LAND USE CONTROLS TO MITIGATE ENVIRONMENTAL AND PUBLIC HEALTH HARMS CAUSED BY CONCENTRATED ANIMAL FEEDING OPERATIONS

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I. INTRODUCTION

Gone are the days of small family farms and red farmhouses on acres of rolling hills smattered with grazing cows and vegetable fields. American agriculture was once considered a "model society for mankind,"[1] and it provided direct contact with nature, valued as a "positive spiritual good."[2] While the farm we once knew exists today only as a rarity, it has largely been replaced by the factory farm, which more closely resembles a factory than a farm. Today, we have large industrialized farms, or Concentrated Animal Feeding Operations ("CAFOs") that produce roughly 99 percent of the meat consumed in the United States.[3] By confining thousands of animals to small spaces with barely enough room to eat, let alone walk, the animal agricultural industry is able to produce meat at an alarmingly high rate while cutting costs at the expense of environmental and human health.[4] It is not uncommon for a single cow feedlot to contain one hundred thousand cows[5] or for twenty hogs to be crammed into a room no larger than a bedroom with no straw, mud, or access to the outdoors.[6] The costs of this practice are myriad, ranging from groundwater pollution to greenhouse gas emissions and the spread of disease.[7] In many states, CAFOs are woefully underregulated, enjoy exemptions from environmental laws, and reap the benefits of laws that were designed to protect small farmers.[8]

While it appears that CAFOs are here to stay—at least as long as the meat industry successfully engages in political control and influence—certain land use controls will mitigate the environmental and health hazards they pose. Impact and license fees; special assessments; excise business taxes; industrial zoning regulations, including overlay and floating zones; conditional use; performance zoning; public nuisance; and environmental

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[1] SUSAN A. SCHNEIDER, FOOD, FARMING & SUSTAINABILITY 5 (2011).

[2] *Id*. at 4.

[3] Nil Zacharias, *It's Time to End Factory Farming*, HUFFINGTON POST (Dec. 19, 2011, 2:53 PM), https://www.huffingtonpost.com/nil-zacharias/its-time-to-end-factory-f_b_1018840.html.

[4] Alan Sutton, Don Jones & Katie Darr, *What is a CFO, CAFO?*, PURDUE U. (Jul. 2007), https://www.extension.purdue.edu/extmedia/ID/cafo/ID-350.pdf.

[5] *Cow Concentration Camps*, CAFO THE BOOK, http://www.cafothebook.org/theissue_3.htm.

[6] *Confined Swine*, CAFO THE BOOK, http://www.cafothebook.org/theissue_5.htm.

[7] *See generally* CARRIE HRIBAR, UNDERSTANDING CONCENTRATED ANIMAL FEEDING OPERATIONS AND THEIR IMPACT ON COMMUNITIES (Mark Schultz ed., 2010).

[8] J.B. Ruhl, *Farms, Their Environmental Harms, and Environmental Law*, 27 ECOLOGY L.Q. 263, 305 (2000).

codes are a number of governmental controls that can be used to protect the environment and public health.

II. ENVIRONMENTAL IMPACT

The environmental harms caused by CAFOs are extreme and manifold.[9] Most of the environmental impacts CAFOs cause are the result of massive amounts of manure produced by keeping thousands of animals in small spaces.[10] The amount of waste produced by even the smallest CAFOs is equal to the amount of urine and feces produced by sixteen thousand humans.[11] One qualifying CAFO[12] produces the same amount of fecal waste as a small city.[13] Manure also contains contaminants, including nitrogen and phosphorous, E. Coli, Salmonella, growth hormones, antibiotics, and animal blood.[14] Massive amounts of waste and limited storage space causes manure from CAFOs to end up in groundwater, in surface water, and in the ambient air of surrounding communities.[15]

There is no single best way to dispose of manure produced by CAFOs, and each disposal method poses its own unique risks. One popular method of disposing of manure is through ground application, in which untreated manure is applied directly to the soil.[16] There is a limit, however, to how many nutrients soil can handle. Furthermore, overapplication of manure can lead to an overload of nutrients such as nitrogen and phosphorous,[17] which in turn can lead to destruction of plant life in affected areas.[18] Another method includes spraying liquefied manure into fields,[19] which can overload the soil's nutrient capacity and run off or leach into surface and groundwater.[20] Other CAFOs attempt to store manure in large, open treatment "lagoons" or in concrete pits beneath the CAFO.[21] Rainwater may cause the lagoons to overflow, however, and concrete pits can break, affecting ground and surface water quality as well as ambient air quality.[22]

Groundwater and surface water contamination are two of the foremost environmental dangers of CAFOs. Runoff from land application and leaks or overflows in storage facilities may cause contaminants such as ammonia

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[9] *See generally* U.S. ENVTL. PROT. AGENCY, RISK ASSESSMENT EVALUATION FOR CONCENTRATED ANIMAL FEEDING OPERATIONS 24 (2004).

[10] HRIBAR, *supra* note 7, at 2.

[11] *Id*.

[12] The Environmental Protection Agency ("EPA") defines a CAFO as a large or medium Animal Feeding Operation ("AFO"). *See* 40 C.F.R. § 122.23(b)(1)(i) (2019) (defining an AFO as a lot or facility where animals have been or will be fed or maintained for a total of forty-five days or more in a twelve-month period); *see also id*. § 122.23(2)(6) (2019) (defining medium and large CAFOs by the number of animals kept on the feedlot depending upon the kind of animal).

[13] U.S. ENVTL. PROT. AGENCY, *supra* note 9, at 24.

[14] HRIBAR, *supra* note 7, at 2.

[15] *See generally id*.

[16] *Id*. at 2.

[17] *Id*. at 2–3.

[18] *See, e.g.*, *Soil Tests and High Phosphorous Levels*, SUSTAINABLE MKT. FARMING (Nov. 6, 2017), https://www.sustainablemarketfarming.com/2017/11/06/soil-tests-and-high-phosphorus-levels/.

[19] Emily Kenyon, *Enough of this Manure: Why the EPA Needs to Define the Agricultural Stormwater Exemption to Limit the "Runoff" from the Alt Court*, 92 N.Y.U. L. REV. 1187, 1190 (2017).

[20] *Id*. at 1190–91.

[21] Sara Kangas, *Water Pollution Concerns Surround CAFOs*, NAT'L FARMERS UNION (Oct. 30, 2015), https://nfu.org/2015/10/30/water-pollution-concerns-surround-cafos.

[22] *Id*.

and nitrogen to leak into streams, rivers, or groundwater supplies.[23] The toxins that leak into groundwater supplies can contaminate the drinking water of communities located near CAFOs.[24] One danger of groundwater contamination is that disease-causing organisms will enter groundwater supplies and be consumed by humans. A study in Idaho found elevated levels of nitrates and veterinary antibiotics in private drinking water.[25] The National Water Quality Inventory Survey also found that twenty-nine states reported that CAFOs impaired water quality.[26] Surface water contamination has equally devastating consequences.[27] Contamination can cause a buildup of ammonia and nitrates.[28] Excess ammonia in surface water can deplete oxygen and kill off aquatic life.[29] Fecal bacteria from CAFOs have also found their way into surface water, closing beaches and threatening E. coli contamination.[30]

More extreme than the effects on ground and surface water are the effects that CAFOs have on ambient air quality. A recent study conducted by the Food and Agriculture Organization of the United States ("FAO") found that animal agriculture is responsible for nearly 18 percent of all greenhouse gas emissions.[31] Specifically, it accounts for for 9 percent of all human-induced emissions of carbon dioxide, 37 percent of all methane emissions, and 65 percent of all emissions of nitrous oxide, which has almost three hundred times the global warming power of carbon dioxide.[32] A 2014 study found that food-related carbon emissions alone can account for a worldwide temperature increase of more than two degrees by 2050.[33] Another study found that the top five big meat and dairy corporations are responsible for emitting more greenhouse gases than Exxon, Shell, or BP.[34] The majority of this impact stems from gases emitted during animal digestion as well as emissions from uncovered manure lagoons and digesters.[35] Manure

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[23] *See* Adam Skolnick, *The CAFO Industry's Impact on the Environmental and Public Health*, SIERRA CLUB (Feb. 23, 2017), https://www.sierraclub.org/sierra/2017-2-march-april/feature/cafo-industrys-impact-environment-and-public-health.

[24] *Id*.

[25] Angela L. Batt et al., *Occurrence of Sulfonamide Antimicrobials in Private Water Wells in Washington County, Idaho, USA*, 64 CHEMOSPHERE 1963, 1971 (2006), http://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1017&context=watercenterpubs.

[26] Claudia Copeland, *Animal Waste and Water Quality: EPA Regulation of Concentrated Animal Feeding Operations (CAFOs)*, CRS REPORT FOR CONGRESS RL31851 1, 4 (2010).

[27] Kangas, *supra* note 21.

[28] *Id*.

[29] HRIBAR, *supra* note 7, at 4.

[30] *Id*.

[31] *An HSUS Fact Sheet: Greenhouse Gas Emissions from Animal Agriculture*, HUMANE SOC'Y OF THE U.S. 1, https://www.humanesociety.org/assets/pdfs/farm/hsus-fact-sheet-greenhouse-gas-emissions-from-animal-agriculture.pdf.

[32] *Id*.

[33] Scott Weathers, Sophie Hermanns & Mark Bittman, *Health Leaders Must Focus on Threats From Factory Farms,* N.Y. TIMES (May 21, 2017), https://www.nytimes.com/2017/05/21/opinion/who-factory-farming-meat-industry-.html.

[34] Juliette Majot, *New Research Shows the Industrial Livestock Industry is Creating a Climate Crisis,* INST. FOR AG. & TRADE POL'Y (Nov. 7, 2017), https://www.iatp.org/new-research-shows-industrial-livestock-industry-creating-climate-crisis#main-content. The top five meat and dairy companies emitted 578 MT of greenhouse gases ("GHGs") in 2016. *Id*.

[35] *Putting Meat on the Table: Industrial Farm Animal Production in America*, PEW COMM'N ON INDUS. FARM ANIMAL PROD. 1, 2 (2008), http://www.pcifapia.org/_images/PCIFAPFin.pdf.

management accounts for 15 percent of the total greenhouse gas emissions produced by agriculture in the United States.[36]

III. PUBLIC NUISANCE

CAFOs have a devastating impact on the wider environment as well as adverse physical, emotional, and economic impacts on residential homes, farms, and communities that are the unfortunate neighbors of CAFOs. The public health emergencies that threaten communities surrounding CAFOs range from contaminated drinking water and unendurable odor to asthma and blue baby syndrome.[37]

One tragic impact of CAFOs on neighboring communities is contaminated drinking water.[38] Runoff from ground application of manure, leaching due to improper ground application, and breaks or leaks in storage units are three common ways that manure can contaminate drinking supplies.[39] About 53 percent of the United States relies on groundwater for drinking—a percentage that can be even higher in rural areas.[40] When contaminants end up in groundwater supplies, community members that drink the water are at risk of nitrate poisoning, which is especially harmful to infants and can result in blue baby syndrome[41] or death.[42] Elevated nitrate levels in drinking water can also lead to decreased oxygen levels in adults, causing miscarriages, birth defects, and overall poor health.[43] Other disease-causing organisms such as Salmonella and E. Coli[44] also infect drinking water and can be transmitted from person to person once consumed.[45]

In addition, the acute odors emitted by CAFOs can travel as far as ten miles, affecting the quality of life in nearby communities.[46] The odors are often a mix of ammonia, hydrogen sulfide, carbon dioxide, and semi-volatile organic compounds, and are worse than odors emitted by smaller farms.[47] A study examining the impact of odor on the emotional and mental well-being of communities surrounding CAFOs found that people living near hog feeding operations experienced "significantly more tension, more depression, more anger, less vigor, more fatigue, and more confusion than control subjects. . . ."[48] People who live near CAFOs can also experience CAFO-related post-traumatic stress disorder and anxiety caused by declining

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[36] *Sources of Greenhouse Gas Emissions,* EPA, https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions (last updated Sept. 13, 2019).

[37] *See* Lynda Knobeloch et al., *Blue Babies and Nitrate-Contaminated Well Water*, 108 ENVTL. HEALTH PERSPECTIVES 675, 675 (2000).

[38] *Id*. at 675–76.

[39] *Id*.

[40] *Water on Tap: A Consumer's Guide to the Nation's Drinking Water*, EPA, http://permanent.access.gpo.gov/lps21800/www.epa.gov/safewater/wot/wheredoes.html (last updated Sept. 16, 2004).

[41] Blue baby syndrome is a condition in which a baby's skin turns blue due to poorly oxygenated blood. *Blue Baby Syndrome*, HEALTHLINE, https://www.healthline.com/health/blue-baby-syndrome (last visited Feb. 12, 2020).

[42] HRIBAR, *supra* note 7, at 4.

[43] *Id*.

[44] *Id*. at 9, Table 2.

[45] *Putting Meat on the Table: Industrial Farm Animal Production in America*, *supra* note 35, at 7.

[46] HRIBAR, *supra* note 7, at 7.

[47] *Id*.

[48] Susan S. Schiffman et al., *The Effect of Environmental Odors Emanating from Commercial Swine Operations on the Mood of Nearby Residents*, 37 BRAIN RES. BULL. 369, 369 (1995).

quality of life.[49] Odors emitted by CAFOs also affect physical health. Toxic gasses and odors emitted by CAFOs can cause farm workers to develop upper respiratory diseases and can cause people in nearby communities—specifically the ederly and children—to develop asthma.[50] A 2005 study found that the prevalence of asthma in children attending a school in Iowa located one half mile from a CAFO was 24.6%, while the prevalence of asthma in children in a school located ten miles away from the same CAFO was 11.7%.[51]

While it would seem that the purported economic efficiency of CAFOs would benefit surrounding communities,[52] the opposite is true. Because CAFOs affect the use and enjoyment of neighboring land, CAFOs cause property values in their community to decrease.[53] Further, while proponents often claim that the economic opportunity presented by CAFOs helps alleviate poverty in rural areas, rural areas near CAFOs have levels of poverty similar to those of nearby localities without CAFOs.[54] One study further found a twenty-six billion dollar decrease in the value of land across the Unites States as a result of CAFOs.[55]

Nor does the presence of CAFOs in a community have the alleged positive effect on local economies. While farmworkers in rural communities used to work in safe family-operated farms, they are now largely employed by industrial agricultural companies who pay minimum wage for extremely hazardous work.[56] Further, because CAFOs are vertically integrated structures, they tend not to do business with local suppliers.[57]

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[49] HRIBAR, *supra* note 7, at 8.

[50] *Putting Meat on the Table: Industrial Farm Animal Production in America*, *supra* note 35, at 7.

[51] U. of Iowa, *Concentrated Animal Feeding Operations Near Schools May Pose Asthma Risk*, NEWSWISE (Jun. 21, 2006, 12:00 AM), https://www.newswise.com/articles/concentrated-animal-feeding-operations-near-schools-may-pose-asthma-risk.

[52] CAFOs streamline production and lower the amount of time and money necessary to produce the same amount of an agricultural product than traditional, smaller farms. *Putting Meat on the Table: Industrial Farm Animal Production in America*, *supra* note 35, at 2.

[53] Multiple studies have found that the presence of CAFOs directly leads to property value decreases. *See* Jungip Kim, Peter D. Goldsmith & Michael H. Thomas, *Using Spatial Econometrics to Assess the Impact of Swine Production on Residential Property Values*, IDEAS (Jul. 2004), http://ageconsearch.umn.edu/record/20186/files/sp04ki05.pdf (finding an average value loss of 23.5 percent for communities located within one mile of a CAFO); *see also* Joseph A. Herriges et al., *Living with Hogs in Iowa: The Impact of Livestock Facilities on Rural Residential Property Values* 4 (Iowa State U. Ctr. for Agric. and Rural Dev., Working Paper No. 03-WP 342, 2003) (finding a 6 percent loss in property value in properties located within one and a half miles of a CAFO and a 26 percent loss in property values of properties located within one half mile of a CAFO).

[54] *Putting Meat on the Table: Industrial Farm Animal Production in America*, *supra* note 35, at 17.

[55] DOUG GURIAN-SHERMAN, UNION OF CONCERNED SCIENTISTS, CAFOS UNCOVERED: UNTOLD COSTS OF CONFINED ANIMAL FEEDING OPERATIONS 1, 5–6 (2008).

[56] *Cow Concentration Camps*, *supra* note 5.

[57] *Id.*

IV. EXEMPTIONS, CORRUPTION, AND UNDERENFORCEMENT: AN OVERVIEW OF THE CURRENT STATE AND FEDERAL CAFO REGULATORY SCHEME

A. FEDERAL REGULATION

The detriments of CAFOs are wide-spread and well-documented. Despite efforts by some federal agencies to regulate CAFOs, they are largely exempt from federal environmental protection statutes primarily due to a lack of political will caused by the influence of meat and dairy lobbies.[58] The statutes most pertinent to CAFOs are the Clean Water Act ("CWA"), the Clean Air Act ("CAA"), the National Environmental Protection Act ("NEPA"), the Emergency Planning and Community Right-to-Know Act ("EPCRA"), and the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"). Each one is fraught with exemptions for CAFOs, allowing them to go generally unregulated.[59] Even where CAFOs are not exempt, the statutes are often largely underenforced.[60]

1. Clean Water Act and National Pollution Discharge Elimination System

The Clean Water Act was passed in 1972 and prohibits toxic discharge of pollutants into the nation's waters from a point source.[61] Among other things, the Act gives the Environmental Protection Agency ("EPA") authority to implement its own pollution control programs and makes it illegal for any point source to discharge pollutants into the nation's waters without a permit.[62] The permitting system of the CWA is implemented through the National Pollution Discharge Elimination System ("NPDES"). No person may pollute the waters of the United States without an NPDES permit.[63] NPDES permits also contain limits on what can be discharged, as well as monitoring and reporting requirements.[64]

Although CAFOs are included in the statute's definition of a point source, and they certainly emit pollutants as defined by the CWA, there are many exceptions that relieve CAFOs from regulation pursuant to the CWA. One notable exemption was added when Congress amended the definition of "point source" in 1987.[65] In this amendment, the definition mandated that "[t]his term [point source] does not include agricultural storm water

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[58] *See generally* Ruhl, *supra* note 8.

[59] *See generally id*.

[60] *See generally id*.

[61] 33 U.S.C.S. § 1251(a) (LexisNexis, Lexis Advance through Public Law 116-47, approved August 21, 2019).

[62] *See* 33 U.S.C. § 1311 (1994). The statute defines both "point source" and "pollutant" very broadly. The statute defines a point source as "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." *Id*. at § 1362(14). The statute defines a pollutant as, ". . . dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water." *Id*. at § 1362(6).

[63] 33 U.S.C.S. § 1342; *NPDES Permit Basics*, EPA, https://www.epa.gov/npdes/npdes-permit-basics (last updated July 12, 2019).

[64] *NPDES Permit Basics*, *supra* note 63.

[65] Water Quality Act of 1987, 100 Pub L. No. 4, 101 Stat. 7 (1987).

discharges and return flows from irrigated agriculture."[66] This provides a massive loophole for CAFOs. For example, a district court in 2013 found that a CAFO in West Virginia without a permit that discharged agricultural runoff into a body of water did not violate the CWA because precipitation caused the discharge from her farm and was therefore exempted as storm water discharge.[67] Another fatal flaw of the CWA is that the definition of CAFO has a high animal unit requirement,[68] and thus many large-scale animal feeding operations with high polluting potential evade regulation. As a direct result of these exemptions, the vast majority of CAFOs do not have NPDES permits yet are allowed to pollute waterways with no restriction and no monitoring or reporting requirements.[69] According to the 2017 NPDES CAFO Permitting Status Report, there are a total of 19,961 CAFOs in the United States and a mere 6,591 have NPDES permits.[70]

A further problem posed by NPDES permitting is that a prospective polluter may apply either for a specific or a general permit.[71] The problem with general permits is that, unlike specific permits, the reporting and effluent emission standards and limits apply broadly to many different operations polluting different bodies of water.[72] Operations that receive general permits are therefore less likely than those that receive specific permits to fulfill exacting site-specific requirements. Issuance of a general permit may also hinder the ability of public participation and citizen enforcement because general permits cover wider geographical areas.[73] The EPA has failed to develop any policy that would alleviate the dangers presented by issuance of general permits,[74] but general permits have been successfully challenged in recent court cases. On April 23, 2018, the New York Supreme Court struck down a general permit offered to large CAFOs by New York's Department of Environmental Conservation.[75] In striking down the permit, the court noted that the general permit failed to fulfill the CWA's requirements for agency oversight and public participation.[76] In another case, *Environmental Defense Center v. EPA*, the Ninth Circuit held that the lack of public participation procedures and the failure to review pollution plans for a proposed general permit constituted a "failure to regulate."[77]

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[66] 33 U.S.C.S. § 1362(14) (LexisNexis, Lexis Advance through Public Law 116-47, approved August 21, 2019).

[67] Alt. v. U.S. Envtl. Prot. Agency, 979 F. Supp. 2d 701, 704–05, 715 (N.D. W.Va. 2013).

[68] 40 C.F.R. § 122.23(b)(4) (2019).

[69] EPA, NPDES CAFO PERMITTING STATUS REPORT (2017), https://www.epa.gov/sites/production/files/2018-05/documents/tracksum_endyear_2017.pdf.

[70] *See id*.

[71] *See* 33 U.S.C. § 1342 (2019).

[72] *See* 40 C.F.R. § 122.2 (2006). This section authorizes "a category of discharges under the CWA within a given area." *Id*.

[73] *See* Jeffrey M. Gaba, *Generally Illegal: NPDES General Permits Under the Clean Water Act*, 31 HARV. ENVTL. L. REV. 409, 411 (2007).

[74] *Id*. at 411–12.

[75] Matter of Riverkeeper, Inc. v. Seggos, 75 N.Y.S.3d 854, 876 (N.Y. Sup. Ct. 2018).

[76] *Id*. at 861–62. The general permits issued in this case allowed the CAFO operators to submit a far less comprehensive annual nutrient management plan, the operators were never sent to the Department of Environmental Conservation ("DEC"), and the permits were not made available to the public. *Id*.

[77] Envtl. Def. Ctr., Inc. v. EPA, 344 F.3d 832, 854–57 (9th Cir. 2003); Gaba, *supra* note 73, at 412.

2. Clean Air Act

The CAA was passed in 1963 with the goal of promoting federal, state, and local laws for pollution prevention.[78] CAFO exemptions under the CAA are not as prolific as exemptions under the CWA, but CAFOs are nonetheless able to evade most regulation under the CAA as a result of "de minimus discharge requirements."[79] Pursuant to the CAA, the EPA established national ambient air quality standards ("NAAQs") to limit certain pollutants.[80] Under Section 110 of the CAA, each state must implement a state implementation plan ("SIP") to determine the level of criteria pollutants in the air and develop a plan to bring the pollutants within the acceptable range.[81] If a state chooses not to prepare a SIP, then the federal government must prepare a federal implementation plan ("FIP").[82] Further, when a state does make a SIP, much of what to include in the implementation plan is up to the state. The CAA does not mandate which polluters are to be regulated; thus, states can choose to regulate some polluters and not others.[83] Not surprisingly, most states choose not to rigorously regulate CAFOs in their SIPs.[84] Indeed, the EPA even dissuades states from regulating CAFOs through their SIPs.[85]

Yet another loophole for CAFOs is in Section 112 of the CAA; the EPA can exempt from specified control and reporting systems any substance used in agriculture.[86] The EPA has, in fact, exempted ammonia from the Section 112 requirements when it is "held by farmers."[87] The EPA also raised the quantity threshold for propane, which is frequently used in farming operations.[88]

3. National Environmental Policy Act

The National Environmental Policy Act ("NEPA") demonstrates a broad national commitment to environmental protection[89] and has been called the Magna Carta of environmentalism in the United States.[90] The Act establishes a set of procedures requiring federal agencies to prepare—to the fullest extent possible—an Environmental Impact Statement ("EIS") when the federal government proposes to take any major action that may significantly affect "the quality of the human environment."[91] EISs serve two purposes:

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[78] 42 U.S.C. § 7401 (1963).

[79] Ruhl, *supra* note 8, at 305.

[80] *See* 42 U.S.C. §§ 7408–7409 (2018). These "criteria pollutants" include carbon monoxide, lead, nitrogen dioxide, particulate matter, ozone, and sulfur dioxide. *Id*.

[81] *See* § 7419.

[82] Ruhl, *supra* note 8, 306 n.239.

[83] *Id*.

[84] *Id*. at 306.

[85] *Id*. For example, the EPA has contended that farms are not a major contributor of particulate matter in the air, although almost no data supports this contention. *Id*. at 306 n.242. The EPA also gives states guidance in making their state implementation plans ("SIPs"). *Id*. The SIPs give information alleging farms make a small contribution to particulate matter in the air. *Id*.

[86] *Id*. at 307.

[87] *Id*.

[88] *Id*. at 307–08.

[89] Robertson v. Methow Valley Citizens Council, 490 U.S. 332, 348 (1989).

[90] *See* Amanda Jahshan, *NEPA: The Magna Carta of Environmental Law*, NAT'L RESOURCES DEF. COUNCIL (July 26, 2013), https://www.nrdc.org/experts/amanda-jahshan/nepa-magna-carta-environmental-law.

[91] National Environmental Policy Act of 1969 § 102, 42 U.S.C. § 4332(2)(C) (2018).

(1) it guarantees the environmental information will be available to people who will play a role in the decision-making process and implementation of the plan; and (2) it ensures that, in reaching its decision, an agency will carefully consider the environmental impacts of the project.[92] An agency may prepare a more limited version of an EIS, called an Environmental Assessment ("EA"), if the agency's action is neither excluded from the requirement to produce an EIS nor clearly requiring an EIS.[93] If, after reviewing the EA, the agency determines that an EIS is not required, it must issue a Finding of No Significant Impact ("FONSI") and ensure that information is available to public officials and citizens who may play a role in the decision-making process.[94] Finally, the federal agency that seeks project approval must hold a public hearing in which experts and the public can comment on the project's development.[95]

NEPA's requirements are largely toothless when it comes to CAFOs, but some recent litigation put pressure on the federal government and agencies to prepare better EISs before loaning to prospective CAFO operators. Some development projects are exempt from submitting an EIS or can abstain from the process entirely.[96] As is—or, at least, was—the case with CAFOs, federal agencies grant loans to prospective CAFO developers without seriously considering the environmental impacts as mandated under NEPA.[97] In 2014, the environmental group Earthjustice challenged this practice in *Buffalo River Watershed Alliance v. USDA*, in which the Small Business Administration ("SBA") did not assess the environmental impacts of a hog CAFO in Buffalo, New York, before providing funds for the CAFO's construction.[98] The Farm Service Agency ("FSA"), which also provided funding for the CAFO, did prepare an EA but did not include the major impacts that the project would have on nearby water resources or any possible alternative locations. The court held that each agency arbitrarily and capriciously granted the loans because: (1) the EA prepared by the FSA did not address the main environmental impacts of the proposed project and failed to notify the public; and (2) the SBA's "lack of a hard look" at environmental impacts violated NEPA.[99] This order did give NEPA more teeth by requiring that agencies consider the environmental impacts of a

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[92] Food & Water Watch v. USDA, Civil Action No. 17-1714, 2018 U.S. Dist. LEXIS 152787, at *3–4 (D.D.C. Sept. 7, 2018).

[93] *Id*. at *4.

[94] *Id*. at *43.

[95] Sam Schipani, *NEPA Is Under Threat – Here's Why That Matters*, SIERRA CLUB (May 21, 2018), https://www.sierraclub.org/sierra/national-environmental-policy-act-nepa.

[96] Bellamy Pailthorp, *Unpacking Government: What Good Are Environmental Impact Statements?*, KNKX (Mar 6. 2017), http://www.knkx.org/post/unpacking-government-what-good-are-environmental-impact-statements#main-content. The pipeline controversy is an example of a project that skipped over the EIR process altogether, leaving a community without the awareness of the pending process, and thus no ability to contest the project or negotiate for greater protections. *Id*.

[97] *See* Buffalo River Watershed All. v. Dep't of Agric., No. 4:13-cv-450-DPM, 2014 U.S. Dist. LEXIS 168750, at *2–5 (E.D. Ark. Dec. 2, 2014); *see also Victory for the Buffalo River, Environmental Impacts Must Be Reviewed*, EARTHJUSTICE (Dec. 2, 2014), https://earthjustice.org/news/press/2014/victory-for-the-buffalo-river-environmental-impacts-must-be-reviewed.

[98] *Buffalo River*, 2014 U.S. Dist. LEXIS 168750 at *1–2.

[99] *Id*. at *10–12.

project or face an injunction; however, it also created some confusion as it is unclear what the "hard look" language requires.[100]

Despite the *Buffalo River* decision, NEPA essentially has no teeth. It requires reporting through EISs for the sake of transparency alone, without any requirement that anything be done in response to the information provided in an EIS.[101] The important function of transparency is alerting the public to the environmental impacts of proposed government action, thereby allowing it to challenge a given action that may negatively impact their environment.[102] As a result of this transparency, negotiations occur in which communities are often able to achieve added protections to mitigate potential environmental harm.[103]

Recently, however, NEPA's reporting requirements have been under attack by the Trump Administration, which threatens to roll back reporting requirements and streamline the process for project approval. There are several proposals in Congress today that would weaken the key provisions of NEPA.[104] In February 2018, Trump proposed a "one agency, one decision" framework for environmental reviews.[105] He plans to designate a "lead agency" to produce one review document for each proposed project and streamline approval.[106] NEPA permitting normally takes between three to five years and can sometimes take up to twenty-five years.[107] Trump's planned restructuring would cut the permitting process down to two years or less.[108] This could take us back to the pre-*Buffalo River* days when loans were given without EIS review, with incomplete reviews, or with no reviews at all.

4. Emergency Planning and Community Right to Know Act and Comprehensive Environmental Response, Compensation, and Liability Act

The Emergency Planning and Community Right to Know Act ("EPCRA")[109] and the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA")[110] are federal statutes that require industries to report when toxic chemicals are released into the environment.[111] The purpose of the statutes is for local, state, and federal

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[100] *See, e.g.*, Catherine Boudreau, *Feds Hit Brakes on Loans to Big Farms*, POLITICO (Oct. 24, 2016, 12:31 PM), https://www.politico.com/story/2016/10/slow-loans-over-green-woes-put-cafos-in-limbo-230234. The SBA claimed that because of the ruling, its loans will now take longer to process, "hurting the already sluggish rural economy." *Id.*

[101] *Id.*

[102] Letter from Laura Neish, Exec. Dir., 350 Bay Area, et al., to Mary Neumayr, Chief of Staff, Council on Envtl. Quality (Aug. 20, 2018).

[103] *Id.*

[104] *Id.*

[105] Nick Sobczyk, T*rump Proposes Sweeping Changes to NEPA*, E&E NEWS (Feb. 12, 2018), https://www.eenews.net/stories/1060073597.

[106] *Id.*

[107] *Id.* The Trump Administration cited that the main reason for the changes is that the EIS preparation and review period takes a significant amount of time, which stalls important infrastructure projects. Schipani, *supra* note 95.

[108] Sobczyk, *supra* note 105.

[109] 42 U.S.C. § 11001 (2018).

[110] § 9601.

[111] *See Summary of the Comprehensive Environmental Response, Compensation, and Liability Act (Superfund)*, ENVTL. PROTECTION AGENCY: LAWS & REGS., https://www.epa.gov/laws-regulations/summary-comprehensive-environmental-response-compensation-and-liability-act (last updated Aug. 15, 2019).

officials to evaluate when there may be a need for an emergency response to hazardous emissions.[112] Both of the laws have greatly increased the amount of information available to governmental agencies and the public regarding the amount of hazardous pollutants released into the environment.[113]

Farms are largely exempt from EPCRA and CERCLA.[114] "Air emissions from animal waste at a farm" are exempt from reporting under CERCLA.[115] Under Section 304 of EPCRA, air emissions from animal waste are not required to be reported.[116] EPCRA also currently excludes from reporting requirements any substance used in "routine agricultural operations."[117]

The current lack of CAFO regulation under EPCRA and CERCLA remains despite a ten-year battle over the exemptions and a court order mandating that the EPA vacate a rule generally exempting all farms, other than CAFOs, from reporting air releases from animal waste.[118] In 2008, the D.C. District Court vacated the rule, finding that it could not "be justified as a reasonable interpretation of any statutory ambiguity or implementation of a de minimis exception."[119] Despite this ruling, Congress passed legislation to renew the general exemption relieving farms from reporting releases from animal waste under CERCLA.[120] On August 1, 2018, the EPA reinserted the CERCLA exemption for reporting air emissions from animal waste.[121] The effect of exempting farms from CERCLA and EPCRA reporting requirements is that many CAFOs and large Animal Feeding Operations ("AFOs") are able to pollute without being monitored or held accountable by the EPA or the communities they affect. It also undermines the proposition that communities have the right to know about toxic pollutants in their community.

5. Federal Subsidies

CAFOs also enjoy a number of federal subsidies, both direct and indirect.[122] One of the largest subsidies is for commodity crops such as corn and soy.[123] Since the 1996 Farm Bill, the federal government makes subsidy

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[112] *Id*.

[113] Ruhl, *supra* note 8, at 312–13.

[114] *Id*. at 313.

[115] On March 23, 2018, the Fair Agricultural Reporting Method Act became law and amended CERCLA section 103(e) to exempt air emissions from animal waste at a farm from reporting. 83 Fed. Reg. 37,444 (Aug. 1, 2018) (to be codified at 40 C.F.R. pts. 302 & 355); *CERCLA and EPCRA Reporting Requirements for Air Releases of Hazardous Substances from Animal Waste at Farms*, ENVTL. PROTECTION AGENCY, https://www.epa.gov/epcra/cercla-and-epcra-reporting-requirements-air-releases-hazardous-substances-animal-waste-farms.

[116] 83 Fed. Reg. 37,444 (Aug. 1, 2018) (to be codified at 40 C.F.R. pts. 302 & 355).

[117] 42 U.S.C. § 11021(e)(5) (2012).

[118] Don't Waste Ariz., Inc. v. Hickman's Egg Ranch, Inc., No. CV-16-03319-PHHX-GMS, 2018 U.S. Dist. LEXIS 163879, at *6 (D. Ariz. Sept. 25, 2018).

[119] *Id*. at *6 (citing Waterkeeper Alliance v. EPA, 853 F.3d 527 (D.C. Cir. 2017)).

[120] *Id*. at *6–7.

[121] 83 Fed. Reg. 37,444 (Aug. 1, 2018) (to be codified at 40 C.F.R. pts. 302 & 355); *CERCLA and EPCRA Reporting Requirements for Air Releases of Hazardous Substances from Animal Waste at Farms*, *supra* note 115.

[121] 83 Fed. Reg. 37444 (Aug. 1, 2018) (to be codified at 40 C.F.R. pts. 302 & 355).

[122] Patrick Baron, *Sweetening the Deal for CAFOs: Hidden Subsidies for IFAP in the 2012 Farm Bill*, CTR. FOR LIVABLE FUTURE (Dec. 6, 2011, 12:26 AM), http://livablefutureblog.com/2011/12/hidden-subsidies-for-ifap.

[123] *Id*.

payments to commodity crop growers.[124] This reduces the cost of production and leads to an increase of production even if there is less market demand.[125] CAFOs benefit indirectly from commodity crop subsidies because corn and soy are the two main ingredients in CAFO feed, and feed expenses are the largest operating cost of CAFOs.[126] One study estimated that from 1997 to 2005, commodity crop subsidies saved CAFO farmers $3.86 billion per year.[127]

Another subsidy that CAFOs enjoy is a direct subsidy resulting from the federal Environmental Quality Incentives Program ("EQIP"), which pays polluters to reduce their pollution.[128] CAFOs were originally excluded from the EQIP program because it was intended to benefit smaller farms, but in 2002 the exclusion was removed, allowing CAFOs to participate in the program.[129] Through EQIP, the government can pay polluters up to $415 million to make conservation efforts.[130] EQIP also favors CAFO participation by using certain criteria to prioritize projects.[131] For example, manure disposal projects are favored over others.[132] One study estimated that CAFOs may have received about $215 million in EQIP subsidies in 2007.[133]

B. STATE REGULATION

States can issue their own regulations to combat the lack of federal regulation, but most choose to leave CAFOs largely unregulated.[134] Historically, common law nuisance suits have been a remedy for people whose right to "quiet use and enjoyment" of their land has been invaded.[135] Though nuisance law is less consequential in urban areas—where zoning and planning have diminished most of the need for nuisance suits by separating uses into respective zones[136]—it is still a powerful tool for rural communities to combat polluters.[137] There are two kinds of nuisance suits: private and public. Private nuisance suits deal with interest in private land, whereas public nuisance involves interference with rights of the public; however both forms of nuisance can apply in the same controversy, as is the case with CAFOs.[138] The nuisance remedy can be damages, an injunction, or both.[139] While nuisance law applies retroactively, courts will typically deny an

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[124] *Id*.
[125] *Id*.
[126] *Id*.
[127] Elanor Starmer & Timothy A. Wise, *Feeding at the Trough: Industrial Livestock Firms Saved $35 Billion from Low Feed Prices, GDAE Policy Brief 07-03*, TUFTS GLOBAL DEV. & ENV'T INST. 1, 1 (2007).
[128] Jack Kittredge, *The Untold Costs of CAFOs*, THE NATURAL FARMER (May 1, 2015), https://thenaturalfarmer.org/article/the-untold-costs-of-cafos/.
[129] GURIAN-SHERMAN, *supra* note 55, at 3.
[130] *Id*.
[131] *Id*.
[132] *Id*.
[133] *Id*.
[134] *See* Ruhl, *supra* note 8, at 315.
[135] DAVID L. CALLIES ET AL., LAND USE CASES AND MATERIALS 5 (7th ed. 2017).
[136] *Id*.
[137] *Id*. at 5.
[138] *Id*. at 6.
[139] *Id*.

injunction and grant only damages when they find that the plaintiffs were "coming to the nuisance."[140]

There is a long, complicated, and controversial history of CAFO nuisance suits. One might expect that a private or public nuisance suit against CAFO operations that interfere with enjoyment of land either by polluting air or water would be an effective way of either shutting down the CAFO or monetarily compensating the affected communities. As with other areas of the law, nuisance suits against CAFOs are not simple. The otherwise clear proposition that if a CAFO interferes with the use and enjoyment of one's property, then the CAFO must either compensate the affected properties or shut down, is muddied by two main areas of law: right-to-farm laws and the coming-to-the-nuisance doctrine.[141]

Right-to-farm laws seek to shield farmers from nuisance suits by "immunizing farm operations from being declared nuisances."[142] All fifty states have enacted right-to-farm laws.[143] Level of protection varies by state,[144] but the effect is the same: farmers are protected from nuisance suits while affected communities are largely left without remedy. While right-to-farm laws are meant to protect agriculture, they have unintended consequences: they intrude on property and affect communities' property rights, they make farmers less sensitive to the needs of surrounding communities, and they interfere with efficient allocation of resources.[145] This begs the question: are right-to-farm laws justified and necessary in today's farming landscape?

One common argument against right-to-farm laws is that farms today differ greatly from farms that existed when right-to-farm laws were created.[146] Many right-to-farm laws adopt a coming-to-the-nuisance stance, where the use of a property that was not a nuisance at the start does not become a nuisance when neighboring land use changes.[147] The right-to-farm laws, when promulgated, were designed to protect the smaller farms that America once knew. The nuisances from these farms, however, substantially differ from the nuisances associated with the massive industrial operations of farms today. Legislatures in the day of the small family farm likely did not consider that they would be exempting farms from nuisance suits against the hazards associated with CAFOs—respiratory disease, mental illness, blue baby syndrome, and contaminated drinking water, among many others. This

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[140] *Id*.

[141] "Coming-to-the-nuisance" represents the idea that a neighbor cannot locate or change position near an existing use and then sue for the nuisance. RESTATEMENT (SECOND) OF TORTS § 840D (AM. LAW INST. 1979).

[142] *Id*.

[143] Alexandra Lizano & Elizabeth Rumley, *States' Right-to-Farm Statutes*, NAT'L AGRIC. L. CTR., http://nationalaglawcenter.org/state-compilations/right-to-farm/ (last updated June 11, 2019).

[144] Here is one example of a right-to-farm law in California: "No agricultural activity, operation, or facility, or appurtenances thereof, conducted or maintained for commercial purposes, and in a manner consistent with proper and accepted customs and standards, as established and followed by similar agricultural operations in the same locality, shall be or become a nuisance, private or public, due to any changed condition in or about the locality, after it has been in operation for more than three years if it was not a nuisance at the time it began." CAL. CIV. CODE § 3482.5 (Deering 2019).

[145] Terence J. Centner, *Nuisances from Animal Feeding Operations: Reconciling Agricultural Production and Neighboring Property Rights*, 11 DRAKE J. AGRIC. L. 5, 6–7 (2006).

[146] *See, e.g*., *id*. at 8.

[147] Terence J. Centner, *Governments and Unconstitutional Takings: When Do Right-to-Farm Laws Go Too Far?*, 33 B.C. ENVTL. AFF. L. REV. 87, 88 (2006).

certainly weighs in favor of a new kind of exemption: exempting CAFOs from the protections afforded by right-to-farm laws.[148]

Right-to-farm laws have also been challenged and even invalidated as unconstitutional takings under the Fifth Amendment.[149] The Iowa Supreme Court, for example, found that Iowa's right-to-farm law created an easement that amounted to an unconstitutional taking of a neighbor's property.[150] The rationale behind the takings argument is that the nuisance reduces the value of the neighboring property.[151] The value of the property, however, has not been totally diminished.[152] Neither has there been a physical occupation of the land.[153] Right-to-farm takings are therefore neither per se takings nor takings by physical invasion.[154] Instead, right-to-farm takings may be regulatory takings as described by Justice Harlan in *Pennsylvania Coal v. Mahon*.[155] An ad hoc balancing test must be used when determining whether right-to-farm laws go so far as to constitute such a regulatory taking.[156] History also suggests that federal courts are not likely to follow *Bormann*, in which a court found that an Idaho right-to-farm law did not amount to a constitutional violation.[157] However, states are not preempted from making their own rules regarding takings under state constitutions.[158] States can, for example, expand the meaning of a physical taking to include odors, noise, and particulate matter.[159] Due to the weighty interests in protecting both the environment and the health of communities surrounding CAFOs, a manipulation of state rules regarding takings is advisable.

V. CAFO REGULATION: A NEW APPROACH

With the federal and state governments' gross dereliction of their duty to protect environmental and public health, it is clear that a new approach to CAFO regulation is necessary to protect the environment and ensure the rights of all citizens are recognized. The current approach to CAFO regulation is corrupted and fraught with exemptions,[160] and in the current

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[148] It is often argued that CAFOs should be characterized as industrial rather than agricultural, and are thus excluded from the favorable treatment offered to farms by right-to-farm laws. *See* Centner, *supra* note 145, at 7.

[149] The Fifth Amendment takings clause provides that "private property [shall not] be taken for public use, without just compensation." U.S. CONST. amend. V.

[150] Bormann v. Bd. of Supervisors, 584 N.W.2d 309, 311, 321 (Iowa 1988). *But see* Moon v. N. Idaho Farmer's Ass'n, 96 P.3d 637 (2004) (finding that Idaho's right-to-farm law did not amount to a constitutional violation).

[151] Centner, *supra* note 147, at 137.

[152] *See* Lucas v. S.C. Coastal Council, 505 U.S. 1003, 1015–19 (1992) (defining a regulatory taking as one that deprives the landowner of "all economically beneficial uses").

[153] *See* Loretto v. Teleprompter Manhattan CATV Corp., 458 U.S. 419, 435–36 (1982) (defining a regulatory taking as a "permanent physical taking").

[154] Centner, *supra* note 147, at 137.

[155] *See generally* Pa. Coal Co. v. Mahon, 260 U.S. 393 (1922).

[156] Centner, *supra* note 147, at 137–38.

[157] Bormann v. Bd. of Supervisors, 584 N.W.2d 309, 311, 321 (Iowa 1988).

[158] Centner, *supra* note 147, at 138.

[159] *Id*.

[160] While whole works can and have been dedicated to discussion of the corruption within the agricultural sector, some examples are: (1) an inside EPA lobbyist; (2) a task force within the USDA that is dominated by people who represent interests of big agricultural corporations; and (3) a memorandum of understanding between the USDA and EPA that ensures the EPA will confer with the USDA on agricultural air quality issues (and will consequently be influenced by the task force on the USDA comprised of representatives of industry interests). MICHELE M. MERKEL, EPA AND STATE FAILURES TO REGULATE CAFOS UNDER FEDERAL ENVIRONMENTAL LAWS, OUTLINE OF REMARKS PREPARED FOR

political atmosphere, it is unlikely to change and even more likely to worsen. What, then, can be done to combat the unsustainable, unregulated, and deleterious CAFO farming practices? Below is a discussion of land use practices, from tax incentives to buffer zones, that can mitigate harms caused by CAFOs.

A. CONDITIONAL USE PERMITS

One land use control regulating CAFOs requires prospective CAFO operators to obtain conditional use permits. When a specific CAFO will have significant adverse impacts on the environment, the planning commission can be given authority to require the developer to obtain a conditional use permit.[161] Some uses that frequently require conditional use permits include group homes, schools, community service facilities, and agriculture.[162] Conditional use permits can be helpful in regulating CAFOs because the local government can provide specific criteria that must be met before a permit is issued.

A CAFO permit may be based upon a broad range of useful conditions. It is within the state's police power to impose conditions upon prospective builders as long as there is an "essential nexus" between the public purpose to be served and the condition being imposed,[163] and a rough proportionality exists between the condition and the impact of the proposed development.[164] In other words, a planning commission has broad discretion to condition a permit on specified criteria as long as the condition is connected to a public purpose and is not significantly more onerous than the project would be burdensome. The purpose of conditioning a CAFO building permit upon specified criteria is to minimize the impact on the environment and surrounding communities. The condition, therefore, will be tied to actions that will mitigate the negative externalities imposed by the CAFO. A planning commission could, for example, condition a permit to build a CAFO upon the prospective builder's agreement to compensate affected neighborhoods, fund environmental clean-ups, fund development of buffer zones, or generally fund mitigation work.[165] Due to the degree of harm that CAFOs cause the environment and surrounding areas, municipalities should be able to impose exacting conditions upon CAFOs in order to mitigate their extreme effects.

THE NATIONAL COMMISSION ON INDUSTRIAL FARM ANIMAL PRODUCTION MEETING ON SEPTEMBER 11, 2006 5–7 (Sept. 11, 2006), http://environmentalintegrity.org/pdf/publications/EPA_State_Failures_Regulate_CAFO.pdf.

[161] *See* PORTLAND, OR., ZONING CODE tit. 33 § 33.815.010 (1991).

[162] *Id*.

[163] *See* Nollan v. Cal. Coastal Comm'n., 483 U.S. 825, 837 (1987).

[164] Dolan v. City of Tigard, 512 U.S. 374, 390 (1994).

[165] *E.g*. Koontz v. St. Johns River Water Mgmt. Dist., 570 U.S. 595 (2013) (where a planning commission conditioned the issuance of a permit to dredge on land on the criteria that the landowner fund offsite mitigation projects, and the amount of money requested to fund the mitigation projects must satisfy the nexus and rough proportionality standards established in *Nollan* and *Dolan*). *See Dolan*, 512 U.S. at 403; *Nollan*, 483 U.S. at 837.

B. FLOATING AND OVERLAY ZONES

While floating zones closely resemble conditional use permits, they have one major advantage: zoning is a legislative process subject to minimum rational scrutiny rather than a quasi-judicial determination subject to a substantial evidence standard.[166] As a result, the use of floating zones gives legislative bodies far greater leeway to impose conditions and mitigation requirements. Establishing a floating zone is a two-step zoning process by which the municipality first creates a text amendment that provides for certain uses if specified criteria are met.[167] In the next step, the city places the zone on the map when the "appropriate" development application is filed.[168] Most states treat all zoning amendments and rezoning as legislative acts and give them a presumption of validity.[169] A test derived from *Euclid v. Amber Realty Co*.[170] is used to overcome the presumption of validity, but it is a heavy burden.[171] This highly deferential standard gives legislative bodies essentially unrestrained power to place conditions on floating zones.[172] Conditional use permits, on the other hand, are treated as quasi-judicial decisions.[173] Accordingly, no presumption of validity attaches when a zoning board issues a conditional use permit; instead the permit is subject to close judicial scrutiny.[174]

Overlay zones override established use districts and impose their own restrictions on land use within the given zones.[175] Overlay zone boundaries generally do not coincide with those of existing use districts but cover existing districts without regard to their boundaries.[176] Cities make extensive and varied use of overlay districts, and some include overlay districts for environmental protection and conservation that may be useful in preventing or mitigating CAFO effects.[177] For example, Oregon has an Environmental Protection Zone where development will only be approved in "rare and unusual circumstances."[178] By creating environmental protection overlay zones, localities may be able to protect certain ecologically sensitive areas from CAFOs by prohibiting development generally.[179]

C. BUFFER ZONES AND SETBACK REQUIREMENTS

Buffer zones between the CAFO and surrounding developments can be utilized to minimize the public health risks posed by CAFOs. The purpose of buffer zones is to separate incompatible land uses by natural features such

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166 CALLIES ET AL., *supra* note 135, at 166.
167 Kristine Karnezis, *Zoning: Regulations and Placing "Floating Zones"*, 80 A.L.R. 3d 95, 1 (1977).
168 CALLIES ET AL., *supra* note 135, at 166.
169 *Id*. at 194.
170 Euclid v. Amber Realty Co., 272 U.S. 365 (1926).
171 CALLIES ET AL., *supra* note 135, at 194.
172 *See id*.
173 *Id*.
174 *Id*. at 195.
175 *Id*. at 165.
176 *Id*.
177 *Id*. at 164–65.
178 *Id*.
179 *See id*. at 165.

as rivers or surface infrastructure—the "landscape buffer"[180]—or by intervening medium intensity zones—the "land use" buffer.[181] There are a number of landscape buffers that are particularly useful for animal waste, such as riparian buffers and filter strips.

Land use buffers may be effective in avoiding the public health hazards that arise when CAFOs are located near residential areas. Land use buffers have been used to protect single-family, residential zones from commercial areas or low-income housing.[182] Zoning multiple-occupancy residences between single-family homes and "undesirable" uses, however, would not be as effective for CAFOs; it may even cause more harm given that more people would live in the area closest to the CAFO and be subjected to the odor and potential water contamination. The land use buffer that would be most effective for CAFOs is an industrial zone between CAFOs and other residential or commercial zones. It could consist of a substantial area not designated for frequent human occupancy that would separate CAFOs from residences and commercial areas, reducing the likelihood that odors and particulate matter in the air would affect residences.

There are four kinds of landscape buffers that are used to minimize the impacts of negative externalities generated by animal waste: (1) riparian and water-related buffers; (2) wind buffers; (3) agronomic buffers; and (4) buffers employed as zoning setbacks.[183] Riparian buffers provide areas of vegetation next to waterways to protect water from contaminants and enhance overall water quality.[184] They are able to protect and enhance water quality by acting as "filters, transformers, sinks, and sources."[185] Particularly useful to CAFO regulation is requiring vegetation in riparian buffers that can transform nitrate into nitrogen gas, thus reducing nitrogen runoff by as much as 80 percent.[186] Vegetation buffers can also transform toxic compounds into nontoxic compounds through a number of biodegrading forces.[187] Wind barriers can protect the environment surrounding CAFOs by reducing soil erosion and improving irrigation efficiency.[188] They can also reduce the odor and particulate matter to which surrounding residences may otherwise be subjected.[189] Agronomic buffers, which involve a living fence of trees or shrubs, or a permanent strip of vegetation around a border, would mitigate CAFO impacts by providing wildlife with food, cover, and screens and by aesthetically improving the landscape.[190] Setbacks alleviate offensive odors, sights, and sounds that emanate from CAFOs by creating a mandatory spacing requirement between a CAFO and surrounding uses.[191] While

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[180] AM. SOC'Y OF PLANNING OFFICIALS, ZONING BUFFERS: SOLUTION OR PANACEA? 1 (1960), https://planning-org-uploaded-media.s3.amazonaws.com/legacy_resources/pas/at60/pdf/report133.pdf.

[181] *Id*.

[182] CALLIES ET AL., *supra* note 135, at 167–68.

[183] Terence J. Centner, *Concentrated Feeding Operations: An Examination of Current Regulations and Suggestions for Limiting Negative Externalities*, 25 COLUM. J. ENVT'L L. 219, 236 (2000).

[184] *Id*. at 236–37.

[185] *Id*. at 237.

[186] *Id*.

[187] *Id*. at 237–38. Some of these processes include microbial decomposition, oxidation, reduction hydrolysis, and solar radiation. *Id*.

[188] *Id*. at 241.

[189] *See generally id*.

[190] *See id*. at 243.

[191] *Id*. at 222.

buffers may not ameliorate all of the hazards posed by CAFOs, they are a good place for state legislatures to start. In jurisdictions that are unlikely to increase CAFO regulation and accountability, implementing buffer zones is a viable method for reducing the impact of CAFOs on surrounding communities.

D. PERFORMANCE ZONING

Performance zoning, often used to control spillover effects that industrial uses have on neighbors, is another helpful land use control that can mitigate the impact of CAFOs.[192] Performance zoning is based on standards that regulate the intensity of land use to prevent adverse impacts on neighbors.[193] It also provides more flexibility than traditional use-based zoning.[194] Performance standards address public and private categories of nuisance from industrial uses that are generated by CAFOs: odor, noxious gases, noise, industrial waste and runoff, lighting, aesthetics, and psychological effects. Mitigation of CAFO externalities would apply performance standards similar to those which apply to other industrial uses.

E. CAP AND TRADE SYSTEMS

Cap and trade systems are "market-based compliance mechanism[s] for achieving reductions in greenhouse gas ("GHG") emissions."[195] Cap and trade programs work by creating a group of entities in which tradable emissions allowances are sold to polluters by non-polluters, thus equalizing total GHG emissions.[196] These programs create a monetary incentive to reduce emissions.[197] Both the requirement to surrender allowances as well as the ability to trade allowances put a price tag on GHG emissions.[198] In turn, entities that emit GHGs will be more incentivized to reduce their emissions than they would be if it cost nothing to pollute.[199] Further, cap and trade ensures that allowances make their way to their highest-valued uses and safeguards the emissions that are the costliest to reduce.[200]

Including CAFOs in cap and trade programs is a valuable way to mitigate their environmental effect because they will either be incentivized to reduce emissions, or their high emissions will balance with lower emissions from lower-valued uses. In addition, it would likely be more acceptable to hesitant governmental regulators because they will merely

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[192] *See generally* DENNIS O'HARROW, AM. PLANNING ASS'N, PERFORMANCE STANDARDS IN INDUSTRIAL ZONING (1951), https://planning-org-uploaded-media.s3.amazonaws.com/legacy_resources/pas/at60/pdf/report32.pdf. Performance zoning addresses eleven types of spillover effects from industrial uses: noise, smoke, odor, dust and dirt, noxious gases, glare and heat, fire hazards, industrial wastes, transportation and traffic, aesthetics, and psychological effects. *Id*. at 3.

[193] NASHUA REG'L PLANNING COMM'N, PERFORMANCE ZONING, https://www.nashuarpc.org/files/7213/9042/4981/FS34_Performance_Zoning.pdf (last updated Jul. 2011).

[194] *Id*.

[195] CALLIES ET AL., *supra* note 135, at 948.

[196] *Id*.

[197] Robert N. Stavins, *A Meaningful U.S. Cap-and-Trade System to Address Climate Change*, 32 HARV. ENVTL. L. REV. 293, 296–97 (2008).

[198] *Id*.

[199] *Id*.

[200] *Id*.

include CAFOs in restrictions imposed on other industries, rather than subjecting them to their own, possibly more exacting regulations. Under the American Clean Energy and Security Act ("ACES"), deforestation is the only agricultural activity included in cap and trade.[201] ACES also focuses almost exclusively on the transportation, electricity, and industry sectors, which makes it a less-than-comprehensive program for reducing GHG emissions nationwide. [202] A new section within ACES could incorporate agriculture or agricultural uses could be incorporated into already-existing sections of the Act.[203] This would again require a recognition of agriculture's departure from the small family farm and its transformation into an industry that contributes significantly to the world's GHG emissions.

F. IMPACT FEES, SPECIAL ASSESSMENTS, AND EXCISE BUSINESS TAXES

Impact fees can be used to reduce the burdens that CAFOs place on communities. They are especially useful for funding off-site sewage plants and nutrient removal projects. CAFO waste management creates a number of health and environmental hazards not posed by human waste. Sewage treatment plants, or publicly owned treatment works ("POTWs"), have greatly reduced pollution generated by fecal waste in the United States.[204] Treating animal fecal waste instead of spraying it on a field or leaving it in a massive lagoon to decompose will reduce the likelihood that the waste will end up in groundwater supplies, contaminate drinking water, or release GHGs into the atmosphere. It can be quite costly to build and maintain a sewage treatment facility.[205] However, requiring impact fees to support adequate CAFO public facilities is well within the nexus and proportionality standards discussed *infra*. A county seeking to charge an impact fee may be required to conduct a study on the amount of sewage generated by the project and demonstrate that they can survive a reasonable relationship challenge.[206]

A special assessment is a charge levied on a property owner for a benefit the property receives from public improvement and can be used to regulate CAFOs.[207] The essential characteristic of a special assessment is that it must confer a benefit to the property assessed.[208] A special assessment for a local, public improvement must also confer a benefit on the assessed property that is "at least equal to the burden imposed."[209] Some special assessments are *ad*

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[201] Annise Maguire, *Shifting the Paradigm: Broadening our Understanding of Agriculture and its Impact on Climate Change*, 33 ENVIRONS ENVTL. L. & POL'Y J. 275, 312 (2010).

[202] *Id*.

[203] *Id*. at 313.

[204] *See generally* EPA, INTRODUCTION TO THE NATIONAL PRETREATMENT PROGRAM (1999), https://www3.epa.gov/npdes/pubs/final99.pdf.

[205] *See How Much Does an Industrial Water Treatment System Cost?*, SAMCO (Sept. 22, 2017), https://www.samcotech.com/how-much-does-an-industrial-water-treatment-system-cost/.

[206] *See* Ayers v. City Council of L.A., 207 P.2d 1, 6 (Cal. 1949). The reasonable relationship test requires that there is a reasonable relationship between the fee amount and development impact. *See* Carmen Carrión & Lawrence W. Libby, DEVELOPMENT IMPACT FEES: A PRIMER, 6–9, http://www.impactfees.com/publications%20pdf/dif.pdf (last visited Feb. 18, 2020).

[207] Julia Kagan, *Special Assessment Tax*, INVESTOPEDIA (May 31, 2018), https://www.investopedia.com/terms/s/specialassessmenttax.asp.

[208] CALLIES ET AL., *supra* note 135, at 608.

[209] *Id*.

valorem and are assessed according to property values.[210] Others are based on the physical characteristics of the property, such as frontage or square footage, and are not based on property value.[211] They are not constrained by state-level property tax limitations.[212] Special assessments are used to fund a variety of public improvement projects such as road and sewage improvement.[213] Localities may impose special assessments on CAFOs for sewage treatment projects, road enhancement, or storm water management because CAFOs benefit from all of these uses. Special assessments may not be imposed on CAFOs for lighting and sidewalk projects, among other types, because CAFO properties generally do not benefit from such projects.[214]

Excise taxes are a form of special assessment and can also be imposed on CAFO operators.[215] Unlike property taxes, excise taxes are based not on the assessed value of a property but on a particular act, event, or occurrence.[216] Excise taxes are levied to provide revenue for the general expenses of government, and the payment of the tax is a condition precedent to the act, event, or occurrence on which it is based.[217] An important effect of implementing an excise tax is that it raises the price of the act or event upon which the tax is based and thus decreases its frequency or amount.[218] The most common excise taxes in the United States are imposed on tobacco, alcohol, and gasoline. While CAFO operators are generally not required to pay for off-road gasoline and diesel, they are required to pay for gasoline and diesel used for on-road vehicles.[219] This is one way that the government can regulate CAFOs through excise taxes.[220]

G. CO-LOCATION OF CITES AND EXCLUSIVE AGRICULTURAL DISTRICTS

The impact fee works well in conjunction with co-locating all CAFOs in one area so they all use the same public sewer system. Sharing the cost of the sewage system would likely decrease the cost for each individual CAFO operator and make it more likely that the sewage impact fee would pass the rough proportionality test. Creating an exclusive agricultural district may assist in co-locating CAFO sites by creating a district that is to be used only for productive farming.[221] The CAFOs that choose to locate in this area could

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[210] Rebecca Hendrick, *Use of Special Assessments by Municipal Governments in the Chicago Metropolitan Area: The Taming of Leviathan*, 1 ILL. MUN. POL'Y J. 15, 15 (2016), https://las.depaul.edu/centers-and-institutes/chaddick-institute-for-metropolitan-development/research-and-publications/Documents/Use%20of%20Special%20Assessments%20by%20Municipal%20Governments%20in%20the%20Chicago%20Metropolitan%20Region%20The%20Taming%20of%20Leviathan%20-%20R.%20Hendrick.pdf.

[211] *Id*.

[212] *Id*.

[213] Kagan, *supra* note 207.

[214] *Id*.

[215] CALLIES ET AL., *supra* note 135, at 608.

[216] *Id*.

[217] *Id*.

[218] *Excise Tax,* INVESTING ANSWERS, https://investinganswers.com/financial-dictionary/tax-center/excise-tax-1495 (last updated Oct. 8, 2019).

[219] Gregory M. Perry & Clair J. Nixon, *How Much do Farmers Pay in Taxes?*, 20 J. AGRIBUSINESS 41, 43 (2002).

[220] *Id*.

[221] CALLIES ET AL., *supra* note 135, at 1143.

collectively pay the assessment fee for one sewage treatment plant that they all would share. Another benefit of locating multiple CAFOs in one area that is designated only for CAFOs or agricultural use is that fewer people would be living near the CAFOs, as the CAFOs would be their only neighbors in an exclusively agricultural district. It was once said that a nuisance is "a right thing in the wrong place at the wrong time—like a pig in the parlor instead of the barnyard."[222] Co-locating CAFOs in one, exclusive agricultural district could eliminate their nuisance by creating a literal barnyard in which CAFO runoff is unlikely to find its way into drinking supplies of nearby residences, and there would be no residences nearby disturbed by the odor.

H. TRANSFER OF DEVELOPMENT RIGHTS ("TDRS")

Transferring development rights may be more complicated than creating an exclusive agricultural district, but the practice is particularly useful for co-locating CAFOs on the same site. TDRs work to financially compensate landowners with development rights in land for choosing not to develop the land.[223] In other words, the landowner is given the option to sever its land development rights and sell them to another landowner or developer for use at another location.[224] When allowed by state law, localities can transfer the right to develop property from one part of the community to another.[225] There are three essential elements of a TDR: the sending district, the receiving district, and the transfer credits.[226] The sending district is the area from which the development rights are transferred and the receiving district is the area to which development rights are transferred.[227] The TDR credits are the legal representation of the development rights that will be severed from one district and sent to another.[228] TDRs have been used to minimize potential conflicts between farmers and non-farming neighbors.[229] TDRs are typically used to protect the environment and preserve ecologically sensitive land, but they can also be used to relocate CAFOs from their existing location to locations near other CAFOs and away from residential or commercial areas. The co-located CAFOS could then fund, through impact fees, sewage systems for their joint use.

VI. CONCLUSION

CAFOs pose formidable threats to both the environment and public health. With a rapidly changing climate and growing population, it is imperative to properly regulate CAFOs and to encourage sustainable forms of food production and consumption. Unfortunately, the government and laws do just the opposite. From exempting CAFOs from major

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[222] Euclid v. Amber Realty Co., 272 U.S. 365, 387–88 (1926).

[223] John Theilacker & Andrew Loza, *Transfer of Development Rights*, PENN. LAND TR. ASS'N, Jan. 22, 2019, at 1, 1, https://conservationtools.org/guides/12-transfer-of-development-rights#heading.

[224] *Id*.

[225] John R. Nolon, *Managing Climate Change Through Biological Sequestration: Open Space Law Redux*, 31 STAN. ENVTL. L.J 195, 237 (2012).

[226] *Id*.

[227] *Id*. at 238.

[228] *Id*.

[229] *Id*.

environmental protection statutes to providing billions of dollars in subsidies, the law and government promote, rather than discourage, CAFO production. Due to the agriculture industry's significant political influence and control, it is unlikely that CAFOs will lose their subsidies or be made to comply with environmental statutes.

While the future of CAFO use, climate change, and human health may look dire, there are a number of land use controls that localities can implement to mitigate the harmful effects of CAFOs. Each land use technique has different benefits and drawbacks, and each can affect a variety of improvements. Floating zones, for example, may be more useful than conditional use permits because they allow for greater flexibility. TDRs may be useful in a locality that wishes to co-locate CAFOs on one site to share one sewage treatment plant, and buffer zones can help to isolate surrounding communities from nuisances created by CAFOs. Cap and trade systems create a monetary incentive to reduce pollution, and impact fees, special assessments, and excise taxes allow localities to require CAFOs to fund a variety of public services or pay for impacts of their operation. Localities may choose to implement many or none of these land use practices, but one reality is glaringly true: if federal and local governments choose not to regulate CAFOs or implement practices to mitigate their harmful effects, public and environmental health will continue to suffer for the benefit of the agriculture industry.