WATER POLLUTION UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

KATE CELENDER*

INTRODUCTION

Meat recalls have become such a common place news topic that an announcement from the United States Department of Agriculture ("USDA") recalling 143 million pounds of ground beef, the largest recall in history,¹ hardly sparked much public interest. Like many other farming practices, raising and slaughtering livestock has become an industrialized process.² Upton Sinclair's seminal book, *The Jungle*, first brought the lurid details of the industry to the forefront of national attention in 1906 and prompted President Theodore Roosevelt to task the United States Department of Agriculture with the inspection of animal carcasses and slaughterhouses.³ The USDA's focus in inspections has shifted to a prevention-based program that establishes sanitation requirements for slaughterhouses.⁴ While regulations promulgated under the prevention-based program have arguably provided a minimum level of

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¹ See Andrew Martin, *Largest Recall of Ground Beef is Ordered*, N.Y. TIMES, Feb. 18, 2008, available at <http://www.nytimes.com/2008/02/18/business/18recall.html>. Approximately 50 million pounds of that beef went into school lunches and federal food programs for the poor and elderly. *Id.*

² Michael Boehlje, *Globalization and Agriculture: New Realities*, BUS. ENV'T, at 2 (2002), available at <http://www.agecon.purdue.edu/extension/sbpcp/resources/GlobalizationandAg.pdf>. See generally JIM MASON & PETER SINGER, ANIMAL FACTORIES: THE MASS PRODUCTION OF ANIMALS FOR FOOD AND HOW IT AFFECTS THE LIVES OF CONSUMERS, FARMERS, AND THE ANIMALS THEMSELVES (Cronin Publishers, 1980).

³ See Aisha Ikramuddin & Leila Mead, *Slaughterhouse 5: Farming of Meat and Poultry*, NAT'L GEOGRAPHIC GREEN GUIDE, Mar. 1, 1998, available at <http://www.thegreenguide.com/doc/51/slaughterhouse>. See also The Theodore Roosevelt Association, Timeline: Life of Theodore Roosevelt, <http://www.theodoreroosevelt.org/life/timeline.htm> (last visited Feb. 12, 2009).

⁴ See Jean C. Buzby & Stephen R. Crutchfield, *USDA Modernizes Meat and Poultry Inspection*, FOOD REV., Jan.-Apr. 1997, at 14-15, available at <http://www.ers.usda.gov/publications/foodreview/jan1997/jan97b.pdf>.

food safety,⁵ dealing with the millions of tons of animal waste produced annually has become a pressing national problem⁶ that receives little public attention.⁷

Presently, lagoons and sprayfields are the most common methods for dealing with animal feedlot waste.⁸ Feedlots generally collect waste from the area containing a concentrated number of animals and store it, untreated, in lagoons before applying it at agronomic rates as fertilizer onto land called sprayfields.⁹ Federal regulation of feedlot waste applies peripherally to concentrated animal feeding operations, or CAFOs, through laws such as the Clean Water Act.¹⁰ The Clean Water Act requires certain CAFOs to apply for a National Pollutant Discharge Elimination System ("NPDES") permit.¹¹ Obtaining the permit means the CAFO must implement a nutrient management plan to dispose of waste in an efficient way while minimizing risk to the environment.¹² Most states undertake responsibility for implementing the NPDES permitting system and are allowed to supplement it with their own requirements or voluntary procedures.¹³ The EPA mandates that states require a nutrient management plan but gives the states the option of creating stricter enforcement beyond the EPA's water protection guidelines and the ability to decide what sort of permits to issue.¹⁴

⁵ But see GAIL A. EISNITZ, *SLAUGHTERHOUSE: THE SHOCKING STORY OF GREED, NEGLECT, AND INHUMANE TREATMENT INSIDE THE U.S. MEAT INDUSTRY* (Prometheus Books 2006).

⁶ See ROBBIN MARKS, NATURAL RES. DEF. COUNCIL AND THE CLEAN WATER NETWORK, *CESSPOOLS OF SHAME: HOW FACTORY FARM LAGOONS AND SPRAYFIELDS THREATEN ENVIRONMENT AND PUBLIC HEALTH* 3-4 (2001), available at <http://www.nrdc.org/water/pollution/cesspools/cesspools.pdf>.

⁷ Dana Cole, et al., *Concentrated Swine Feeding Operations and Public Health: A Review of Occupational and Community Health Effects*, 108 ENVTL. HEALTH PERSPECTIVES 685, 693 (2000) (commenting on the lack of research on CAFO contribution to air and water pollution problems leading to adverse mental and physical health effects in nearby residents).

⁸ MARKS, *supra* note 6, at 3-4.

⁹ *Id.*

¹⁰ ENVTL. PROT. AGENCY, NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) (2007), <http://cfpub.epa.gov/npdes/>.

¹¹ 40 C.F.R. § 122.23(a), (d)(1) (2007).

¹² 40 C.F.R. § 412.4(c) (2007).

¹³ See National Pollutant Discharge Elimination System Permit Regulation and Effluent Limitation Guidelines and Standards for Concentrated Animal Feeding Operations (CAFOs), 68 Fed. Reg. at 7231 (Feb. 12, 2003). See also ENVTL. PROT. AGENCY, *supra* note 10, at 1.

¹⁴ National Pollutant Discharge Elimination System Permit Regulation and Effluent Limitation Guidelines and Standards for Concentrated Animal Feeding Operations (CAFOs), 68 Fed. Reg. 7207, 7231-32 (Feb. 12, 2003).

Improperly managed CAFO waste "is among the many contributors to remaining water quality problems . . . [and] has caused serious acute and chronic water quality problems throughout the United States."¹⁵ The EPA only requires NPDES permits for those CAFOs that qualify as point sources of pollution, and does not regulate Animal Feeding Operations ("AFOs") too small to qualify as CAFOs, despite their potential for a collectively significant impact on water pollution.¹⁶ Furthermore, many of the requirements within the NPDES permitting system only apply to large CAFOs, such as effluent limitations,¹⁷ leaving regulation of small CAFOs to state discretion,¹⁸ and making national uniformity in regulation difficult.

The current methods feedlots employ in handling animal waste, such as sprayfields and lagoons, create substantial water pollution problems.¹⁹ Runoff from the sprayfields and lagoons may introduce heavy metals, pathogens, antibiotics, pesticides, and ammonia into ground and surface-water.²⁰ In addition to numerous adverse effects on human health,²¹ contaminated runoff and spills have resulted in multiple fish kills.²²

Congress should enact federal laws which create a more expansive standard of feedlot waste regulation while simultaneously mandating either gradual phase-out or responsible use of waste lagoons and sprayfields because current federal and state laws fail to adequately protect water quality.

At the least, federal laws currently applicable to CAFOs should mandate the inclusion of Effluent Limitation Guidelines ("ELGs") in all NPDES permits, rather than just requiring them for large CAFOs, and should state that all AFOs qualified as CAFOs must apply for a NPDES

¹⁵ National Pollutant Discharge Elimination System Permit Regulation and Effluent Limitation Guidelines and Standards for Concentrated Animal Feeding Operations (CAFOs), 68 Fed. Reg. 7176 (Feb. 12, 2003) (to be codified at 40 C.F.R. pt.9, 122-123, 412).

¹⁶ 40 C.F.R. § 122.23(a), (d)(1) (2007).

¹⁷ National Pollutant Discharge Elimination System Permit Regulation and Effluent Limitation Guidelines and Standards for Concentrated Animal Feeding Operations (CAFOs), 68 Fed. Reg. at 7207-08, 7226.

¹⁸ *Id.* at 7207.

¹⁹ See *infra* Part IV.

²⁰ Eric Pianin & Anita Huslin, *EPA Issues New Rules on Livestock Waste*, WASH. POST, Dec. 17, 2002, at A06. See also Ikramuddin & Mead, *supra* note 3, at 1.

²¹ See Lynda Knobeloch et al., *Blue Babies and Nitrate-Contaminated Well Water*, 108 ENVTL. HEALTH PERSP. 675 (2000). See also CDC, *Spontaneous Abortions Possibly Related to Ingestion of Nitrate-Contaminated Well Water—LaGrange County, Indiana, 1991-1994*, 45 MORBIDITY & MORTALITY WKLY REP. 569 (1996).

²² Ikramuddin & Mead, *supra* note 3, at 1.

permit. Furthermore, the EPA or responsible state permitting authorities should increase enforcement of its water quality requirements and implement a policy that forbids CAFOs from obtaining more animals if they do not apply for the mandated NPDES permit or implement responsible waste management techniques in a timely manner. Finally, the changes to current CAFO legislation should account for alternative methods of waste treatment, such as wastewater treatment options offered by the private sector and conversion of the waste into fertilizer, bioenergy, and compost. In order to encourage the industry to take advantage of these opportunities to protect water quality, the government should subsidize these technological changes by providing tax breaks and funding applications.

Part I of this paper will discuss the most common methods of feedlot waste management. Part II will examine the current federal regulations applicable to feedlots, while Part III deals with the implications of federal regulation on the states. Part IV will outline the problems associated with the current methods of feedlot waste management as well as those arising from applicable federal laws. Finally, Part V will propose solutions for both strengthening federal regulation of feedlots, and implementing methods for managing feedlot waste in an environmentally responsible manner.

I. CURRENT METHODS OF FEEDLOT WASTE MANAGEMENT

The shift made over time towards greater confinement of livestock and the rise of CAFOs have made handling the 220 billion gallons of waste produced annually by these animals a serious issue.²³ The CAFOs collect waste from the area containing the animals by gravity flow gutters, flushing systems, or scrapers with the manure being stored, untreated, in open-air pits, or lagoons.²⁴ Solid materials like dirty bedding are typically separated out of dairy cattle waste but not removed from others.²⁵ The lagoon storing the liquified waste may take a variety of forms, including aerobic or anaerobic lagoons, or temporary storage bins, and may be as large as seven and a half acres, containing nearly forty-five million gallons.²⁶ Once the wastewater collects in the lagoon, the feedlots normally spray the untreated liquid manure onto pastures or crop land, otherwise known as sprayfields.²⁷

²³ MARKS, *supra* note 6, at 3.

²⁴ *Id.*

²⁵ *Id.*

²⁶ *Id.*

²⁷ *Id.* at 4, 17.

Ideally, this system applies the nutrients in the waste at agronomic rates to maximize soil fertility without over-saturating the land and causing damage.²⁸ The concept implicitly assumes that lagoons will not fill with waste faster than it may be applied to the land at the proper rate.²⁹

II. THE CURRENT STATE OF FEDERAL REGULATION

Feedlots that concentrate animals in an industrialized process must deal with a serious problem—the millions of tons of waste produced.³⁰ An Animal Feeding Operation, or “AFO,” is legally defined as a:

[l]ot 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 where crops, [or] vegetation forage growth . . . are not sustained in the normal growing season over any portion of the lot or facility.³¹

Essentially, an AFO congregates a large amount of animals in a confined area and brings them food, rather than allowing the animals to graze on their own in pastures.³² An AFO is a Concentrated Animal Feeding Operation, or CAFO, if it has a certain number of confined animals or if it has been designated as such by an appropriate authority.³³

A. NPDES Permitting System

Currently, federal regulation of feedlot waste as it pertains to water pollution only applies to CAFOs and is primarily achieved through permits obtained by the National Pollutant Discharge Elimination System (“NPDES”).³⁴ This system controls water pollution by regulating it as a

²⁸ *Id.*

²⁹ *Id.* at 7.

³⁰ *Id.* at 3-4.

³¹ 40 C.F.R. § 122.23(b)(1) (2007).

³² ENVTL. PROT. AGENCY, GUIDANCE MANUAL AND EXAMPLE NDES PERMIT FOR CONCENTRATED ANIMAL FEEDING OPERATIONS REVIEW DRAFT 2-1 (1999), available at http://www.epa.gov/npdes/pubs/dman_afo.pdf.

³³ 40 C.F.R. § 122.23 (2007). The CAFO will at least be a medium CAFO and subject to NPDES permitting requirements if it has as many as or more than “200 . . . mature dairy cows, 300 . . . veal calves, 300 . . . cattle other than mature dairy cows or veal calves . . . 750 . . . swine each weighing 55 pounds or more, [or] 3,000 . . . swine each weighing less than 55 pounds.” *Id.*

³⁴ The Clean Water Act of 1972 created the NPDES permitting system. ENVTL. PROT. AGENCY, *supra* note 10, at 1.

point source. Large and medium CAFOs are considered point sources for the purposes of The Clean Water Act.³⁵ A point source discharges "pollutants from discrete conveyances [a pipe, channel, or ditch] directly into the waters of the United States."³⁶ Specifically, the EPA includes in its definition of a point source both the locations of animal confinement and the areas where waste is stored or applied to land, meaning runoff from both of these sources is considered discharge and must meet NPDES permitting requirements.³⁷

Those CAFOs qualified as point sources must apply for a permit under the NPDES³⁸ and meet a variety of other requirements as part of the development and implementation of best management practices.³⁹ This includes developing and following a nutrient management plan, determining application rates, sampling soil and manure, inspecting waste management equipment for leaks, and adhering to the setback requirements.⁴⁰ Specifically, the permitting authority must conduct an assessment of the CAFO to determine the potential for runoff of nitrogen and phosphorus to surface waters (basing the determination on annual manure and soil samples), and must develop a flexible application plan that minimizes that risk while still maintaining production.⁴¹ Furthermore, the permitting system prohibits CAFO application of "manure, litter, and process wastewater" to land less than 100 feet from any surface waters, channels to surface waters, water intakes, agricultural wells, or sink-holes, unless the CAFO provides a thirty-five foot vegetated buffer or equivalent alternative control method.⁴²

³⁵ 40 C.F.R. § 122.23 (2007).

³⁶ ENVTL. PROT. AGENCY, PRODUCER'S COMPLIANCE GUIDE FOR CAFOs: REVISED CLEAN WATER ACT REGULATIONS FOR CONCENTRATED ANIMAL FEEDING OPERATIONS 3 (2003), available at http://www.epa.gov/npdes/pubs/cafo_prod_guide_entire_doc.pdf.

³⁷ National Pollutant Discharge Elimination System Permit Regulation and Effluent Limitation Guidelines and Standards for Concentrated Animal Feeding Operations (CAFOs), 68 Fed. Reg. at 7196 (Feb. 12, 2003).

³⁸ 40 C.F.R. § 122.23(a), (d)(1) (2007). Even if the CAFO does not discharge during a twenty-five year, twenty-four hour storm, it must still contact the permitting authority to provide required information to assure that a permit is not needed. *See* ENVTL. PROT. AGENCY, *supra* note 36, at 3. *See also*, *Waterkeeper Alliance v. E.P.A.*, 399 F.3d 486 (2d Cir. 2005) (upholding EPA provision that stated those facilities with no potential to pollute need not obtain a NPDES permit after applying).

³⁹ 40 C.F.R. § 412.4 (2007).

⁴⁰ 40 C.F.R. § 412.4(c) (2007).

⁴¹ *Id.*

⁴² 40 C.F.R. § 412.4(c)(5) (2007). For a detailed discussion about the use of buffers in controlling animal waste, *see generally* Terrence J. Centner, *Concentrated Feeding*

NPDES permits, the main mechanism for controlling the discharge of pollution into U.S. waters, also set effluent limitations guidelines ("ELGs"), which the EPA mandates for all large CAFOs regardless of whether a state or the EPA issues the permit.⁴³ The ELGs limit how much of a certain pollutant the large CAFO may discharge by creating discharge limits, and set requirements for record-keeping and management practices.⁴⁴ The standard for the ELGs will either be technology-based or, when that standard is not sufficient to meet water quality standards, water quality-based.⁴⁵ In choosing technology-based effluent limitations, the permitting authority determines the degree to which a reduction in pollution may be accomplished by pollution control practices or technologies.⁴⁶ In contrast, water quality-based effluent limits are based on concerns for the condition of the water body into which the runoff drains.⁴⁷ If the large CAFO obtains a permit and follows the nutrient management plan developed as a prerequisite, then discharge from waste application areas on land (sprayfields) will simply be treated as agricultural storm water not subject to ELGs.⁴⁸ Because ELG limitations do not normally apply to small and medium CAFOs, the permit writer uses its best professional judgment to set technology-based effluent limitations as needed and on an individual basis.⁴⁹ This allows for greater flexibility and more economically achievable results.

Obtaining a NPDES permit means that the CAFO complies with the Clean Water Act.⁵⁰ The NPDES permit identifies the facility, which is the point source of wastewater discharge to surface water, and attempts

Operations: An Examination of Current Regulations and Suggestions for Limiting Negative Externalities, 25 COLUM. J. ENVTL. L. 219 (2000).

⁴³ 40 C.F.R. §§ 412.30, 412.40 (2007). *See also* National Pollutant Discharge Elimination System Permit Regulation and Effluent Limitation Guidelines and Standards for Concentrated Animal Feeding Operations (CAFOs), 68 Fed. Reg. at 7207 (Feb. 12, 2003); ENVTL. PROT. AGENCY, *supra* note 36, at 4-5.

⁴⁴ 40 C.F.R. §§ 412.30, 412.40 (2007). *See also* ENVTL. PROT. AGENCY, *supra* note 36, at 4-5.

⁴⁵ National Pollutant Discharge Elimination System Permit Regulation and Effluent Limitation Guidelines and Standards for Concentrated Animal Feeding Operations (CAFOs), 68 Fed. Reg. at 7207 (Feb. 12, 2003).

⁴⁶ *Id.*

⁴⁷ *Id.*

⁴⁸ *Id.*

⁴⁹ 40 C.F.R. §§ 412.30, 412.40 (2007). *See also* National Pollutant Discharge Elimination System Permit Regulation and Effluent Limitation Guidelines and Standards for Concentrated Animal Feeding Operations (CAFOs), 68 Fed. Reg. at 7207-08, 7226 (Feb. 12, 2003); ENVTL. PROT. AGENCY, *supra* note 36, at 4-5.

⁵⁰ 40 C.F.R. § 122.5(a) (2007).

to protect water quality by setting requirements relating to management practices, discharge limits, and record-keeping.⁵¹ If the CAFO has a NPDES permit, it may discharge pollutants (which includes suspended solids, pathogens, nutrients, and oxygen-demanding substances) as long as it meets the requirements set forth in the permit.⁵²

III. REGULATION BY THE STATES

A. *The Effect of Federal Regulation*

Authorized states administer the permits as provided under the NPDES.⁵³ Currently, forty-five states have CAFO permit programs authorized under the NPDES.⁵⁴ The EPA implements the NPDES permitting program in those states without an authorized program.⁵⁵ The EPA also reserves for the states the power to decide when to issue to a large CAFO an individual rather than generalized permit so that states may have more flexibility in setting local standards.⁵⁶ The permitting body typically gives generalized permits when the facility has similar characteristics to other facilities.⁵⁷ In contrast, the permitting body only issues an individual permit under exceptional circumstances, such as when a facility is unusually large, has "a history of noncompliance," or where the facility is using some performance standard other than technology-based effluent limits.⁵⁸

While the EPA has primarily focused on regulating large CAFOs, it still encourages states to use their own voluntary and regulatory programs to compel participation from small and medium CAFOs.⁵⁹ For example, the EPA delegates to the states the optional task of creating

⁵¹ ENVTL. PROT. AGENCY, *supra* note 36, at 4.

⁵² *Id.*

⁵³ ENVTL. PROT. AGENCY, *supra* note 10, at 1. *See also* 33 U.S.C. § 1342 (b) (2007) (providing that states must have adequate resources and proper authority).

⁵⁴ National Pollutant Discharge Elimination System Permit Regulation and Effluent Limitation Guidelines and Standards for Concentrated Animal Feeding Operations (CAFOs), 68 Fed. Reg. at 7231 (Feb. 12, 2003).

⁵⁵ *Id.*

⁵⁶ *Id.* at 7205.

⁵⁷ *Id.* at 7232.

⁵⁸ *Id.*

⁵⁹ National Pollutant Discharge Elimination System Permit Regulation and Effluent Limitation Guidelines and Standards for Concentrated Animal Feeding Operations (CAFOs), 68 Fed. Reg. at 7231 (Feb. 12, 2003).

technical standards as part of the regulation of agricultural storm water in order to establish adequate water quality protection.⁶⁰ The EPA classifies agricultural storm water as discharge from land areas where large CAFOs (that follow a nutrient management plan as required under their NPDES permit) apply waste.⁶¹ The EPA does require states to have nutrient management plans consistent with what the NPDES requires.⁶²

IV. THE PROBLEMS

A. *Regulation only Applies to Certain CAFOs*

The NPDES regulations only require those CAFOs which qualify as medium or large facilities, and in some cases small AFOs with certain characteristics, to meet the federal guidelines for managing animal waste.⁶³ According to the EPA, the specific condition that triggers the classification of the AFO as a small or medium CAFO will be unique to each site.⁶⁴ For this reason, the individualized NPDES permit issued based on the permit authority's best professional judgment seems to control discharge from the facility better.⁶⁵ The EPA also mandates that only large CAFOs are subject to ELGs, while the permitting body uses its best professional judgment to set discretionary requirements for small and medium CAFOs.⁶⁶ The EPA cites concerns about creating a lesser financial burden on the industry and the economic achievability of the regulations as the reasons for limiting federal regulation to large CAFOs.⁶⁷ The recently expanded permitting requirements now apply to a greater number of large CAFOs, and have already added approximately \$335 million to the feedlots' annual operating costs.⁶⁸

⁶⁰ *Id.* at 7207.

⁶¹ *Id.*

⁶² *Id.* at 7231.

⁶³ The Clean Water Act considers medium and large CAFOs to be point sources which are therefore required to apply for a permit under NPDES. *See supra* notes 10 & 36; "Small and medium AFOs are defined or designated as CAFOs only when certain conditions that pose an environmental risk are present at the operation." National Pollutant Discharge Elimination System Permit Regulation and Effluent Limitation Guidelines and Standards for Concentrated Animal Feeding Operations (CAFOs), 68 Fed. Reg. at 7208 (Feb. 12, 2003).

⁶⁴ National Pollutant Discharge Elimination System Permit Regulation and Effluent Limitation Guidelines and Standards for Concentrated Animal Feeding Operations (CAFOs), 68 Fed. Reg. at 7208.

⁶⁵ *Id.*

⁶⁶ *Id.* at 7207.

⁶⁷ *Id.* at 7208.

⁶⁸ Pianin & Huslin, *supra* note 20, at A7.

The NPDES requirements under federal law apply to 15,500 feedlots, which are responsible for approximately 60% of all waste runoff.⁶⁹ The remaining AFOs that do not qualify as CAFOs depend on the states to voluntarily regulate their waste, despite their collective potential for substantially contributing to water pollution problems. Unfortunately, this large amount of discretion conferred on local permitting authorities and the lack of oversight or strong national guidelines from the EPA creates the potential for a lack of uniformity in application and enforcement.⁷⁰ In an attempt to attract profitable agribusiness to the state, permitting authorities may engage in a race to the bottom by reducing the amount of AFOs required to obtain a permit.⁷¹ This may be achieved by failing to recognize those conditions or environmental risks of AFOs that would normally qualify them as CAFOs subject to NPDES requirements under the Clean Water Act.⁷² State permitting authorities may further promote a race to the bottom by failing to issue and review the permits for CAFOs or by not enforcing the Clean Water Act.⁷³ For instance, even when states do qualify AFOs as CAFOs, thus bringing them under the minimum federal requirements of the NPDES section of the Clean Water Act,⁷⁴ they may not fully enforce the Federal Law. For example, states such as Arkansas and Iowa have issued permits to less than 5% of all CAFOs requiring NPDES permits within their borders.⁷⁵ Illinois also experiences similar problems.⁷⁶ New York has not only failed to enforce its state permitting

⁶⁹ *Id.*

⁷⁰ Michele M. Merkel, EPA and State Failures to Regulate CAFOs Under Federal Environmental Laws, Outline of Remarks Prepared for the National Commission on Industrial Farm Animal Production Meeting (Sept. 11, 2006), at 3, 8, available at www.environmentalintegrity.org/pub401.cfm.

⁷¹ *Id.* at 8.

⁷² National Pollutant Discharge Elimination System Permit Regulation and Effluent Limitation Guidelines and Standards for Concentrated Animal Feeding Operations (CAFOs), 68 Fed. Reg. at 7208 (Feb. 12, 2003).

⁷³ Merkel, *supra* note 70, at 8. Similarly, the EPA has also failed to enforce the NPDES requirement under the Clean Water Act, since almost no cases have been referred for prosecution to the DOJ and few administrative actions have been initiated, despite less than half of all CAFOs known to require NPDES permits having obtained them. *Id.* at 3; see also Terence J. Centner, *Courts and the EPA Interpret NPDES General Permit Requirements for CAFOs*, 38 ENVTL. L. 1215, 1238 (2008).

⁷⁴ Federal regulation of feedlot waste as it pertains to water pollution only applies to those AFOs classified as CAFOs through NPDES permits under the Clean Water Act. ENVTL. PROT. AGENCY, *supra* note 10, at 1.

⁷⁵ Merkel, *supra* note 70, at 3.

⁷⁶ Danielle J. Diamond, *Illinois' Failure to Regulate Concentrated Animal Feeding Operations in Accordance with the Federal Clean Water Act*, 11 DRAKE J. AGRIC. L. 185, 189 (2006).

requirements in the past, but provides no “review, oversight, or required approval of [waste management] plans to evaluate whether the [CAFO] will in fact comply with state and federal water quality regulations.”⁷⁷ Other states may even go so far as to set their laws below federal requirements, making CAFO compliance with the Clean Water Act impossible within the state.⁷⁸

Feedlot companies may also have too much flexibility to create their own waste management plans and are not required to use modern technology, such as monitoring groundwater for contamination, to better combat pollution.⁷⁹ Additionally, none of the regulations hold the corporations that contract with feedlots liable for any problems arising from waste disposal.⁸⁰ Though some companies operate feedlots themselves, many others contract with producers.⁸¹ These contracts state that the company owns the livestock, but “the contractor owns the waste,” which allows the large company that sells the finished meat product to shield itself from any liability associated with waste management or disposal.⁸² For instance, the Seaboard Corporation, one of the largest pork producers in the country, maintained that it actually owned no hogs.⁸³ Other companies use a cooperative structure, so that when pollution problems arise, only the operator is responsible, rather than the entire cooperative to which the facility belongs.⁸⁴ These forms of corporate structuring, designed to shield companies from liability, are typically effective, despite a 2004 case in which a federal judge found Tyson liable for damages arising from feedlot

⁷⁷ Michael Schade, Citizens’ Envtl. Coal. & Sierra Club, *The Wasting of Rural New York State: Factory Farms and Public Health* 24, 24-25 (2005), available at <http://www.ecothreatny.org/cectoxic/WastingRuralNy.pdf>. The state permitting requirements also did not include basic pollution control methods that are part of best management practices, such as lining and covering manure lagoons, forbidding the spread of manure to sprayfields before or during precipitation events or on snow-covered or frozen ground, and meeting setback requirements for waterbodies and drinking water wells. *Id.* at 25.

⁷⁸ Hugh Espey, Neil Seaman, & Karla Raettig, Petition for Withdrawal of the National Pollutant Discharge Elimination System Program Delegation from the State of Iowa (Sept. 20, 2007), at 3, available at www.environmentalintegrity.org/pubs/MicrosoftWord_IowaCWAPetition_09-19-07_.pdf. The citizen groups have formally petitioned the EPA in writing for a public hearing under 33 U.S.C. § 1342(c)(3) regarding Iowa’s alleged failure to administer the CAFO permitting program as required. *Id.* at 1-2.

⁷⁹ Pianin & Huslin, *supra* note 20, at A6.

⁸⁰ *Id.*

⁸¹ MARKS, *supra* note 6, at 7.

⁸² *Id.* See also Peter S. Goodman, *From Farm to Slaughterhouse*, WASH. POST, Aug. 3, 1999, at A1.

⁸³ MARKS, *supra* note 6, at 10.

⁸⁴ *Id.* at 14.

pollution because Tyson exerted too much control over how the grower raised the chickens and received the majority of the related profits.⁸⁵

B. Environmental Risks of Waste Lagoons and Sprayfields

CAFOs routinely spray the liquified animal waste contaminated with pathogens, antibiotics, pesticides, and ammonia onto agricultural land as "fertilizer," which ends up running off "into surface water, killing fish, spreading disease and contaminating supplies of drinking water."⁸⁶ Runoff and animal waste (even if applied at appropriate rates) may also contain heavy metals,⁸⁷ as well as undigested antibiotics and resistant bacteria, which may seep into groundwater or runoff into nearby surface water.⁸⁸

1. Higher Nitrate Levels

Water pollution around CAFOs has raised nitrate levels in nearby waters.⁸⁹ Nitrate levels in excess of certain amounts increases the risk in infants of methemoglobinemia ("blue baby syndrome"), a condition capable of causing developmental deficiencies or even death.⁹⁰ High amounts of nitrates in drinking water also correlates with spontaneous abortions in some cases.⁹¹ In addition to causing adverse effects in humans, excess nitrogen levels in water creates surplus algae growth, which chokes out nutrients and sunlight needed by fish and grasses.⁹² Thus, high nitrate

⁸⁵ Aloma Dew, et al., *Tyson Chicken Held Accountable for Pollution*, UNITED POULTRY CONCERNS, Jan. 26, 2005, available at <http://www.upc-online.org/environment/20205/tyson.htm>.

⁸⁶ Pianin & Huslin, *supra* note 20, at A6.

⁸⁷ Ikramuddin & Mead, *supra* note 3, at 1.

⁸⁸ KAREN FLORINI ET AL., RESISTANT BUGS AND ANTIBIOTIC DRUGS: STATE AND COUNTY ESTIMATES OF ANTIBIOTICS IN AGRICULTURAL FEED AND ANIMAL WASTE, 42 (2005), available at www.edf.org/documents/4301_AgEstimates.pdf; see generally Amy R. Sapkota et al., *Antibiotic-Resistant Enterococci and Fecal Indicators in Surface Water and Groundwater Impacted by a Concentrated Swine Feeding Operation*, 115 ENVTL. HEALTH PERSP. 1040 (2007), available at www.ehponline.org/members/2007/9770/9770.pdf.

⁸⁹ See Merkel, *supra* note 70, at 2,8.

⁹⁰ See generally Knobloch et al., *supra* note 21. This condition may be misdiagnosed as sudden infant death syndrome or congenital heart disease. See Cole et al., *supra* note 7, at 695.

⁹¹ See generally CDC, *supra* note 21. High levels of nitrates have also been linked to other reproductive health problems such as developmental defects of the central nervous system. See Cole et al., *supra* note 7, at 688.

⁹² See John T. Holleman, *In Arkansas Which Comes First, the Chicken or the Environment*, 6 TUL. ENVTL. L.J. 21, 28 (1992).

levels not only extinguish animal and plant life but opportunities for human recreation, such as fishing.⁹³ In Texas, farm runoff partly made up of animal waste has led to increased nutrient levels in the Gulf of Mexico, creating a “seven thousand square mile ‘dead zone’ of hypoxia (low oxygen) that cannot support most aquatic life.”⁹⁴ Hundreds of miles of rivers and streams and approximately 23,700 acres of lakes in Texas have also suffered serious pollution damage, primarily around where feedlots dominate.⁹⁵

2. Biological Hazards

Biological hazards may also result from improperly managed feedlot waste when bacteria and viruses common in animal fecal matter mix into nearby waters and contaminate swimming and drinking resources.⁹⁶ The federal government has failed to provide restrictions on the concentration of microbial content in animal wastes that may permissibly be applied to land, though these restrictions exist for similar application of human wastes.⁹⁷ The movement of microorganisms through the soil has also been observed, indicating that other contaminants such as antibiotics and chemicals may be capable of tainting groundwater.⁹⁸

3. Excessive Application of Wastes

Animal waste is frequently applied to sprayfields in excess of agronomic rates.⁹⁹ This excess application contaminates soil, pollutes ground and surface water, harms crops, and wastes nutrients.¹⁰⁰ For example,

⁹³ *Id.* Unfortunately, the extent of nitrate poisoning throughout the country is unknown because it is not considered a reportable disease. See Cole et al., *supra* note 7, at 694.

⁹⁴ Consumers Union SWRO, *Animal Factories: Pollution and Health Threats to Rural Texas* 7 (2000), available at <http://www.consumersunion.org/pdf/CAFOforweb.pdf>.

⁹⁵ *Id.*

⁹⁶ See Holleman, *supra* note 92, at 28. Viruses and bacteria (such as E. Coli, giardia, and salmonella) are prevalent in untreated wastes and when applied to the land they may seep through the soil and contaminate ground water consumed by citizens, potentially causing “acute gastroenteritis and fever, kidney failure, and even death.” MARKS, *supra* note 6, at 21.

⁹⁷ See Cole et al., *supra* note 7, at 693.

⁹⁸ See ENVTL. PROT. AGENCY, RISK ASSESSMENT EVALUATION FOR CONCENTRATED ANIMAL FEEDING OPERATIONS 70 (2004), available at www.epa.gov/nrmrl/pubs/600r04042/600r04042.pdf. In fact, scientists monitoring groundwater located downstream from CAFOs have detected “bacteria with antibiotic resistant genes.” MARKS, *supra* 6, at 1.

⁹⁹ See MARKS, *supra* note 6, at 3.

¹⁰⁰ See *id.*

in September of 1997, runoff from chicken waste applied to a cornfield resulted in the death of over 50,000 fish in the Chesapeake Bay when it caused levels of *Pfiesteria piscida*, a toxic microbe, to rise to dangerous levels.¹⁰¹ While small, diversified farms may be capable of using all of the animal waste they produce as fertilizer for their crops, large CAFOs, "whose only 'crops' are animals," cannot possibly ensure appropriate application of waste to the land using agronomic volume standards.¹⁰²

4. Inherent Risks of Lagoons

While lagoons share many of the same problems as sprayfields, the structure of the lagoon itself poses a set of unique issues. CAFOs often-times construct lagoons, which are giant pits that store liquified animal waste, with dirt walls that are prone to rupture.¹⁰³ Since the lagoons hold untreated waste, spillage into local water bodies poses a serious threat to water quality and public safety and may release millions of gallons of pollution.¹⁰⁴ For instance, in June of 1995, an eight-acre lagoon containing hog waste collapsed and spilt 20 million gallons into New River in North Carolina.¹⁰⁵ Waste lagoons can also lead to the proliferation of insects around CAFOs, such as flies that "breed in manure" and mosquitos that multiply wherever water collects and remains uncleaned.¹⁰⁶ These pests may not only pose a nuisance, but may threaten the health of livestock and nearby citizens by promoting the spread of disease.¹⁰⁷

5. Negative Impact on Local Residents

CAFOs may decrease property value of nearby residences, forcing long-time citizens to move from the area and can lead to the shut down of family farms, making the claim that CAFOs enhance local economy questionable.¹⁰⁸ For the most part, CAFOs have a tendency to hire migratory workers at low wages making competition difficult.¹⁰⁹ Additionally, residents

¹⁰¹ See Ikramuddin & Mead, *supra* note 3.

¹⁰² *Id.*

¹⁰³ See, e.g., *id.*

¹⁰⁴ See MARKS, *supra* note 6, at 3.

¹⁰⁵ See Ikramuddin & Mead, *supra* note 3, at 1.

¹⁰⁶ Susan Steeves & Ralph Williams, *Insect Considerations*, CONTAINED ANIMAL FEEDING OPERATIONS, 1-2, July 2007, available at www.ces.purdue.edu/new/ID-353.pdf.

¹⁰⁷ See *id.*

¹⁰⁸ See Consumers Union SWRO, *supra* note 94, at 10.

¹⁰⁹ See *id.*

neighboring CAFOs have suffered from a higher incidence of certain mental health problems, such as tension, depression, anger, confusion, and fatigue.¹¹⁰

V. PROPOSED SOLUTIONS

Congress should enact federal laws which create a more expansive standard of feedlot waste regulation and which allow for either the gradual phase-out or responsible use of waste lagoons and sprayfields. Current federal and state laws fail to adequately protect water quality.

At a minimum, the federal laws which currently apply to CAFOs should be subject to the following changes: (1) ELGs should be mandated in all NPDES permits rather than just for large CAFOs, and (2) all AFOs qualified as CAFOs should be required to apply for an NPDES permit, regardless of size. Furthermore, the EPA or responsible state permitting authority should increase enforcement of the regulations already in existence, and implement a policy that forbids the CAFO from obtaining any more animals if it does not apply for its mandated NPDES permit or implement responsible waste management techniques in a timely manner. Such an enforcement policy demonstrates that the permitting body takes compliance with the law seriously and prevents irresponsible CAFOs from indefinitely contributing to water pollution. Finally, the changes made to the current laws should take into account all of the alternative methods of waste management, including those offered by the private sector such as wastewater treatment systems, and conversion of the waste into fertilizer, bioenergy, and compost. In order to encourage the feeding industries to take advantage of these opportunities despite the imposed burden, the government should round out its subsidization of animal farming by assisting feeding operations at this end point the same way it subsidizes the farming of meat itself.¹¹¹

A. *Expansion of ELGs to all CAFOs*

The EPA should require that all CAFOs be subject to ELGs. This would promote uniformity in permitting, consistent ELGs, and would give the permit writer a more appropriate degree of flexibility.¹¹² Current

¹¹⁰ See Cole et al., *supra* note 7, at 694.

¹¹¹ See Mark Bittman, *Rethinking the Meat-Guzzler*, N.Y. TIMES, Jan. 27, 2008, available at <http://www.nytimes.com/2008/01/27/weekinreview/27bittman.html>.

¹¹² See National Pollutant Discharge Elimination System Permit Regulation and Effluent Limitation Guidelines and Standards for Concentrated Animal Feeding Operations (CAFOs), 68 Fed. Reg. at 7208 (Feb. 12, 2003).

legislation only requires that all large CAFOs meet ELG limitations as part of their NPDES permits, while determining the necessity of ELGs to be provided for small and medium CAFOs remains an individualized process.¹¹³ The EPA bases its reasoning for making provision of ELGs individualized for small and medium CAFOs on concerns for flexibility and economic achievability.¹¹⁴ While logical, Congress should amend the legislation to include a provision making the inclusion of ELGs in all NPDES permits issued to CAFOs mandatory, rather than leaving it to the permitting authority's best professional judgment.¹¹⁵ This change would partially account for the substantial impact that small and medium CAFOs can have collectively on water pollution. The change would also ensure regulatory uniformity of water quality throughout the nation while still giving the permit writer an appropriate degree of flexibility,¹¹⁶ instead of encouraging a race to the bottom between the states.

B. Requiring Small CAFOs to Apply for a NPDES Permit

Currently, The Clean Water Act only classifies large and medium CAFOs as point sources required to obtain an NPDES permit.¹¹⁷ Small CAFOs must obtain an NPDES permit if the appropriate permitting authority so determines, after an on-site inspection and consideration of certain factors. These factors include the size of the CAFO, the location relative to nearby waterbodies, the amount of waste entering the water, the means by which the waste enters the water, as well as the rainfall, vegetation, slope, and "other factors affecting the likelihood or frequency of discharge of animal wastes manure."¹¹⁸ Furthermore, the small CAFO must either discharge pollutants into the water through a flushing system, manmade ditch or other device, or discharge other water that came into direct contact with the confined animals in a similar manner to be required to obtain a NPDES permit.¹¹⁹

¹¹³ 40 C.F.R. §§ 412.30, 412.40 (2007). *See also* National Pollutant Discharge Elimination System Permit Regulation and Effluent Limitation Guidelines; Standards for Concentrated Animal Feeding Operations (CAFOs), 68 Fed. Reg. at 7207-08, 7226 (Feb. 12, 2003); ENVTL. PROT. AGENCY, *supra* note 36, at 4-5.

¹¹⁴ *See* National Pollutant Discharge Elimination System Permit Regulation and Effluent Limitation Guidelines and Standards for Concentrated Animal Feeding Operations (CAFOs), 68 Fed. Reg. at 7208 (Feb. 12, 2003).

¹¹⁵ *See id.* at 7207.

¹¹⁶ *See id.* at 7208.

¹¹⁷ 40 C.F.R. § 122.23 (2007).

¹¹⁸ *Id.*

¹¹⁹ *See id.*

Seemingly, this system of individualized inspections by state permitting authorities would most appropriately deal with the unique conditions of small CAFOs that qualify them as needing a NPDES permit because citizens can hold their states accountable through their votes. However, it seems more probable that an insufficient number of citizens pay attention to these matters and vote accordingly to make such a control method effective. Rather, those feedlots with a significant economic stake in the State's NPDES permitting practices more likely possess the power to influence the candidate platforms and control the votes.

Furthermore, the system for permitting small CAFOs poses the same problem as the individualized process used by states to determine whether the permitting authority needs to set ELGs for small and medium CAFOs. The degree of discretion given to the states may create a lack of uniformity across the nation in recognizing those small CAFOs that should classify as needing a NPDES permit, and states may be motivated to conduct assessments laxly in order to attract and retain business.¹²⁰ Because of the possibility of states to use their discretion in this area to advantage the CAFOs rather than to make more stringent environmental permitting decisions,¹²¹ Congress should limit the lack of uniformity across the states. Specifically, the EPA should treat all AFOs qualified as CAFOs equally, by qualifying all CAFOs as point sources, and requiring all CAFOs to apply for a NPDES permit. A feedlot with any of the factors that cause it to be qualified as a CAFO in the first place, even if it is a small CAFO, clearly has the potential to contribute to water pollution problems in the area, and so should be more strongly regulated.¹²²

The EPA should also eliminate the discharge provision for small CAFOs under the NPDES. As with medium and large CAFOs, the small CAFO should have the burden of demonstrating that it has no potential to discharge after initially applying for an NPDES permit in order to be exempt from the NPDES permitting requirements.¹²³

¹²⁰ See Merkel, *supra* note 70, at 8.

¹²¹ See MARKS, *supra* note 6, at 4 (stating that only around 2520 out of approximately 13,000 CAFOs, or 19%, had actually obtained a required NPDES permit).

¹²² A CAFO qualifies as "small" if it meets the previously mentioned requirements and has fewer animals than a medium CAFO. A medium CAFO has animals in the following ranges: 200-699 dairy cows, 300-999 veal calves, 300-999 cattle of any sort (besides dairy cows or veal calves), 750-2499 pigs of at least fifty-five pounds each, 3000-9999 pigs of less than fifty-five pounds, 150-499 horses, 3000-9999 lambs or sheep, 16,500-54,999 turkeys, 9000-29,999 laying hens or chickens or 37,500-124,999 chickens depending on the waste management system used. 40 C.F.R. § 122.23 (2007).

¹²³ 40 C.F.R. § 412.4 (2007).

Otherwise, the inspection by the permitting authority to uncover factors subjecting a small CAFO to NPDES permitting requirements may result in small CAFOs, which only discharge during storms, escaping regulatory control if the inspection fortuitously occurs on a day when the small CAFO is not discharging. Requiring all AFOs classified as CAFOs to apply for an NPDES permit would transfer the burden of establishing no potential to discharge from the permitting authority to the CAFO and would lessen the degree of risk associated with the timing of qualifying inspections.¹²⁴ Allowing states to use their discretion beyond these basic federal regulations would ensure a more acceptable standard below which states could not abuse their discretion.

C. *Alternative Approaches to Waste Lagoons and Sprayfields*

The above proposed changes do not negate the problems associated with ruptured lagoons and over-application of waste on sprayfields. In reality, in order for water pollution problems associated with feedlot waste runoff to be effectively managed and prevented, CAFOs must begin to implement alternative methods to manage the mass quantities of animal waste produced. While potentially costly to implement, tax breaks and subsidies by states and the federal government can encourage bottom-line minded CAFOs to put into effect these plans.

1. Treating CAFO Wastewater

The private sector offers a wide range of waste management options capable of removing nitrogen, phosphorus, and heavy metals from the wastewater.¹²⁵ For instance, aerated bioreactors harbor mass quantities of microorganisms that consume the nutrients in waste, including nitrogen and phosphorus.¹²⁶ Once the microorganisms have been given time

¹²⁴ CAFOs have the burden of contacting the permitting authority and providing information to assure that a permit is not needed, even if they have no potential to discharge. ENVTL. PROT. AGENCY, *supra* note 36, at 4.

¹²⁵ See generally John Todd & Beth Josephson, *The Design of Living Technologies for Waste Treatment*, 6 ECOLOGICAL ENGINEERING 109 (1996).

¹²⁶ See, e.g., Dairy Nutrient Management System: The First Generation System, www.biontech.com/services/dairy.php (last visited Jan. 25, 2009); see also WTR Solutions, www.wtrsolutions.com/cafo.php (last visited Jan. 25, 2009); WTR Solutions, www.wtrsolutions.com/products.php (last visited Jan. 25, 2009) for an alternative example of wastewater treatment options involving aeration offered by the private sector.

to consume the nutrients, the wastewater containing the microbes and solids passes into a separate container to settle the solids out of the mixture.¹²⁷ CAFOs may periodically collect the “settled biomass” and use it in developing agricultural products, such as fertilizer.¹²⁸ Since the time of the Romans, animal waste has functioned as a fertilizer and contributes to both the organic and nutrient quality of the soil.¹²⁹ The “soil type, waste type, soil conditions, erosion potential, and climate” determine the optimum nutrient distribution rate for the soil, which in turn restricts the value of the animal waste as fertilizer.¹³⁰ The fertilizer should be applied at optimum times for crop growth, which typically occurs after the harvesting of the last crop.¹³¹

The remaining water may then be reused for purposes permissible under state statute, dispersed onto a sprayfield, or properly discharged.¹³² Engineering elements relating to the physical layout of the sprayfields may also impact the amount of nutrient runoff into nearby waterbodies.¹³³ Intentional placement of grass or vegetation buffer strips, terraces, man-made wetlands, detention basins or ponds, riparian buffers and diversions is an important element to managing the CAFOs contribution to water pollution.¹³⁴ These additional degrees of filtration and treatment would reduce the likelihood of dispersion of waste onto sprayfields at inappropriate absorption levels.¹³⁵

2. Collecting CAFO Waste to Produce Biogas Energy

An alternative to treating CAFO wastewater involves collecting the animal waste and using anaerobic digestion to produce methane gas, which when properly harvested can produce energy.¹³⁶ The anaerobic

¹²⁷ See Dairy Nutrient Management System: The First Generation System, *supra* note 126.

¹²⁸ *Id.*

¹²⁹ ENVTL. PROT. AGENCY, *supra* note 98, at 70.

¹³⁰ *Id.* at 71.

¹³¹ *Id.* at 70, 75.

¹³² See, e.g., Dairy Nutrient Management System: The First Generation System, *supra* note 126.

¹³³ ENVTL. PROT. AGENCY, *supra* note 98, at 75.

¹³⁴ *Id.* These solutions would be most effective if used as one facet in the approach to managing the CAFOs impact on water quality, and after initial construction would only need periodic maintenance and cleaning to retain capacity. *Id.* at 75-76.

¹³⁵ *Id.* See also Dairy Nutrient Management System: The First Generation, *supra* note 126.

¹³⁶ See Charles Fulhage, Dennis Sievers, & James R. Fischer, UNIV. OF MISSOURI-COLUMBIA, DEPARTMENT OF AGRICULTURAL ENGINEERING, *Generating Methane Gas From Manure* (1993), available at www.usask.ca/agriculture/caedac/dbases/MANURE1.html.

digestion works to break down the volatile substances in the animal waste into a certain kind of bacteria, which are then converted by a separate bacteria into carbon dioxide and methane gas.¹³⁷ This entire process must take place at a certain heat and pH level and in the absence of oxygen, heavy metals (which can be precipitated out), and antibiotics in order to achieve "maximum gas production."¹³⁸ While this process has the benefits of creating energy and a productive use of animal waste while reducing odors and pests, the equipment and scientific management needed to harvest a profitable amount of methane may be cost-prohibitive to most CAFOs.¹³⁹ However, the EPA, along with the U.S. Department of Energy and the USDA, currently have a program called AgSTAR that promotes the use of methane recovery technology from animal waste by CAFOs.¹⁴⁰ This program promotes the installation of digester systems made up of a conglomeration of several components, part of which involves covered lagoons made of steel, concrete or synthetically-lined tanks that facilitate the collection of gas while simultaneously preventing the contamination of groundwater.¹⁴¹ This technology provides the additional benefits of settling out heavy metals and reducing the nutrient load before the remaining water waste is land-applied onto sprayfields at agronomic rates.¹⁴² The federal government, along with many of the states, has developed funding programs such as grants, tax incentives, and low-interest loans to aid CAFOs in shifting their waste management plans to this more responsible alternative.¹⁴³ This sort of encouragement by the government to develop these systems produced 256,000 MWh of energy in 2008 alone,¹⁴⁴ and in some cases even enabled the farm to sell energy back to the power company.¹⁴⁵

¹³⁷ *Id.*

¹³⁸ *Id.*

¹³⁹ *Id.* See also MARK A. MOSER, ET AL., ENVTL. PROT. AGENCY, KEEPING THE NEIGHBORS HAPPY—REDUCING ODOR WHILE MAKING BIOGAS (2007), available at www.epa.gov/agstar/resources/proj_sums.html.

¹⁴⁰ ENVTL. PROT. AGENCY, THE AGSTAR PROGRAM: BASIC INFORMATION (2008), available at www.epa.gov/agstar/overview.html (last visited Jan. 25, 2009).

¹⁴¹ ENVTL. PROT. AGENCY, MANAGING MANURE WITH BIOGAS RECOVERY SYSTEMS: IMPROVED PERFORMANCE AT COMPETITIVE COSTS: THE AGSTAR PROGRAM 4-5, 7 (2002), available at www.epa.gov/agstar/pdf/manage.pdf.

¹⁴² *Id.* at 7.

¹⁴³ See generally, ENVTL. PROT. AGENCY, FUNDING ON-FARM BIOGAS RECOVERY SYSTEMS: A GUIDE TO FEDERAL AND STATE RESOURCES 1 (2007), available at www.epa.gov/agstar/pdf/ag_fund_doc.pdf.

¹⁴⁴ ENVTL. PROT. AGENCY, THE AGSTAR PROGRAM: ACCOMPLISHMENTS (2008), available at www.epa.gov/agstar/accomplish.html; *supra* note 141, at 4.

¹⁴⁵ See ENVTL. PROT. AGENCY, *supra* note 141, at 4.

3. Composting CAFO Waste

While the above process offers a feasible alternative for mostly dairy and swine CAFOs,¹⁴⁶ other options may be more sensible for those that raise poultry. Composting animal waste offers numerous benefits such as conversion of nutrients into more stable forms (which reduces leaching into groundwater), reduction of the total mass of waste and the amount of pathogens, and easy storage for later land applications at appropriate rates.¹⁴⁷ The compost may also be reused by the CAFO or sold for profit.¹⁴⁸ Poultry waste typically contains large amounts of dry bedding such as straw and wood chips.¹⁴⁹ The straw and other bulking agents facilitate the composting process by maintaining appropriate moisture levels and giving the microorganisms the space needed to self-heat.¹⁵⁰ Provided that minimum temperature and time conditions have been satisfied, this self-heating process also self-pasteurizes most pathogens,¹⁵¹ which may help control the quality of the soil. Additionally, power plants may burn the waste as fuel to produce power for nearby communities, though this process remains controversial.¹⁵²

Experimental trials for dairy composting have shown promising results as well.¹⁵³ Farmers have created an innovative three-step composting process where belts move manure from storage pits to separators that remove solids from liquids, with the solids ending up in storage barns to begin the composting process on worm beds.¹⁵⁴ This extra step of aerating the compost with worms creates a superior form of compost which

¹⁴⁶ See ENVTL. PROT. AGENCY, *supra* note 140, at 1.

¹⁴⁷ See ENVTL. PROT. AGENCY, *supra* note 98, at 77.

¹⁴⁸ See Eleanor Jacobs, *Worming Their Way to No More Waste: An Innovative Manure Treatment Experiment May Offer Solutions to Handling Nutrients in a Neighbor and Environmentally Friendly Way*, Dairy Bus. Comm'ns (2001), available at <http://www.dairybusiness.com/northeast/Feb01/worming.htm>.

¹⁴⁹ See ENVTL. PROT. AGENCY, *supra* note 98, at 80. See also G.A. Flory et al., *On-Farm Compositing for Turkey Carcasses*, 48 BIOCYCLE 9, 17 (2007), for a discussion relating to the compositing of poultry carcasses.

¹⁵⁰ See ENVTL. PROT. AGENCY, *supra* note 98, at 77. Compost piles may achieve temperatures of up to fifty-five degrees Celsius on their own. *Id.*

¹⁵¹ *Id.*

¹⁵² Susan Saulny, *From Turkey Waste, a New Fuel and a New Fight*, N.Y. TIMES, June 6, 2007, available at <http://www.nytimes.com/2007/06/06/science/earth/06manure.html>. These types of power plants produce less electricity than coal-fired plants. *Id.*

¹⁵³ See Jacobs, *supra* note 148.

¹⁵⁴ *Id.*

brings a higher price in the marketplace.¹⁵⁵ An aeration system reduces the ammonia content of the remaining liquid so that it may be applied to grasses within greenhouses, which provide a controlled environment for the waste.¹⁵⁶ These grasses may be harvested and fed back to the cattle as an excellent source of nutrients.¹⁵⁷

4. Implementing Recommended Solutions

Of course, all of these recommended solutions to dealing with the massive quantity of animal waste produced by CAFOs and controlling their substantial potential for contributing to water pollution will work only if the EPA or responsible state permitting authority increases enforcement of its regulations.¹⁵⁸ The responsible authority can most effectively achieve compliance with water quality requirements by implementing a policy that prevents the CAFO from obtaining any more animals if it does not apply for its mandated NPDES permit or begin shifting to a responsible waste management plan, such as those proposed above, in a timely manner. The government should further order a moratorium on the building of any new CAFOs that plan to use lagoons or sprayfields without adequate environmental safeguards. This policy would demonstrate a serious commitment by the permitting authority to improving water quality for citizens.¹⁵⁹

Beyond these punitive measures, states and the federal government can give tax incentives, subsidies, or provide other methods of funding to make these alternatives appealing to bottom-line minded CAFOs. For instance, Oklahoma has already implemented a funding pool and tax credits that reduce the amount of state tax due in order to stimulate

¹⁵⁵ *Id.*

¹⁵⁶ *Id.*

¹⁵⁷ *Id.*

¹⁵⁸ The EPA mentioned stepping up enforcement of its current regulations by conducting "strategically targeted inspections and enforcement actions [with] publicized enforcement results" primarily targeted in states with lesser CAFO permit coverage because it felt it would be impossible to identify all CAFOs discharging without an NPDES permit. ENVTL. PROT. AGENCY, FY08-FY10 COMPLIANCE AND ENFORCEMENT NATIONAL PRIORITY: CLEAN WATER ACT, WET WEATHER, CONCENTRATED ANIMAL FEEDING OPERATIONS (CAFOs) 2 (2007), available at <http://epa.gov/compliance/resources/publications/data/planning/priorities/fy2008prioritycwacafo.pdf>.

¹⁵⁹ See Merkel, *supra* note 70, at 8. See also MARKS, *supra* note 6, at 2 (suggesting that the EPA needs to ban the building of new lagoons and "phase-out existing systems").

buyers in the market.¹⁶⁰ These same ideas could be used to encourage alternative methods of waste management by offsetting the high costs of applying whichever new method or technology the CAFO found most suitable for its needs. More specifically, states and the federal government can use tax credits to reduce taxes in proportion to the amount spent managing CAFO waste with new and environmentally friendly technology. Additionally, the USDA could make subsidy payments to feedlots to encourage the use of other waste management options. The USDA already “makes direct subsidy payments through the Commodity Credit Corporation to farmers for . . . environmental activities.”¹⁶¹ The USDA could easily expand these payments by including use of new environmentally friendly feedlot waste management technology in its definition of environmental activities it sponsors. In order to account for this increase in funding, the distribution of subsidies for conservation purposes could also be expanded.¹⁶²

CONCLUSION

Addressing the impact of feedlot waste on water pollution requires a recognition of the problems inherent in the current methods of waste management and federal regulations under the NPDES permitting system. In order to address this important and overlooked issue, Congress should enact federal laws that create a more expansive standard of feedlot waste regulation while simultaneously mandating either gradual phase-out or responsible use of waste lagoons and sprayfields.

The Clean Water Act requires certain CAFOs to apply for an NPDES permit. In order to obtain this permit, however, the CAFOs must meet certain requirements such as creating a nutrient management plan and meeting effluent limitations guidelines. States maintain responsibility for implementing any regulations beyond these federal guidelines, including regulation of small CAFOs and those AFOs not qualified as confined. This increases the potential for irregularity in regulations between states and promotes a race to the bottom in an effort to attract business.

¹⁶⁰ See Josh Payne, *Incentives to Buy Poultry Litter*, OKLAHOMA STATE UNIVERSITY WATER QUALITY EXTENSION PROGRAM, available at http://www.ok-littermarket.org/upload/INCENTIVES_SUMMARY_08.pdf.

¹⁶¹ Jasper Womach, *Average Farm Subsidy Payments, by State, 2002*, CONGRESSIONAL RESEARCH SERVICE 1 (2004), available at <http://www.ncseonline.org/NLE/CRSreports/04Sep/RL32590.pdf>.

¹⁶² Conservation made up 16% of the total subsidies given in 2002. *Id.* at 3. Conservation purposes include payments made to farmers to “remedy environmental problems.” *Id.* at 4.

These issues can lead to serious consequences for water quality across the United States, as current methods for managing feedlot waste create substantial water pollution problems. Generally, feedlots collect animal waste into large lagoons or disperse them onto sprayfields, or use a combination of these methods. This can lead to runoff of water contaminated with antibiotics, heavy metals, pathogens, pesticides, and ammonia, and result in contamination of ground and surface waters. Furthermore, lagoons can break and flood and spill millions of gallons of waste into nearby waters.

The solutions to these problems would require more active enforcement of regulations and encouragement of environmentally friendly alternatives through government incentives like tax breaks and subsidies. Only then would bottom-line minded CAFOs consider waste management alternatives such as those offered by the private sector, or conversion of the waste into fertilizer, bioenergy, and compost.