STRIKING THE PROPER BALANCE BETWEEN THE *CARROT* AND THE *STICK* APPROACHES TO ANIMAL FEEDING OPERATION REGULATION

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Agriculture is one of the cornerstones of the success of the United States, yet it has also dramatically and negatively affected the quality of our nation's waters. Animal Feeding Operations (AFOs) and Concentrated Animal Feeding Operations (CAFOs) are responsible for significantly degrading water quality in watersheds across the country due to their creation of massive amounts of animal waste and the methods used to dispose of and utilize the waste for fertilizer. Although the Environmental Protection Agency (EPA) ostensibly regulates these operations through the permitting requirements of the Clean Water Act (CWA), it has failed to implement policies that effectively and efficiently address the pollution caused by AFOs and CAFOs. This Note discusses the different regulatory mechanisms that attempt to reign in the degradation, categorized into groups of carrot *and* stick *approaches that are endorsed by U.S. agricultural groups and environmentalists, respectively. The Note provides an overview of potential solutions, including current EPA regulatory methods, the EPA's draft Clean Water Strategy, a restoration plan in place in the Chesapeake Bay watershed, and solutions proposed by various commentators and interested individuals. Ultimately, this Note concludes that the adoption of either a* carrot *or a* stick *approach in totality is not the best solution; rather, a combination of incentive-based approaches and ex post liability would be most successful, leading to more compliance and less pollution overall. A chronological framework for creating this type of hybrid solution is proposed, drawing from ideas already suggested but not implemented by the EPA. The Note argues that agriculture's impact on water quality could result in calamity if it continues in the current fashion. To prevent such calamity, this Note calls for nationwide collaboration, extensive information gathering, revision and tightening of current regulatory and permitting schemes, and the implementation of creative new methods, such as a water-quality trading system.*

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I. INTRODUCTION

Agriculture is fundamentally integrated into our civilization.[1] Beyond the deeply rooted cultural ideologies and nostalgic principles surrounding U.S. agriculture, it provides vast social and economic benefits.[2] Agricultural production practices, however, can impose dramatic landscape and environmental effects.[3] Often at competing ends of the spectrum, both environmental sustainability and agricultural production are imperative to a healthy nation.[4]

Challenged by both environmental advocates and agricultural industry groups, the federal government is often torn between incentivizing healthy production through a *carrot* approach and deterring undesired practices through a *stick* approach.[5] Regulating numerous diverse livestock operations is often financially and administratively prohibitive.[6] Consequently, the majority of current agricultural policies employ the *carrot* approach by providing economic incentives to adopt conservation practices.[7] Recent federal activities spurred by environmental concerns, however, have increased focus on the *stick* approach.[8]

Compared to federal and state regulation of other industries, agriculture has received substantially diverse treatment.[9] Environmentalists view agriculture as "virtually unregulated by the expansive body of environmental law . . . in the United States."[10] Agriculture often escapes environmental regulation through exemptions or structural loopholes.[11] Within the livestock production sector, however, animal feeding operations form an exception to this traditional regulatory exemption.[12] These operations, called Animal Feeding Operations (AFOs) and Concentrated Animal Feeding Operations (CAFOs), are regulated under the Clean Water Act (CWA), which aims, in part, to decrease and/or restrict animal waste pollutants that can substantially impair the nation's waters.[13] Originally promulgated in the 1970s, these regulations have not been sig-

1. J.B. Ruhl, *Farms, Their Environmental Harms, and Environmental Law*, 27 ECOLOGY L.Q. 263, 265–66 (2000).

2. *Id.* at 266.

3. *Id.*; *see also* MEGAN STUBBS, CONG. RESEARCH SERV., R41622, ENVIRONMENTAL REGULATION AND AGRICULTURE 1 (2011).

4. STUBBS, *supra* note 3.

5. *Id.*

6. *Id.*

7. *Id.*

8. *Id.*

9. CLAUDIA COPELAND, CONG. RESEARCH SERV., RL31851, ANIMAL WASTE AND WATER QUALITY: EPA REGULATION OF CONCENTRATED ANIMAL FEEDING OPERATIONS (CAFOS) 1 (2010).

10. Ruhl, *supra* note 1, at 265.

11. COPELAND, *supra* note 9, at 1.

12. *Id.*

13. *Id.* at 1–2.

nificantly amended to reflect rapidly evolving components of the livestock production sector.[14]

AFOs have expanded considerably in size while decreasing in total number over the past several decades.[15] Increased numbers of animals at each facility result in the generation of greater amounts of waste and, subsequently, grave dangers of water pollution.[16] The evolution of livestock operations from small "mom-and-pop" establishments to large economies of scale, with concentrations of thousands of animals on minimal acreage, has led to waste management problems.[17] Poorly managed or located AFOs and CAFOs and "improper, excessive or poorly timed application[s]" of fertilizer are activities that commonly affect water quality.[18] AFO and CAFO managers face the difficult tasks of finding cost-effective methods for disposing of enormous amounts of livestock waste and concurrently implementing environmentally protective methods for doing so.[19]

Recognizing potential hazards associated with animal waste produced at AFOs and CAFOs, the Environmental Protection Agency (EPA) and the U.S. Department of Agriculture (USDA) have increased efforts to control and reduce potential water pollution.[20] The EPA issued a draft Clean Water Strategy (draft CWS) on August 20, 2010[21] with the objective of establishing healthy watersheds and sustainable communities.[22] Several of the suggested strategies are directed at AFO and CAFO practices and regulations.[23] The draft CWS generated roughly one hundred comments, with over twenty of them specifically addressing agricultural water pollution.[24] Some commentators strongly contended that agencies must strengthen regulatory devices to effectuate reductions in

14. *Id.* at 1; *see also* Nicholas M. White, Note, *Industry-Based Solutions to Industry-Specific Pollution: Finding Sustainable Solutions to Pollution from Livestock Waste*, 15 COLO. J. INT'L ENVTL. L. & POL'Y 153, 153 (2004).

15. White, *supra* note 14.

16. *Id.*

17. *See* Kristen E. Mollnow, Concerned Area Residents for the Environment v. Southview Farm*: Just What Is a Concentrated Animal Feeding Operation Under the Clean Water Act?*, 5 ALB. L. ENVTL. OUTLOOK 11, 11 (2000) (citing Larry C. Frarey & Staci J. Pratt, *Environmental Regulation of Livestock Production Operations*, 9 NAT. RESOURCES & ENV'T, Winter 1995, at 8, 8 ("Economies of scale, specialization, and regional concentration in all major livestock production sectors have fueled a trend toward fewer, larger operations that confine thousands of animals on limited acreage.")).

18. ENVTL. PROT. AGENCY, *Agriculture*, POLLUTED RUNOFF (NONPOINT SOURCE POLLUTION), http://www.epa.gov/owow_keep/nps/agriculture.html (last visited Mar. 8, 2012) [hereinafter *Agriculture*].

19. Mollnow, *supra* note 17, at 11.

20. *See* Terence J. Centner, *Enforcing Environmental Regulations: Concentrated Animal Feeding Operations*, 69 MO. L. REV. 697, 697 (2004).

21. *See* ENVTL. PROT. AGENCY, *Draft Clean Water Strategy Is Released*, COMING TOGETHER FOR CLEAN WATER DISCUSSION FORUM (Aug. 20, 2010, 11:58 AM), http://blog.epa.gov/waterforum/2010/08/draft-clean-water-strategy-is-released/ [hereinafter *Draft Clean Water Strategy*].

22. ENVTL. PROT. AGENCY, COMING TOGETHER FOR CLEAN WATER: EPA'S STRATEGY FOR ACHIEVING CLEAN WATER, PUBLIC DISCUSSION DRAFT 1 (Aug. 2010), [hereinafter Public Discussion Draft] *available at* http://blog.epa.gov/waterforum/ (follow "Draft Aug 2010 Final" hyperlink).

23. *See id.* at 6–7.

24. *Draft Clean Water Strategy*, *supra* note 21.

agricultural water pollution, while others intensely objected to increased governmental regulation as too cost restrictive on the livestock sector.[25]

In developing and implementing a final nationwide CWS, the EPA plans to employ the same restorative measures used in the Chesapeake Bay as "a model for watershed protection" across the country.[26] Recognizing the severe water-quality implications imposed by AFOs and CAFOs within the Chesapeake Bay, federal and state agencies worked together to develop strategies for decreasing water pollution from the livestock sector, publishing guidelines in 2010.[27] Although the Chesapeake Bay restoration effort is a positive movement in the direction of water-quality improvement, it has received substantial criticism and opposition.[28] The Chesapeake Bay plan is often regarded as "a regulatory framework shaped by political expediencies and more notable for its gaps than its coverage."[29] Shortcomings of the Chesapeake Bay plan are attributable to tensions between retaining established *carrot* approaches and an urgency to adopt *stick* approaches.[30]

Cumulatively, the draft CWS and the Chesapeake Bay restoration plan are respectable starts to addressing water pollution problems associated with AFOs and CAFOs but are not effective resolutions. The EPA must look beyond these blueprints to create operative strategies for reducing water pollution from AFOs and CAFOs and implement an overall effective plan for improving nationwide water quality.[31] In finding the proper balance between the *carrot* and *stick* approaches to regulating AFOs and CAFOs, the EPA must be cognizant of the constant struggle between ensuring the viability of the agricultural industry and protecting nationwide environmental health against harmful pollutants.[32]

The goal of this Note is to evaluate both voluntary, incentive-based *carrot* approaches and mandatory, regulatory-based *stick* approaches to controlling water pollution from AFOs and CAFOs. Part II of this Note provides a description of water-quality threats imposed by AFOs and CAFOs and then provides a brief overview of the current federal AFO

25. Kim Knowles, Comment to *Draft Clean Water Strategy Is Released*, COMING TOGETHER FOR CLEAN WATER DISCUSSION FORUM (Sept. 16, 2010, 11:16 AM), http://blog.epa.gov/waterforum/2010/08/draft-clean-water-strategy-is-released/; Ron Sheffield, Comment to *Draft Clean Water Strategy is Released*, COMING TOGETHER FOR CLEAN WATER DISCUSSION FORUM (Sept. 9, 2010, 10:34 AM), http://blog.epa.gov/waterforum/2010/08/draft-clean-water-strategy-is-released/.

26. PUBLIC DISCUSSION DRAFT, *supra* note 22, at 6.

27. *See, e.g.*, ENVTL. PROT. AGENCY, EPA841-R-10-002, GUIDANCE FOR FEDERAL LAND MANAGEMENT IN THE CHESAPEAKE BAY WATERSHED 2-31, 2-38 (2010) [hereinafter Guidance in the Chesapeake Bay], http://www.epa.gov/owow_keep/NPS/chesbay502/pdf/chesbay_chap02.pdf.

28. MICHELLE PEREZ ET AL., ENVTL. WORKING GRP., FACING FACTS IN THE CHESAPEAKE BAY 1 (2009), *available at* http://www.ewg.org/conservation/chesapeake-bay-pollution/report (follow the "Download the full report" hyperlink).

29. *Id.* at 2.

30. *See id.* at 2–3.

31. Even the EPA recognizes that it needs to do more. *See* PUBLIC DISCUSSION DRAFT, *supra* note 22, at 1 ("While we have certainly made progress toward [our] vision since 1972, we face challenges in attaining it completely . . . .").

32. *See* White, *supra* note 14, at 157.

and CAFO regulatory framework. Part III then analyzes both *carrot* and *stick* approaches to water-quality control of AFOs and CAFOs, including evaluations of current and proposed regulations as well as market- and incentive-based mechanisms. Finally, Part IV recommends implementation of a highly integrated nationwide water-quality strategy that utilizes a proper balance between the *carrot* and *stick* approaches to addressing AFO and CAFO water pollution.

II. BACKGROUND

Discharge of pollutants into bodies of water threatens water quality throughout the United States.[33] Congress first recognized this concern in 1972 with the passage of the CWA.[34] The Act regulates pollution of federal waters with the objective of "restor[ing] and maintain[ing] the chemical, physical, and biological integrity of the Nation's waters."[35] The CWA established a goal of eliminating pollutant discharge into navigable waters by 1985.[36] While the EPA is responsible for implementing the CWA, significant obligations are placed on states "to prevent, reduce, and eliminate pollution, to plan the development and use (including restoration, preservation, and enhancement) of land and water resources."[37]

Degradation in water quality presents numerous threats to aquatic ecosystems and potable water supplies.[38] A 2008 nationwide water assessment revealed the presence of pollutants in nearly all streams and streambed sediment tested, as well as in approximately three-fourths of groundwater wells.[39] In addition, one-fifth of surface water and one-third of groundwater wells tested exposed contaminant levels exceeding the human health water-quality standards.[40]

Agriculture, as a major contributor of nutrient pollution,[41] is a primary source of pathogen presence in rivers and streams, thereby causing significant water-quality degradation throughout the country.[42] The 2000 National Water Quality Inventory (Inventory) reported that "agricultural nonpoint source (NPS) pollution was the leading source of water quality impacts on surveyed rivers and lakes."[43] The Inventory also revealed that agricultural nonpoint source pollution ranked second in contribu-

33. PUBLIC DISCUSSION DRAFT, *supra* note 22, at 1 ("[N]utrient pollution . . . affect[s] upwards of 50 percent of our lakes and streams . . . .").
34. Clean Water Act, 33 U.S.C. §§ 1251–1387 (2006).
35. 33 U.S.C. § 1251(a).
36. *Id.* § 1251(a)(1).
37. *Id.* § 1251(b).
38. PUBLIC DISCUSSION DRAFT, *supra* note 22, at 2.
39. *See id.*
40. *Id.*
41. *Id.* at 1 (recognizing agriculture as one of six "main national sources of water degradation").
42. *Id.* (discussing "recent National Water Quality Inventories").
43. *Agriculture*, *supra* note 18. For definitions of nonpoint source and point source pollution, see *infra* text accompanying notes 47, 56–59.

tions to wetland impairments and was a major cause of estuary contamination.[44]

Section A provides definitions of point and nonpoint sources of pollution and then explains how these two types of sources are regulated. Section B defines and distinguishes AFOs and CAFOs, describes water pollution concerns imposed by both types of feeding operations, and explains the regulation of AFOs and CAFOs as nonpoint and point sources of pollution, respectively. Section C then summarizes the EPA's draft CWS, including AFO- and CAFO-specific action proposals and utilization of the Chesapeake Bay restoration efforts as a nationwide model. Finally, Section D explains the Chesapeake Bay restoration plan, initiated by an executive order and supplemented by a management guidance publication.

A. Point and Nonpoint Sources of Pollution

Two sources of pollutant discharge are recognized by the Clean Water Act: point and nonpoint sources.[45] Generally, the Act "only regulates discharges from point sources."[46] Point source pollutants include:

> any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged.[47]

Discharge of pollutants into navigable waters from a point source without a valid permit is unlawful.[48] The CWA defines "discharge of a pollutant" as "any addition of any pollutant to navigable waters from any point source."[49] "Pollutant," as defined by the Act, includes agricultural waste.[50]

Water pollution is controlled by the National Pollution Discharge Elimination System (NPDES) permit program, which regulates the discharge of point source pollutants into U.S. waters.[51] The EPA supervises the NPDES program and delegates authority to the states to issue, administer, and enforce pollutant permits.[52] Under the NPDES, the EPA sets effluent limitations (i.e., maximum pollutant concentration discharge

44. *Agriculture*, *supra* note 18.
45. *See* 33 U.S.C. § 1362(14) (2006); Mollnow, *supra* note 17, at 13.
46. Mollnow, *supra* note 17, at 13; *accord infra* notes 48–50, 56–57 and accompanying text.
47. 33 U.S.C. § 1362(14).
48. *Id.* §§ 1311(a), 1342(a).
49. *Id.* § 1362(12).
50. *Id.* § 1362(6).
51. *See id.* § 1342.
52. *See id.* § 1342(b)–(c). For information regarding states' NPDES permit issuance authority, see *NPDES Permit Program Basics*, ENVTL. PROT. AGENCY, http://cfpub.epa.gov/npdes/home.cfm?program_id=45 (follow "Map of Authorized States and Territories" PDF link) (last visited Mar. 8, 2012).

allowable) on industry-wide and water-quality bases.[53] Permits under NPDES implement national, state, and tribe-established water-quality standards.[54] Antidegradation policies, use designations, and water-quality criteria that protect the designated uses are among the water-quality standards included in NPDES permits.[55]

Nonpoint source pollution is not defined within the CWA but is interpreted "to mean any source of water pollution that does not meet the legal definition of 'point source'" in section 1362(14) of the CWA.[56] Unlike point source pollution, nonpoint source pollution is not the result of discharge at a specific confined location but rather the general result of land runoff, drainage, precipitation, atmospheric deposition, seepage, and hydrologic modification.[57] The EPA recognizes "[b]acteria and nutrients from livestock . . . [and] wastes" as sources of nonpoint pollution.[58] States continue to recognize that nonpoint source pollution is the leading cause of water-quality problems nationwide.[59]

Due to the regional and site-specific nature of nonpoint sources of pollution, regulatory authority has historically been vested in the states.[60] States are directed to "identify nonpoint source pollution problems, identify [Best Management Practices], and establish management programs to achieve water quality standards."[61] Federal leadership and support, however, continues to play a vital role in assisting state efforts to control nonpoint source pollution.[62] States, territories, and tribes can receive grant money from the federal government to finance water pollution mitigation strategies.[63] These strategies include, but are not limited to,

53. 33 U.S.C. §§ 1311, 1312. "Effluent limitation" is defined as "any restriction established by a State or the Administrator on quantities, rates, and concentrations of chemical, physical, biological, and other constituents which are discharged from point sources into navigable waters, the waters of the contiguous zone, or the ocean, including schedules of compliance." *Id.* § 1362(11).

54. *See id.* §§ 1314(b), 1342(a)–(b); 40 C.F.R. § 122.31 (2008); *see also* U.S. DEP'T OF AGRIC. & U.S. ENVTL. PROT. AGENCY, UNIFIED NATIONAL STRATEGY FOR ANIMAL FEEDING OPERATIONS ¶ 4.2 (1999) [hereinafter Unified National Strategy], http://cfpub.epa.gov/npdes/afo/ustrategy.cfm (follow link for PDF version).

55. UNIFIED NATIONAL STRATEGY, *supra* note 54.

56. ENVTL. PROT. AGENCY, *Basic Information*, POLLUTED RUNOFF (NONPOINT SOURCE POLLUTION), http://www.epa.gov/owow_keep/nps/whatis.html (last visited Mar. 8, 2012) [hereinafter *Basic Information*]; *see also* Mollnow, *supra* note 17, at 14 (explaining that "[a] nonpoint source is defined by exclusion" from the CWA and includes any discharge not subject to the point source NPDES requirements).

57. Mollnow, *supra* note 17, at 14; *see also Basic Information*, *supra* note 56.

58. *Basic Information*, *supra* note 56.

59. *Id.*

60. *See, e.g.*, 33 U.S.C. §§ 1288, 1329 (2006).

61. Karen R. Hansen, *Agricultural Nonpoint Source Pollution: The Need for an American Farm Policy Based on an Integrated Systems Approach Recoupled to Ecological Stewardship*, 15 HAMLINE J. PUB. L. & POL'Y 303, 310 (1994).

62. *See* Envtl. Prot. Agency, *Clean Water Act Section 319*, POLLUTED RUNOFF (NONPOINT SOURCE POLLUTION), http://www.epa.gov/owow_keep/nps/cwact.html (last visited Mar. 8, 2012) [hereinafter *Section 319*].

63. 33 U.S.C. § 1329(h); *Section 319*, *supra* note 62.

"technical assistance, financial assistance, education, training, technology transfer, demonstration projects and monitoring."[64]

B. AFOs and CAFOs

1. Definitions and Scope

Animal feeding operations in the United States are categorized into two separate classes: "(1) confined or concentrated feeding operations where animals are kept in enclosed facilities throughout most or all of their lives; and (2) unconfined operations where animals are maintained on pastures and allowed to forage at will or are provided feed in relatively open settings."[65] Operations classified in category (2) do not usually fall within regulation as point sources of pollution.[66] Category (1) can be further subdivided into two classes of animal feeding operations: (a) AFOs and (b) CAFOs.[67]

The EPA identifies AFOs as "agricultural enterprises where animals are kept and raised in confined situations."[68] AFOs comprise production operations on a small area of land that lead to the congregation of "animals, feed, manure and urine, dead animals, and production operations."[69] Animals remain in confined locations where feed is brought to them.[70] The implementing regulation defines an AFO as:

> a lot or facility (other than an aquatic animal production facility) where the following conditions are met[]
>
> (i) Animals (other than aquatic 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
>
> (ii) Crops, vegetation, forage growth, or post-harvest residues are not sustained in the normal growing season over any portion of the lot or facility.[71]

The first part of this regulation does not require "that the same animals must remain on the lot for [forty-five] days or more," but instead requires that any animals are maintained on the land for forty-five days out of a twelve month period.[72] Further, maintenance of animals is interpreted to mean "confine[ment] in an area where waste is generated and/or concentrated" or where animals are "watered, cleaned, groomed

64. *Section 319*, POLLUTED RUNOFF, *supra* note 62.
65. Mollnow, *supra* note 17, at 14–15 (citation omitted).
66. *Id.* at 15.
67. *See id.*
68. UNIFIED NATIONAL STRATEGY, *supra* note 54, ¶ 2.1.
69. *Id.*
70. *Id.*
71. 40 C.F.R. § 122.23(b)(1) (2008).
72. Mollnow, *supra* note 17, at 15 (quoting ENVTL. PROT. AGENCY, GUIDANCE MANUAL ON NPDES REGULATIONS FOR CONCENTRATED ANIMAL FEEDING OPERATIONS 3–4 (draft 1993)).

or medicated" within a confined location.[73] Thus, "fed" is not included within the definition of "maintained."[74] Regulatory authority is, therefore, contingent upon the characteristics of waste production, animal care, and animal confinement, but not upon whether animals are "fed" at that location.[75]

Classification of an AFO as a CAFO occurs when specific regulatory criteria are met or when it is designated by the EPA, or its agent, as a CAFO.[76] An AFO may also be classified as a CAFO, even if its regulatory criteria are not met, if either the state director, regional administrator, or both designate it as a CAFO "upon determining that it is a significant contributor of pollutants to waters of the United States."[77] The regulatory criteria for classification as a CAFO, dependent upon the type and number of animals confined, is provided in the Code of Federal Regulations.[78] In addition, the EPA is authorized to designate an AFO of any size as a CAFO if an on-site inspection reveals that the operation contributes significantly to the pollution of U.S. waters.[79] The Code of Federal Regulations provides a list of factors that the inspector should consider in making such a determination.[80] Factors include:

(i) The size of the AFO and the amount of wastes reaching waters of the United States;

(ii) The location of the AFO relative to waters of the United States;

(iii) The means of conveyance of animal wastes and process waste waters into waters of the United States;

(iv) The slope, vegetation, rainfall, and other factors affecting the likelihood or frequency of discharge of animal wastes manure and process waste waters into waters of the United States; and

(v) Other relevant factors.[81]

If the numerical limitation for classifying an AFO as a CAFO is not met, then an on-site inspection by the state director or regional adminis-

73. *Id.* (citation omitted).

74. *Id.*

75. *Id.* Animal operations where animals are temporarily confined but not fed include "dairy farms, stockyards, and auction houses." *Id.*

76. *See* 40 C.F.R. § 122.23(b)–(c). "Agent" refers to the State Director or Regional Administrator, who may designate a CAFO in accordance with 40 C.F.R. § 122.23(c). For definitions of "State Director" and "Regional Administrator," see 40 C.F.R. § 122.22.

77. *Id.* § 122.23(c).

78. *Id.* § 122.23(b).

79. *See id.* § 122.23; UNIFIED NATIONAL STRATEGY, *supra* note 54, ¶ 4.2.

80. 40 C.F.R. § 122.23(c)(2). "Agent" refers to the State Director or Regional Administrator, who may designate a CAFO in accordance with 40 C.F.R. § 122.23(c). For definitions of "State Director" and "Regional Administrator," see 40 C.F.R. § 122.22.

81. *Id.*

trator must be conducted, and one of the following two additional conditions must also be met:[82]

> (i) Pollutants are discharged into waters of the United States through a manmade ditch, flushing system, or other similar manmade device; or
>
> (ii) Pollutants are discharged directly into waters of the United States 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.[83]

2. Water Pollution Concerns

AFOs and CAFOs impose serious water-quality risks as sources of agricultural pollution.[84] The most prevalent form of pollution associated with AFOs and CAFOs is nutrient transfer from animal manure to waterways.[85] Livestock waste, the majority of which is comprised of manure, contains significant amounts of pollutants, including nitrogen and nitrates, phosphorus, ammonia, methane, fecal coliform bacteria, hormones, and antibiotics.[86] Transfer of any of these nutrients to waterways may pose serious human health and environmental threats.[87]

Excessive levels of nitrogen and phosphorous in water can result in toxic algal blooms, low levels of dissolved oxygen, and eutrophication.[88] This imposes serious threats to wildlife and often results in declining fish populations.[89] It can also reduce the quality of drinking water and has been associated with waterborne diseases "such as e.coli, fecal coliform, and salmonellae," as well as microbe outbreaks of Pfiesteria piscicida.[90] Pathogens, such as Cryptosporidium, can impair drinking water supplies as well as food safety.[91] The AFO/CAFO pollutant most easily identified

82. *Id.* § 122.23(c)(3); *see also* Mollnow, *supra* note 17, at 15.

83. 40 C.F.R. § 122.23(c)(3).

84. *See* PUBLIC DISCUSSION DRAFT, *supra* note 22, at 6–7 (noting that the EPA recognizes several changes in AFO and CAFO standards that it intends to implement in order to restore degraded waters and reduce pollution discharge into waters); *see also* ENVTL. PROT. AGENCY, *Animal Feeding Operations*, NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES), http://cfpub.epa.gov/npdes/home.cfm?program_id=7 (last updated Mar. 8, 2012) (identifying waste created by AFOs and CAFOs as a source of water pollution).

85. White, *supra* note 14, at 155.

86. Mollnow, *supra* note 17, at 11; White, *supra* note 14, at 155; ENVTL. PROT. AGENCY, *Animal Feeding Operations Frequently Asked Questions*, NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES), http://cfpub.epa.gov/npdes/faqs.cfm?program_id=7 (last updated Oct. 18, 2007) [hereinafter *AFO Frequently Asked Questions*].

87. *AFO Frequently Asked Questions*, *supra* note 86.

88. *Id.*

89. White, *supra* note 14, at 155; *AFO Frequently Asked Questions*, *supra* note 86.

90. White, *supra* note 14, at 155; *AFO Frequently Asked Questions*, *supra* note 86. Pfiesteria piscicida can pose serious health and survival risks to fish and cause skin irritation and cognitive impairments in humans. *See* ENVTL. PROT. AGENCY, EPA-842-F-98-011, What You Should Know About Pfiesteria Piscicida 2, 5 (1998), *available at* http://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=2000 50HU.txt.

91. *AFO Frequently Asked Questions*, *supra* note 86.

is odor, which besides being generally unpleasant can cause adverse health responses.[92]

The most common method for livestock operations to handle waste is through complex systems that utilize lagoons or other types of holding ponds where waste is liquefied and stored.[93] This stored manure is often used as land fertilizer and is applied in both liquid and solid form.[94] Water pollution occurs when livestock waste, including "manure, bedding, and other [waste] matter generated on livestock operations comes into contact with" various forms of surface water, most often streams.[95] Sources of water pollution from livestock operations include direct discharge, runoff from the application of waste as fertilizer onto land, and overflow of lagoons and other types of waste holding ponds.[96]

3. Categorization of AFOs and CAFOs As Sources of Pollution

The majority of agricultural pollutant discharges are regulated as nonpoint sources of pollution because they rarely appear as specific and discrete releases into waterways.[97] Instead, pollution from agricultural operations occurs primarily in the form of runoff.[98] For this reason, AFOs are regulated as nonpoint sources of pollution.[99] CAFOs, however, are the only agricultural operation statutorily defined as a point source of pollution.[100]

States, territories, and authorized tribes are required by the CWA to identify impaired waters.[101] Impaired waters are waters that do not meet water-quality standards established by states, territories, or authorized tribes due to pollution or other degradation.[102] Priority rankings and Total Maximum Daily Loads must be developed for each impaired water body.[103] A Total Maximum Daily Load calculates the "maximum amount of a pollutant that a waterbody can receive and still safely meet water quality standards."[104] The EPA interprets the requirements of the CWA to apply to both point and nonpoint sources.[105]

92. White, *supra* note 14, at 155.
93. Mollnow, *supra* note 17, at 11.
94. *Id.*
95. White, *supra* note 14, at 154–55.
96. *Id.* at 155.
97. Mollnow, *supra* note 17, at 14.
98. *Id.*
99. *See id.*
100. *Id.*; *see also* 33 U.S.C. § 1362(14) (2006); 40 C.F.R. § 122.23(a) (2008).
101. 33 U.S.C. § 1313(d)(1)(A).
102. *Impaired Waters and Total Maximum Daily Loads*, ENVTL. PROT. AGENCY, http://water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/index.cfm (last updated Feb. 15, 2012).
103. 33 U.S.C. § 1313(d)(1)(A), (C).
104. *Impaired Waters and Total Maximum Daily Loads*, *supra* note 102.
105. ENVTL. PROT. AGENCY., RECOMMENDED FRAMEWORK FOR EPA APPROVAL DECISIONS ON 2002 STATE SECTION 303(D) LIST SUBMISSIONS 4 (May 2002), http://water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/guidance.cfm (follow "PDF Version" hyperlink).

a. Regulation of AFOs As Nonpoint Sources of Pollution

As nonpoint sources of pollution, AFOs are less stringently regulated than CAFOs. Approximately ninety-five percent of AFOs are regulated under voluntary programs.[106] States are afforded significant deference to decide the best pollution control methods for nonpoint sources.[107] The majority of states have adopted voluntary programs that primarily implement financial and educational assistance.[108] These voluntary government programs, funded both on the federal and state levels, are available to assist agricultural operators in designing, financing, and managing the prevention of nonpoint source pollution.[109]

b. Regulation of CAFOs As Point Sources of Pollution

As point sources of pollution, CAFOs are regulated by the NPDES permit program.[110] Through the CWA, the EPA has vested authority to develop and implement federal regulations governing requirements permitting wastewater discharges.[111] The EPA may, however, direct authority to implement the national program to states or tribes.[112] As of 2003, only five states had not been granted authority to implement the NPDES permit program through permit approval processes.[113] In the other forty-five states, federal permitting authority is suspended, and state agencies issue permits.[114] States must implement standards and limitations that, at minimum, meet the standards and limitations imposed by the federal regulations.[115]

The NPDES mandates that any discharge of pollutants from a point source into U.S. waters requires a permit.[116] A permit allows an operation to discharge a specified amount of waste into a particular receiving

106. UNIFIED NATIONAL STRATEGY, *supra* note 54, ¶ 4.0 fig.2.

107. *See* 33 U.S.C. § 1288.

108. *See generally* ENVTL. PROT. AGENCY, *Where You Live*, POLLUTED RUNOFF (NONPOINT SOURCE POLLUTION), http://www.epa.gov/owow_keep/nps/where.html (last updated Feb. 19, 2010) (providing state and regional EPA nonpoint source pollution programs); *see also* UNIFIED NATIONAL STRATEGY, *supra* note 54, ¶¶ 4.0–4.1, 4.3.

109. *See* ENVTL. PROT. AGENCY, EPA 841-F-05-001, PROTECTING WATER QUALITY FROM AGRICULTURAL RUNOFF 1 (2005), http://www.epa.gov/owow/NPS/Ag_Runoff_Fact_Sheet.pdf.

110. *See* 33 U.S.C. § 1342; 40 C.F.R. § 122.23(a) (2008); *see also* OFFICE OF WASTEWATER MGMT., ENVTL. PROT. AGENCY, WATER PERMITTING 101, at 4, http://www.epa.gov/npdes/pubs/101pape.pdf (last visited Mar. 8, 2012).

111. 33 U.S.C. § 1342; 40 C.F.R. §§ 122–24; *see* OFFICE OF WASTEWATER MGMT., *supra* note 110, at 2–4.

112. 33 U.S.C. § 1342(a)–(b); 40 C.F.R. § 122.31.

113. ENVTL. PROT. AGENCY, *State Program Status*, NAT'L POLLUTANT DISCHARGE ELIMINATION SYS. (NPDES), http://cfpub.epa.gov/npdes/statestats.cfm (last updated Apr. 14, 2003).

114. 33 U.S.C. § 1342(c); Terence J. Centner, *Courts and the EPA Interpret NPDES General Permit Requirements for CAFOs*, 38 ENVTL. L. 1215, 1221 (2008).

115. 33 U.S.C. §§ 1342(b), 1370. State permitting agencies "may not adopt or enforce any effluent limitation, or other limitation, effluent standard, prohibition, pretreatment standard, or standard of performance which is less stringent than the effluent limitation, or other limitation, effluent standard, prohibition, pretreatment standard, or standard of performance under this chapter." *Id.* § 1370.

116. *See* 33 U.S.C. § 1342.

water when certain conditions are met.[117] Permits can also license facilities to "process, incinerate, landfill, or beneficially use sewage sludge."[118] Two levels of control are provided in NPDES permits: (1) technology-based limits (i.e., end-of-pipe controls), which are evaluated by the ability of similar dischargers, within the same industrial category, to treat waste; and (2) water-quality limits, which are implemented only when technology-based limits are insufficient to provide protection.[119] Effluent limitations, which are the primary tool for controlling pollutant discharges, are based upon these two types of standards.[120]

NPDES permits are issued in two basic types: individual permits and general permits.[121] Individual permits are tailored to individual operations. The permitting agent develops a specific NPDES permit for an applicant operation based on information provided by the operation concerning scope of activity, discharge nature, and quality of receiving water.[122] A permit is then issued to the operation for a precise time period,[123] which is not to exceed five years.[124] Operations must reapply for individual permits prior to the expiration date.[125] In contrast, general permits encompass several operations within a particular geographic area that can be classified within the same category.[126] Because general permits can contain a significant number of operations in one permit, they can be a more cost-effective and efficient method for permitting compared to issuing numerous individual permits.[127] General permitting categories can include "[s]torm water point sources" or facilities that (1) "involve the same or substantially similar types of operations;" (2) "discharge the same types of wastes or engage in the same types of sludge use or disposal practices;" (3) "require the same effluent limits, operating conditions, or standards for sewage sludge use or disposal;" and (4) "require the same or similar monitoring."[128]

As point sources of pollution, CAFOs are prohibited from discharging pollutants into U.S. water without a valid NPDES permit.[129] CAFOs are regulated under a three-tiered categorical system that distinguishes facilities based on the number of animals contained and the possibility of

117. OFFICE OF WASTEWATER MGMT., *supra* note 110, at 6–7.
118. *Id.* at 7.
119. *Id.* at 2.
120. *Id.* at 7.
121. *Id.*
122. *Id.*
123. *Id.*
124. 33 U.S.C. § 1342(b)(1)(B) (2006).
125. OFFICE OF WASTEWATER MGMT., *supra* note 110, at 7.
126. *Id.*
127. *Id.*
128. *Id.*; *accord* 40 C.F.R. § 122.28(a)(2) (2008).
129. *See* 33 U.S.C. §§ 1311(a), 1342(a); 40 C.F.R. § 122.23(a). Even with a valid NPDES permit, horse, sheep, duck, swine, poultry, and veal calf CAFOs are prohibited from discharging wastewater into navigable U.S. waters. 40 C.F.R. §§ 412.15(a), 412.25(a), 412.46(a) (2008). Cattle and dairy cow CAFOs, however, do not have this prohibition. *See id.* § 412.35.

a discharge.[130] Large, medium, and small CAFOs are defined in the Code of Federal Regulations, and are subject to different requirements for classification based on size.[131] Any operation classified as a CAFO must obtain a NPDES permit,[132] unless it falls under an exception.[133] The Code creates an exemption to NPDES permit coverage for large CAFO owners who receive a notification of determination from the permitting agency "that the CAFO has 'no potential to discharge' manure, litter or process wastewater."[134]

The NPDES permit program sets specific standards for CAFOs.[135] A CAFO operator may apply waste created on the operation to land as fertilizer but is subject to NPDES permitting if a discharge results.[136] Effluent limitations must be established in NPDES permits for discharge resulting from application of manure, litter, or process wastewater to land under control by CAFOs.[137] This requirement is met through implementation of a nutrient-management plan that utilizes manure as a provider of nutrients for plant and crop growth.[138]

The Code of Federal Regulations mandates that, at a minimum, a nutrient-management plan must contain Best Management Practices that meet all NPDES requirements as well as all effluent limitations and other standards.[139] Best Management Practices are defined as "schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of 'waters of the United States,'" including also "treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage."[140] The Code also establishes specific requirements for nutrient-management plans:

> (i) Ensure adequate storage of manure, litter, and process wastewater, including procedures to ensure proper operation and maintenance of the storage facilities;

130. 40 C.F.R. § 122.23(b)(2), (4), (6), (9).

131. By way of example, large CAFOs have more than 700 dairy cows and 1000 cattle other than dairy cows. *Id.* § 122.23(b)(4)(i), (iii). Medium CAFOs have 200 to 699 dairy cows and 300 to 999 cattle. *Id.* § 122.23(b)(6)(i). Small CAFOs are those that fail to meet the numerical requirements for a medium CAFO. *Id.* § 122.23(b)(9). Medium CAFOs also must meet discharge requirements beyond the numerical limits. *Id.* § 122.23(b)(6)(ii).

132. *Id.* § 122.23(d)(1) (providing that CAFO owners may submit a notice of intent if the permitting agency has made a general NPDES permit available, and if no such permit is available, CAFO owners must apply for an individual NPDES permit).

133. *Id.* § 122.23(d)(2).

134. *Id.*

135. *See id.* § 122.23.

136. *Id.* § 122.23(e).

137. *Id.*

138. *See id.* § 122.42(e)(1).

139. *Id.*

140. *Id.* § 122.2.

(ii) Ensure proper management of mortalities (i.e., dead animals) to ensure that they are not disposed of in a liquid manure, storm water, or process wastewater storage or treatment system that is not specifically designed to treat animal mortalities;

(iii) Ensure that clean water is diverted, as appropriate, from the production area;

(iv) Prevent direct contact of confined animals with waters of the United States;

(v) Ensure that chemicals and other contaminants handled on-site are not disposed of in any manure, litter, process wastewater, or storm water storage or treatment system unless specifically designed to treat such chemicals and other contaminants;

(vi) Identify appropriate site specific conservation practices to be implemented, including as appropriate buffers or equivalent practices, to control runoff of pollutants to waters of the United States;

(vii) Identify protocols for appropriate testing of manure, litter, process wastewater, and soil;

(viii) Establish 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; and

(ix) Identify specific records that will be maintained to document the implementation and management of the minimum elements described in paragraphs (e)(1)(i) through (e)(1)(viii) of this section.[141]

Imposition of these limitations on CAFOs through nutrient-management plans prevents harmful and inappropriate waste disposal that can potentially harm water quality.[142]

The nutrient-management plans must also establish application rates for waste, including manure, litter, and other process wastewater, applied to CAFO-controlled land in a manner that "minimize[s] phosphorus and nitrogen transport from the field to surface waters."[143] Application rates must comply with nutrient-management technical standards, as determined by the permitting agency.[144] These technical standards must:

141. *Id.* § 122.42(e)(1).
142. Centner, *supra* note 114, at 1221.
143. 40 C.F.R. § 412.4(c)(2).
144. *Id.*

(i) Include a field-specific assessment of the potential for nitrogen and phosphorus transport from the field to surface waters, and address the form, source, amount, timing, and method of application of nutrients on each field to achieve realistic production goals, while minimizing nitrogen and phosphorus movement to surface waters; and

(ii) Include appropriate flexibilities for any CAFO to implement nutrient management practices to comply with the technical standards . . . .[145]

The Code of Federal Regulations further establishes effluent limits based specifically on the types of animals contained in the CAFO.[146] The categories are divided as "Horses and Sheep," "Ducks," "Dairy Cows and Cattle Other than Veal Calves," and "Swine, Poultry, and Veal Calves."[147] Failure to establish effluent limitations through determination of pollutant levels violates the CWA and thus precludes issuance of a NPDES permit.[148] The CWA provides an exception to agricultural stormwater discharges through explicit exclusion of the term in the statutory definition of point source pollution.[149]

C. The EPA's Draft Clean Water Strategy

The EPA's draft CWS provides an outlined plan to address water-quality stressors and threats through adaptation of current practices as well as development and implementation of new tools.[150] Overall proposed strategies include "smarter regulations, stronger partnerships, more balanced and coordinated compliance and enforcement, more integrated approaches to capitalize on synergies, improved communication with a broader audience, and greater leveraging of programs."[151] Two key elements of the strategy, as identified by the EPA, are improvement on and adaptation of permitting regulations and compliance enforcement, and improvement on water assessment and classification.[152] Recognizing excess nutrient pollution of U.S. water bodies as a major contributor to water-quality concerns, the EPA proposes to work more closely with states to manage pollutants and promote watershed-based state accountability frameworks that are locally binding.[153] Without co-

145. *Id.*
146. *See generally id.* § 412.1–412.47.
147. *Id.*
148. Centner, *supra* note 114, at 1230 ("Without effluent limitations, a certificate of coverage under a general permit fails to establish pollutant levels, and thus does not comply with the Clean Water Act.").
149. 33 U.S.C. § 1362(14) (2006). The definition explains that the term point source "does not include agricultural stormwater discharges and return flows from irrigated agriculture." *Id.*
150. PUBLIC DISCUSSION DRAFT, *supra* note 22, at 2.
151. *Id.* at 2–3.
152. *Id.*
153. *Id.*

ordination and harmonization between federal agencies, local government, states, and tribes, the success of the EPA's CWS will be significantly undermined.[154]

In an effort to increase available information and accountability, the EPA established a goal to develop five Aquatic Resource Surveys within the next several years that will provide a more complete picture of the water-quality condition of different water body types throughout the United States.[155] The EPA recognizes that identifying and maintaining healthy watersheds is just as important as identifying and restoring degraded watersheds.[156]

Recognizing the unique and significant concerns associated with AFOs and CAFOs, the EPA developed several key action proposals.[157] First, coordination between the EPA and USDA for funding nutrient reduction plans and tackling agricultural challenges through an integrated approach is a goal of the draft CWS.[158] Implementation of trade offsets and other market-driven tools are proposed to implement cost-effective restorative measures.[159] Second, the EPA established a goal to strengthen the NPDES permit program to more thoroughly address point sources of pollution.[160] It also proposed a rule to streamline regulatory authority to designate an AFO as a CAFO.[161] Third, the EPA strives to audit point source pollution programs, explicitly including CAFOs, to assure full CWA compliance.[162]

To reach its goal of restoring impaired water bodies, the EPA will utilize Chesapeake Bay restorative practices as a model for nationwide efforts.[163] Using the Chesapeake Bay as a starting point, the EPA proposes to implement and enforce current CAFO regulations in the region.[164] The EPA also endeavors to develop new regulations that will effectively attain necessary pollution reductions to meet the Chesapeake Bay Total Maximum Daily Load requirements.[165]

D. The Chesapeake Bay Restoration Plan

Identifying the Chesapeake Bay watershed as "a national treasure constituting the largest estuary in the United States and one of the largest and most biologically productive estuaries in the world," President Barack Obama issued the Chesapeake Bay Protection and Restoration

154. *Id.*
155. *Id.* at 5.
156. *See id.* at 5–6.
157. *Id.* at 5–8.
158. *Id.* at 6.
159. *Id.*
160. *Id.* at 7.
161. *Id.*
162. *Id.*
163. *Id.* at 6.
164. *Id.*
165. *Id.*

Executive Order on May 12, 2009.[166] The Order charges a committee of federal agencies, in collaboration with state and local agencies, and under primary management by the EPA, to develop and manage strategies and programs to restore and maintain the Chesapeake Bay watershed and ecosystems.[167] This committee, the Federal Leadership Committee for the Chesapeake Bay, released its *Strategy for Protecting and Restoring the Chesapeake Bay Watershed* in May 2010, which specifically identifies goals and results to be accomplished by 2025.[168]

Section 502 of the Order requires the EPA Administrator to publish federal land-use management guidance for the Chesapeake Bay.[169] The guidance must provide detailed information on appropriate and cost-effective tools and land-use procedures for federal lands and facilities.[170] Released May 12, 2010,[171] the guidance manual contains measures targeted at agricultural sources of pollution, with specific practice recommendations for feeding operations.[172] Chapter two of the guidance manual addresses water pollution reduction strategies in the agricultural sector.[173] Generally, chapter two provides suggested practices "to reduce the loadings of nitrogen . . . , phosphorus . . . , and sediment from agricultural activities."[174] The guidance manual directs animal feeding operators on proper nutrient-management techniques, particularly for animal waste storage and disposal, that will help restore the Chesapeake Bay watershed.[175]

III. ANALYSIS

Common themes can be summarized from the comments submitted in response to the draft CWS, including a lack of "regulatory backbone" and oversight.[176] These themes are not new in the realm of environmental regulation of livestock production. Agricultural and environmental groups have battled extensively over regulation of AFOs and CAFOs.[177] Both groups are subject to a constant and universal struggle between

166. Exec. Order No. 13,508, 74 Fed. Reg. 23,099, 23,099 (May 12, 2009).

167. *Id.* at 23,099–101.

168. FED. LEADERSHIP COMM. FOR THE CHESAPEAKE BAY, STRATEGY FOR PROTECTING AND RESTORING THE CHESAPEAKE BAY WATERSHED 4 (2010), http://executiveorder.chesapeakebay.net/ (follow "Executive Order 13508 Strategy" hyperlink for PDF version).

169. Exec. Order No. 13,508, 74 Fed. Reg. 23,099, 23,102 (May 12, 2009).

170. *Id.*

171. GUIDANCE IN THE CHESAPEAKE BAY, *supra* note 27.

172. *See id.* at 2-3 to 2-4.

173. *See id.* at 2-7.

174. *Id.* at 2-3.

175. *Id.* at 2-6 to 2-7.

176. *See, e.g.*, Natalie Roy, Comment to *Draft Clean Water Strategy Is Released*, COMING TOGETHER FOR CLEAN WATER DISCUSSION FORUM (Sept. 17, 2010, 2:44 PM), http://blog.epa.gov/waterforum/2010/08/draft-clean-water-strategy-is-released/.

177. *Cf.* White, *supra* note 14, at 157–58.

protecting the environmental health of the United States and sustaining the viability of agriculture.[178]

Sensitivity surrounding livestock operations within the agricultural industry often raises issues regarding the proper degree of voluntary and involuntary regulations. Proponents of the *carrot* approach, generally agricultural industry groups, maintain that market-based regulatory compliance alternatives are capable of achieving the same, if not greater, quantities of water pollution reduction as compared to strict regulatory controls.[179] The concept of controlling agricultural point and nonpoint sources of pollution through voluntary, incentive-based mechanisms, rather than implementing additional mandatory controls, is appealing to agricultural industry groups.[180] Proponents of the *stick* approach, typically environmental advocates, contend that continued failures to meet nationwide water-quality standards prove that regulations "do not reach far enough" and that previous efforts were "weak and poorly implemented."[181] Current regulatory approaches, argue environmental advocates, create safe harbors for the agricultural industry that effectively amount to "anti-law."[182]

Shortfalls in successful pollution management of AFOs and CAFOs are primarily attributable to a failure to recognize and internalize "the unique quality of the [agricultural] industry being regulated, and the pollution generated by that industry"[183] as well as a lack of federal oversight.[184] By issuing the draft CWS, the EPA took an honorable step in approaching water-quality problems, but it has done nothing more than merely recognize a need for change. For the EPA to reach its lofty goal of achieving the CWA's water-quality goals, it must do more than merely propose broad visions. Instead, more specific regulatory approaches are necessary. Relying on the Chesapeake Bay restoration as a model is a constructive start but is not the answer.

This Note analyzes proposed regulatory approaches tailored specifically to AFOs and CAFOs. A deep-rooted concern will arise and recur throughout the examination of possible solutions: the constant battle between the *carrot* and the *stick* approaches to regulation. The federal government is consistently torn between incentivizing producers to implement sustainable practices and requiring producers to comply with regulatory standards.[185] Section A begins with an analysis of the *stick* approach to regulating CAFOs, including an explanation of previous federal CAFO regulations, preeminent case law, as well as suggestions for

178. *See id.* at 158.

179. Dana L. Hoag & Jennie S. Hughes-Popp, *Theory and Practice of Pollution Credit Trading in Water Quality Management*, 19 REV. AGRIC. ECON. 252, 253 (1997).

180. *Cf.* White, *supra* note 14, at 157–58, 169.

181. Ruhl, *supra* note 1, at 319–20.

182. *Id.* at 293.

183. White, *supra* note 14, at 158.

184. *See* Centner, *supra* note 20, at 700–01.

185. STUBBS, *supra* note 3, at 1.

regulatory improvements under the draft CWS. Section B provides descriptions of promising *carrot* market-based approaches, including incentive-based measures, water-quality trading programs, and taxation programs.

A. The Stick *Approach: AFO and CAFO Regulatory Framework*

The cyclical nature of Federal CAFO regulations over the last decade is a precursor of what is to come in the next ten years. Regulations are revised, agricultural industry groups and environmental advocacy groups challenge the revisions, courts interpret the revisions, and then the EPA issues new regulations. The future of water-quality standards and the success of the EPA's draft CWS depend on the ability of the EPA to exit this repeating cycle and progress forward in a collective motion. Choosing the path forward requires understanding and consideration of the most recent regulation revisions.

1. 2003 Revisions

All confined animals within a CAFO facility, and all litter, manure, and process wastewater created by those animals are subject to NPDES permit requirements.[186] Direct discharge was originally regulated because of its significant and apparent effects on water quality, but another source with similar potential effects was left largely unregulated until 2003.[187] At that time, the EPA recognized that land application of manure and wastewater by CAFOs was a major source of pollution.[188] To clarify that land application is subject to point source regulation under the NPDES permitting system, the EPA revised the Federal CAFO regulations to include a separate definition for "land application area."[189] Almost ten years prior to the EPA revision, the U.S. Court of Appeals for the Second Circuit acknowledged that spreading manure on a field was classified as point source pollution subject to CAFO NPDES permitting.[190]

Large CAFOs are the only category of CAFOs that are subject to effluent limitation guidelines and to Best Management Practices for land application of manure, litter, and process wastewater.[191] With the exception of duck, sheep, and horse operations, the 2003 revisions incorpo-

186. 40 C.F.R. § 122.23(a) (2008).

187. National Pollutant Discharge Elimination System Permit Regulation and Effluent Limitation Guidelines and Standards for Concentrated Animal Feeding Operations (CAFOs), 68 Fed. Reg. 7176, 7176 (Feb. 12, 2003) (codified at 40 C.F.R. §§ 122.1–122.64, 412.1–412.47).

188. *Id.*

189. 40 C.F.R. § 122.23(b)(3).

190. *See* Concerned Area Residents for the Env't v. Southview Farms, 34 F.3d 114, 117–19 (2d Cir. 1994) (holding that application of manure onto fields by tankers on a dairy operation that fell within the definition of a CAFO was a form of point source pollution).

191. *See* 40 C.F.R. §§ 412.30–412.31.

rated more regulations for large CAFOs.[192] These included preparation and application of nutrient-management plans, land application rates based on annual manure analyses, setback requirements, and Best Management Practices.[193] Large CAFOs are required to develop nutrient plans that are "based on a field-specific assessment of the potential for nitrogen and phosphorus transport from the field" to water.[194] These plans must also establish land application rates and methods for applying litter, manure, and process wastewater that minimize pollution into surface waters.[195]

The 2003 revisions extended regulation to about 2800 AFOs that were not previously classified as CAFOs.[196] Under the revised NMP regulations, the EPA estimated that about 4500 CAFOs would be required to develop new NMPs.[197] Many critics were skeptical, however, that the 2003 revisions contained a mandatory component necessary to effectively reduce water pollution.[198] Thereafter, environmental groups challenged the 2003 revisions in *Waterkeeper Alliance, Inc. v. EPA*.[199] The environmental groups challenged the CAFO permitting scheme and the CAFO effluent limitations.[200] The court held that by failing to require permitting authorities to review the nutrient-management plans prior to issuing a permit that authorizes land application, the regulation violated the CWA.[201] The court also directed the EPA to clarify the basis for excluding water quality-based effluent limitations for discharges other than agricultural storm water and the authority of states to develop water quality-based effluent limitations on their own.[202]

192. *Id.* § 412 (2003).
193. *Id.* § 412.4.
194. *Id.* § 412.4(c)(1).
195. *Id.* § 412.4(c).
196. Centner, *supra* note 20, at 721.
197. *Id.*
198. *See id.* (arguing that the revised regulations "may unwittingly encourage operators to forego compliance"); White, *supra* note 14, at 165 (noting that some farmers disputed whether the new regulations applied to them as point sources of pollution).
199. Waterkeeper Alliance, Inc. v. EPA, 399 F.3d 486, 489 (2d Cir. 2005).
200. *Id.* at 498, 511.
201. *Id.* at 499.
202. *Id.* at 523.

2. 2008 Revisions

In response to the 2005 *Waterkeeper Alliance* ruling, the EPA issued revised regulations in November 2008.[203] The 2008 revisions added a requirement that CAFOs submit a nutrient-management plan with NPDES permit applications or notices of intent.[204] The permitting authority is then required to review the plan and integrate its terms as enforceable elements of the permit.[205] In response to the court's clarification request, the EPA stated that water quality-based effluent limitations "may be required in [CAFO] permits" that allow discharge from production areas or land application areas and do not qualify for the agricultural storm water exemption.[206] The 2008 revisions also removed the requirement that all CAFOs apply for a permit unless they can show "no potential to discharge."[207] Instead, only CAFOs that "discharge or propose to discharge" must apply for a permit.[208] Under this standard, any CAFO that might discharge must either apply for a permit or demonstrate a set of "eligibility criteria" imposing the same effluent limitation conditions as would be issued in a permit.[209]

3. National Pork Producers Council v. EPA

While the 2008 regulation revisions seemed to solve CAFO regulation issues, lawsuits were soon filed by both agricultural industry groups and environmental groups.[210] The petitions were consolidated in *National Pork Producers Council v. EPA*, which was recently decided by the U.S. Court of Appeals for the Fifth Circuit.[211] EPA officials and environmental groups settled some issues in December 2009, which were severed from the case.[212] Terms of the settlement require the EPA to issue CAFO guidance to help operators determine if a permit application is necessary and implement procedures to place CAFOs in compliance

203. Revised National Pollutant Discharge Elimination System Permit Regulation and Effluent Limitations Guidelines for Concentrated Animal Feeding Operations in Response to the Waterkeeper Decision, 73 Fed. Reg. 70,418 (Nov. 20, 2008) (codified at 40 C.F.R. §§ 9.1, 122.1–122.64, 412.1–412.47) [hereinafter 2008 Revised NPDES Regulations].

204. *Id.* ("EPA is also requiring CAFOs seeking permit coverage to submit their nutrient management plans with their applications for individual permits or notices of intent to be authorized under general permits."); 40 C.F.R. § 122.21(i)(1)(x).

205. 40 C.F.R. § 122.23(h).

206. OFFICE OF WASTEWATER MGMT., ENV'T PROT. AGENCY, CONCENTRATED ANIMAL FEEDING OPERATIONS FINAL RULEMAKING—Q & A 1 (2008) [hereinafter CAFO Q & A], http://www.epa.gov/npdes/pubs/cafo_final_rule2008_qa.pdf.

207. *See* 2008 Revised NPDES Regulations, *supra* note 203, at 70,425; CAFO Q & A, *supra* note 206, at 2; *see also* 40 C.F.R. § 122.23(d)(2), (f).

208. 40 C.F.R. § 122.23(d)(1); 2008 Revised NPDES Regulations, *supra* note 203, at 70,425.

209. 40 C.F.R. § 122.23(d), (i)(2).

210. STUBBS, *supra* note 3, at 16–17.

211. 635 F.3d 738 (5th Cir. 2011); *see also* STUBBS, *supra* note 3, at 16–17.

212. STUBBS, *supra* note 3, at 17.

with federal clean water regulations.[213] The EPA issued that CAFO guidance on May 28, 2010.[214] The settlement also requires the EPA to propose a rule to collect operational information from all CAFOs.[215]

In the consolidated case, agricultural industry groups claimed that the CWA grants authority to the EPA to regulate only actual discharges.[216] Thus, their argument was founded on the theory that by including proposed discharges and basing permits on mere speculation, the EPA violated the CWA.[217]

The Fifth Circuit decided *National Pork Producers Council* on March 15, 2011.[218] The main issue addressed by the court was whether the EPA could require NPDES permit application by CAFOs that propose to discharge.[219] The Fifth Circuit invalidated the 2008 regulation imposing such a requirement, stating:

> [T]here must be an actual discharge into navigable waters to trigger the CWA's requirements and the EPA's authority. Accordingly, the EPA's authority is limited to the regulation of CAFOs that discharge. Any attempt to do otherwise exceeds the EPA's statutory authority. Accordingly, we conclude that the EPA's requirement that CAFOs that "propose" to discharge apply for an NPDES permit is *ultra vires* and cannot be upheld.[220]

In ruling, the Fifth Circuit followed precedent established by the Second Circuit in *Waterkeeper Alliance, Inc. v. EPA* as well as other U.S. circuit courts and the Supreme Court.[221] Specifically, the Fifth Circuit stated that "[t]he Second Circuit's decision is clear: without a discharge, the EPA has no authority and there can be no duty to apply for a permit."[222] Further, the court held the 2008 regulation imposing liability on CAFOs for failure to apply for a permit invalid.[223] The court reasoned that the CWA penalty provision does not include liability for failure to apply for an NPDES permit.[224] Rather, liability may only be imposed when CAFOs unlawfully discharge pollutants.[225]

213. *Id.*; *see also* Settlement Agreement at 2–3, Nat'l Pork Producers Council v. EPA, 635 F.3d 738 (5th Cir. 2011), http://nppc.org/uploadedfiles/CAFO%20Rule%20EPA%20Enviro%20Settlement.pdf.

214. STUBBS, *supra* note 3, at 17; *see also* ENVTL. PROT. AGENCY, EPA-833-R-10-006, IMPLEMENTATION GUIDANCE ON CAFO REGULATIONS—CAFOS THAT DISCHARGE OR ARE PROPOSING TO DISCHARGE 1 (2010), http://www.epa.gov/npdes/pubs/cafo_implementation_guidance.pdf.

215. STUBBS, *supra* note 3, at 17; *see also* Settlement Agreement, *supra* note 213.

216. *Cf.* STUBBS, *supra* note 3, at 17.

217. *Id.*

218. 635 F.3d 738, 738 (5th Cir. 2011).

219. *Id.* at 749–51.

220. *Id.* at 751.

221. *See id.* at 749–51.

222. *Id.* at 750.

223. *Id.* at 753.

224. *Id.* at 752–53

225. *Id.* (discussing and affirming the Eighth Circuit's holding in Serv. Oil, Inc. v. EPA, 590 F.3d 545 (8th Cir. 2009)).

Although the court held that the EPA cannot impose a duty to apply for a permit or liability for failure to apply for a permit on a CAFO not actually discharging, the court upheld the EPA's authority, as provided by the CWA, "to impose a duty to apply on CAFOs that are discharging."[226] Therefore, CAFOs have no duty to apply for a permit in advance of discharging pollutants.[227] The moment that pollutant discharging without a permit occurs, however, the CWA is violated and the EPA's authority to impose liability in the form of monetary penalties commences.[228]

4. Moving Forward Under the Draft CWS

In an effort to cure the problems associated with CAFOs throughout the country by using the Chesapeake Bay as a model, the draft CWS proposes to implement current CAFO regulations in the Chesapeake Bay and develop more effective CAFO regulations to meet the area's Total Maximum Daily Load requirements.[229] The current state of the Chesapeake Bay restoration plan, however, provides minimal direction to the EPA on strengthening the overall NPDES permitting system for CAFOs. Besides proposing the use of software in reducing land application runoff and in aiding CAFOs to determine whether to opt for the "No Discharge" declaration,[230] the Chesapeake Bay guidance manual does little to improve NPDES CAFO permitting. The EPA initiated a "Chesapeake Bay CAFO Rule" on February 5, 2010, but the rule is currently stagnant in the "Preproposal" stage.[231] Outside of the Chesapeake Bay area, the draft CWS also proposes to audit CAFO programs that may potentially reduce their nutrient pollution by significant levels.[232]

The cyclical nature of CAFO regulations changing indicates that the EPA has not yet adopted the most effective strategies. Considering the Chesapeake Bay restoration plan's failure to propose significant and foundational changes to CAFO regulations, the EPA must look to alternative solutions.[233] Answers are readily available but have been overlooked in the past. After the 2003 revisions, commentators suggested additional components to the regulations that had the potential to create

226. *Id.* at 751.

227. *Cf. id.* at 752 ("[T]he imposition of 'failure to apply' liability is outside the bounds of the CWA's mandate."); *id.* at 753 (noting that CWA penalty provisions do not "authorize liability for 'failure to apply' for NPDES permit coverage, but only for non-compliance with permit terms" (quoting Envtl. Prot. Info. Ctr. v. Pac. Lumber Co., 469 F. Supp. 2d 803, 826 (N.D. Cal. 2007))).

228. *See id.* at 752–53.

229. PUBLIC DISCUSSION DRAFT, *supra* note 22, at 6.

230. *See, e.g.*, GUIDANCE IN THE CHESAPEAKE BAY, *supra* note 27, at 2-246 to 2-247.

231. *Revised Regulations for Concentrated Animal Feeding Operations (CAFOs) in the Chesapeake Bay Watershed*, ENVTL. PROT. AGENCY, http://yosemite.epa.gov/opei/rulegate.nsf/byRIN/2040-AF20 (last updated Feb. 20, 2012).

232. PUBLIC DISCUSSION DRAFT, *supra* note 22, at 7.

233. *See supra* notes 229–31 and accompanying text.

significant change in the right direction.[234] The EPA, however, declined to include these necessary components in the 2008 revisions.[235] The following Subsections discuss four proposed components: expanded coverage of CAFO regulations, uniform standards for all CAFOs, institutional regulation, and funding requirements.

a. Expanded Coverage of CAFO Regulations

The EPA proposes to strengthen current CAFO regulations and implement more effective regulations in the Chesapeake Bay as a model for repairing water quality throughout the United States.[236] The agricultural industry, however, continues to rank among the highest of waterway polluters.[237] Recognizing this fact in 2002, the EPA adjusted the threshold number of contained animals for classification as a CAFO.[238] This allowed for the classification of numerous additional AFOs as CAFOs.[239] Through the draft CWS, the EPA again proposes to "streamline the regulatory authority to designate" an AFO as a CAFO.[240]

The threshold revision was made almost a decade ago, and water quality continues to remain a top environmental and safety issue.[241] Environmental groups continue to pressure the EPA to adjust the threshold numbers once again.[242] Lowering the threshold limit for classifying AFOs as CAFOs will subject a larger number of operations to NPDES permitting control and enforcement.[243] Environmental advocates contend that too many feeding operations fall short of the CAFO threshold limits and remain without permits.[244] In some states, AFOs without permits contribute to the majority of total animal populations, while only large operations are regulated under NPDES permitting.[245] Beyond advocating for heightened CAFO classification, environmental groups suggest implementing a "moratorium on the construction of new [waste] lagoons" and

234. *See generally* Centner, *supra* note 20 (arguing that the 2003 revisions lack enforcement mechanisms that would allow for a stronger and more comprehensive regulatory system); White, *supra* note 14 (discussing the shortcomings of AFO regulations and arguing for a technology-based sustainability approach to AFO regulation).

235. *See generally* 2008 Revised NPDES Regulations, *supra* note 203.

236. PUBLIC DISCUSSION DRAFT, *supra* note 22, at 6.

237. *See supra* notes 41–44 and accompanying text.

238. White, *supra* note 14, at 164.

239. *Id.*

240. PUBLIC DISCUSSION DRAFT, *supra* note 22, at 7.

241. *See id.* at 1–2; *see also* White, *supra* note 14, at 164.

242. *See, e.g.*, Jon Devine, Comment to *Draft Clean Water Strategy Is Released*, COMING TOGETHER FOR CLEAN WATER DISCUSSION FORUM (Sept. 17, 2010, 9:05 PM), http://blog.epa.gov/waterforum/2010/08/draft-clean-water-strategy-is-released/ (expressing the opinion of the National Resources Defense Council that "[t]he agency can bring more facilities into the permitting system by adopting lower animal number thresholds to trigger treatment as a CAFO" and "urg[ing] EPA to do so"); *see also* COPELAND, *supra* note 9, at 19.

243. *Cf.* PEREZ, *supra* note 28, at 9.

244. *Id.*

245. *Id.*

"eliminat[ing] existing lagoons."[246] They also advocate for injection of waste products into the soil instead of land application techniques.[247]

Agricultural industry groups, however, consistently maintain that CAFO regulations extend beyond CWA requirements and exceed authority granted to the EPA and permitting authorities by the Act.[248] Many livestock producers do not accept that agricultural pollution is a form of point source pollution and thus decline to recognize the EPA's regulation of this industry under the CWA.[249]

An additional common contention among agricultural industry groups in opposition to heightened CAFO regulation is the increased cost associated with change.[250] The groups argue that new restrictions lead to "prohibitive" and "harmful" results to livestock producers.[251] For example, estimated costs per producer associated with the 2002 threshold adjustment ranged from approximately $850 to $37,000 per producer each year.[252] Increased costs reflect necessities to "update equipment, adjust operations, and pay administrative costs."[253] Agricultural industry groups claim that cost implications of regulatory compliance create barriers to competition in the worldwide agricultural market.[254] Livestock producers whose governments impose fewer and less financially restrictive environmental regulations gain economic advantages over producers in countries with more stringent regulatory approaches.[255]

The EPA acknowledges the potential negative effect on the ability of producers to continue operations under cost restrictive regulations.[256] The CAFO adjusted thresholds for 2002 subjected approximately 285 CAFOs to possible forced shutdown due to financial difficulties with compliance.[257] Agricultural industry groups and environmental advocacy groups both recognize that some CAFOs may choose to forego NPDES permit application due to possible detrimental financial implications.[258]

246. *See* White, *supra* note 14, at 166.

247. *Id.* ("Such injection would help curb the deposit of nutrients from runoff water entering waterways.").

248. *See, e.g.*, Waterkeeper Alliance, Inc. v. EPA, 399 F.3d 486, 504 (2d Cir. 2005); STUBBS, *supra* note 3, at 17; White, *supra* note 14, at 165.

249. *See* White, *supra* note 14, at 165; *cf.* COPELAND, *supra* note 9, at 16, 19.

250. Centner, *supra* note 20, at 723–24; White, *supra* note 14, at 165.

251. White, *supra* note 14, at 165.

252. *Id.*; *see also* Centner, *supra* note 20, at 723.

253. White, *supra* note 14, at 165.

254. *Id.* at 157–58 ("In the United States, many agricultural supporters see the issue as a competition among producers worldwide.").

255. *Id.* at 158.

256. Centner, *supra* note 20, at 723.

257. *Id.*

258. *Id.*

b. Uniform Standards for All CAFOs

Under current CAFO regulations, large CAFOs are subject to significantly more regulations than medium and small CAFOs.[259] If implemented correctly, the requirements contained in these regulations, including development and application of nutrient-management plans and Best Management Practices, are beneficial methods for reducing agricultural pollution in waterways.[260] Because all CAFOs create vast amounts of waste that can impose injurious amounts of pollutants into waterways, commentators have suggested revising threshold classification levels among CAFOs.[261] Creating uniform standards for all CAFOs, therefore, is a top concern for both agricultural industry groups and environmental advocacy groups.

In a domestically and internationally competitive market, agricultural industry groups are primarily concerned about unfair market advantages created by regulations.[262] In *National Pork Producers Council v. EPA*, for example, agricultural groups were concerned with differing regulation interpretations that could create an economic advantage to producers in some parts of the country.[263] Such an advantage is created when the interpretation allows operations to forego NPDES permit application and the potential costs associated with permit issuance and relieves operators from liability if discharge occurs.[264] Though primarily concerned with extending regulation to more operations, environmental groups have also indicated concern for clarifying regulation of all CAFOs.[265] In recent settlements with the EPA, for example, environmental advocacy groups agreed to sever their challenges to the 2008 revisions on the condition that the EPA issue a general CAFO guidance manual and begin implementing CAFO monitoring and reporting strategies.[266]

The EPA is also concerned with possible differing interpretations of CAFO regulations. Agricultural industry groups frequently propose differing interpretations of CAFO standards and argue that regulations sin-

259. *See supra* notes 191–92 and accompanying text.

260. *See supra* notes 193–95 and accompanying text.

261. *See, e.g.*, Devine, *supra* note 242; Ed Hopkins, Comment to *Draft Clean Water Strategy Is Released*, COMING TOGETHER FOR CLEAN WATER DISCUSSION FORUM (Sept. 17, 2010, 2:48 PM), http://blog.epa.gov/waterforum/2010/08/draft-clean-water-strategy-is-released (expressing the Sierra Club's support of "more effective regulations for CAFOs").

262. *See, e.g.*, STUBBS, *supra* note 3, at 17; Centner, *supra* note 20, at 728–29.

263. The agricultural industry groups claimed that various EPA regions applied different interpretations of a 2008 provision that empowered CAFOs to self-certify that they would not discharge. This could allow CAFOs to avoid permit application and protect them against potential liability in the event of an accidental discharge. STUBBS, *supra* note 3, at 16–17. The court in *National Pork Producers Council* did not specifically address this issue; *see generally* Nat'l Pork Producers Council v. EPA, 635 F.3d 738 (5th Cir. 2011).

264. *See supra* note 259 and accompanying text; *see also* STUBBS, *supra* note 3, at 17.

265. *See supra* notes 213 and accompanying text.

266. *See supra* notes 212–15 and accompanying text.

gle out some CAFOs.[267] As a result, the EPA has recognized that it is in its best interest to develop more fully integrated and clear regulations for all CAFOs.[268]

Additionally, commentators have expressed concern over an unfair market created by lack of enforcement activities.[269] In May 2002, the EPA released a report containing information about state CAFO activities.[270] In the report, the EPA highlighted common problems with regulating CAFOs, which include a lack of enforcement actions when violations of CAFO regulations are found.[271] Explanations for lack of action include personnel shortages, belief that other matters were more important for dedication of time and resources, and sympathy toward operators.[272] One state agency was noted as saying that it was more "interested in bringing producers into compliance" rather than retroactively punishing violators.[273] While bringing all CAFOs into compliance should be a top priority, allowing violators to go unpunished can create an unfair market advantage and reward wrongdoers.[274] Those CAFOs that expend time and money to abide by CAFO regulations are automatically set back economically when violators are not required to expend the same resources through initial compliance or punished in a way that realigns competitive advantages in the market through fines.[275] Violators may also continue to gain a market advantage over initial compliers by receiving specialized attention when violations are uncovered because regulators prefer to work closely with these operators to bring them into compliance.[276]

c. Institutional Enforcement

The EPA has taken considerable measures to increase water quality through NPDES permitting of CAFOs but has fallen behind in implementing proper oversight and enforcement.[277] States are delegated authority by the EPA to administer and enforce the federal NPDES permitting provisions.[278] While many states have progressed in creating region-specific regulations, failure to monitor and enforce compliance al-

267. *See generally* Brief for Petitioner at 36–39, Nat'l Pork Producers Council v. EPA, 635 F.3d 738 (5th Cir. 2011) (No. 08-61093), http://www.fb.org/legal/files/id_15/Final%20Joint%20AFBF%20brief%20(5.7.2010).pdf.

268. *See, e.g.*, PUBLIC DISCUSSION DRAFT, *supra* note 22, at 6–7.

269. *Cf.* Centner, *supra* note 20, at 722–24.

270. *Id.* at 713–15.

271. *Id.*

272. *Id.* at 715.

273. *Id.* (citation omitted).

274. *Id.* at 729.

275. *See id.*; *see also supra* notes 250–55 and accompanying text (providing a description of compliance costs and estimates per producer of such costs).

276. *Cf.* Centner, *supra* note 20, at 715.

277. *Id.* at 700–01.

278. *Id.* at 700.

lows for continued water pollution by CAFOs.[279] Similarly, a lack of federal oversight of states' CAFO permits through NPDES is often cited as a primary cause of ineffective water pollution reduction.[280] The EPA has also recognized that both federal and state agencies do not highly prioritize regulation of CAFO water pollution.[281]

In the draft CWS, the EPA concludes that the success of the entire strategy is dependent upon the harmonization of several institutions.[282] The draft CWS proposes that states, local governments, and tribes must join the EPA's plan while also "working under their own authorities and capacities."[283] The EPA must then collectively organize separate jurisdictions and coordinate national efforts.[284] The extent of control among the separate jurisdictions, however, has been a considerable controversy for several years.[285]

Agriculture advocates often argue that national solutions and standards are not the answer to environmental problems imposed by CAFOs.[286] Regionalized problems in an industry with unique characteristics require specialized solutions.[287] States are closer and more aware of the problems and can generally create more beneficial localized solutions than the federal government.[288] Regulation of feeding operations by state and local authorities provides industry incentives, long-term sustainability, and flexibility to address unique challenges in regionalized units.[289]

The U.S. General Accounting Office (GAO) has proposed significant increases in federal oversight of state permitting activities.[290] Advocates of increased federal control have concluded that the EPA must increase administration and enforcement assistance to states to ensure long-term sustainability of agriculture.[291] Greater harmonization of state regulatory schemes is a common desire because evidence shows significant differences in state administration of NPDES permitting.[292] Without

279. *Id.* at 700–01; *cf.* COPELAND, *supra* note 9, at 7.

280. COPELAND, *supra* note 9, at 18 (highlighting the opinion that "the [EPA] will need to increase its oversight of state regulatory programs").

281. *Id.* at 20.

282. PUBLIC DISCUSSION DRAFT, *supra* note 22, at 3.

283. *Id.*

284. *Id.*

285. *See, e.g.*, COPELAND, *supra* note 9, at 1; PEREZ, *supra* note 28, at 2; Centner, *supra* note 20, at 701; Ruhl, *supra* note 1, at 266–68; White, *supra* note 14, at 158–67.

286. COPELAND, *supra* note 9, at 18.

287. White, *supra* note 14, at 160, 168.

288. *Id.* at 166–67.

289. *Id.* at 177–78.

290. U.S. GEN. ACCOUNTING OFFICE, GAO-03-285, LIVESTOCK AGRICULTURE: INCREASED EPA OVERSIGHT WILL IMPROVE ENVIRONMENTAL PROGRAM FOR CONCENTRATED ANIMAL FEEDING OPERATIONS 3–5 (2003); COPELAND, *supra* note 9, at 18, 20.

291. Centner, *supra* note 20, at 701.

292. Centner, *supra* note 114, at 1237–38.

federal oversight, states often try to "appease polluters and attract industry."[293]

More extreme movements to curb the contention between state and federal regulatory authority of CAFOs is present in the Chesapeake Bay.[294] Out of concern that the federal CAFO regulations allow too many CAFOs to remain unregulated, states within the Chesapeake Bay region have initiated efforts to develop state-level CAFO permitting.[295] The Environmental Working Group supports state regulations governing agricultural pollution that do not provide jurisdiction to the federal government.[296] On the opposite end of the spectrum, U.S. Senator Cardin from Maryland proposed a bill in an effort to federally enforce the terms of the Chesapeake Bay restoration program.[297] Under the bill, the EPA would have the power to induce state submission and implementation of plans to achieve their pollution reduction obligations and subject states to punitive judgments for failure to act.[298] Although the bill has received strong support, it has not proceeded to a full Senate vote.[299]

d. Regulatory Funding

In addition to a lack of federal oversight of state CAFO NPDES permitting programs, fiscal shortages for program funding is a large contributor to inadequacies in regulatory actions.[300] After *Waterkeeper Alliance*, the CAFO regulations were amended to include a requirement that permitting agencies review nutrient-management plans submitted by CAFOs seeking NPDES permit coverage.[301] Although this requirement was a step in the right direction, shortages in permitting agency personnel imposes an obstacle to the fulfillment requirements.[302] Already experiencing shortages in administrative capacity, additional regulations, such as this, spurred concern among regulatory authorities, industry groups, and environmental advocates.

The GAO reported that increased CAFO regulations necessitate expansion of administrative and financial resources for both the EPA and states.[303] States will need to hire additional staff to "process permits,

293. *Id.* at 1238.

294. *See* PEREZ, *supra* note 28, at 3–4.

295. *See id.* at 14–15 (explaining the state-level CAFO regulatory structures proposed and implemented by New York and Maryland).

296. *See id.* at 22.

297. Chesapeake Clean Water and Ecosystem Restoration Act, S. 1816, 111th Cong. (2009); *see also* PEREZ, *supra* note 28, at 3.

298. S. 1816 § 2(i); *see also* PEREZ, *supra* note 28, at 3.

299. *See Chesapeake Clean Water and Ecosystem Restoration Act*, CHOOSE CLEAN WATER, www.choosecleanwater.org/cms/ccwa (last visited Mar. 8, 2012).

300. U.S. GEN. ACCOUNTING OFFICE, *supra* note 290, at 10, 13; COPELAND, *supra* note 9, at 20.

301. *See supra* notes 199–201 and accompanying text.

302. Centner, *supra* note 20, at 711.

303. COPELAND, *supra* note 9, at 18.

conduct required inspections, and take enforcement actions."[304] In consideration of the historic lack of state oversight by the EPA, the GAO determined that successful adoption and implementation of CAFO regulations is dependent upon hiring additional staff to monitor state activities.[305] The GAO concluded, however, that current state and federal budgetary restrictions do not allow for the increased costs associated with additional personnel.[306]

B. The Carrot *Approach: Managing AFOs and CAFOs with Incentive and Market-Based Mechanisms*

Public commentary on the draft CWS produced a common concern among citizens: should regulatory agencies continue to administer voluntary AFO and CAFO water pollution reduction programs, or should mandatory programs be substituted? Critical commentary identified a lack of regulatory success in controlling water pollution caused by AFOs and CAFOs through the *carrot* approach as a major cause of deficient water-quality standards throughout the country.[307] Other commentators are optimistic about the effectiveness of voluntary programs and recognize the past and future efforts by producers to contribute to water-quality health.[308] Comments expressing favor for the *carrot* approach suggest expansion of voluntary, incentive-based financial programs for management of AFOs and CAFOs.[309] The agricultural industry is most familiar and comfortable with voluntary incentive programs and therefore typically resists change to the traditional *carrot* approaches.[310]

Environmental regulation outside of the agricultural industry has experienced success in *carrot* approaches through utilization of incentives, pollutant trading, and taxation programs.[311] Discussion of each of

304. *Id.*

305. U.S. GEN. ACCOUNTING OFFICE, *supra* note 290, at 13–15.

306. *Id.* at 13. Most funding for state NPDES permitting programs comes from CWA section 106 grants, which allow for development and implementation of water pollution control programs. COPELAND, *supra* note 9, at 18. Section 106 grants are often used "for standard setting, permitting, planning, enforcement, and related activities." *Id.*

307. *See* Roy, *supra* note 176.

308. For example, one comment on the draft CWS explained:

> We support efforts to improve and protect the Chesapeake Bay watershed while maintaining the economic viability of farms, ranches and local communities. Producers have already implemented many environmental best management practices and will continue to do their fair share to protect and preserve the Bay. To encourage additional best management practices, these efforts should be voluntary, locally-led, and incentive-based. With 70 percent of the land in the U.S. in private hands, it's vital that we encourage and incentivize private-land conservation to meet national clean water goals.

Steve Robinson, Comment to *Draft Clean Water Strategy Is Released*, COMING TOGETHER FOR CLEAN WATER DISCUSSION FORUM (Sept. 17, 2010, 4:26 PM), http://blog.epa.gov/waterforum/2010/08/draft-clean-water-strategy-is-released/.

309. *See* Sheffield, *supra* note 25 ("Water quality should be protected at the source through cooperative partnerships that utilize financial incentives. Financial programs such as market-based incentives should be pilot-tested before wide-spread implementation is considered.").

310. STUBBS, *supra* note 3, at 1.

311. Ruhl, *supra* note 1, at 334.

these *carrot* approaches to addressing water pollution in the livestock production sector follows.

1. Incentive Programs

Compliance with federal CAFO regulations subjects operators to significant costs, including waste handling and disposal, development and implementation of nutrient-management plans, and record keeping.[312] To relieve CAFOs of some of these burdens, federal financial support is often necessary.[313] Recognizing the financial dependence of CAFOs on federal funding, incentive-based programs were established by the federal government.[314] The majority of CAFO incentive programs are voluntary and subsidy based.[315]

One of the most central CAFO incentive programs is the Environmental Quality Incentives Program (EQIP), which is a voluntary program that provides technical and financial assistance to agricultural producers.[316] Administered by the Natural Resources Conservation Service (NRCS),[317] EQIP offers cost sharing and incentive payments to aid livestock producers in implementing conservation and environmental practices.[318] The NRCS works with producers to develop operation plans that identify and execute proper land management and operational practices, including nutrient and animal waste management.[319]

Mandatory funding for EQIP was increased from $200 million to $1.3 billion per year in the 2002 farm bill.[320] Of the annual $1.3 billion budget, sixty percent is reserved specifically for livestock operations.[321] The 2002 farm bill allowed payments of up to $450,000 per producer through 2007.[322] The 2008 farm bill expanded EQIP funding to $1.75 billion annually, but reduced per-producer payments to $300,000 every six years, except in the case of special environmental significance.[323] The 2008 farm bill also created the Chesapeake Bay Watershed Program,

312. COPELAND, *supra* note 9, at 17.
313. *Id.*
314. *Id.*
315. *Cf. id.* at 15, 17.
316. *Environmental Quality Incentives Program*, NATURAL RES. CONSERVATION SERV., U.S. DEP'T OF AGRIC., http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial (follow "Environmental Quality Incentives Program" hyperlink) (last modified Feb. 13, 2012).
317. *Id.*
318. COPELAND, *supra* note 9, at 17.
319. Environmental Quality Incentives Program, *supra* note 316; *see also* COPELAND, *supra* note 9, at 17.
320. COPELAND, *supra* note 9, at 17.
321. Farm Security and Rural Investment Act of 2002, Pub. L. No. 107-171, § 2301, 116 Stat. 134, 256.
322. § 2301, 116 Stat. at 257.
323. Food, Conservation, and Energy Act of 2008, Pub. L. No. 110-246 § 2508(2), 122 Stat. 1651, 1791. "Special environmental significance" envelops projects for "methane digesters, other innovative technologies, and projects that will result in significant environmental improvement." 7 C.F.R. § 1466.21(d) (2008).

which provides additional funding to existing federal conservation programs.[324] The purpose of the program is to provide financial assistance for conservation practices designed to enhance land and water resources.[325] Although the 2008 farm bill reduced per-producer payments, federal funding for conservation efforts increased to levels never before realized.[326]

The Chesapeake Bay guidance manual provides several general strategies for pollution source control in animal agriculture.[327] First, the guidance manual suggests decreasing the phosphorous, nitrogen, and toxic substance content of manure through adjustments in animal feed additives and animal feeding strategies.[328] Second, NRCS practices for manure storage and transport are emphasized.[329] Third, exclusion of livestock from streams is suggested.[330] Fourth, reduction of manure volume and nutrient loss through physical, chemical, and biological treatment of wastewater and animal wastes is proposed.[331] The EPA recognizes that many of the proposed CAFO practices have the potential to produce positive water restorative efforts in the Chesapeake Bay,[332] but it still does not require CAFOs to implement any of the practices mentioned.[333] Significant cost increases associated with implementation of most of the suggested voluntary practices is a probable explanation for resistance by the EPA to establish practice-specific requirements.

Establishing more stringent federal CAFO regulations imposes cost increases on operators to comply.[334] Voluntary, incentive-based programs are often a method of assisting producers not only to comply with the regulations but also to implement additional conservation measures.[335] Without proper funding, agricultural industry groups argue, detrimental agricultural and environmental results will ensue.[336] Many agricultural industry groups view increased conservation funding in the 2008 farm bill as a clear indicator of governmental support of incentive-based programs.[337]

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324. Food, Conservation, and Energy Act of 2002 § 2605, 122 Stat. 1651, 1797.

325. *Id.*

326. NATURAL RES. CONSERVATION SERV., U.S. DEP'T OF AGRIC., CONSERVATION PRACTICES AND PROGRAMS FOR YOUR LAND: HELPING PEOPLE HELP THE LAND 2 (Nov. 2009).

327. GUIDANCE IN THE CHESAPEAKE BAY, *supra* note 27, at 2-31.

328. *Id.* at 2-31 to 2-35

329. *Id.* at 2-35 to 2-38.

330. *Id.* at 2-38 to 2-41.

331. *Id.* at 2-41 to 2-60.

332. *See id.* at 2–3; *see generally* notes 328–31 and accompanying text.

333. PEREZ, *supra* note 28, at 21–23.

334. *See, e.g.*, COPELAND, *supra* note 9, at 17.

335. *Id.* (discussing the voluntary EQIP assistance program).

336. *See supra* notes 257–58 and accompanying text.

337. *Cf.* NATURAL RES. CONSERVATION SERV., *supra* note 326 ("The 2008 Farm Bill offers America's agricultural producers . . . more assistance than ever before to voluntarily conserve natural resources . . . . Its provisions provide technical and financial assistance to help producers implement conservation practices . . . .").

One obstacle to achieving higher quality water, the Environment Working Group claims, is "reliance on a failed voluntary approach to agricultural pollution."[338] Three primary reasons for shortfalls in voluntary approaches are often identified by environmental advocates: (1) lack of funding, (2) lack of participation, and (3) lack of motivation.[339] In light of the extensive costs associated with CAFO operations, annual funding for most voluntary programs is insufficient to fulfill all financial requirements of pollution prevention.[340] Additionally, agencies do not properly distribute the funds that are budgeted to the region's largest polluters.[341] Environmental advocates also claim that the operators causing the most severe pollution do not participate in voluntary programs.[342] Instead of retiring land for conservation purposes, voluntary conservation programs stimulate continued utilization of land.[343] Voluntary programs, claim environmental advocates, send legal and economic signals too weak to motivate operators to deviate from their current behavior.[344] Significant progress cannot be made, they argue, unless "conservation policy and farm policy [are] decoupled."[345]

2. Water-Quality Trading Programs

Over a decade ago, the EPA began promoting water-quality trading as an innovative, flexible, and economically efficient method for achieving water-quality standards.[346] On a basic level, water-quality trading is established at a watershed level.[347] Through the Total Maximum Daily Load process or a similar water-quality and pollutant-load assessment, a watershed pollutant cap is determined.[348] Each polluter within the watershed receives pollution credits based on its load and wasteload allocations.[349] Creation of tradable credits occurs when polluters reduce loadings below Total Maximum Daily Load allocations.[350] Tradable credits are attractive to polluters that face higher compliance costs and are unable to reduce loadings below the allocations.[351] Credit buyers may in-

338. PEREZ, *supra* note 28, at 1.
339. *Id.* at 18–20.
340. *Id.* at 2.
341. *Id.*
342. *Id.*
343. Ruhl, *supra* note 1, at 340.
344. PEREZ, *supra* note 28, at 20.
345. Ruhl, *supra* note 1, at 340 (describing how, under the current system, "environmental objectives [are] subordinate to farm policy").
346. OFFICE OF WASTEWATER MGMT., ENVTL. PROT. AGENCY, EPA 833-R-07-004, WATER QUALITY TRADING TOOLKIT FOR PERMIT WRITERS 1 (2007) [hereinafter Water-Quality Trading Toolkit], http://www.epa.gov/npdes/pubs/wqtradingtoolkit.pdf.
347. *Id.*
348. *Id.* at 4.
349. *Id.*
350. *Id.*
351. *Id.*

crease loadings over the allocations in an amount equivalent to credits purchased.[352]

The basic assumption of water-quality trading is that post-trade pollution is less than pollution discharged absent a trading system.[353] Although this type of market-based voluntary approach has the potential to benefit both operators and the environment, very few trades have actually occurred.[354] Moving forward, however, water-quality trading programs may impose net reductions in loading allocations as trading occurs, thereby reducing pollution credits in the future and contributing to an overall decline of watershed pollution.[355]

Similar to other regulatory and incentive CAFO programs, water-quality trading places additional burdens on agencies to implement and monitor the program.[356] The EPA recognizes that regulatory agencies, usually state permitting agencies, must develop credit certificate forms as well as trade tracking and monitoring techniques.[357] To ensure accountability, the agencies must also review trade data, inspect credit trading by both buyers and sellers, and implement enforcement if improper trading or noncompliance occurs.[358] The most natural authoritative agencies on which to place these burdens are state NPDES permitting agencies.[359] The EPA believes that creation of a water-quality trading system by state NPDES permitting agencies will ensure consistent trading and permitting frameworks.[360]

Proponents of water-quality trading emphasize the success of the Clean Air Act's sulfur dioxide pollutant trading system among large coal-burning electric utilities.[361] Environmentalists claim that water-quality trading provides operators with flexibility in deciding whether to use pollution credits, save them for future use, sell them, or purchase additional credits and gives them the ability to increase operation efficiency under current regulations.[362] The factors identified by environmental economists as necessary for an effective trading regime, environmental advocates argue, are present within the water-quality realm.[363] The EPA's watershed-based effluent trading policies and Total Maximum Daily Load mechanisms are identified as additional support for full integration of a water-quality trading system in the agricultural industry.[364]

352. *Id.*
353. *Id.*
354. *Id.* at 1.
355. *Id.* at 4.
356. *Id.* at 5.
357. *Id.*
358. *Id.*
359. *See id.*; *see also* Centner, *supra* note 20, at 700–02, 718–19.
360. WATER-QUALITY TRADING TOOLKIT, *supra* note 346, at 5–7.
361. Ruhl, *supra* note 1, at 344–45.
362. *Id.* at 345–46.
363. *Id.* at 346.
364. *Id.*

Hesitancy to accept water-quality trading as an ideal solution resides in the complexities often involved in proper implementation of the program.[365] Initial transaction costs for the program include increased administrative and implementation costs for federal and state agencies and producers themselves.[366] Traditional market costs of connecting a willing buyer and seller may also have the potential to discourage trading.[367] Once a water-quality trading program is established and transaction costs decrease, enforcement costs may continue to impair the trading market.[368] Environmental economists propose that a successful system requires polluters with differing abatement costs.[369]

Furthermore, proper definition of the market is necessary because too many or too few market participants make trading difficult.[370] The most feasible market would contain a small number of large point source polluters and a small number of large nonpoint source polluters all emitting the same type of pollutant.[371] Attaining this type of market is problematic because geographic boundaries are often limited, and property rights of buyers and sellers are extremely divergent.[372] Additionally, point source polluters are subject to harsher legal requirements than nonpoint source polluters.[373] In defining a water-quality trading market, agencies must consider state and federal regulations, difficulties with nonconventional pollutant trading, and trade between point and nonpoint source polluters.[374]

Most importantly, an effective water-quality trading system is not possible without initially regulating loading limits.[375] Unless pollution levels exceed agency-established loading limits, stimulation of trade will not occur.[376] Enthusiasm to participate in market-based trading thus depends entirely on the necessity of trade "to reduce pollution, which is a function of [agency]-set limits."[377] Necessity is created with a closed market, the institution of load limits for each source, and an overall pollution cap.[378]

365. *See* Hoag & Hughes-Popp, *supra* note 179, at 254.

366. *See id.* at 254, 257; *see also* U.S. GEN. ACCOUNTING OFFICE, *supra* note 290, at 12–13 (discussing transaction costs in CAFO regulatory actions generally).

367. *Cf.* Hoag & Hughes-Popp, *supra* note 179, at 254.

368. *See id.* at 254; *see also* U.S. GEN. ACCOUNTING OFFICE, *supra* note 290, at 12–13 (discussing oversight and transaction costs implicated by CAFO regulation).

369. Ruhl, *supra* note 1, at 346.

370. Hoag & Hughes-Popp, *supra* note 179, at 254.

371. *Id.*; Ruhl, *supra* note 1, at 346.

372. Hoag & Hughes-Popp, *supra* note 179, at 258.

373. *See id.*

374. *See, e.g.*, WATER-QUALITY TRADING TOOLKIT, *supra* note 346, at 5–7, 11, 14–19.

375. *Cf.* Hoag & Hughes-Popp, *supra* note 179, at 254.

376. *Id.*

377. *Id.* at 259.

378. *Cf. id.* at 253–54, 259–60; Ruhl, *supra* note 1, at 345–46.

3. Taxation Programs

Current tax policies do little to control agricultural water pollutants,[379] and water pollution taxes have not been widely adopted throughout the United States.[380] Yet environmentalists argue that taxing mechanisms are the best approach for eliminating water degradation caused by animal feeding operations.[381] Tax instruments are "proposed as a means of influencing pollution behavior by internalizing the social costs of pollution in the polluter."[382] Two primary advantages of a pollutant taxing system are often cited: promotion of innovation and generation of revenue.[383] Though not addressed as a possible solution to controlling water-quality problems associated with animal operations by either the EPA in the draft CWS or the Chesapeake Bay Restoration Plan, taxation mechanisms are worth exploring as a promising approach.

Taxation provides a flexible mechanism for meeting water-quality standards.[384] Water pollution sources often vary and are challenging to measure individually.[385] Economists applaud pollution taxes for overcoming these difficulties.[386] Pollutant taxes allow dischargers to compare tax consequences with emission control costs.[387] If tax costs exceed control costs, emissions are reduced to avoid paying taxes.[388] Producers are incentivized, through this *carrot* approach, to reduce pollutant discharge to a level below the mandated effluent tax limit. If producers can operate at a level below the tax standard, they will not be required to pay taxes.[389] Under this system, an overall watershed pollutant reduction is achieved at the least overall cost.[390] Furthermore, polluters are encouraged to innovate new ideas to reduce pollution with cost effective techniques.[391] Those polluters that are unable to reduce control costs below tax costs will contribute to revenue production.[392] Water-quality projects require significant capital investments, which are funded primarily through public financing.[393] Tax revenues collected from polluters can be redistributed to polluters to fund water-quality improvement and pollution control projects.[394]

379. James Boyd, *Water Pollution Taxes: A Good Idea Doomed to Failure?* 3 PUB. FIN. MGMT. 34 36–41 (2003).
380. *See id.* at 34.
381. *See, e.g.*, Ruhl, *supra* note 1, at 339.
382. *Id.* at 338 (footnote omitted).
383. Boyd, *supra* note 379, at 34–35.
384. *Id.* at 34.
385. *Id.*
386. *Id.*
387. *Id.*
388. *Id.*
389. *Id.*
390. *Id.*
391. *Id.*
392. *Id.*
393. *Id.*
394. *Id.*

A command-and-control pollution quantity standard, determined by a state or federal agency, is necessary to administer a taxing system.[395] By properly accounting for costs and benefits of water pollution control, agencies can mandate efficient levels of pollution control through permits.[396] Although facially promising, real-world constraints limit the capability of water pollution taxation to succeed.[397] Information regarding the costs and benefits of pollution control and emission reductions is necessary to construct effective taxation mechanisms.[398] Because this information is currently unavailable to regulators, policy goals are not directed at creation of a water pollution taxation system.[399]

Both environmental and regulated agricultural communities have met the concept of water pollution taxes with strong political opposition.[400] CAFO and AFO operators, who are already under increased financial pressures to meet regulatory standards, oppose taxes because pollution taxes are yet another cost burden.[401] If the operations cannot shift increased costs to consumers through higher prices, then they face a loss in revenue and possible shutdown.[402] Meanwhile, environmentalist opposition arises to the flexibility afforded to producers under the pollution taxation system.[403] Operators can merely choose to pay the tax and continue to pollute.[404] Furthermore, some environmentalists find it ethically unsound to put a price on pollution.[405] Finally, state and federal agencies fear additional administrative and legal implementation challenges imposed through taxation.[406] For example, exact measurements of many forms of water pollution caused by AFOs and CAFOs, which would be necessary to properly assess a tax amount, are difficult to obtain.[407]

C. Information: Necessary for Both the Carrot *and the* Stick *Approaches*

The success of CAFO programs, whether they are voluntary or involuntary, depends on the accessibility of information regarding the operations and their corresponding pollutants.[408] In the draft CWS, the EPA recognized that "[e]ffective management of water resources re-

395. *Cf. id.* at 41–42.
396. *Id.*
397. *Id.*
398. *Id.*
399. *Cf. id.*
400. *Id.* at 45.
401. *See id.*
402. *See id.*
403. *Id.* at 45–46.
404. *Id.*
405. *Id.*
406. *Id.* at 46 (noting that these challenges may lead to "more potential abuse by presumably well-connected polluters").
407. Ruhl, *supra* note 1, at 338.
408. *Id.* at 337.

quires reliable information."[409] To make better informed decisions and improve accountability, the EPA proposes to implement a multiscaled approach.[410] First, the EPA plans to complete a set of five Aquatic Resource Surveys to obtain information regarding the health of water bodies across the Nation.[411] Then the EPA will work with agencies and stakeholders to develop an assessment and monitoring system to track changes to water body conditions.[412]

CAFO regulatory critics point to information shortages as a missing link in the effective administration of environmental laws for CAFOs.[413] Implementation of a system similar to the Toxic Release Inventory, which reports toxic chemical releases in manufacturing industries, has been suggested.[414] Proponents of the Inventory system have compared the success it achieved in California with implementation of a similar reporting system for CAFOs.[415] They claim that Toxic Release Inventory effectiveness validates the proposition that a national CAFO reporting system, which adopts the Inventory's components, is a feasible and cost-effective option for inducing policy decisions and enhancing water quality.[416]

While the agricultural industry does not oppose collection of water body health information and implementation of assessment and monitoring systems, the industry is concerned with the EPA's reporting accuracy.[417] In response to the Watershed Model developed by the EPA for the Chesapeake Bay, several agricultural groups, organized as the Agricultural Nutrient Policy Council (ANPC), commissioned a report highlighting concerns with the model.[418] This report recognized discrepancies between EPA and USDA Total Maximum Daily Load calculations, land-use estimates, hydrology and pollutant transport, and Watershed Model frameworks and results.[419] Because the Watershed Model is now implemented in a regulatory framework, ANPC may fear that improper reporting and modeling will misdirect regional resources and erode public confidence in the EPA.[420] To prevent these grave dangers to water quality, the report concludes that the EPA and USDA must resolve Watershed Model framework differences.[421] In addition to EPA and USDA

409. PUBLIC DISCUSSION DRAFT, *supra* note 22, at 4.
410. *Id.* at 4–5.
411. *Id.* at 5.
412. *Id.*
413. *See* Ruhl, *supra* note 1, at 337.
414. *Id.* at 337–38.
415. *Id.* at 338.
416. *Id.*
417. *See, e.g.*, LIMNOTECH, COMPARISON OF DRAFT LOAD ESTIMATES FOR CULTIVATED CROPLAND IN THE CHESAPEAKE BAY WATERSHED 1–2 (2010), http://www.limno.com/pdfs/2010(Dec 9)_LTI_USDA_EPA_ChesBay_comparision.pdf.
418. *See generally id.*
419. *See id.* at 1.
420. *Id.* at 2.
421. *Id.*

representatives, the report suggests input from the Chesapeake Bay states, stakeholders, and agricultural scientists.[422]

IV. RESOLUTION

The United States is at a critical turning point for restoring its waters. As major sources of water-quality degradation, AFOs and CAFOs are likely among the first pollution contributors that the EPA will strive to repair. This task, however, is as grave as the environmental and human health dangers that these operations impose. No doubt the EPA will feel the traditional tensions between agricultural groups that struggle to preserve the industry's economic integrity and environmental advocates that endeavor to create a healthier environment. Development of an effective final Clean Water Strategy demands recognition of the sensitivity surrounding AFO and CAFO regulation.

The draft CWS provides a working backbone to build upon but lacks an integrated approach necessary for water-quality restoration.[423] Proposed utilization of the Chesapeake Bay restoration plan as a model for nationwide water-quality improvement should be reconsidered because of failed efforts with the plan. Instead of implementing practices included within the Chesapeake Bay restorative efforts nationwide, the EPA should develop an independent plan that better addresses the broad variety of water degradation issues across the country. Elements of the plan, as proposed below, should be applied first in the Chesapeake Bay watershed to create a model for the rest of the country.

Numerous commentators, agricultural industry groups, and environmental advocates have argued both for and against a shift from the traditional *carrot* approaches of AFO and CAFO regulation to *stick* approaches.[424] Neither the *carrot* nor the *stick* approaches are exclusively correct or incorrect. Instead, a proper blend between the two approaches is the answer to improving nationwide water quality. The final CWS requires a fully integrated and strictly chronologically applied strategy. The four steps of this strategy will be outlined in the Sections that follow.

422. *Id.*

423. *See generally* PUBLIC DISCUSSION DRAFT, *supra* note 22. The draft CWS establishes key action plans "for strengthening water protections," including "Know What You've Got," "Fix What's Broken," and "Build for the Future." *Id.* at 4–9. These key action plans provide a working backbone to develop a sound final strategy. This Note utilizes these key action plans in developing a resolution.

424. *See generally* Boyd, *supra* note 379; Ruhl, *supra* note 1; *Draft Clean Water Strategy*, *supra* note 21.

A. Step One: "Coming Together"

The EPA's draft CWS is entitled "Coming Together for Clean Water."[425] This is the first critical step toward water-quality restoration.[426] As the EPA recognizes, the success of the entire strategy depends on several entities working together on an intimate level.[427] This is the first step of the chronological strategy. Acting as a facilitator, the EPA must bring together the USDA, agricultural industry groups, AFO and CAFO operators, environmental advocacy groups, states, local governments, and any other potentially affected stakeholders to produce a unified effort.[428] These groups must all work together in creating a final CWS instead of continuing to labor against one another. Otherwise, the cyclical battle between the groups will linger, and progress will be halted.[429]

Inconsistent enforcement and monitoring by state and local agencies, coupled with failure to prioritize CAFO regulatory administration, have led to failed attempts to attain water-quality standards.[430] Now is the time for the EPA to step in and create a harmonized regulatory system. This is not to say that the EPA should implement national standards. Rather, state and local agencies are in a better position to create more regionalized standards.[431] The EPA, however, should provide guidance in establishing those standards and must continue to oversee compliance. Just as state and local agencies monitor AFOs and CAFOs to ensure compliance, the EPA must actively supervise state and local agencies to guarantee consistent administration.

B. Step Two: "Know What You've Got"

Once the EPA has unified all stakeholders in AFO and CAFO water pollution regulation, the next critical step to an effective strategy begins. A system founded upon blind regulatory approaches will never prosper. Information concerning pollution implications of individual AFOs and CAFOs, as well as information regarding the health of water bodies, are vital assets to proper water-quality strategies. Currently, this information is missing.[432] The EPA recognizes this shortfall and has proposed to conduct a set of five nationwide aquatic surveys.[433]

Beyond these surveys, the EPA must establish regionalized assessment and monitoring systems to ensure that information is always up-to-

425. PUBLIC DISCUSSION DRAFT, *supra* note 22, at 1.
426. *See id.* at 2.
427. *Id.* at 3.
428. *See id.*
429. As history indicates, this unity is difficult to achieve. Specific recommendations for achieving unity between these groups is beyond the scope of this Note.
430. *See* Centner, *supra* note 20, at 700–01; *see also* COPELAND, *supra* note 9, at 7, 20.
431. *See supra* notes 286–89 and accompanying text.
432. *See* Ruhl, *supra* note 1, at 337.
433. *See supra* notes 409–11 and accompanying text.

date. This requires a coordinated effort between all stakeholders.[434] The assessment and monitoring system must evaluate both pollution sources and water body conditions. Access to current information will allow agencies to address issues as they arise, rather than having to wait until they cause widespread problems. After the EPA has conducted national water body health surveys and guided state and local agencies in establishing assessment and monitoring systems, it can more effectively resolve the substantive challenges facing AFO and CAFO water pollution control. Access to this information will allow for success at the early stages in the chronological strategy proposed.

C. Step Three: "Fix What's Broken"

The most common criticism of the AFO and CAFO regulatory framework from environmental advocacy groups is the need for additional *stick* approaches.[435] This is not the answer. Before the EPA "propose[s] new regulations to more effectively achieve pollutant reductions," [436] it must fix the regulations currently in place. The enacted AFO and CAFO regulations have the potential to produce positive restorative results but have not been properly implemented. Through informed and collective efforts, the nation can concurrently achieve water-quality standards and economic viability within the agricultural industry.

1. Compliance by All Current CAFOs

Prior to considering extension of CAFO classification to additional operations, the EPA must work toward bringing all current CAFOs into compliance. The greatest concerns with current CAFO regulatory approaches are differing interpretations of CAFO standards across the country and the creation of unfair market advantages through lack of enforcement in some regions.[437] With the information obtained in step two, the EPA will gain crucial knowledge of CAFO discharges and regional administrative activities. The EPA must then utilize this information to create a nationalized interpretation of the CAFO regulations, so that all agencies and producers are on the same level.

Once a nationalized interpretation is created, the EPA should extend its federal oversight, as established in step one, to ensure that the CAFO regulations are consistently implemented, monitored, and enforced in all regions. Enforcement of regulations on each operator through regional efforts is the critical breaking point to an effective nationwide strategy. The inequalities created through divergent enforcement techniques and tolerance of wrongdoing must be eliminated. This

434. *See, e.g.*, *supra* notes 417–22 and accompanying text.
435. *See* Ruhl, *supra* note 1, at 293, 319–20.
436. PUBLIC DISCUSSION DRAFT, *supra* note 22, at 6.
437. *See supra* notes 262–76 and accompanying text.

will create economic equality in compliance costs for all CAFOs and will contribute significantly to a reduction in water pollution. It is highly likely that attaining nationalized compliance of all current CAFOs will take several years to accomplish. This is necessary, however, to create a more sound national policy. A regulatory system founded on broken strategies will never proceed successfully.

2. Extension of CAFO Classification

After steps one and two of the chronological strategy are complete and all current CAFOs are brought into compliance, the CAFO regulatory coverage can be extended to include additional operations. This will require amendments of the threshold animal numbers to both the three-tiered size classification of CAFOs and the categorical limitations distinguishing AFOs from CAFOs.

Creation of significant amounts of harmful waste is not limited to large CAFOs, and thus subjecting large CAFOs to more regulations than medium and small CAFOs is inconsistent with the overall goal of reducing water pollution.[438] The practices that large CAFOs are singly required to implement, including nutrient-management plans, best maintenance practices, and land application rates, can provide beneficial results if extended to all CAFOs. Additionally, subjecting all CAFOs to the same regulations would help to achieve the goal of economic equality among producers by eliminating cost prohibitive market disadvantages.

In the draft CWS, the EPA proposes to establish a rule that will streamline designation of an AFO as a CAFO.[439] The EPA attempted to address this issue in 2002 when it adjusted the threshold number of contained animals required for classification of an AFO as a CAFO, thereby extending CAFO regulatory scope to additional operations.[440] This amendment was made almost a decade ago, yet agricultural production remains among the top sources of water pollution.[441] As nonpoint sources of pollution, AFOs are not as stringently regulated as CAFOs but are found to contribute significant amounts of water pollution through runoff.[442] Therefore, to effectuate additional decreases in the amount of animal waste contaminating water bodies, the threshold CAFO classification numbers should again be amended to incorporate additional operations.

438. *Cf. supra* notes 259–61 and accompanying text.
439. PUBLIC DISCUSSION DRAFT, *supra* note 22, at 7.
440. *See supra* notes 238–39 and accompanying text.
441. *See* PUBLIC DISCUSSION DRAFT, *supra* note 22, at 1–2; *see also* White, *supra* note 14, at 164.
442. *See supra* notes 243–45 and accompanying text.

D. Step Four: "Build for the Future"

Steps one through three will certainly impose increased financial burdens on the livestock production sector and state and federal agencies. Under step three, AFOs and CAFOs subject to more stringent regulatory standards when threshold levels are amended will feel the pressure of increased compliance costs.[443] State and federal agencies, however, will also have to meet the burdens of increased financial demands to sufficiently collect and monitor information and administer the regulations.[444]

1. Increased Incentive-Based Efforts

Abolishing voluntary, incentive-based programs, as recommended by several environmental advocates, will have a detrimental effect on the ability of agencies and producers to comply with CAFO regulations.[445] Instead of eliminating incentive-based programs, such as EQIP, federal and state agencies should work to strengthen existing efforts and expand coverage in the future. In today's economy, voluntary, incentive-based programs are efficient alternatives to solving financial burdens and achieving water pollution reduction.[446]

Current flaws in voluntary, incentive-based programs must be addressed before the programs can operate at their full potential.[447] First, funding for the programs by state and federal governments must increase. Although President Obama recognizes the dire need to improve water quality,[448] this will be a significant obstacle to overcome considering current federal economic constraints. Second, more conventional methods must be integrated into incentive programs to increase producer participation and decrease water pollution. The four general strategies proposed in the Chesapeake Bay guidance manual[449] should be included in subsidy-based programs to incentivize producers to implement more environmentally sustainable production methods by providing financial support. Voluntary conservation programs that incentivize producers

443. *Cf. supra* notes 250–57 and accompanying text.

444. *See supra* notes 271–72, 300–06 and accompanying text.

445. *See* Centner, *supra* note 20, at 723; *see also* COPELAND, *supra* note 9, at 17.

446. *See id.*

447. For a description of flaws in voluntary incentive based programs, see *supra* notes 338–44 and accompanying text.

448. *See* ENVTL. PROT. AGENCY ET AL., CLEAN WATER: FOUNDATION OF HEALTHY COMMUNITIES AND A HEALTHY ENVIRONMENT 1 (2011), *available at* www.whitehouse.gov/administration/eop/ceq/initiatives/clean-water (follow "Clean Water Framework" hyperlink) ("Despite the dramatic progress in restoring the health of the Nation's waters, serious problems remain.").

449. The four general strategies proposed in the Chesapeake Bay guidance manual include: (1) decreasing the phosphorous, nitrogen, and toxic substance content of manure through adjustments in animal feed additives and animal feeding strategies; (2) emphasizing NRCS practices for manure storage and transport; (3) excluding livestock from streams; and (4) reducing manure volume and nutrient loss through physical, chemical, and biological treatment of wastewater and animal wastes. *See* GUIDANCE IN THE CHESAPEAKE BAY, *supra* note 27, at 2-31 to 2-32, 2-35 to 2-37, 2-38, 2-41.

through cost-sharing techniques are a popular method of approaching water-quality issues in the livestock production industry.[450] To continue a positive working relationship with producers and concurrently address the concerns of environmental advocates, the EPA should include provisions for strengthening and increasing these programs within the final CWS.

2. Promotion of a Water-Quality Trading System

Once the information collection strategy in step two and the increased coverage and enforcement of CAFO regulations in step three are complete, natural progression to promoting a water-quality trading regime is realistic because information necessary to establish loading limits and watershed markets for each CAFO will be readily available. Increased monitoring, administrative, and enforcement activities of CAFOs by state and federal agencies can be implemented. The two greatest hurdles to establishing an effective pollution permit trading system[451] will already be eliminated. Beyond initial transactional costs of promoting the system and connecting willing buyers and sellers,[452] implementing a trading system within the chronological strategy will not impose the traditional burdens that have discouraged adoption of such a regime.

The success of the Clean Air Act's sulfur dioxide pollutant trading system[453] should further encourage promotion of a similar system within water-quality restorative efforts. A water-quality trading system will also help to equalize compliance costs among producers while promoting reduction in water pollution. Over time, as the system develops, agencies can impose net reductions in loading allocations to further contribute to decreases in overall watershed pollution.[454] A watershed pollution permit trading regime offers the flexibility, economic efficiency, and restorative efforts necessary for a successful nationwide water-quality strategy.[455] The EPA should adopt and promote such a system within the final CWS after completing steps one through three of the proposed chronological strategy.

450. *See* Robinson, *supra* note 308; *see also* WILLIAM L. ANDREEN ET AL., MISSING THE MARK IN THE CHESAPEAKE BAY: A REPORT CARD FOR THE PHASE I WATERSHED IMPLEMENTATION PLANS, 12 (Jan. 2011), http://www.progressivereform.org/articles/ChesBay_WIPs_1102.pdf; COPELAND, *supra* note 9, at 17–18; MEGAN STUBBS, CONG. RESEARCH SERV., R40763, AGRICULTURAL CONSERVATION: A GUIDE TO PROGRAMS 2, 4, 6, 16 (2010).

451. For a description of the hurdles of a water-quality trading system, see *supra* notes 356–79 and accompanying text.

452. *See* Hoag & Hughes-Pop, *supra* note 179, at 254, 247; *see also* U.S. GEN. ACCOUNTING OFFICE, *supra* note 290, at 12–13 (discussing transaction costs in CAFO regulatory actions generally).

453. *See* Ruhl, *supra* note 1, at 344–45.

454. WATER-QUALITY TRADING TOOLKIT, *supra* note 346, at 4.

455. *See id.* at 1.

3. Taxing Programs: The Last Resort

Although pollutant taxing programs have the potential to promote innovation and generate revenue, they should be considered only as a last resort in the proposed chronological strategy. If the voluntary, incentive-based programs cannot produce the financial support necessary to fund CAFO regulatory compliance costs, and a water-quality trading system is ineffective in reducing water pollution levels, then the EPA should reevaluate water pollutant taxing as an alternative. This will not likely occur within the near future, or even within the next decade. Taxing systems impose additional financial restrictions on producers and are politically controversial.[456] Adoption of such a system is often difficult and is subject to severe political scrutiny. Therefore, the EPA should not include a taxing system in its final CWS as a part of the chronological strategy.

V. CONCLUSION

A sustainable environment domestically and an economically viable agricultural industry internationally are both necessary for a healthy nation. Striking the proper balance between these two historically competitive concepts is a daunting task that has not been achieved. While providing extensive social and economic benefits to the country, AFOs and CAFOs impose grave threats to the environmental health of the nation's waters. In an effort to reduce water-quality degradation, the EPA is in the process of developing a nationwide Clean Water Strategy to restore impaired waters and develop practices to ensure a sustainable future. As part of the plan, the EPA proposes to integrate strategies directed at AFO and CAFO regulatory regimes. Significant pressure on the EPA from both agricultural industry groups and environmental advocates continues to feed the fire between the two perspectives. Agricultural industry groups lobby for continuation of voluntary *carrot* approaches that incentivize AFOs and CAFOs to meet compliance standards and adopt additional conservation practices, while environmental advocates campaign for a shift to mandatory *stick* approaches to regulation. In drafting a final CWS, the EPA must be cognizant of the sensitivity surrounding both the agricultural industry and the health of the environment. Incorporation of concerns of both communities through a highly integrated and chronologically implemented nationwide strategy that utilizes both the *carrot* and the *stick* approaches in harmony is the proper solution for meeting the EPA's goal of healthier watersheds.

456. *See supra* notes 400–07 and accompanying text.