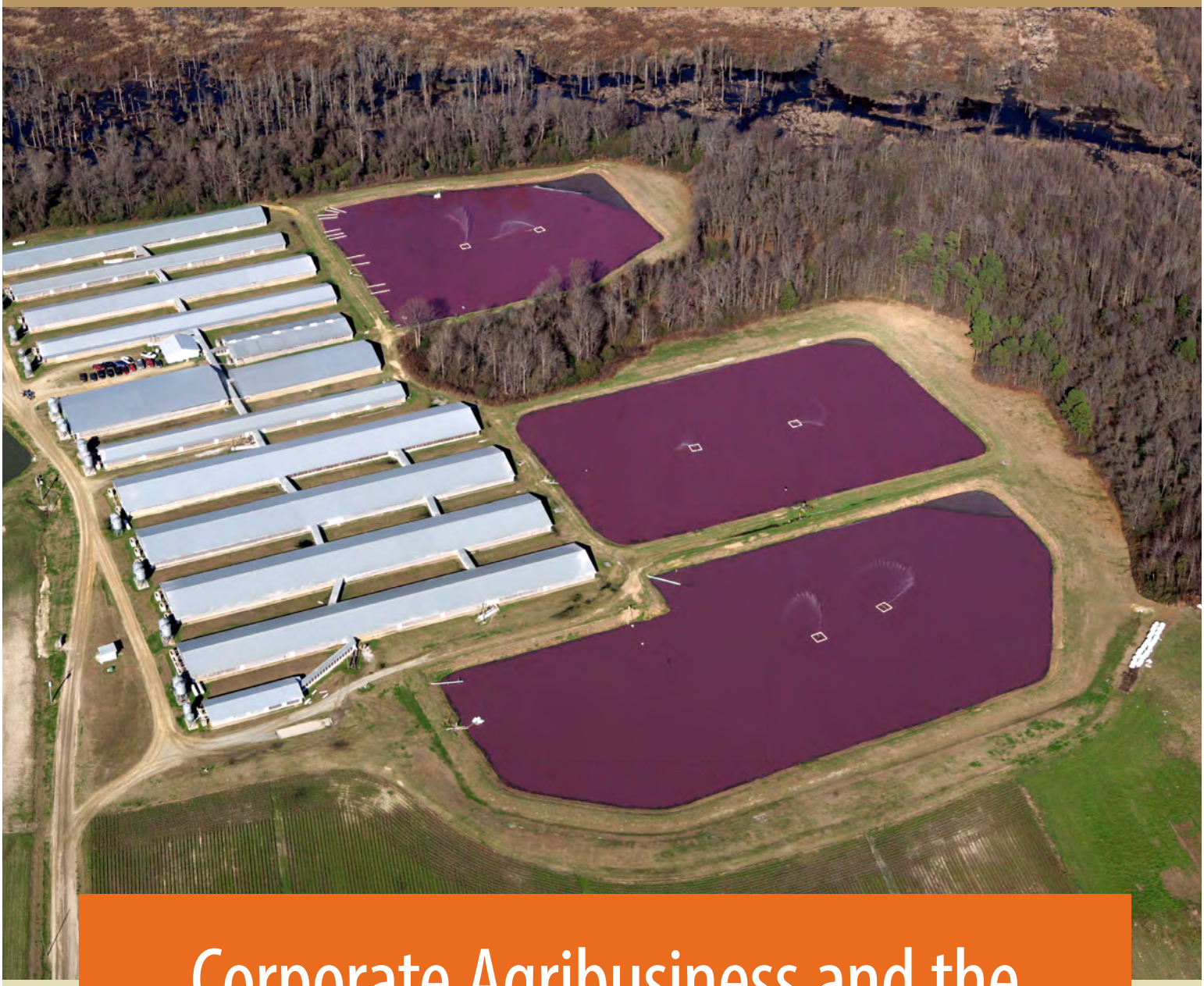

Corporate Agribusiness and the Fouling of America's Waterways

The Role of Large Agribusiness Companies in Polluting our Rivers, Lakes and Coastal Waters

ENVIRONMENT NORTH CAROLINA
RESEARCH & POLICY CENTER

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Environment America Research & Policy Center

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Executive Summary

Pollution from agribusiness is responsible for some of America's most intractable water quality problems – including the "dead zones" in the Chesapeake Bay, the Gulf of Mexico and Lake Erie, and the pollution of countless streams and lakes with nutrients, bacteria, sediment and pesticides.

Today's agribusiness practices – from the concentration of thousands of animals and their waste in small feedlots to the massive planting of chemical-intensive crops such as corn – make water pollution from agribusiness both much more likely and much more dangerous.

The shift to such industrial practices is no accident. It is largely the result of decisions made in the boardrooms of some of the world's largest corporations. Major agribusiness firms are responsible for the degradation of many American waterways, and they must change practices throughout their supply chains to clean up the mess.

Big agribusiness is a major polluter of America's waterways.

According to the U.S. Environmental Protection Agency (EPA), agriculture is the probable cause for making more than 145,000 miles of rivers and streams, 1 million acres of lakes and reservoirs, and 3,000 square miles of bays and estuaries too polluted for swimming, fishing, drinking, and/or maintaining healthy wildlife.

This agribusiness pollution is a leading cause of the dead zones that plague waters from the Chesapeake Bay to the Gulf of Mexico. In fact, this pollution is so severe that it is beginning to threaten our drinking water as well. In Toledo, Ohio, runoff from agribusiness operations contributed to a toxic algae bloom in Lake Erie which contaminated the drinking water for 500,000 people around Toledo with cyanotoxins in 2014. In Iowa, nitrate pollution from agribusiness operations have so badly polluted the Raccoon River that Des Moines is now suing three counties for failing to stop contamination of its main drinking water source. And factory farms have contaminated drinking water wells from Washington to Wisconsin.

Top companies are producing staggering volumes of pollution. In this report, we assess the water pollution footprint of five major agribusinesses: Tyson, Smithfield, Cargill, JBS, and Perdue. With each of these corporations, pollution in their supply chains includes manure from livestock, runoff from vast acres of grain, and direct dumping from processing facilities into our rivers and streams.

First, as the livestock industry concentrates its operations, more and more factory farms generate massive volumes of manure with no place to put it. All too often, excess manure winds up in our rivers and streams. We calculate the "manure footprint" of these five agribusiness companies as follows:

Table ES-1. Manure Footprint

Company	Tons of Manure
Tyson	55,289,069
JBS	45,797,269
Cargill	39,200,000
Smithfield	18,935,217
Perdue	3,715,140
TOTAL	**162,936,695**

Second, **runoff from vast acres of commodity crops is a major pollution problem for our waterways.** A huge volume of corn and soybean production is driven by the need to feed livestock for these five companies and other agribusiness giants. Massive production of chemical-intensive corn – driven by public policies that subsidize corn production – is wreaking havoc on waterways, including the Gulf of Mexico.

Finally, these same five companies also directly dump huge volumes of pollution into our rivers from their slaughterhouses and processing plants. Four of them were among the top ten parent companies – from *all* industries - with the highest volumes of direct toxic discharges to our waterways in 2014, according to U.S. EPA's Toxics Release Inventory (TRI). The fifth profiled company, Perdue Farms, ranked 11th for direct dumping in the same year. These companies had the same basic pattern of pollution from over 2010-2014 as well – all ranking among the top 15 parent companies in America for direct dumping of toxic substances into our waterways.

Needless to say, agribusiness pollution is hardly limited to these five companies. In 2014, more than 200 agribusiness facilities in more than 30 states reported dumping toxic pollution into our rivers.

Table ES-2. Direct Dumping of Toxic Pollutants 2010-2014 (from U.S. EPA's Toxics Release Inventory)

Company	Pounds Released to Waterways
Tyson	104,468,732
Cargill	50,405,770
JBS*	37,625,829
Perdue	31,002,822
Smithfield**	27,301,782
TOTAL	**250,804,935**

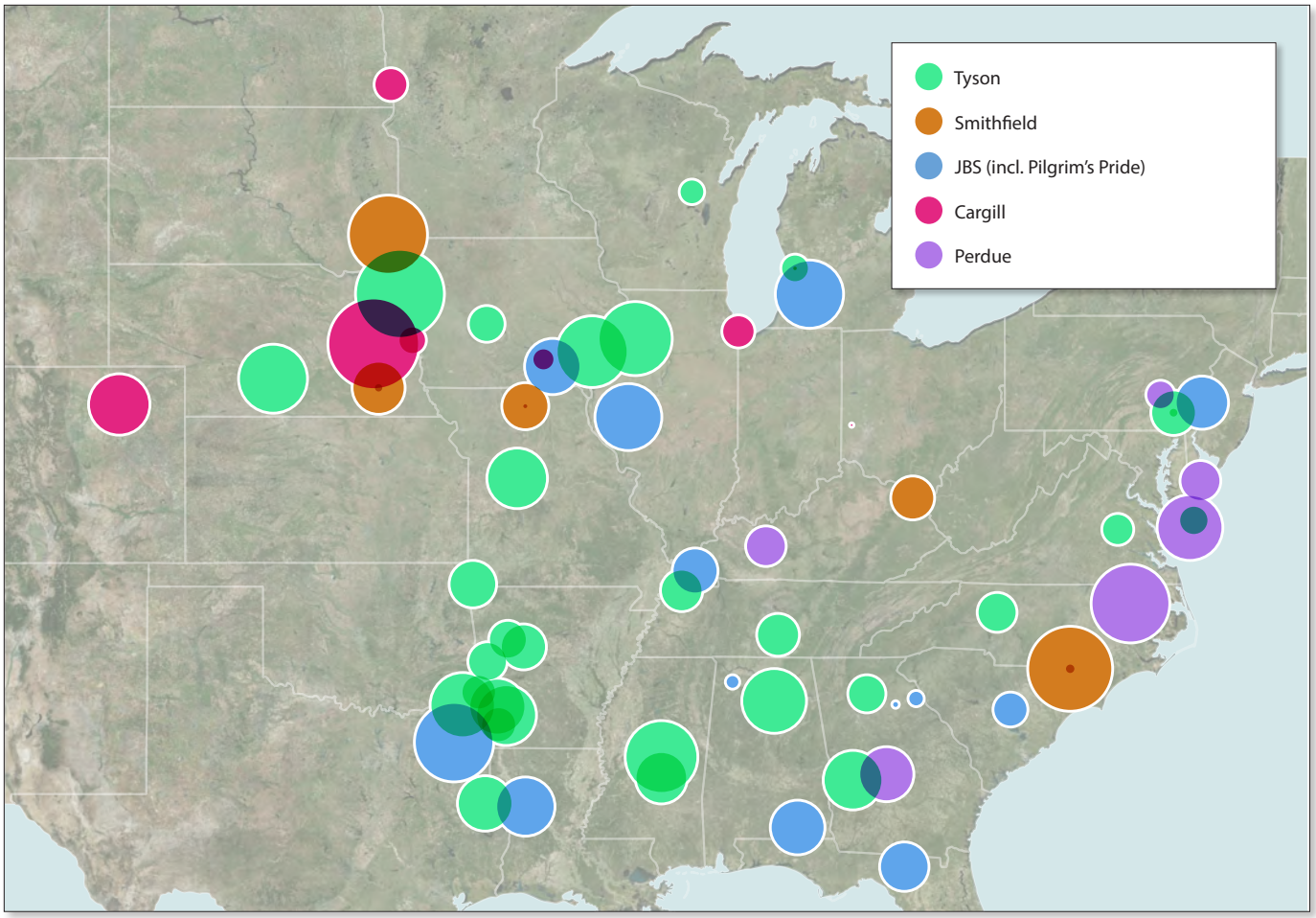
*includes Pilgrim's Pride
**includes United Global Foods US Holdings

Table ES-3. Direct Dumping of Toxic Pollutants by Major Companies in 2014

Parent Company	Pounds Released to Water	Rank
AK STEEL HOLDING CORP	22,623,451	1
TYSON FOODS INC	**20,859,034**	**2**
US DEPARTMENT OF DEFENSE	10,825,508	3
CARGILL INC	**8,131,465**	**4**
BASF CORP	7,736,805	5
SMITHFIELD (incl. United Global Foods U.S. Holdings)	**7,439,411**	**6**
US STEEL CORP	7,213,877	7
KOCH INDUSTRIES INC	7,115,649	8
JBS USA (including Pilgrim's Pride)	**6,901,540**	**9**
MCCAIN FOODS USA INC	5,900,202	10
PERDUE FARMS INC	**4,898,159**	**11**
DSM HOLDING CO USA INC	4,879,298	12
PHILLIPS 66 CO	4,809,714	13
E I DU PONT DE NEMOURS & CO	4,353,681	14
INTERNATIONAL PAPER CO	4,150,198	15
PBF ENERGY	3,393,738	16
EXXON MOBIL CORP	3,050,190	17
VALERO ENERGY CORP	3,008,002	18
CF INDUSTRIES HOLDINGS INC	2,658,126	19
EASTMAN CHEMICAL CO	2,497,831	20
OUTOKUMPU STAINLESS USA LLC	2,401,752	21
KOCH FOODS	2,025,777	22
CHEVRON CORP	1,941,444	24
CONTINENTAL GRAIN CO	1,877,768	25

Smithfield TRI discharge figures are from all Smithfield discharging facilities – including those reported under the parent company United Global Foods US Holdings. Similarly, Pilgrim's Pride is owned by JBS and so TRI discharge volumes for these two separately reporting companies are combined herein.

Figure ES-1: Facilities of Five Agribusiness Companies that Dumped Toxic Pollution into Waterways in 2014 (from EPA's Toxics Release Inventory)



The solutions to curb agribusiness pollution are feasible and well-known to the industry. It is well-documented that halting excess application of manure and other fertilizer is the most effective means to preventing agribusiness pollution. Perennial cover crops, buffer zones, and other techniques can reduce runoff as well. Moreover, raising livestock in pasture at smaller scale minimizes manure as a pollution threat. And for existing factory farms, when compelled by legal action, agribusiness companies have even found ways to haul massive volumes of waste out of endangered watersheds.

Supermarkets, food service companies, and restaurant chains also bear some responsibility – and can exert enormous influence on - how agribusiness operates. Under pressure from consumers and investors, major restaurant chains – and some of their agribusiness suppliers - have recently committed to end routine use of antibiotics on livestock. Yet as two top retailers – Costco and Wal-Mart – enter into agribusiness production, it remains to be seen whether they will follow the industry's polluting practices or chart a more sustainable path.

Recommendations

Corporate agribusiness companies must change practices to keep their waste out of America's waterways. To restore our rivers, lakes and streams, the industry must shift away from industrial-scale livestock facilities and overproduction of commodity crops which depend on heavy doses of fertilizers and

pesticides. Here are concrete steps that huge agribusiness companies can take to begin curbing pollution of our waters and transitioning toward more sustainable production:

- 3rd party certification to ensure that none of the manure from animals raised for the company winds up in our waterways or groundwater.
- Limit operations in watersheds and communities that are already overburdened with manure and other agricultural pollution.
- For livestock production, commit that all new contracts will be with pasture-based producers using sustainable methods, not factory farms.
- Big agribusiness companies should take full responsibility to remove excess manure from nutrient-saturated watersheds and ensure its sustainable use elsewhere.
- For grain production in the supply chain, insist on best practices to prevent pollution – especially limiting the volume, timing, and methods of applying manure and other fertilizer to cropland, as well as perennial cover crops and buffer zones.
- Create and use metrics to document substantial reductions in water pollution and make the results public.
- Supermarkets, food service companies, and restaurants should use their leverage in the marketplace to insist on zero-water pollution from their suppliers.

State and federal governments should take immediate steps to protect America's waterways from corporate agribusiness pollution, including the following:

- Ban the worst practices, including leaking waste piles or lagoons and the over-application of manure or other fertilizer, that lead to pollution of waterways.
- Establish moratoria on new or expanded industrial-scale livestock operations, especially in watersheds already overburdened by agricultural pollution.
- Hold corporate agribusiness responsible for manure pollution by clarifying that companies are legally responsible for waste produced by livestock they own or have contracted for.
- Ratchet down pollution limits in clean water permits for agribusiness facilities such as slaughterhouses and processing plants – especially for nitrate compounds.
- Require enforceable clean water permits for *all* industrial-scale livestock operations.
- Give environmental laws real teeth by beefing up inspections and ensuring that repeated or serious violations of water pollution laws are met with real penalties, not slaps on the wrist. Where states are failing to protect their own waters and citizens' health, EPA must step in.
- The courts should uphold the Clean Water Rule to ensure federal protection for all of our nation's streams, thousands of wetlands, and the other waters on which they depend.
- Provide the public with access to detailed information about factory farms and other agribusiness facilities, including information about their total flow of pollution to the environment.
- Preserve (or restore) the right of local communities to reject industrial-scale livestock operations to protect clean water, health, and/or quality of life.
- Remove subsidies for industrial row crop and livestock production, and dramatically expand incentives for using sustainable farming methods to ensure that American agriculture delivers safe, healthy food without destroying our waterways.

Introduction

"Cultivators of the earth are the most valuable citizens. They are the most vigorous, the most independent, the most virtuous, and they are tied to their country and wedded to its liberty and interests by the most lasting bonds."[1]

"I hope we shall ... crush in its birth the aristocracy of our moneyed corporations."[2]

—Thomas Jefferson

The idea that American agriculture would one day be dominated by "moneyed corporations" would have been unthinkable to Thomas Jefferson – the man who, more than any other American, defined the nation's farmers as the paragons of republican virtue.

Over the last several decades, however, Jefferson's independent yet community-minded "cultivators of the earth" have been eclipsed by a few, large, often multi-national corporations in deciding how America's food will be produced. In towns where family farmers once gathered to make decisions that shaped the future of their communities, today it is often the case that the most important decisions are made in corporate boardrooms hundreds of miles away – or even on another continent.

The shift to corporate agribusiness has done more than change the nature of American farming; it has also triggered an environmental crisis. Thomas Jefferson's Monticello home sits near the Rivanna River, which flows into the James River and ultimately the Chesapeake Bay – an important and once ecologically vital waterway that has been degraded over the course of decades by agricultural pollution, in particular, waste from corporate chicken farming. The Chesapeake is not alone. From the Gulf of Mexico to the Great Lakes – and in countless rivers and streams in between – pollution from agricultural activities is fueling algae blooms, threatening wildlife and fouling drinking water supplies.

That pollution is the result of an agricultural system that increasingly produces the nation's meat on farms

Waste from North Carolina's hog farms is typically stored in liquid manure lagoons. Credit: Bob Nichols, USDA Natural Resources Conservation Service

that pack thousands of animals onto small plots of land, producing waste on the scale of entire cities and making pollution of nearby waterways a near-certainty. It is a system that increasingly feeds those animals with corn planted in vast plots across the nation – corn that requires pesticides and fertilizers, some of which wash into our waterways, to thrive.

It is also a system that is largely molded to the design, and designed to the benefit, of a few massive corporations, one in which family farmers still participate, but in which they are increasingly vulnerable and lack the independence that Jefferson once praised.

Four decades ago, America's waterways were confronted by different set of pollution problems - industrial dumping into our nation's rivers, streams and lakes. Those problems were so intense that the Cuyahoga River caught fire and nearby Lake Erie was considered "dead."

At the time, few Americans waxed poetic about the wholesomeness of the sewage treatment plant, or rhapsodized about the republican virtues of the steel mill. Instead, we acted on the principle that no one – especially not powerful, well-resourced corporations – has the right to pollute our waterways with impunity and endanger the public's health and our natural resources. We took action, and while the job of stopping industrial pollution is far from done, we've made tremendous progress.

Today, however, corporate agribusiness giants hide behind the wholesome image of the American family farmer to evade responsibility for their pollution. Tyson, Smithfield, Cargill, JBS, and Perdue: these are among the corporations whose actions have contributed to the devastation of American waterways. They are also corporations with vast resources to implement better, more sustainable ways of producing America's food.

The time has come to hold corporate agribusiness accountable for its pollution of our environment – just as Americans a generation ago did with industrial polluters. It is up to Americans to insist on better practices that repair the damage already done, and eliminate the massive burden that agricultural pollution inflicts on our waterways.

Big Agribusiness: A Big Polluter of America's Waterways

Farming is not an inherently polluting activity. On the contrary, many farmers take stewardship of the land and the environment as a sacred trust.

However, as agriculture in America has increasingly adopted the structures and methods of industrial production, it has become a source of industrial-scale pollution. In this section, we review the data on pollution from agribusiness, document the trend toward greater concentration in industrial agribusiness, and show how the shift to industrial agribusiness has magnified the environmental impact of food production.

Agribusiness Is Polluting America's Waterways

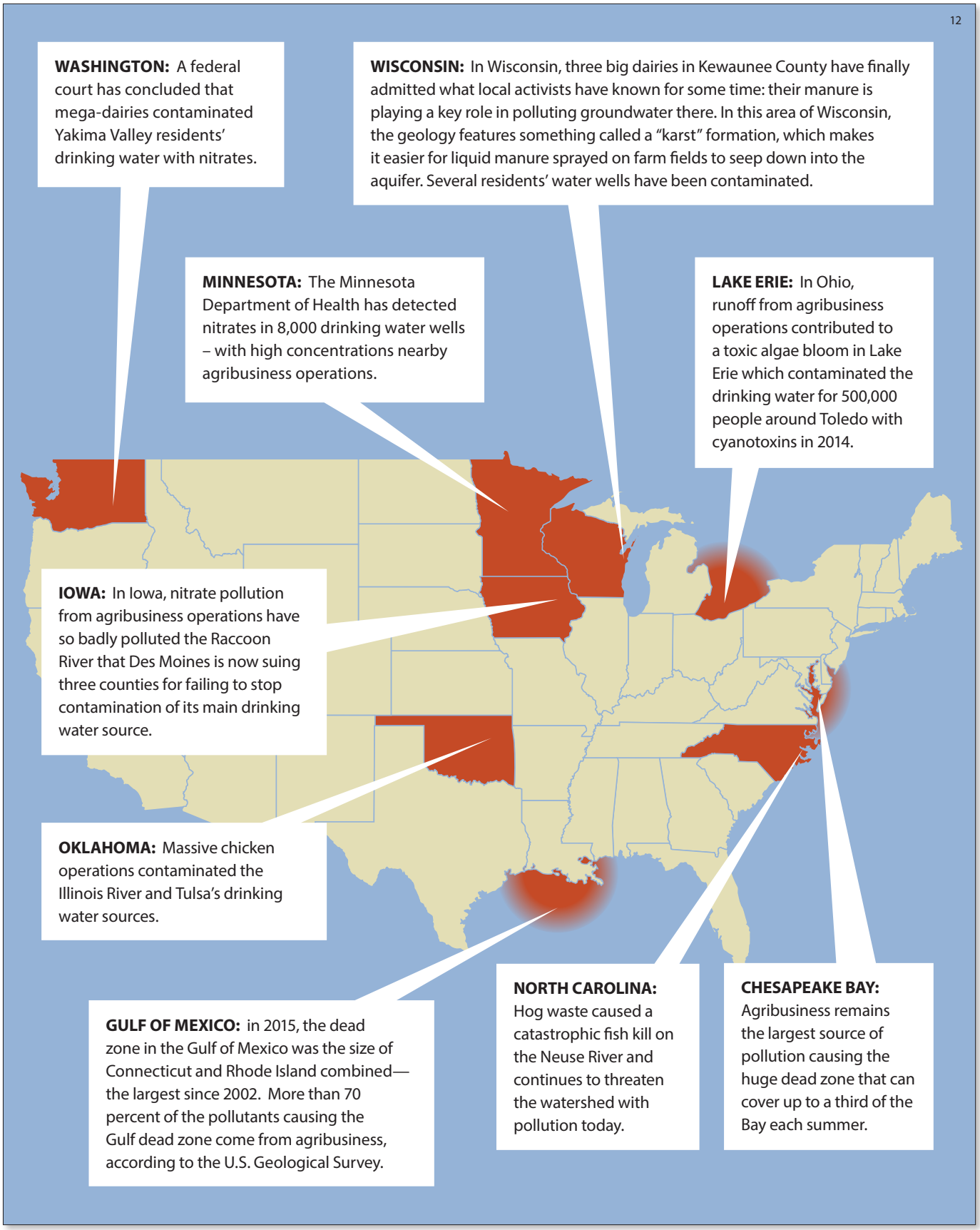
Corporate agribusiness[3] imposes a heavy – and growing – toll on America's waterways. From the dead zones in the Gulf of Mexico, the Chesapeake Bay and Lake Erie to the pollution of countless local rivers, streams and lakes with nutrients, fertilizers and pathogens, the impact of agribusiness on the nation's waterways is severe.

According to the U.S. Environmental Protection Agency (EPA), agriculture is the leading cause of pollution in more than 145,000 miles of rivers and streams; 1 million acres of lakes, reservoirs and ponds; and 3,000 square miles of bays and estuaries in the United States.[4] These waters are so polluted that they are unsafe for fishing, swimming, drinking, and/or maintaining healthy wildlife.

In all likelihood, these EPA figures greatly understate the impact of agribusiness pollution on America's waterways, since officials have only assessed water quality in the 31.3 percent of America's river and stream miles and in less than half of all other types of waterways.[5]

The problems extend to America's coastal waters, where the number of documented areas of low dissolved oxygen – often called "dead zones" because oxygen levels are so low that they can kill fish and other marine life – has increased from 12 in 1960 to 300 today.[6] This includes the dead zone in the Gulf of Mexico, which last year was the size of Connecticut and Rhode Island combined—the largest since 2002.[7] The increase in coastal dead zones has coincided with the expansion of industrial agribusiness in the United States.[8]

Moreover, agribusiness pollution is also emerging as a threat to drinking water. In Ohio, runoff from agribusiness operations contributed to a toxic algae bloom in Lake Erie which contaminated the drinking water for 500,000 people around Toledo with cyanotoxins in 2014.[9] In Iowa, nitrate pollution from agribusiness operations have so badly polluted the Raccoon River that Des Moines is now suing three counties for failing to stop contamination of its main drinking water source.[10] Manure from mega-dairies has contaminated drinking water in Washington and Wisconsin as well.[11]


WASHINGTON: A federal court has concluded that mega-dairies contaminated Yakima Valley residents' drinking water with nitrates.
WISCONSIN: In Wisconsin, three big dairies in Kewaunee County have finally admitted what local activists have known for some time: their manure is playing a key role in polluting groundwater there. In this area of Wisconsin, the geology features something called a "karst" formation, which makes it easier for liquid manure sprayed on farm fields to seep down into the aquifer. Several residents' water wells have been contaminated.
MINNESOTA: The Minnesota Department of Health has detected nitrates in 8,000 drinking water wells – with high concentrations nearby agribusiness operations.
LAKE ERIE: In Ohio, runoff from agribusiness operations contributed to a toxic algae bloom in Lake Erie which contaminated the drinking water for 500,000 people around Toledo with cyanotoxins in 2014.
IOWA: In Iowa, nitrate pollution from agribusiness operations have so badly polluted the Raccoon River that Des Moines is now suing three counties for failing to stop contamination of its main drinking water source.
OKLAHOMA: Massive chicken operations contaminated the Illinois River and Tulsa's drinking water sources.
GULF OF MEXICO: in 2015, the dead zone in the Gulf of Mexico was the size of Connecticut and Rhode Island combined—the largest since 2002. More than 70 percent of the pollutants causing the Gulf dead zone come from agribusiness, according to the U.S. Geological Survey.
NORTH CAROLINA: Hog waste caused a catastrophic fish kill on the Neuse River and continues to threaten the watershed with pollution today.
CHESAPEAKE BAY: Agribusiness remains the largest source of pollution causing the huge dead zone that can cover up to a third of the Bay each summer.

Industrial agribusiness pollutes our waterways through three types of operations. First, runoff carries pollution – including manure, synthetic fertilizer, and pesticides - from vast acres of commodity crops into nearby rivers, streams, or wetlands. Particularly in the Midwest, subsurface drainage systems and ditches intensify this transfer of pollutant-laden water from cropland to waterways.

Second, industrial-scale livestock operations (often referred to as "factory farms" but the largest of them are technically known as "concentrated animal feeding operations" or CAFOs) can directly discharge manure from leaking, ruptured or overflowing manure lagoons. And third, many industrial facilities that process farm outputs into consumer products – from slaughterhouses to ethanol plants – also discharge pollutants into waterways.

All three of these polluting operations are integrally connected and reinforce each other. Most manure from factory farms is applied to cropland, which contributes significantly to the runoff problem. A huge portion of U.S. grain production is fueled by the need to feed massive concentrations of livestock on factory farms. And finally, huge processing plants both facilitate and drive the nearby industrial-scale production of required inputs – i.e., factory farms and/or vast acres of commodity crops.

The types of pollutants flowing from these agribusiness operations include the following:

Nutrients: Nitrogen and phosphorous – whether from manure or synthetic fertilizer - are applied to fields to help crops grow. But when these "nutrients" are applied in volumes or times beyond what soil and crops can absorb, rain washes the excess off the land into surrounding waterways, where it fuels algal blooms. Sometimes these algal blooms are toxic, making swimmers sick and/or contaminating drinking water. Toledo's drinking water was contaminated by a toxic algal bloom in Lake Erie in the summer of 2014. More commonly, decomposing algae consumes oxygen in the water, and creates huge dead zones – such as those in the Chesapeake Bay and the Gulf of Mexico – where fish and wildlife cannot survive.

Nitrates: Nitrates are another form of nutrients, but they are toxic in their own right. Linked to "blue baby syndrome" and some types of cancer, nitrates can render water unsafe to drink.[13] Data from EPA's Toxics Release Inventory shows that nitrates are the most common toxic pollutant dumped from agribusiness processing plants directly into waterways.

Pathogens: Animal waste also contains harmful bacteria and viruses. When livestock are kept in concentrated environments like CAFOs, large volumes of pathogen-bearing waste are produced. These wastes can find their way into waterways through accidental spills, ruptures or flooding of manure storage lagoons, or runoff from the spraying of farm fields with liquid manure. Pathogens can render water unsafe for human consumption or use, contaminate shellfishing areas, and contribute to fish kills and other ecosystem damage.[14]

Sediment: Sediment pollution results from practices that allow rainfall to run off land too quickly, carrying valuable topsoil with it. Washed into rivers and streams, soil can cloud the water and diminish the light received by aquatic plants. It also settles in the stream, disrupting ecosystems by filling in spawning grounds or otherwise altering the streambed, and clogs the gills of fish and other aquatic animals. Sediment also provides one vehicle for many other agricultural pollutants, embedded in particles of soil, to wash into waterways.[15]

Pesticides: Toxic chemicals applied to kill weeds and insects can wash from cropland into waterways and contaminate drinking water. Moreover, pesticides can kill aquatic plants and make fish and shellfish unsafe to eat.

Industrialized Practices Drive the Pollution Problem

How did we get to the point where the production of our food became such a threat to our water?

The root of the problem is the industrialization of agriculture in the United States, a development that has been advanced over the course of the last several decades by major agribusiness corporations.

Practiced poorly, even traditional forms of farming can create problems for waterways. But the methods of food production used in industrial agribusiness – vast acres of monoculture crops and concentrated livestock operations – make environmental impacts far more likely.

Control of America's system of food production has become increasingly concentrated in the hands of a few large corporations, which in turn have helped reshape the way America produces food, often to the detriment of our environment.

A Few Corporations Control America's Food System

As documented in our 2010 report, our nation's food production is concentrated in the hands of a few large corporations.[16] Agribusiness firms have emerged as among the nation's richest and most powerful corporations. Archer Daniels Midland ranks 41st on the Fortune 500 list of largest U.S. companies, with $68 billion in annual revenue, followed by Tyson Foods (66th), ConAgra (176th) and Dean Foods (336th).[17] Other agribusiness corporations would rank highly on the list if they were U.S.-based, publicly traded companies. Cargill, for example, is privately held, but would rank in Fortune's Top 20.[18]

Liquid manure from a hog feeding operation in northeast Iowa being pumped onto cropland. Credit: Tim McCabe, courtesy of National Resources Conservation Service, United States Department of Agriculture.

Moreover, the consolidation of agribusiness sectors has been dramatic as well. By 2009, just four firms in each sector accounted for 72 percent of the beef, 63 percent of the pork, and 57 percent of the broiler chickens in the nation.[19] Major consolidations have occurred in other agribusiness segments – from dairy to eggs to grain.[20]

Moreover, some companies – such as Tyson, Cargill and JBS – have established dominant positions in multiple sectors of the agricultural economy. Tyson, for example, is one of the top five firms in chicken, pork and beef production, and also mills its own grain to feed its poultry. Cargill is known primarily for grain processing, but is also a major producer of beef, oilseeds, and biofuels.

How Corporate Agribusiness Is Reshaping America's Food System

There are several tools major corporations have used to reshape America's agricultural system into one that is reliant on environmentally damaging factory farming and chemical-intensive production of crops such as corn.

Vertical Integration

Over time, some corporate agribusiness firms have moved from acting as the middlemen between farmers and consumers to controlling larger shares of the process of producing, processing and distributing America's food. In a few sectors – especially the chicken and pork industries –"vertically integrated" corporate agribusiness firms now control virtually the entire food production process, from the genetic manipulation of seeds and livestock, through crop and livestock production, processing, and marketing of final product to the consumer. One vertically integrated pork producer, Smithfield Foods, describes vertical integration as controlling the process "from squeal to meal."[21]

In the vertically integrated model, the only portion of the process that occurs "out of house" is the raising of animals from youth to slaughter. This happens to be the part of the process with the greatest potential environmental impacts. Nominally independent growers raise animals under contract with agribusiness corporations – contracts that typically contain strict conditions detailing how the grower must raise and feed the animals. The "arm's length" arrangement between the grower and the corporation, however, means that while the corporation owns the animals, it can disclaim responsibility for proper disposal of the waste those animals produce, shifting that burden of environmental compliance to the growers.

The result is an arrangement that is the best of both worlds for the integrated agribusiness firm. It can ensure the production of standardized, low-cost meat without bearing the risk of owning and operating its own facilities. It can also disclaim responsibility for the environmental damage caused by the rearing of its livestock. It is little surprise that the model has come to dominate the chicken and pork industries – fueling the proliferation of factory farms and their associated environmental impacts – and is making inroads in other sectors of agribusiness.

Market Power

Even in areas of agribusiness in which independent farmers still play an important role, corporate agribusiness giants can attain enough market power to effectively dictate the prices farmers receive for their goods. "Monopsony" and "oligopsony" are the economic terms for a situation in which only one or a few potential buyers exist for a given product, giving those buyers the ability to dictate the price a seller may receive.

The consolidation of agribusiness has reduced the number of potential buyers for certain products. For example, as recently as 2010, Dean Foods controlled 57 percent of the milk market in Wisconsin and northern Illinois.[22]

What does market power have to do with the environment? By driving down the prices farmers receive, and leaving farmers with few options for selling their products, major agribusiness corporations create economic conditions that make it nearly impossible for small, independent operators to survive. Large, concentrated livestock operations have somewhat lower costs of operation – at least when the environmental and public health impacts of their pollution are not included in the equation.[23] But more importantly, they are likelier to have the financial resources and access to capital that would enable them to survive a brief but sharp decline in commodity prices, such as the steep drop in milk prices that occurred during 2009. As a result, small, family operations are being replaced by massive factory farms with outsized environmental impacts.

Concentrated Farms Lead to Concentrated Environmental Impacts

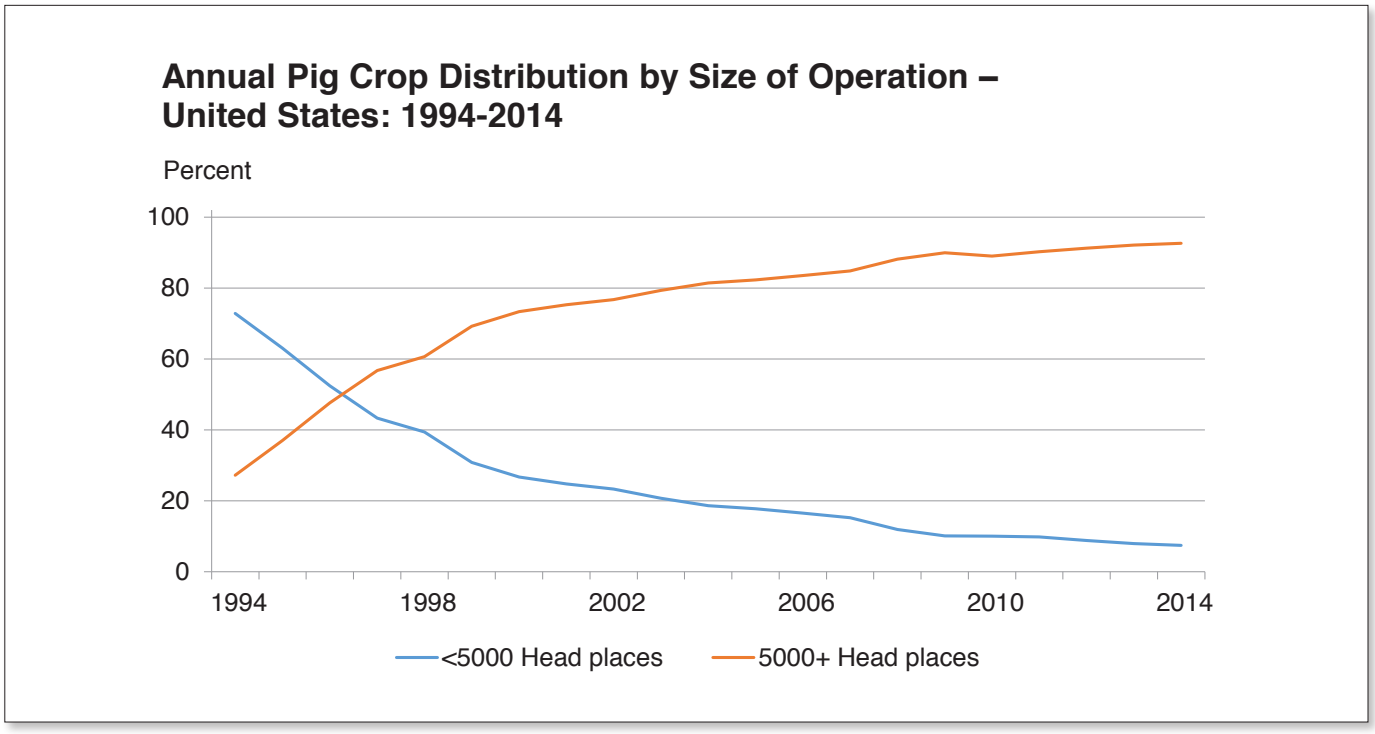
In rural areas of America, homeowners typically dispose of household sewage in septic tanks. This system works only because population density is low. But the same system that works well, for example, in rural upstate New York would be an environmental and public health disaster if it were applied in New York City.

The same thing is true of waste from animals. In the past, most animal farming was widely dispersed across the landscape, mitigating the impact of manure on waterways and providing a helpful source of fertilizer to farmers. The transition to corporate agribusiness, however, has helped bring about a wholesale shift toward concentrated animal feeding operations (CAFOs), which produce vast amounts of nutrient and bacteria-laden manure – sometimes in volumes that approach the sewage production of small cities – on small plots of land.

These factory farms confine hundreds to thousands of animals in small areas, where they are largely fed on commodity grain usually grown with the aid of manufactured fertilizers (and subsidized by taxpayers). The manure from these animals is often stored in open-air lagoons and later spread on land, nominally as fertilizer. However, over-spreading of manure is common – and in some places, given the vast volume of manure produced in particular watersheds, inevitable – resulting in manure washing into waterways, bringing nutrients and pathogens with it.

At the other end of the cycle, the conversion of vast areas of land to corn or soy production – both for the production of animal feed and other products – requires the input of large amounts of chemical fertilizers and pesticides, which also can find their way into waterways.

The transition from small farms to CAFOs has occurred with lightning speed. Between 1987 and 2007, for example, the United States lost more than half of its dairy farms and nearly 70 percent of its pig farms, with an increasing share of production taking place on the very largest farms – often CAFOs with hundreds to thousands of animals at a single site.[24] In 1987, it took more than 16,000 hog and pig farms to produce half of the nation's sales. By 2007, the same share of sales was produced by just over 1,700 farms.[25] And by 2014, more than 93 percent of hog production came from operations with more than 5000 pigs.[26]



Credit: USDA (October 2015)

By 2014, more than 93 percent of hog production came from operations with more than 5,000 pigs.

The water pollution impact of these concentrated livestock operations is exacerbated by their tendency to be clustered together in compact regions of the country.

A harmful algae bloom covers the waters of the western basin of Lake Erie. Algae blooms have become more common in recent years – reversing decades of progress in the restoration of the lake. Credit: T. Archer, NOAA Great Lakes Environmental Research Laboratory

The propensity of similar industries to cluster in a small area has existed for centuries, from the steel mills of Pittsburgh to the auto manufacturers of Detroit to the high-tech businesses of Silicon Valley. By clustering together, industrial producers share access to support services and a trained labor force.

The industrialization of agribusiness leads to similar concentrations.[27] The eastern shore of Maryland and northwest Arkansas are to chickens what Iowa is to corn, which is what eastern North Carolina is to pork. These areas not only have lots of farms, but they also possess the slaughterhouses, grain mills and other forms of infrastructure that make factory farming possible. Unfortunately, these concentrations also further magnify the environmental impact of factory farming on local waterways. More waste per farm plus many factory farms located together means a huge manure overload for that watershed.

As the corporate profiles in the next section describe, the shift toward industrial agribusiness has too often resulted in the degradation of critical waterways that Americans depend on for recreation, drinking water, and the preservation of healthy populations of wildlife.

Corporate Profiles: The Water Pollution Footprints of Five Major Agribusiness Companies

In this section, we calculate the "water pollution footprint" of five major agribusiness companies – Tyson, Smithfield, Cargill, JBS and Perdue. Together, these five companies (including their subsidiaries[28] account for roughly 44 percent of the combined total of cattle, chicken, and hogs processed for meat each year in the United States.[29] The supply chain of each of these companies includes all three types of polluting agribusiness operations – manure from factory farms, runoff from grain production, and direct dumping of toxic pollution from their processing plants to our rivers and streams.

Using publicly available data, this section assesses each company's water pollution footprint from these operations and their track records and actions (or lack thereof) to reduce that footprint. Manure calculations are based each company's annual livestock processing and the animal waste characteristics manual published by the U.S. Department of Agriculture.

Each corporation's direct dumping of pollution is drawn from U.S. Environmental Protection Agency's Toxics Release Inventory (TRI). As such, these pollution totals *only* include direct "surface water discharges" of *toxic* substances, as reported by the facilities to TRI. A substantial portion of these discharges are nitrate compounds. As noted previously, nitrates can contribute to algal blooms and dead zones, and also pose threats to human health, including cancer and "blue baby syndrome" for infants. The TRI numbers do not include "non-toxic" substances that are polluting our rivers, lakes and streams – e.g., phosphorous.

Tyson Foods, Inc. is one of the world's largest producers of meat and poultry. Based in Springdale, Arkansas, the company has long been a dominant player in the region's high concentration of chicken production. It has additional operations in the Midwest and the Chesapeake Bay watershed.

The company has a staggering water pollution footprint, including manure from factory farms in its supply chain, direct dumping of pollution into rivers, and numerous incidents and alleged violations related to its operations.

Based on available production data, we calculate that Tyson's operations generate **55,289,069 tons of manure** per year. This includes Tyson's chickens raised by contract growers, as well as livestock raised and sold to the company by other operators.

Table 1.[30] Tyson's Manure Load

Animal Type	animals/year	lbs manure/year
cows (beef)	6,656,000	65,228,800,000
hogs	20,852,000	25,022,400,000
sows	62,500	306,937,500
chickens (broilers)	1,820,000,000	20,020,000,000
TOTAL in lbs		110,578,137,500

Given the prevalence of factory farm operations and their concentrated location in watersheds already overburdened with nutrients, it is highly likely that a significant portion of manure from livestock raised for Tyson winds up in our waterways.

Tyson also dumps an enormous volume of pollution into rivers from its processing plants. According to the TRI, Tyson Foods Inc. and its subsidiaries dumped **104 million pounds of toxic pollutants** into waterways from 2010 to 2014 – the second highest volume of discharges reported to TRI for those years, for all industrial facilities.[31] The 2014 pollution volumes for each reporting Tyson facility is shown in Table 3.

In addition to manure and direct discharges, Tyson's water pollution footprint also includes runoff from the huge volume of grain required to feed all the livestock in its supply chain. Tyson's chickens alone are fed an estimated 23 billion pounds of feed each year, most of it corn and soybean meal.[32]

Tyson's pollution has had particularly severe impacts on the waters of northwest Arkansas and eastern Oklahoma. When chicken manure contaminated two sources of drinking water for Tulsa, Oklahoma, Tyson and other poultry processors agreed to pay the city $7.5 million.[33] And when the Illinois River and several tributaries became so polluted with pathogens from animal waste that they were no longer safe for swimming,[34] the Oklahoma attorney general sued Tyson and several other chicken processors to clean it up.[35]

Since then, Tyson has been charged with numerous violations and pollution incidents.[36] In 2015, for example, Tyson settled a case in Missouri for releases into a municipal sewage system that ultimately resulted in killing at least 100,000 fish in Clear Creek.[37]

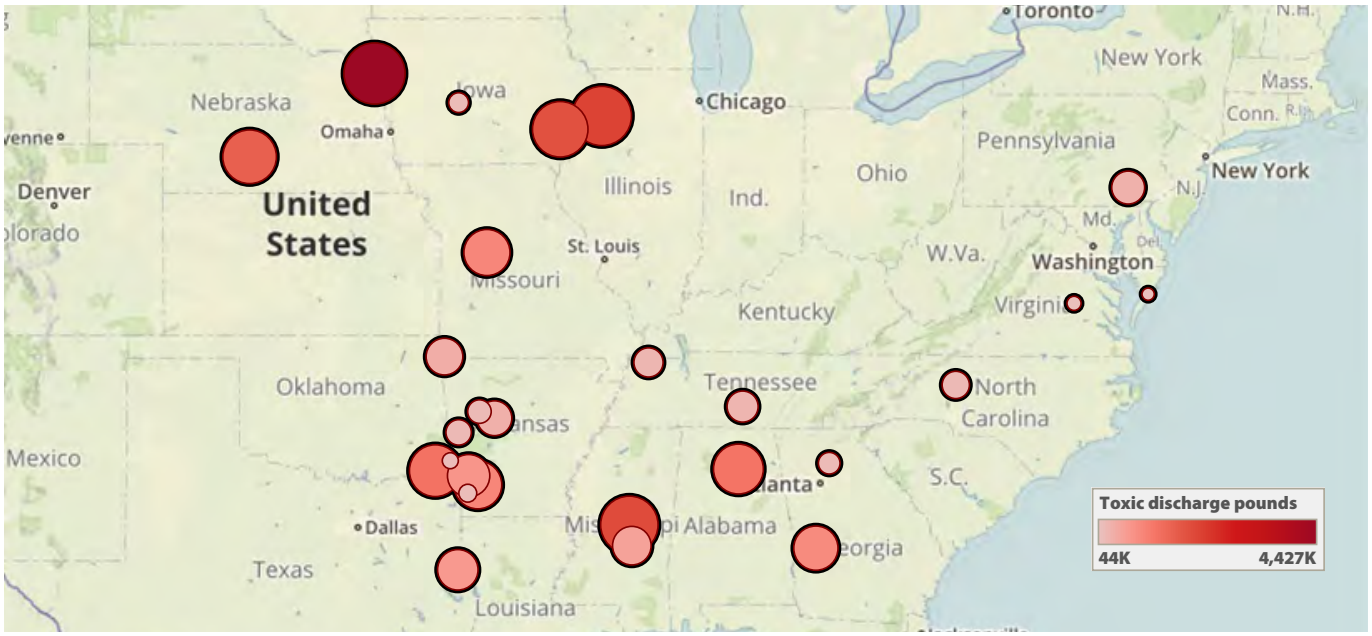
In fact, Tyson's own 2015 "sustainability report" shows that the company exceeded water pollution limits on hundreds of occasions in recent years. (See Table 2 below, reprinted from Tyson Foods Inc 2015 Sustainability Report.[38])

Will Tyson begin to curb its massive water pollution footprint? So far, the signs are not encouraging. While the company's "environment" webpage highlights efforts to address water *consumption*, it has no reference to water *pollution*.[39] Moreover, in the past two years, Tyson has twice rejected shareholder resolutions calling on the company to reduce its water pollution.[40]

Table 2. Tyson's Self-Reported Environmental Compliance

Environmental Compliance	FY2013 Excludes Hillshire	FY2014 Excludes Hillshire	FY2015 Includes Hillshire
Wastewater Permit Exceedances	56	134	117
Notices of Violation (NOV's)	11	40	29
Penalties Per Fiscal Year	$3,952,908	$354,207	$403,809
Supplemental Environmental Project Amount Per Fiscal Year	$300,000	$19,284	$220,000
Total Reportable Chemical Releases	21	21	11

Table 3. Tyson Facilities' Direct Pollution into Waterways Reported in TRI



Facility	City	State	Toxic disharge pounds
Tyson Fresh Meats Inc WWTP	Dakota City	NE	4,426,970
Tyson Fresh Meats Inc - Joslin II	Hillsdale	IL	2,065,975
Tyson Farms Inc - Carthage MS Processing Plant	Carthage	MS	1,923,808
Tyson Fresh Meats Inc	Columbus Junction	IA	1,811,690
Tyson Fresh Meats Inc	Lexington	NE	1,539,622
Tyson Poultry Inc-Broken Bow Processing Plant	Broken Bow	OK	1,218,685
Tyson Farms Inc - Blountsville Processing Plant	Blountsville	AL	1,183,681
Tyson Chicken Inc - Hope Processing Plant	Hope	AK	901,899
Tyson Poultry Inc - Processing Plant	Sedalia	MI	898,632
Tyson Farms Inc	Buena Vista	GA	834,389
Tyson Poultry Inc - Nashville Processing Plant	Nashville	AK	679,239
Tyson Foods Inc-Center TX Processing	Center	TX	615,811

Facility	City	State	Toxic disharge pounds
Tyson Farms Inc	Forest	MS	482,791
Tyson Chicken Inc - Noel Complex	Noel	MI	321,694
Tyson Poultry Inc	Dardanelle	AK	279,366
Tyson Poultry Inc-New Holland Complex	New Holland	PA	266,189
Tyson Farms Inc-Processing	Shelbyville	TN	206,084
Tyson Farms Inc - Union City Processing	Union City	TN	197,862
Tyson Farms Inc	Harmony	NC	151,310
Tyson Poultry Inc	Waldron	AK	145,259
Tyson Poultry Inc	Scranton	AK	131,809
Tyson Poultry Inc-Processing Plant	Cumming	GA	125,280
Tyson Fresh Meats Inc	Perry	IA	107,025
Tyson Poultry Inc	Texarkana	AK	93,503
Tyson Poultry Inc - Grannis Processing Plant	Grannis	AK	88,429
Tyson Farms Inc - Processing Facility	Glen Allen	VA	58,478
Tyson Farms Inc-Temperanceville	Temperanceville	VA	44,066

Smithfield

"[T]he largest pork producer in the world," **Smithfield** is now owned by a Chinese company, WH Group.[41] Headquartered in Smithfield, Virginia, the company's subsidiaries include several well-known brands – including Armour, Nathan's, John Morrell, and Healthy Ones.

Smithfield has a huge water pollution footprint, including manure from industrial-scale hog farms and discharges from its processing plants.

Based on available production data, we calculate that Smithfield's operations generate **18,935,217 tons of pig manure** per year. (See Table 4) (A prior estimate put Smithfield's pig waste at 26 million tons.[42]) The company's responsibility for this waste is magnified by its vertical integration: "[Smithfield's] Hog Production Division provides about half of the pigs for [its] products" and the company owns the hogs raised by contract growers.[43] Our manure calculation includes all hogs owned by and/or sold to the company.

Table 4. Smithfield's Manure Load[44]

Animal Type	animals/year	lbs manure/year
hogs	27,900,000	33,480,000,000
sows	894,000	4,390,434,000
Total Manure		37,870,434,000

Given the prevalence of factory farm operations and their concentrated location in watersheds already overburdened with nutrients, it is highly likely that a significant portion of manure from hogs in Smithfield's supply chain wind up in our waterways.

Smithfield also dumps significant amounts of pollution into rivers from its processing plants. According to TRI, Smithfield and its subsidiaries dumped more than **27.3 million pounds of toxic pollutants** into waterways from 2010 to 2014.[45] The amount of surface water discharges in 2014 alone from each Smithfield facility reporting to TRI is shown in Table 5.

Table 5. Smithfield Facilities' Direct Pollution into Waterways Reported in TRI

Facility	City	State	Toxic disharge pounds
Smithfield-Tar Heel	Tar Heel	NC	3,669,067
John Morrell & Co	Sioux Falls	SD	2,718,677
Smithfield Farmland Corp-Crete	Crete	NE	513,070
Smithfield-Milan	Milan	MS	308,817
The Smithfield Packing Co Grayson	Grayson	KY	229,780

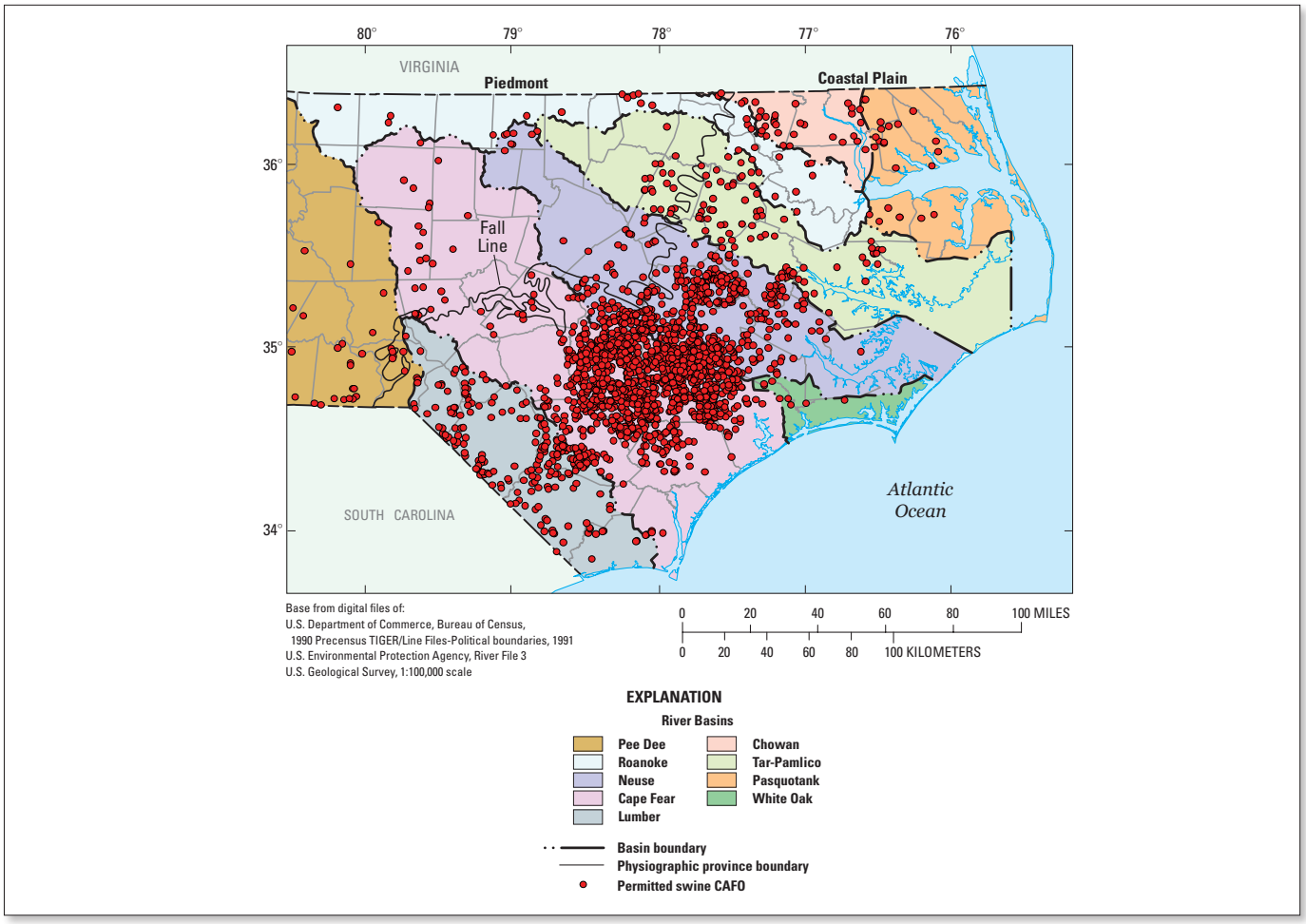
In addition to manure and direct discharges, Smithfield's water pollution footprint also includes runoff from the huge volume of grain required to feed all the hogs in its supply chain. For 2014, Smithfield reported U.S. grain purchases of $1.3 billion.[46]

One of the waterways hardest hit by pollution from Smithfield and other industrial hog operations is the Neuse River in North Carolina. Traversing 248 miles from central North Carolina to Pamlico Sound, the Neuse is not only an important ecological and recreational resource in its own right but also feeds vital coastal estuaries.

Unfortunately, as Smithfield expanded its North Carolina operations, the Neuse experienced a series of fish kills – 1 billion fish in 1995 and then an estimated 100 million fish in 2009 perished in polluted portions of the river.[47] These catastrophic episodes prompted the state legislature to enact a moratorium on CAFOs.

Unfortunately, the impacts of Smithfield and other hog operations persist to this day and extend beyond the Neuse. A 2015 USGS investigation found elevated pollution levels in 21 of 36 eastern North Carolina watersheds sampled "reflecting swine- and (or) poultry CAFO manure effects."[48]

In addition to fish kills, the pig waste in North Carolina waters is a threat to human health: researchers from Johns Hopkins and University of North Carolina recently found high concentrations of fecal coliform



Concentration of industrial hog operations in North Carolina. Credit: United States Department of Agriculture.

– which can cause dysentery, hepatitis, and other illnesses – near spray fields for hog manure.[49]

With WH Group's ownership of Smithfield, some observers are looking at China, which has polluted its own air and water while producing mass consumer products for the U.S. In a role-reversal, is Smithfield now turning places like North Carolina into pollution-plagued sources for cheap China pork?[50]

Or can Smithfield be persuaded to rein in its hog waste pollution?

While Smithfield has taken a few steps to reduce its water pollution footprint, each one comes with caveats. In China, WH Group is apparently using less polluting methods than its standard lagoon-and-spray operations in North Carolina.[51] But in the U.S., the company is diverting only a small fraction of its hog waste from lagoons.[52]

Smithfield has also adopted a policy to source a significant amount of feed from grain growers participating in a "fertilizer optimization" program.[53] Yet it remains unclear whether this program will actually reduce runoff pollution from its suppliers' cropland.

More generally, Smithfield's 2014 "sustainability report" shows that the company received more than 100 notices of violation and paid significant fines from 2009-2014.[54] And as long as the company's main production strategy involves massive factory farms, waste lagoons, and spray fields, its pollution footprint will remain among the largest in the business.

Cargill is "one of the world's largest, privately-owned businesses" with $120 billion in sales in fiscal year 2015. With headquarters in Minnetonka, Minnesota, the company has huge operations in beef, grain, and other industries.[55]

Cargill's significant water pollution footprint includes manure in its supply chain, direct dumping from its processing plants, and runoff pollution from grain production in its supply chain.

With Cargill processing "more than eight million cattle" per year, we calculate that the company's operations generate at least **39.2 million tons of manure** annually.[56] (Cargill's manure load was even higher last year, before the company sold its massive pork production unit to JBS.)

Table 6. Cargill's Manure Load

Animal Type	animals/year	tons manure/year
Cattle	8,000,000	39,200,000

In addition, Cargill's processing plants also dump significant amounts of pollution into our rivers. According to TRI, Cargill facilities dumped more than **50.4 million pounds of toxic pollutants** into waterways from 2010 to 2014 – the *fourth* highest volume of discharges reported to TRI for those years, for all industrial facilities.[57] The amount of surface water discharges in 2014 alone from each Cargill facility reporting to TRI is shown in Table 7.

Table 7. Cargill Facilities' Direct Pollution into Waterways Reported in TRI

Facility	City	State	Toxic disharge pounds
Cargill Meat Solutions Corp	Schuyler	NE	4,977,488
Cargill Meat Solutions Corp*	Beardstown	IL	1,361,993
Cargill Meat Solutions Corp	Fort Morgan	CO	948,902
Cargill Meat Solutions Corp*	Ottumwa	IA	655,953
Cargill Inc Wet Corn Milling - Wahpeton	Wahpeton	ND	73,154
Cargill Texturizing Solutions	Hammond	IN	67,750
Cargill Corn Milling Na	Blair	NE	33,554
Cargill Corn Milling	Eddyville	IA	12,670

*Cargill sold its facilities in Beardstown and Ottumwa to JBS in 2015.

Lastly, any accounting of Cargill's water pollution footprint must also consider the runoff pollution from vast acres of commodity crops it buys, sells, or processes – including corn. As of the late 1990s, Cargill was the second-largest producer of high-fructose corn syrup, trailing only Archer Daniels Midland.[58] Cargill is also one of the top ten U.S. ethanol producers, and in 2013, the company expanded its ethanol operations with a new Iowa plant that has the capacity to process 150,000 bushels of corn per day.[59]

Corn plays a pre-eminent role in the Gulf of Mexico dead zone. The dead zone is caused by algae blooms fueled by nutrients – nitrogen and phosphorus – that are carried downstream into the Gulf from the Mississippi River. Runoff pollution from corn and soybeans is responsible for more than half of the nitrogen and a quarter of the phosphorus that finds its way into the Gulf.[60] The National Research Council of the National Academy of Sciences has found that corn is "the major source of total nitrogen loading to the Mississippi River."[61] The NRC also found that:

- Nitrate concentrations in rivers are the highest in the Corn Belt in the Midwestern United States, where nitrogen fertilizers are applied in the greatest amounts.
- Depending on rainfall levels, on the order of 15 to 36 percent of the nutrients applied to a corn plantation in the Midwest end up in downstream rivers and lakes.[62]

Adding to the challenge is the fact that much of America's corn is grown in parts of the Midwest that use subsurface tile drainage, which conveys nutrient-laden water from fields to ditches to rivers and streams. Not surprisingly, research suggests that intensive farming of fertilized crops on tile-drained land is an important contributor to nitrogen pollution in the Mississippi River and Gulf of Mexico.[63]

To make matters worse, American corn production continues to boom. In 2010, American farmers planted an additional 12.1 million acres of corn – an area twice the size of Maryland – compared with 2001.[64] In 2014, U.S. corn production broke the 14 billion bushel barrier.[65] In 2015, the Gulf of Mexico's dead zone was size of Connecticut and Rhode Island combined—the largest in more than a decade.[66]

Last year, Cargill celebrated its 150th anniversary. Will the company take this milestone moment to commit to clean water? Or will the dead zone in the Gulf of Mexico forever be a part of Cargill's legacy?

At this date, the answer is unclear. Like many other agribusinesses, Cargill's "environment" webpage discusses climate and water consumption, but there is no mention of the company's massive water pollution footprint or efforts to address it.[67] Similarly, in the company's entire 2015 corporate responsibility report, the only reference related to water quality (in the U.S.) is a soil conservation testing effort in Indiana.[68] But the benefits of cover crops and other farming practices that reduce runoff are well-known. When will Cargill insist on such practices in its supply chain, and set concrete goals for pollution reductions throughout its operations?

While most Americans have not heard of **JBS**, the Brazilian company is in fact one of the largest meat producers in the world. By 2010, the company's U.S. operations included 12 slaughterhouses, 11 cattle feedlots, more than 30 poultry processing plants, a hide tannery, and nearly two dozen regional distribution centers.[69] At the time, the company had the capacity to slaughter and package nearly 30,000 cattle, nearly 50,000 hogs, more than 7 million birds, and more than 4,000 sheep into meat products every day.[70]

Moreover, the Brazilian behemoth keeps growing through acquisitions. In 2009, JBS bought Pilgrim's Pride, the second-largest chicken company in the U.S. And last year, the company picked up Cargill's pork operations – including two plants that process 9.3 million pigs (combined), plus "five feed mills and four hog farms."[71] In addition, JBS is now one of four top beef producers in the nation, controlling roughly 20 percent of the market in 2015.[72]

The water pollution footprint from JBS operations is staggering - including manure from factory farms, dumping from processing plants, and runoff from the vast acres of grain grown for all its livestock.

Based on available production data for 2015, we calculate that JBS and its supply chain generate **45.8 million tons of manure** per year in the U.S. (See Table 8.) Moreover, this manure total could increase by as much as 5.6 million tons of hog waste in 2016, just from the supply chain of the two pig processing plants recently acquired from Cargill.

Table 8. JBS Manure Load (includes Pilgrim's Pride)[73]

Animal Type	animals/year	lbs manure/year
cows (beef)	5,659,281	55,460,953,800
hogs	15,643,300	18,771,960,000
sows	175,000	859,425,000
chickens (broilers)	1,500,200,000	16,502,200,000
TOTAL in lbs		91,594,538,800

Second, JBS processing plants dump enormous volumes of pollution into our rivers. According to TRI, JBS facilities (including Pilgrim's Pride) dumped more than **37.6 million pounds of toxic pollutants** into waterways from 2010 to 2014.[74] The amount of surface water discharges in 2014 alone from each JBS (and Pilgrim's Pride) facility reporting to TRI is shown in Table 9.

In addition to manure and direct discharges, the water pollution footprint of JBS includes runoff from the huge volume of grain required to feed more than 1.5 billion animals per year in its supply chain.

Will the beef behemoth from Brazil rein in its water pollution in the U.S.?

Table 9. JBS Facilities' Direct Pollution into Waterways Reported in TRI

Facility	City	State	Toxic disharge pounds
JBS Plainwell	Plainwell	MI	1,478,758
JBS Souderton Inc - Rendering Div	Souderton	PA	519,668
Pilgrim's Pride Corp Mt Pleasant Complex	Mount Pleasant	TX	2,766,086
Pilgrim's Pride Corp Natchitoches Processing Plant	Natchitoches	LA	808,854
Pilgrim's Pride Processing Plant	Enterprise	AL	581,953
Pilgrim's Pride Processing Plant	Live Oak	FL	379,641
Pilgrim's Pride Corp Mayfield KY Facility	Hickory	KY	276,620
Pilgrim's Pride Processing Plant	Sumter	SC	85,751
Pilgrim's Pride Processing Plant	Elberton	GA	2,685
Pilgrim's Pride Processing Plant	Russellville	AL	1,482
Pilgrim's Pride Processing Plant	Athens	GA	42

Note: This table does not include two current JBS pork processing facilities, which were owned by Cargill in 2014.

To its credit, JBS discusses water quality issues directly in its 2015 annual report. Yet even its limited reports of progress raise questions. Although the company states that it has taken steps to address water pollution at two of its processing plants - in Grand Island, Nebraska and Worthington, Minnesota - the pollution reductions are not quantified. Similarly, the company reports that manure from Five Rivers Cattle Feeding is spread on surrounding farmland, but it is difficult to tell if this practice is preventing or exacerbating runoff pollution into nearby rivers and streams.[75] The scope and scale of JBS's water pollution footprint demands a dramatically better response from the company.

Based on Maryland's Eastern Shore, **Perdue Farms** is one of the largest chicken producers in the U.S. With $6.3 billion in annual revenue[76], the company has two subsidiaries – Perdue Foods and Perdue Agribusiness – and it also now owns Coleman Natural Foods.[77] The company became a nationally recognized brand through a successful ad campaign featuring owner and pitchman Frank Perdue.

Perdue's operations have significant vertical integration. The company's chickens are largely grown by contract growers; under typical industry contracts, an integrator like Perdue owns the chickens, but the growers must take care of their excrement. Furthermore, Perdue Agribusiness extends the company's vertical integration into grain for its chickens – gaining a "competitive advantage" with storage and processing facilities.[78]

Perdue has a significant water pollution footprint, including manure from its chickens, runoff from grain to feed those chickens, and direct dumping of pollution from its processing plants.

With 12,990,000 chickens processed per week in 2015, we calculate that Perdue's operations generate **3.7 million tons of manure** per year.[79]

Table 10. Perdue's Manure Load

Animal Type	animals/year	tons manure/year
Chicken	675,480,000	3,715,140

In addition, Perdue's processing plants also dumps significant amounts of pollution into our rivers. According to TRI, Perdue facilities dumped more than **31 million pounds of toxic pollutants** into waterways from 2010 to 2014 – the *eighth* highest volume of discharges reported to TRI for those years, for all industrial facilities.[80] The amount of surface water discharges in 2014 alone from each Perdue facility reporting to TRI is shown in Table 11.

Table 11. Perdue Facilities' Direct Pollution into Waterways Reported in TRI

Facility	City	State	Toxic disharge pounds
Georgetown Processing Plant	Georgetown	DE	168,674
Perdue Farms Inc Perry Processing Plant	Perry	GA	595,788
Perdue Cromwell Processing Plant	Beaver Dam	KY	163,677
Lewiston Processing Plant	Lewiston Woodville	NC	2,664,995
Fredericksburg BC Natural Chicken	Fredericksburg	PA	39,000
Perdue Farms Accomac Processing Plant	Accomac	VA	1,266,025

Finally, an assessment of Perdue's water pollution footprint should also include runoff from the huge quantity of grain grown to feed its chickens. The company buys grain from 23,000 farmers from New York to Florida.[81]

Nevertheless, much of Perdue's pollution footprint is concentrated in its own backyard. As noted earlier in the report, the Chesapeake Bay is suffering from a massive dead zone, and livestock manure is a major source of pollution behind it. Perdue accounts for *more than one-quarter* of the chickens raised on Delmarva Peninsula, according to an analysis by Environmental Integrity Project.[82]

What efforts has the company taken to rein in the water pollution load from its operations? Unlike other Bay aggregators, Perdue does operate a facility that handles excess manure. However, the Perdue Agricycle pelletizing plant took only 7 percent of the manure "exported" off-site from chicken operations on Maryland's Eastern Shore in 2013.[83] Moreover, the chicken manure load created by Perdue and other aggregators is about to get heavier for the Bay; officials approved roughly 200 new poultry houses on the Delmarva Peninsula in 2015.

Water Pollution By Other Major Agribusiness Companies

Beyond these five profiled companies, other agribusiness corporations also dump considerable volumes of pollution into America's rivers, lakes, and streams. Other agribusiness companies with major direct dumping of toxic substances into waterways include Sanderson Farms, Continental Grain, McCain Foods, and Koch Foods. And in addition to Cargill, Archer Daniels Midland bears heavy responsibility for the runoff pollution from massive corn production, as we documented in our 2010 report.

Furthermore, our profiles did not touch upon pollution from major egg or dairy operators – even though dairy cows produce large quantities of manure. Land O Lakes, Nestle, and Dean Foods are among the largest dairy producers in the nation.[84] The huge market share of these large producers gives them significant responsibility for water pollution from their suppliers. Dean Foods, for example, controlled 57 percent of the milk market in Wisconsin and northern Illinois as recently as 2010.[85] It is worth asking whether Dean Foods buys its milk from any of the mega-dairies implicated in the contamination of drinking water in Kewaunee County, Wisconsin.

The Role Of Retailers

Restaurants, supermarkets, and food service companies all bear responsibility for the water pollution in their supply chains. Moreover, these retailers often command significant leverage to improve the environmental and health practices in agribusiness production. In response to pressure from consumers and investors, for example, a set of restaurant chains – including Subway, McDonalds, and Chipotle – have demanded that their suppliers provide meat without the overuse of antibiotics.

However, there is also a troubling new trend among mega-retailers that could reinforce some of the most polluting practices of corporate agribusiness. Perhaps eyeing the vertical integration of their suppliers, two of the largest retailers in America are looking to become food producers as well.

COSTCO: In some ways, Costco has been a force for sustainable agriculture. For example, the company now sells more organic products than Whole Foods.[86] However, Costco could soon be replicating the mega-manure footprint of factory farms. Aiming to ramp up profits on one of its signature products, Costco is now planning to produce up to one-third of the 80 million rotisserie chickens sold in its stores each year.[87] Costco's plans for a massive processing plant in Nebraska, almost certainly to be supplied by massive chicken operators nearby, could put the company in the same polluted henhouse with Tyson and Perdue.

Credit: Stu pendousmat at English Wikipedia

WAL-MART: The retail giant has already demonstrated that it can flex its muscle to demand not just cheaper prices but also better practices by its suppliers. For example, Wal-Mart is already insisting that its suppliers meet standards for humane treatment of animals.[88] There is certainly potential for Wal-Mart to extract substantial reductions in water pollution from those same producers. For example, Tyson depended on Wal-Mart for nearly 17 percent of its sales last year.[89]

Yet Wal-Mart is also set to open its own milk processing plant in Indiana; it will be one of the largest in the country.[90] Will Wal-Mart insist on supplying its new dairy solely from pasture-raised cows (where manure is far less likely to end up in surrounding waterways), or will the giant retailer follow the general industry pattern of huge processing plants reinforcing a concentration of CAFOs?

Policy Recommendations

Industrial agribusiness is taking a severe toll on our nation's waterways. To restore our rivers, lakes and streams, the industry must shift away from industrial-scale livestock facilities and overproduction of commodity crops which depend on heavy doses of fertilizers and pesticides. This will require decisive action by industry and policymakers alike.

Corporate agribusiness companies must change practices to keep their waste out of America's waterways. Here are concrete steps that huge agribusiness companies can take to begin curbing pollution of our waters and transitioning toward more sustainable production:

- 3rd party certification to ensure that none of the manure from animals raised for the company winds up in our waterways or groundwater.
- Limit operations in watersheds and communities that are already overburdened with manure and other agricultural pollution.
- For livestock production, commit that all new contracts will be with pasture-based producers using sustainable methods, not factory farms.
- Big agribusiness companies should take full responsibility to remove excess manure from nutrient-saturated watersheds and ensure its sustainable use elsewhere.
- For grain production in the supply chain, insist on best practices to prevent pollution – especially limiting the volume, timing, and methods of applying manure and other fertilizer to cropland, as well as perennial cover crops and buffer zones.
- Create and use metrics to document substantial reductions in water pollution and make the results public.
- Supermarkets, food service companies, and restaurants should use their leverage in the marketplace to insist on zero-water pollution from their suppliers.

State and federal governments should take immediate steps to protect America's waterways from corporate agribusiness pollution, including the following:

- Ban the worst practices, including leaking waste piles or lagoons and the over-application of manure or other fertilizer, that lead to pollution of waterways.
- Establish moratoria on new or expanded industrial-scale livestock operations, especially in watersheds already overburdened by agricultural pollution.
- Hold corporate agribusiness responsible for manure pollution by clarifying that companies are legally responsible for waste produced by livestock they own or have contracted for.
- Ratchet down pollution limits in clean water permits for agribusiness facilities such as slaughterhouses and processing plants – especially for nitrate compounds.
- Require enforceable clean water permits for *all* industrial-scale livestock operations.
- Give environmental laws real teeth by beefing up inspections and ensuring that repeated or serious violations of water pollution laws are met with real

penalties, not slaps on the wrist. Where states are failing to protect their own waters and citizens' health, EPA must step in.

- The courts should uphold the Clean Water Rule to ensure federal protection for all of our nation's streams, thousands of wetlands, and the other waters on which they depend.
- Provide the public with access to detailed information about factory farms and other agribusiness facilities, including information about their total flow of pollution to the environment.
- Preserve (or restore) the right of local communities to reject industrial-scale livestock operations to protect clean water, health, and/or quality of life.
- Remove subsidies for industrial row crop and livestock production, and dramatically expand incentives for using sustainable farming methods to ensure that American agriculture delivers safe, healthy food without destroying our waterways.

Federal subsidies and targets for ethanol production have pushed American farmers to plant an additional 12 million acres of corn compared with a decade ago. Credit: Jim Parkin, istockphoto.com

Methodology

Assessing the water pollution impact of major agribusiness companies involved two key applications of data: 1) calculations of manure generated from livestock; and 2) exporting direct discharge data from U.S. EPA's Toxics Release Inventory (TRI).

Manure Calculations

Calculating the manure generated from a company's livestock operations involved two steps. First, we used the latest publicly available data to determine the quantity of each type of livestock processed annually by the company in question. This information is mostly from 2015 and was derived from either the companies' own websites or industry trade journals. Second, we calculated the amount of manure generated for each type of animal using the manure per finished animal ratios set forth by the Natural Resources Conservation Service (NRCS) in the U.S. Department of Agriculture's Agricultural Waste Management Field Handbook, Chapter 4.[91] For example, the NRCS field handbook specifies at Table 4-11 (c) that each broiler chicken excretes 11 pounds of manure per finished animal.

These calculations likely undercount manure production for two reasons. First, manure "as excreted" does not include all the other material in waste coming out of factory farm operations – for example, feathers and bedding mixed with poultry manure (together known as "poultry litter") or vast amounts of water used to flush pig manure into lagoons, etc. Second, average weights for some livestock – and therefore manure per animal - have increased considerably since the NRCS published its field handbook in 2008. For example, USDA data shows that the average weight of hogs raised in the U.S. has been increasing steadily over several years, both generally and specifically in North Carolina.[92]

Direct Discharges to Waterways

All data in this report regarding agribusiness' direct discharge of pollutants into waterways were retrieved from the U.S. Environmental Protection Agency's Toxics Release Inventory (TRI), a database of self-reported releases of specific toxic pollutants to air, water, land and waste treatment facilities. This report only represents those volumes of pollutants designated in TRI as "surface water discharges."

The U.S. Environmental Protection Agency's TRI.NET data-access application was downloaded on December 18, 2015, from www2.epa.gov/toxics-release-inventory-tri-program/download-trinet.

Included in that download was the Toxics Release Inventory (TRI) National Analysis data set for 2014, as updated in October 2015, according to U.S. Environmental Protection Agency, *Recent TRI.NET Updates*, archived at web.archive.org/web/20151218161658/http://www.epa.gov/toxics-release-inventory-tri-program/recent-trinet-updates.

This data set is the most recent fixed data set available. While the National Analysis data set does not include updates and adjustments made by reporting facilities since October 2015, it does allow for replication of the analysis by researchers. The most recent version of TRI reporting data can be found at www2.epa.gov/toxics-release-inventory-tri-program.

This TRI data were examined on the level of "parent company" for the years 2010 to 2014 (inclusive), and by "parent company" and individual facility for 2014. The numbers and ranks expressed herein relate to volume – pounds of reported toxic pollutants discharged from agribusiness facilities to waterways.

Discharges reported as separate "parent companies" were added together where the underlying facilities are plainly owned and/or operated by the same entity. For example, TRI only showed one reporting facility in the entire country with a parent company of Smithfield Foods; but it also shows several Smithfield Foods facilities under the parent company "United Global Foods US Holdings." Smithfield's direct discharge totals in this report reflect the sum of these facilities. However, to avoid possible duplication, we did not include 4,485,218 pounds of toxic discharges to surface waters in 2010 and 2011 listed separately in TRI under the parent company "Smithfield Foods." Similarly, TRI only lists two reporting facilities as JBS but also shows several under the parent company Pilgrim's Pride; Pilgrim's Pride is owned by JBS, and so its TRI pollution is included in JBS totals herein.

We excluded releases to water in American Samoa, Guam, Northern Mariana Islands, Puerto Rico, and the U.S. Virgin Islands. Rankings of pollution from parent companies exclude those facilities where TRI shows the parent company as "NA."

For Table A1 in the Appendix (Agribusiness Facility Toxic Discharges to Waterways in 2014), we selected all facilities reporting toxic discharges for 2014 in the Food/Beverage/Tobacco industry type and then deleted those facilities that were obviously either beverage or tobacco-related.

One significant limitation in this analysis is that the TRI only covers releases of *toxic* substances – largely nitrate compounds in the case of agribusiness. Consequently, our calculations of direct discharges do not include the conventional pollutants that these companies dump into waterways – including nitrogen, phosphorous, oil/grease, or other substances that can damage waterways and/or fish and wildlife.

Appendix: Detailed Data on Direct Toxic Discharges from Agribusiness Facilities

Table A1: Agribusiness Facility Toxic Discharges to Waterways in 2014 (U.S. EPA TRI data)

Parent	Name	Address	City	State	5.3 Surface Water Discharges
TYSON FOODS INC	TYSON FARMS INC - BLOUNTSVILLE PROCESSING PLANT	67240 MAIN ST, BLOUNTSVILLE ALABAMA 35031 (BLOUNT)	Blountsville	AL	1,183,681
CONTINENTAL GRAIN CO	WAYNE FARMS LLC - ENTERPRISE FRESH PLANT	1020 COUNTY RD 114, JACK ALABAMA 36346 (COFFEE)	Jack	AL	1,050,292
KOCH FOODS	JCG FOODS OF ALABAMA LLC	764 GEORGE CAGLE DR, COLLINSVILLE ALABAMA 35961 (DEKALB)	Collinsville	AL	754,448
KOCH FOODS	KOCH FOODS OF GADSDEN	501 PADEN RD, GADSDEN ALABAMA 35903 (ETOWAH)	Gadsden	AL	631,768
PILGRIMS PRIDE CORP	PILGRIM'S PRIDE PROCESSING PLANT	4693 COUNTY RD 636, ENTERPRISE ALABAMA 36330 (COFFEE)	Enterprise	AL	581,953
AMERICAN PROTEINS INC	AMERICAN PROTEINS INC/ HANCEV ILLE DIV	1170 COUNTY RD 508, HANCEVILLE ALABAMA 35077 (CULLMAN)	Hanceville	AL	348,071
NA	SOUTHFRESH AQUACULTURE LLC	HWY 43 S, EUTAW ALABAMA 35462 (GREENE)	Eutaw	AL	22,900
KEYSTONE FOODS LLC	EQUITY GROUP EUFAULA DIV LLC	57 MELVIN CLARK RD, BAKER HILL ALABAMA 36027 (BARBOUR)	Baker Hill	AL	2,200
PILGRIMS PRIDE CORP	PILGRIM'S PRIDE PROCESSING PLANT	2045 COUNTY RD 244, RUSSELLVILLE ALABAMA 35653 (FRANKLIN)	Russellville	AL	1,482
KEYSTONE FOODS LLC	KEYSTONE FOODS LLC - ALABAMA DIV	2281 STEELE STATION RD, GADSDEN ALABAMA 35906 (ETOWAH)	Gadsden	AL	940
PECO FOODS INC	PECO FOODS INC	3701 KAULOOSA AVE, TUSCALOOSA ALABAMA 35403 (TUSCALOOSA)	Tuscaloosa	AL	250
NA	BIRMINGHAM HIDE & TALLOW CO INC	5430 JOHNS RD, BESSEMER ALABAMA 35021 (JEFFERSON)	Bessemer	AL	21
TYSON FOODS INC	TYSON CHICKEN INC - HOPE PROCESSING PLANT	275 COUNTY RD 278, HOPE ARKANSAS 71801 (HEMPSTEAD)	Hope	AR	901,899
TYSON FOODS INC	TYSON POULTRY INC - NASHVILLE PROCESSING PLANT	100 E CASSADY ST, NASHVILLE ARKANSAS 71852 (HOWARD)	Nashville	AR	679,239
OK INDUSTRIES INC	OK FOODS INC	4201 REED LN, FORT SMITH ARKANSAS 72904 (SEBASTIAN)	Fort Smith	AR	358,660

Table A1: Agribusiness Facility Toxic Discharges to Waterways in 2014 (U.S. EPA TRI data), cont'd

Parent	Name	Address	City	State	5.3 Surface Water Discharges
TYSON FOODS INC	TYSON POULTRY INC	1291 N HWY 7, DARDANELLE ARKANSAS 72834 (YELL)	Dardanelle	AR	279,366
CONTINENTAL GRAIN CO	WAYNE FARMS LLC - DANVILLE FRESH PLANT	615 MAIN ST, DANVILLE ARKANSAS 72833 (YELL)	Danville	AR	260,191
TYSON FOODS INC	TYSON POULTRY INC	442 PLANT ST, WALDRON ARKANSAS 72958 (SCOTT)	Waldron	AR	145,259
TYSON FOODS INC	TYSON POULTRY INC	7755 N STATE HWY 393, SCRANTON ARKANSAS 72863 (LOGAN)	Scranton	AR	131,809
TYSON FOODS INC	TYSON POULTRY INC	5465 MILLER COUNTY RD 64, TEXARKANA ARKANSAS 71854 (MILLER)	Texarkana	AR	93,503
TYSON FOODS INC	TYSON POULTRY INC - GRANNIS PROCESSING PLANT	8564 HWY 71 S, GRANNIS ARKANSAS 71944 (POLK)	Grannis	AR	88,429
NESTLE USA INC	GERBER PRODUCTS CO	4301 HARRIET LN, FORT SMITH ARKANSAS 72904 (SEBASTIAN)	Fort Smith	AR	23,291
SEABOARD CORP	BUTTERBALL LLC	1294 N COLLEGE, HUNTSVILLE ARKANSAS 72740 (MADISON)	Huntsville	AR	18
CARGILL INC	CARGILL MEAT SOLUTIONS CORP	1505 E BURLINGTON AVE, FORT MORGAN COLORADO 80701 (MORGAN)	Fort Morgan	CO	948,902
LEPRINO FOODS CO	LEPRINO FOODS-GREELEY	1302 1ST AVE, GREELEY COLORADO 80631 (WELD)	Greeley	CO	191,357
MILLERCOORS LLC	GOLDEN BREWERY MILLERCOORS LLC	12TH & FORD ST, GOLDEN COLORADO 80401 (JEFFERSON)	Golden	CO	115,200
LEPRINO FOODS CO	LEPRINO FOODS CO	2400 E BEAVER AVE, FORT MORGAN COLORADO 80701 (MORGAN)	Fort Morgan	CO	924
PERDUE FARMS INC	GEORGETOWN PROCESSING PLANT	20621 SAVANNAH RD, GEORGETOWN DELAWARE 19947 (SUSSEX)	Georgetown	DE	168,674
PILGRIMS PRIDE CORP	PILGRIM'S PRIDE PROCESSING PLANT	19740 US HWY 90, LIVE OAK FLORIDA 32060 (SUWANNEE)	Live Oak	FL	379,641
PEPSICO INC	TROPICANA MANUFACTURING CO INC	1001 13TH AVE E, BRADENTON FLORIDA 34208 (MANATEE)	Bradenton	FL	5
TYSON FOODS INC	TYSON FARMS INC	250 TYSON RD, BUENA VISTA GEORGIA 31803 (MARION)	Buena Vista	GA	834,389
KOCH FOODS	KOCH FOODS OF PINE MOUNTAIN VALLEY	14075 HWY 116, PINE MOUNTAIN VALLEY GEORGIA 31823 (HARRIS)	Pine Mountain Valley	GA	639,561
PERDUE FARMS INC	PERDUE FARMS INC PERRY PROCESSING PLANT	250 GEORGIA HWY 247 SPUR, PERRY GEORGIA 31069 (HOUSTON)	Perry	GA	595,788
CONTINENTAL GRAIN CO	WAYNE FARMS LLC - PENDERGRASS FRESH PLANT	977 WAYNE POUTRY RD, PENDERGRASS GEORGIA 30567 (JACKSON)	Pendergrass	GA	156,576
TYSON FOODS INC	TYSON POULTRY INC- PROCESSING PLANT	340 W MAPLE ST, CUMMING GEORGIA 30041 (FORSYTH)	Cumming	GA	125,280
MILLERCOORS LLC	MILLERCOORS LLC	405 CORDELE RD, ALBANY GEORGIA 31705 (DOUGHERTY)	Albany	GA	17,376
KEYSTONE FOODS LLC	EQUITY GROUP GEORGIA DIV LLC - PROCESSING PLANT	7220 HWY 19, CAMILLA GEORGIA 31730 (MITCHELL)	Camilla	GA	12,400
PILGRIMS PRIDE CORP	PILGRIM'S PRIDE PROCESSING PLANT	1129 OLD MIDDLETON RD, ELBERTON GEORGIA 30635 (ELBERT)	Elberton	GA	2,685

Table A1: Agribusiness Facility Toxic Discharges to Waterways in 2014 (U.S. EPA TRI data), cont'd

Parent	Name	Address	City	State	5.3 Surface Water Discharges
FIELDALE FARMS CORP	FIELDALE FARMS CORP TOCCOA WATER TREATMENT	270 FDC BY PRODUCTS RD, EASTANOLLEE GEORGIA 30538 (STEPHENS)	Eastanollee	GA	1,500
HARRISON POULTRY INC	HARRISON POULTRY INC	107 E STAR ST, BETHLEHEM GEORGIA 30620 (BARROW)	Bethlehem	GA	1,410
AMERICAN PROTEINS INC	AMERICAN PROTEINS/ CUMMING	4990 LELAND DR, CUMMING GEORGIA 30041 (FORSYTH)	Cumming	GA	303
ISONOVA TECHNOLOGIES LLC	ISONOVA TECHNOLOGIES LLC - SOCIAL CIRCLE	1022 E HIGHTOWER TRAIL, SOCIAL CIRCLE GEORGIA 30025 (WALTON)	Social Circle	GA	250
PILGRIMS PRIDE CORP	PILGRIM'S PRIDE PROCESSING PLANT	898 BARBER ST, ATHENS GEORGIA 30601 (CLARKE)	Athens	GA	42
FUJI SPECIALTIES INC	FUJI VEGETABLE OIL INC	120 BRAMPTON RD, SAVANNAH GEORGIA 31408 (CHATHAM)	Savannah	GA	5
MCCAIN FOODS USA INC	MCCAIN FOODS USA INC	218 W HWY 30, BURLEY IDAHO 83318 (CASSIA)	Burley	ID	2,616,276
LACTALIS AMERICAN CO INC	SORRENTO LACTALIS INC	4912 E FRANKLIN RD, NAMPA IDAHO 83687 (CANYON)	Nampa	ID	1,907
TYSON FOODS INC	TYSON FRESH MEATS INC - JOSLIN IL	HWY 92 & I-88 28424 38TH AVE N, HILLSDALE ILLINOIS 61257 (ROCK ISLAND)	Hillsdale	IL	2,065,975
CARGILL INC	CARGILL MEAT SOLUTIONS CORP	8295 ARENZVILLE RD, BEARDSTOWN ILLINOIS 62618 (CASS)	Beardstown	IL	1,361,993
TATE & LYLE INGREDIENTS AMERICAS LLC	TATE & LYLE DECATUR	2200 E ELDORADO ST, DECATUR ILLINOIS 62521 (MACON)	Decatur	IL	46,167
MGP INGREDIENTS INC	ILLINOIS CORN PROCESSING LLC	1301 S FRONT ST, PEKIN ILLINOIS 61554 (TAZEWELL)	Pekin	IL	4,492
DEAN FOODS CO	DEAN DAIRY HOLDINGS LLC	6303 MAXON RD, HARVARD ILLINOIS 60033 (MCHENRY)	Harvard	IL	750
ARCHER DANIELS MIDLAND CO	ADM	4666 FARIES PKWY, DECATUR ILLINOIS 62526 (MACON)	Decatur	IL	389
CARGILL INC	CARGILL TEXTURIZING SOLUTIONS	1100 INDIANAPOLIS BLVD, HAMMOND INDIANA 46320 (LAKE)	Hammond	IN	67,750
PEPSICO INC	FRITO-LAY INC	323 S COUNTY RD 300W, FRANKFORT INDIANA 46041 (CLINTON)	Frankfort	IN	49,000
TATE & LYLE INGREDIENTS AMERICAS LLC	TATE & LYLE SAGAMORE	2245 SAGAMORE PKWY N, LAFAYETTE INDIANA 47904 (TIPPECANOE)	Lafayette	IN	1,036
TATE & LYLE INGREDIENTS AMERICAS LLC	TATE & LYLE LAFAYETTE SOUTH	3300 US 52 S, LAFAYETTE INDIANA 47905 (TIPPECANOE)	Lafayette	IN	133
BUNGE LTD	BUNGE NA (EAST) LLC	1200 N 2ND ST, DECATUR INDIANA 46733 (ADAMS)	Decatur	IN	73
LOUIS DREYFUS COMMODITIES LLC	LOUIS DREYFUS AGRICULTURAL INDUSTRIES	7344 ST RD 15 S, CLAYPOOL INDIANA 46510 (KOSCIUSKO)	Claypool	IN	57
TYSON FOODS INC	TYSON FRESH MEATS INC	16198 HWY 70 N, COLUMBUS JUNCTION IOWA 52738 (LOUISA)	Columbus Junction	IA	1,811,690
CARGILL INC	CARGILL MEAT SOLUTIONS CORP	600 S IOWA AVE, OTTUMWA IOWA 52501 (WAPELLO)	Ottumwa	IA	655,953
NA	AGRI STAR MEAT & POULTRY LLC	220 W ST, POSTVILLE IOWA 52162 (ALLAMAKEE)	Postville	IA	363,770
TYSON FOODS INC	TYSON FRESH MEATS INC	1350 I CT, PERRY IOWA 50220 (DALLAS)	Perry	IA	107,025

Table A1: Agribusiness Facility Toxic Discharges to Waterways in 2014 (U.S. EPA TRI data), cont'd

Parent	Name	Address	City	State	5.3 Surface Water Discharges
SWISS VALLEY FARMS COOPERATIVE	SWISS VALLEY FARMS COOPERATIVE	11744 EDGEWOOD AVE, LUANA IOWA 52156 (CLAYTON)	Luana	IA	96,695
GELITA USA INC	GELITA	2445 PORT NEAL IND US TRIAL RD, SERGEANT BLUFF IOWA 51054 (WOODBURY)	Sergeant Bluff	IA	83,235
ROQUETTE AMERICA INC	ROQUETTE AMERICA INC	1003 S 5TH ST, KEOKUK IOWA 52632 (LEE)	Keokuk	IA	56,840
ASSOCIATED MILK PRODUCERS INC	ASSOCIATED MILK PRODUCERS INC ARLINGTON DIV	3281 40TH ST, ARLINGTON IOWA 50606 (FAYETTE)	Arlington	IA	52,418
PINNACLE FOODS GROUP LLC	PINNACLE FOODS GROUP LLC FORT MADISON PLANT	2467 HENRY LADYN DR, FORT MADISON IOWA 52627 (LEE)	Fort Madison	IA	33,700
ARCHER DANIELS MIDLAND CO	ADM CORN PROCESSING	1251 BEAVER CHANNEL PKWY, CLINTON IOWA 52732 (CLINTON)	Clinton	IA	23,001
MICHAEL FOODS INC	PAPETTI'S HYGRADE EGG PRODUCTS INC	100 PAPETTI PKWY, LENOX IOWA 50851 (TAYLOR)	Lenox	IA	19,921
LAURIDSEN GROUP INC	TWIN COUNTIES DAIRY LLC	2206 540TH ST SW, KALONA IOWA 52247 (JOHNSON)	Kalona	IA	13,000
CARGILL INC	CARGILL CORN MILLING	1 CARGILL DR, EDDYVILLE IOWA 52553 (MONROE)	Eddyville	IA	12,670
WELLS ENTERPRISES INC	WELLS ENTERPRISES INC SOUTH ICE CREAM PLANT	1191 18TH ST SW, LE MARS IOWA 51031 (PLYMOUTH)	Le Mars	IA	3,994
AJINOMOTO ANIMAL NUTRITION GROUP INC	AJINOMOTO HEARTLAND INC	1116 HWY 137, EDDYVILLE IOWA 52553 (MONROE)	Eddyville	IA	2,670
HONAN HOLDING'S USA INC	MANILDRA MILLING CO	100 GEORGE ST, HAMBURG IOWA 51640 (FREMONT)	Hamburg	IA	558
NESTLE PURINA PETCARE CO	NESTLE PURINA PETCARE CO	2400 5TH AVE S, FORT DODGE IOWA 50501 (WEBSTER)	Fort Dodge	IA	41
OSI INDUSTRIES LLC	OSI INDUSTRIES LLC	21876 N HWY 59, OAKLAND IOWA 51560 (POTTAWATTAMIE)	Oakland	IA	10
PENFORD CORP	PENFORD PRODUCTS CO	1001 FIRST ST SW, CEDAR RAPIDS IOWA 52404 (LINN)	Cedar Rapids	IA	5
SUN CAPITAL PARTNERS INC	CREEKSTONE FARMS PREMIUM BEEF LLC	604 GOFF IND US TRIAL PARK RD, ARKANSAS CITY KANSAS 67005 (COWLEY)	Arkansas City	KS	1,117,008
PILGRIMS PRIDE CORP	PILGRIMS PRIDE CORP MAYFIELD KY FACILITY	2653 STATE RT 1241, HICKORY KENTUCKY 42051 (GRAVES)	Hickory	KY	276,620
THE SMITHFIELD FOODS INC	THE SMITHFIELD PACKING CO GRAYSON	800 CW STEVENS BLVD, GRAYSON KENTUCKY 41143 (CARTER)	Grayson	KY	229,780
PERDUE FARMS INC	PERDUE CROMWELL PROCESSING PLANT	5025 HWY 231 S, BEAVER DAM KENTUCKY 42320 (OHIO)	Beaver Dam	KY	163,677
DARLING INGREDIENTS INC	GRIFFIN INDUSTRIES LLC	3080 CONCORD RD, RUSSELLVILLE KENTUCKY 42276 (LOGAN)	Russellville	KY	4,767
KEYSTONE FOODS LLC	EQUITY GROUP KENTUCKY DIV LLC PROCESSING PLANT	2294 KY HWY 90 W, ALBANY KENTUCKY 42602 (CLINTON)	Albany	KY	1,820
OWENSBORO GRAIN HOLDING CO INC	OWENSBORO GRAIN CO LLC	822 E SECOND ST, OWENSBORO KENTUCKY 42303 (DAVIESS)	Owensboro	KY	5
PILGRIMS PRIDE CORP	PILGRIM'S PRIDE CORP NATCHITOCHES PROCESSING PLANT	7088 HWY S BY PASS, NATCHITOCHES LOUISIANA 71457 (NATCHITOCHES)	Natchitoches	LA	808,854

Table A1: Agribusiness Facility Toxic Discharges to Waterways in 2014 (U.S. EPA TRI data), cont'd

Parent	Name	Address	City	State	5.3 Surface Water Discharges
SANDERSON FARMS INC	SANDERSON FARMS INC	HWY 190 W, HAMMOND LOUISIANA 70401 (TANGIPAHOA)	Hammond	LA	127,620
BUNGE NORTH AMERICA INC	BUNGE NA INC	12486 RIVER RD, DESTREHAN LOUISIANA 70047 (ST CHARLES)	Destrehan	LA	560
MCCAIN FOODS USA INC	MCCAIN FOODS USA INC	319 RICHARDSON RD, EASTON MAINE 04740 (AROOSTOOK)	Easton	ME	2,024,987
	VALLEY PROTEINS INC-LINKWOOD FACILITY	5420 LINKWOOD RD, LINKWOOD MARYLAND 21835 (DORCHESTER)	Linkwood	MD	4
JBS USA LLC	JBS PLAINWELL	11 11TH ST, PLAINWELL MICHIGAN 49080 (ALLEGAN)	Plainwell	MI	1,478,758
MEAD JOHNSON & CO LLC	MEAD JOHNSON & CO LLC	725 E MAIN AVE, ZEELAND MICHIGAN 49464 (OTTAWA)	Zeeland	MI	86,527
TYSON FOODS INC	THE HILLSHIRE BRANDS CO	8300 96TH AVE, ZEELAND MICHIGAN 49464 (OTTAWA)	Zeeland	MI	34,792
MICHIGAN MILK PRODUCERS ASSOC	MICHIGAN MILK PRODUCERS ASSOC	431 W WILLIAMS ST, OVID MICHIGAN 48866 (CLINTON)	Ovid	MI	12,473
MICHIGAN SUGAR CO	MICHIGAN SUGAR CO	2600 S EUCLID AVE BAY CITY FACTORY, BAY CITY MICHIGAN 48706 (BAY)	Bay City	MI	10,900
MICHIGAN SUGAR CO	MICHIGAN SUGAR CO-CROSW ELL FACTORY	159 S HOWARD, CROSWELL MICHIGAN 48422 (SANILAC)	Croswell	MI	1,600
MICHIGAN SUGAR CO	MICHIGAN SUGAR CO - CARO FACTORY	819 PENNINSULAR ST, CARO MICHIGAN 48723 (TUSCOLA)	Caro	MI	800
MICHIGAN SUGAR CO	MICHIGAN SUGAR CO	501 PINE ST, SEBEWAING MICHIGAN 48759 (HURON)	Sebewaing	MI	44
SOUTHERN MINNESOTA BEET SUGAR COOPERATIVE	SOUTHERN MINNESOTA BEET SUGAR COOPERATIVE	83550 COUNTY RD 21, RENVILLE MINNESOTA 56284 (RENVILLE)	Renville	MN	145,156
MICHAEL FOODS INC	M G WALDBAUM	120 TOWER ST S, GAYLORD MINNESOTA 55334 (SIBLEY)	Gaylord	MN	133,379
BLUEGRASS DAIRY & FOOD LLC	BLUEGRASS PROTEINS	1864 311TH AVE, DAWSON MINNESOTA 56232 (LAC QUI PARLE)	Dawson	MN	106,121
DARLING INGREDIENTS INC	DARLING INGREDIENTS INC	9000 382ND AVE, BLUE EARTH MINNESOTA 56013 (FARIBAULT)	Blue Earth	MN	60,056
AMERICAN CRYSTAL SUGAR CO	AMERICAN CRYSTAL SUGAR CO	BUSINESS HWY 2, EAST GRAND FORKS MINNESOTA 56721 (POLK)	East Grand Forks	MN	59,515
AMERICAN CRYSTAL SUGAR CO	AMERICAN CRYSTAL SUGAR CO	HWY 75 S, CROOKSTON MINNESOTA 56716 (POLK)	Crookston	MN	38,471
MICHAEL FOODS INC	MG WALDBAUM	430 RAILROAD AVE, GAYLORD MINNESOTA 55334 (SIBLEY)	Gaylord	MN	34,958
DAIRY FARMERS OF AMERICA INC	DAIRY FARMERS OF AMERICA INC	212 E 1ST ST, WINTHROP MINNESOTA 55396 (SIBLEY)	Winthrop	MN	24,081
AG PROCESSING INC	AG PROCESSING INC A COOPERATIVE	800 DIAGONAL ST, DAWSON MINNESOTA 56232 (LAC QUI PARLE)	Dawson	MN	1,055
AMERICAN CRYSTAL SUGAR CO	AMERICAN CRYSTAL SUGAR CO	2500 N 11TH ST, MOORHEAD MINNESOTA 56560 (CLAY)	Moorhead	MN	408
BONGARDS' CREAMERIES	BONGARDS' CREAMERIES	13200 COUNTY RD 51, NORWOOD MINNESOTA 55368 (CARVER)	Norwood	MN	132
ARCHER DANIELS MIDLAND CO	ADM	400 W ERIE RD, MARSHALL MINNESOTA 56258 (LYON)	Marshall	MN	13

Table A1: Agribusiness Facility Toxic Discharges to Waterways in 2014 (U.S. EPA TRI data), cont'd

Parent	Name	Address	City	State	5.3 Surface Water Discharges
TYSON FOODS INC	TYSON FARMS INC - CARTHAGE MS PROCESSING PLANT	3865 HWY 35N, CARTHAGE MISSISSIPPI 39051 (LEAKE)	Carthage	MS	1,923,808
NA	SOUTHERN HENS INC	329 MOSELLE-SEMINARY RD, MOSELLE MISSISSIPPI 39459 (JONES)	Moselle	MS	976,285
PECO FOODS INC	PECO FOODS INC	HWY 21 S, SEBASTOPOL MISSISSIPPI 39359 (SCOTT)	Sebastopol	MS	795,779
TYSON FOODS INC	TYSON FARMS INC	11634 HWY 80 W, FOREST MISSISSIPPI 39074 (SCOTT)	Forest	MS	482,791
SANDERSON FARMS INC	SANDERSON FARMS INC	4039 RIVER RIDGE RD, SUMMIT MISSISSIPPI 39666 (PIKE)	Summit	MS	257,755
SANDERSON FARMS INC	SANDERSON FARMS INC	1111 N FIR AVE, COLLINS MISSISSIPPI 39428 (COVINGTON)	Collins	MS	192,540
SANDERSON FARMS INC	SANDERSON FARMS INC	28163 HWY 28E, HAZLEHURST MISSISSIPPI 39083 (COPIAH)	Hazlehurst	MS	115,300
NA	SUPERIOR FISH PRODUCTS INC	11751 HWY 45, MACON MISSISSIPPI 39341 (NOXUBEE)	Macon	MS	33,596
NA	FRESHWATER FARMS PRODUCTS LLC	4554 STATE HWY 12 E, BELZONI MISSISSIPPI 39038 (HUMPHREYS)	Belzoni	MS	32,644
NA	SIMMONS FARM RAISED CATFISH I NC	2628 ERICKSON RD, YAZOO CITY MISSISSIPPI 39194 (YAZOO)	Yazoo City	MS	8,910
CONFISH INC	CONFISH INC	S CITY LIMITS RD, ISOLA MISSISSIPPI 38754 (HUMPHREYS)	Isola	MS	3,773
OMEGA PROTEIN INC	OMEGA PROTEIN INC MOSS POINT	5735 ELDER FERRY RD, MOSS POINT MISSISSIPPI 39563 (JACKSON)	Moss Point	MS	417
MAR-JAC POULTRY INC	MAR-JAC POULTRY MS LLC	1301 JAMES ST, HATTIESBURG MISSISSIPPI 39401 (FORREST)	Hattiesburg	MS	250
PECO FOODS INC	PECO FOODS INC	1039 W FULTON ST, CANTON MISSISSIPPI 39046 (MADISON)	Canton	MS	250
NA	PROTEIN PRODUCTS INC	1042 MISSISSIPPI HWY 3, SUNFLOWER MISSISSIPPI 38778 (SUNFLOWER)	Sunflower	MS	102
TYSON FOODS INC	TYSON POULTRY INC - PROCESSING PLANT	19571 WHITFIELD RD, SEDALIA MISSOURI 65301 (PETTIS)	Sedalia	MI	898,632
KYOWA HAKKO BIO	BIOKYOWA INC	5469 NASH RD, CAPE GIRARDEAU MISSOURI 63701 (CAPE GIRARDEAU)	Cape Girardeau	MI	346,000
TYSON FOODS INC	TYSON CHICKEN INC - NOEL COMPLEX	ONE TYSON AVE, NOEL MISSOURI 64854 (MCDONALD)	Noel	MI	321,694
UNITED GLOBAL FOODS US HOLDINGS INC	SMITHFIELD-MILAN	22123 HWY 5, MILAN MISSOURI 63556 (SULLIVAN)	Milan	MI	308,817
SIMMONS FOODS INC	SIMMONS FOODS	10700 S STATE HWY 43, SOUTH WEST CITY MISSOURI 64863 (MCDONALD)	South West City	MI	94,253
GOLDEN TRIANGLE ENERGY LLC	GOLDEN TRIANGLE ENERGY LLC	15053 HWY 111, CRAIG MISSOURI 64437 (HOLT)	Craig	MI	52
WESTERN SUGAR COOPERATIVE	WESTERN SUGAR COOPERATIVE130130	3020 STATE AVE, BILLINGS MONTANA 59101 (YELLOWSTONE)	Billings	MT	3,845
CARGILL INC	CARGILL MEAT SOLUTIONS CORP	590 RD 9, SCHUYLER NEBRASKA 68661 (COLFAX)	Schuyler	NE	4,977,488

Table A1: Agribusiness Facility Toxic Discharges to Waterways in 2014 (U.S. EPA TRI data), cont'd

Parent	Name	Address	City	State	5.3 Surface Water Discharges
TYSON FOODS INC	TYSON FRESH MEATS INC WWTP	1674 C AVE, DAKOTA CITY NEBRASKA 68731 (DAKOTA)	Dakota City	NE	4,426,970
TYSON FOODS INC	TYSON FRESH MEATS INC	1500 S PLUM CREEK PKWY, LEXINGTON NEBRASKA 68850 (DAWSON)	Lexington	NE	1,539,622
UNITED GLOBAL FOODS US HOLDINGS INC	SMITHFIELD FARMLAND CORP-CRETE	2223 COUNTY RD I, CRETE NEBRASKA 68333 (SALINE)	Crete	NE	513,070
WUETHRICH BROTHERS-NEBRASKA LLC	WEST POINT DAIRY PRODUCTS LLC	1715 E RD, WEST POINT NEBRASKA 68788 (CUMING)	West Point	NE	41,669
CARGILL INC	CARGILL CORN MILLING NA	650 INDUSTRIAL PARK DR, BLAIR NEBRASKA 68008 (WASHINGTON)	Blair	NE	33,554
MICHAEL FOODS INC	MG WALDBAUM CO	105 N MAIN ST, WAKEFIELD NEBRASKA 68784 (DIXON)	Wakefield	NE	32,982
NESTLE PURINA PETCARE CO	NESTLE PURINA PETCARE CO	2305 E HWY 33, CRETE NEBRASKA 68333 (SALINE)	Crete	NE	31,887
ARCHER DANIELS MIDLAND CO	ADM CORN PROCESSING-COLUMBUS	3000 E 8TH ST, COLUMBUS NEBRASKA 68601 (PLATTE)	Columbus	NE	8,736
WESTERN SUGAR COOPERATIVE	WESTERN SUGAR COOPERATIVE	2100 E OVERLAND DR, SCOTTSBLUFF NEBRASKA 69361 (SCOTTS BLUFF)	Scottsbluff	NE	7,021
KERRY INC	KERRY INC	158 STATE HWY 320, NORWICH NEW YORK 13815 (CHENANGO)	Norwich	NY	208,471
KRAFT FOODS GROUP INC	KRAFT FOODS GROUP INC	8600 MAIN ST, CAMPBELL NEW YORK 14821 (STEUBEN)	Campbell	NY	110,286
GREAT LAKES CHEESE CO INC	GREAT LAKES CHEESE OF NY INC	23 PHELPS ST, ADAMS NEW YORK 13605 (JEFFERSON)	Adams	NY	67,762
GREAT LAKES CHEESE CO INC	EMPIRE CHEESE	4520 HASKELL RD, CUBA NEW YORK 14727 (ALLEGANY)	Cuba	NY	62,464
HP HOOD LLC	HP HOOD LLC	20700 NYS RT 411, LAFARGEVILLE NEW YORK 13656 (JEFFERSON)	Lafargeville	NY	4,084
SAPUTO CHEESE USA INC	FRIENDSHIP DAIRIES LLC	6701 COUNTY RD 20, FRIENDSHIP NEW YORK 14739 (ALLEGANY)	Friendship	NY	3,669
UNITED GLOBAL FOODS US HOLDINGS INC	SMITHFIELD-TAR HEEL	HWY 87 2 MILES N OF TAR HEEL, TAR HEEL NORTH CAROLINA 28392 (BLADEN)	Tar Heel	NC	3,669,067
PERDUE FARMS INC	LEWISTON PROCESSING PLANT	3539 GOVERNORS RD, LEWISTON WOODVILLE NORTH CAROLINA 27849 (BERTIE)	Lewiston Woodville	NC	2,664,995
CONTINENTAL GRAIN CO	WAYNE FARMS LLC - DOBSON FRESH PLANT	1018 E ATKINS ST, DOBSON NORTH CAROLINA 27017 (SURRY)	Dobson	NC	410,709
TYSON FOODS INC	TYSON FARMS INC	501 SHEFFIELD RD, HARMONY NORTH CAROLINA 28634 (IREDELL)	Harmony	NC	151,310
MILLERCOORS LLC	MILLERCOORS LLC-EDEN BREWERY	863 E MEADOW RD, EDEN NORTH CAROLINA 27288 (ROCKINGHAM)	Eden	NC	1,038
NA	COMMONWEALTH BRANDS INC	301 N SCALES ST, REIDSVILLE NORTH CAROLINA 27320 (ROCKINGHAM)	Reidsville	NC	250
MOUNTAIRE FARMS INC	MOUNTAIRE FARMS INC - LUMBER BRIDGE	17269 NC HWY 71, LUMBER BRIDGE NORTH CAROLINA 28357 (ROBESON)	Lumber Bridge	NC	143
NA	MINN-DAK FARMERS COOPERATIVE	7525 RED RIVER RD, WAHPETON NORTH DAKOTA 58075 (RICHLAND)	Wahpeton	ND	117,845
CARGILL INC	CARGILL INC WET CORN MILLING - WAHPETON	18049 COUNTY RD 8 E, WAHPETON NORTH DAKOTA 58075 (RICHLAND)	Wahpeton	ND	73,154

Table A1: Agribusiness Facility Toxic Discharges to Waterways in 2014 (U.S. EPA TRI data), cont'd

Parent	Name	Address	City	State	5.3 Surface Water Discharges
AMERICAN CRYSTAL SUGAR CO	AMERICAN CRYSTAL SUGAR CO	8152 OLD HWY 44 N, DRAYTON NORTH DAKOTA 58225 (PEMBINA)	Drayton	ND	6,440
AMERICAN CRYSTAL SUGAR CO	AMERICAN CRYSTAL SUGAR CO	121 HWY 81 NE, HILLSBORO NORTH DAKOTA 58045 (TRAILL)	Hillsboro	ND	225
CAMPBELL SOUP CO	CAMPBELL SOUP SUPPLY CO LLC	12-773 STATE RT 110, NAPOLEON OHIO 43545 (HENRY)	Napoleon	OH	32,340
ROTHENBUHLER CHEESEMAKERS INC	MIDDLEFIELD CHEESE	15815 NAUVOO RD, MIDDLEFIELD OHIO 44062 (GEAUGA)	Middlefield	OH	13,611
GENERAL MILLS INC	GENERAL MILLS INC	2403 S PENNSYLVANIA AVE, WELLSTON OHIO 45692 (JACKSON)	Wellston	OH	250
CARGILL INC	PROVIMI NA INC	6531 STATE RT 503, LEWISBURG OHIO 45338 (PREBLE)	Lewisburg	OH	1
E I DU PONT DE NEMOURS & CO	PRYOR SOLAE	5532 HUNT ST, PRYOR OKLAHOMA 74361 (MAYES)	Pryor	OK	1,279,941
TYSON FOODS INC	TYSON POULTRY INC-BROKEN BOW PROCESSING PLANT	HWY 70 S, BROKEN BOW OKLAHOMA 74728 (MCCURTAIN)	Broken Bow	OK	1,218,685
J M HUBER CORP	CP KELCO	1200 W 20TH ST, OKMULGEE OKLAHOMA 74447 (OKMULGEE)	Okmulgee	OK	15,167
H J HEINZ CO	H J HEINZ CO L P HEINZ FROZEN FOOD CO DIV	175 NE 6TH AVE, ONTARIO OREGON 97914 (MALHEUR)	Ontario	OR	158,095
JBS USA LLC	JBS SOUDERTON INC - RENDERING DIV	741 SOUDER RD, SOUDERTON PENNSYLVANIA 18964 (MONTGOMERY)	Souderton	PA	519,668
NA	FARMER'S PRIDE INC	154 W MAIN ST, FREDERICKSBURG PENNSYLVANIA 17026 (LEBANON)	Fredericksburg	PA	452,202
DAIRY FARMERS OF AMERICA INC	DAIRY FARMERS OF AMERICA INC	925 STATE RT 18, NEW WILMINGTON PENNSYLVANIA 16142 (LAWRENCE)	New Wilmington	PA	287,815
TYSON FOODS INC	TYSON POULTRY INC-NEW HOLLAND COMPLEX	403 S C US TER AVE, NEW HOLLAND PENNSYLVANIA 17557 (LANCASTER)	New Holland	PA	266,189
SECHLER FAMILY FOODS	KEYSTONE PROTEIN CO	568 CHESTNUT HILL RD, FREDERICKSBURG PENNSYLVANIA 17026 (LEBANON)	Fredericksburg	PA	126,940
PERDUE FARMS INC	FREDERICKSBURG BC NATURAL CHICKEN	2609 RT 22, FREDERICKSBURG PENNSYLVANIA 17026 (LEBANON)	Fredericksburg	PA	39,000
NESTLE PURINA PETCARE CO	NESTLE PURINA PETCARE CO	2050 POPE RD, ALLENTOWN PENNSYLVANIA 18104 (LEHIGH)	Allentown	PA	28,811
MICHAEL FOODS INC	PAPETTI'S HYGRADE EGG PRODUCTS INC	68 SPAIN RD, KLINGERSTOWN PENNSYLVANIA 17941 (SCHUYLKILL)	Klingerstown	PA	21,856
LAND O LAKES INC	LAND O'LAKES - CARLISLE	405 PARK DR, CARLISLE PENNSYLVANIA 17013 (CUMBERLAND)	Carlisle	PA	5,929
NA	EMPIRE KOSHER POULTRY INC	247 EMPIRE DR, MIFFLINTOWN PENNSYLVANIA 17059 (JUNIATA)	Mifflintown	PA	5,000
DR PEPPER SNAPPLE GROUP	MOTTS LLP	45 ASPERS N RD RD, ASPERS PENNSYLVANIA 17304 (ADAMS)	Aspers	PA	464
DAIRY FARMERS OF AMERICA INC	DAIRY FARMERS OF AMERICA	72 MILK PLANT RD, MIDDLEBURY CENTER PENNSYLVANIA 16935 (TIOGA)	Middlebury Center	PA	153
VALLEY PROTEINS INC	VALLEY PROTEINS INC - TERRE HILL FACILITY	693 WIDE HOLLOW RD, EAST EARL PENNSYLVANIA 17519 (LANCASTER)	East Earl	PA	46

Table A1: Agribusiness Facility Toxic Discharges to Waterways in 2014 (U.S. EPA TRI data), cont'd

Parent	Name	Address	City	State	5.3 Surface Water Discharges
DEVRO INC	DEVRO INC	785 OLD SWAMP RD, SWANSEA SOUTH CAROLINA 29160 (CALHOUN)	Swansea	SC	123,970
PILGRIMS PRIDE CORP	PILGRIM'S PRIDE PROCESSING PLANT	2050 HWY 15 S, SUMTER SOUTH CAROLINA 29150 (SUMTER)	Sumter	SC	85,751
KRAFT FOODS GROUP INC	KRAFT FOODS GROUP INC	3704 LOUIS RICH DR, NEWBERRY SOUTH CAROLINA 29108 (NEWBERRY)	Newberry	SC	365
UNITED GLOBAL FOODS US HOLDINGS INC	JOHN MORRELL & CO	1400 N WEBER AVE, SIOUX FALLS SOUTH DAKOTA 57117 (MINNEHAHA)	Sioux Falls	SD	2,718,677
NA	VALLEY QUEEN CHEESE FACTORY INC	200 E RAILWAY AVE, MILBANK SOUTH DAKOTA 57252 (GRANT)	Milbank	SD	40,050
TYSON FOODS INC	TYSON FARMS INC-PROCESSING	901 W JACKSON ST, SHELBYVILLE TENNESSEE 37160 (BEDFORD)	Shelbyville	TN	206,084
TYSON FOODS INC	TYSON FARMS INC - UNION CITY PROCESSING	2800 E TYSON DR, UNION CITY TENNESSEE 38261 (OBION)	Union City	TN	197,862
TATE & LYLE INGREDIENTS AMERICAS LLC	TATE & LYLE LOUDON	198 BLAIR BEND DR, LOUDON TENNESSEE 37774 (LOUDON)	Loudon	TN	235
PILGRIMS PRIDE CORP	PILGRIM'S PRIDE CORP MT PLEASANT COMPLEX	MONTICELLO RD & PILGRIM AVE, MOUNT PLEASANT TEXAS 75455 (TITUS)	Mount Pleasant	TX	2,766,086
TYSON FOODS INC	TYSON FOODS INC-CENTER TX P ROCESSING	1019 SHELBYVILLE ST, CENTER TEXAS 75935 (SHELBY)	Center	TX	615,811
SANDERSON FARMS INC	SANDERSON FARMS INC	2000 SHILOH DR, BRYAN TEXAS 77803 (BRAZOS)	Bryan	TX	257,000
SANDERSON FARMS INC	SANDERSON FARMS INC	301 AVIATION PKWY, WACO TEXAS 76705 (MCLENNAN)	Waco	TX	36,175
PERRIGO CO	PERRIGO NUTRITIONALS	147 INDUSTRIAL PARK RD, GEORGIA VERMONT 05468 (FRANKLIN)	Georgia	VT	615
PERDUE FARMS INC	PERDUE FARMS ACCOMAC PROCESSING PLANT	22520 LANKFORD HWY, ACCOMAC VIRGINIA 23301 (ACCOMACK)	Accomac	VA	1,266,025
NA	NEW MARKET POULTRY LLC	145 OLD E CROSS RD, NEW MARKET VIRGINIA 22844 (SHENANDOAH)	New Market	VA	81,900
TYSON FOODS INC	TYSON FARMS INC - PROCESSING FACILITY	13264 MOUNTAIN RD, GLEN ALLEN VIRGINIA 23059 (HANOVER)	Glen Allen	VA	58,478
VIRGINIA POULTRY GROWERS COOPERATIVE INC	VPGC LLC HINTON FACILITY	6349 RAWLEY PIKE HWY 33 WE, HINTON VIRGINIA 22831 (ROCKINGHAM)	Hinton	VA	58,054
TYSON FOODS INC	TYSON FARMS INC-TEMPERANCEVILLE	11224 LANKFORD HWY, TEMPERANCEVILLE VIRGINIA 23442 (ACCOMACK)	Temperanceville	VA	44,066
GEORGE'S INC	GEORGE'S CHICKEN LLC	19992 SENEDO RD, EDINBURG VIRGINIA 22824 (SHENANDOAH)	Edinburg	VA	41,142
NORTHWEST DAIRY ASSOC	DARIGOLD - CHEHALIS	67 SW CHEHALIS AVE, CHEHALIS WASHINGTON 98532 (LEWIS)	Chehalis	WA	31,321
MCCAIN FOODS USA INC	MCCAIN FOODS USA INC	10973 HWY 54 E, WISCONSIN RAPIDS WISCONSIN 54494 (PORTAGE)	Wisconsin Rapids	WI	1,258,939
GRASSLAND DAIRY PRODUCTS INC	GRASSLAND DAIRY PRODUCTS INC	N8790 FAIRGROUND AVE, GREENWOOD WISCONSIN 54437 (CLARK)	Greenwood	WI	976,000
NA	LYNN DAIRY/LYNN PROTEINS	W 1929 US HWY 10, GRANTON WISCONSIN 54436 (CLARK)	Granton	WI	245,186

Table A1: Agribusiness Facility Toxic Discharges to Waterways in 2014 (U.S. EPA TRI data), cont'd

Parent	Name	Address	City	State	5.3 Surface Water Discharges
NA	ELLSWORTH COOPERATIVE CREAMERY	232 N WALLACE ST, ELLSWORTH WISCONSIN 54011 (PIERCE)	Ellsworth	WI	84,315
SAPUTO ACQUISITION INC	SAPUTO CHEESE USA INC	N3545 COUNTY EE, WAUPUN WISCONSIN 53963 (FOND DU LAC)	Waupun	WI	49,334
MILK SPECIALTIES GLOBAL	MILK SPECIALTIES CO DBA MILK SPECIALTIES GLOBAL-ADELL	627 MAINE AVE, ADELL WISCONSIN 53001 (SHEBOYGAN)	Adell	WI	33,343
NA	PACKERLAND WHEY PRODUCTS INC	407 FOURTH ST, LUXEMBURG WISCONSIN 54217 (KEWAUNEE)	Luxemburg	WI	24,007
TYSON FOODS INC	HILLSHIRE BRANDS CO NEW LONDON PLANT	N3620 COUNTY RD D, NEW LONDON WISCONSIN 54961 (OUTAGAMIE)	New London	WI	21,236
LACTALIS AMERICAN CO INC	LACTALIS AMERICAN GROUP INC	218 PARK ST, BELMONT WISCONSIN 53510 (LAFAYETTE)	Belmont	WI	13,940
FOREMOST FARMS USA COOPERATIVE	FOREMOST FARMS USA	W3286 COUNTY F, CHILTON WISCONSIN 53014 (CALUMET)	Chilton	WI	4,221
FOREMOST FARMS USA COOPERATIVE	FOREMOST FARMS USA	932 N MADISON ST, LANCASTER WISCONSIN 53813 (GRANT)	Lancaster	WI	1,508
SAPUTO ACQUISITION INC	SAPUTO CHEESE USA INC	317 ROSERA ST, LENA WISCONSIN 54139 (OCONTO)	Lena	WI	1,412
FOREMOST FARMS USA COOPERATIVE	FOREMOST FARMS USA	2541 FOREMOST RD, PLOVER WISCONSIN 54467 (PORTAGE)	Plover	WI	1,024
FOREMOST FARMS USA COOPERATIVE	FOREMOST FARMS USA	10202 FOREMOST DR, ROTHSCHILD WISCONSIN 54474 (MARATHON)	Rothschild	WI	228
BELGIOIOSO CHEESE INC	BELGIOIOSO SHERWOOD	N8495 HWY 55, MENASHA WISCONSIN 54952 (CALUMET)	Menasha	WI	104
SCHREIBER FOODS INC	SCHREIBER FOODS	807 PLEASANT VALLEY RD, WEST BEND WISCONSIN 53095 (WASHINGTON)	West Bend	WI	103
SANIMAX USA LLC	SANIMAX USA LLC	2099 BADGERLAND DR, GREEN BAY WISCONSIN 54303 (BROWN)	Green Bay	WI	65
GRANDE CHEESE CO	GRANDE CUSTOM INGREDIENTS	N2689 COUNTY RD S, JUDA WISCONSIN 53550 (GREEN)	Juda	WI	5
WESTERN SUGAR COOPERATIVE	WESTERN SUGAR COOPERATIVE LOVELL FACTORY	400 GREAT WESTERN AVE, LOVELL WYOMING 82431 (BIG HORN)	Lovell	WY	4,586

Table A2: 50 Agribusiness Facilities with Highest Volume of Discharges to Waterways in 2014

Parent	Name	Address	City	State	5.3 Surface Water Discharges	Rank
CARGILL INC	CARGILL MEAT SOLUTIONS CORP	590 RD 9, SCHUYLER NEBRASKA 68661 (COLFAX)	Schuyler	NE	4,977,488	1
TYSON FOODS INC	TYSON FRESH MEATS INC WWTP	1674 C AVE, DAKOTA CITY NEBRASKA 68731 (DAKOTA)	Dakota City	NE	4,426,970	2
UNITED GLOBAL FOODS US HOLDINGS INC	SMITHFIELD-TAR HEEL	HWY 87 2 MILES N OF TAR HEEL, TAR HEEL NORTH CAROLINA 28392 (BLADEN)	Tar Heel	NC	3,669,067	3
PILGRIMS PRIDE CORP	PILGRIM'S PRIDE CORP MT PLEASANT COMPLEX	MONTICELLO RD & PILGRIM AVE, MOUNT PLEASANT TEXAS 75455 (TITUS)	Mount Pleasant	TX	2,766,086	4
UNITED GLOBAL FOODS US HOLDINGS INC	JOHN MORRELL & CO	1400 N WEBER AVE, SIOUX FALLS SOUTH DAKOTA 57117 (MINNEHAHA)	Sioux Falls	SD	2,718,677	5
PERDUE FARMS INC	LEWISTON PROCESSING PLANT	3539 GOVERNORS RD, LEWISTON WOODVILLE NORTH CAROLINA 27849 (BERTIE)	Lewiston Woodville	NC	2,664,995	6
MCCAIN FOODS USA INC	MCCAIN FOODS USA INC	218 W HWY 30, BURLEY IDAHO 83318 (CASSIA)	Burley	ID	2,616,276	7
TYSON FOODS INC	TYSON FRESH MEATS INC - JOSLIN IL	HWY 92 & I-88 28424 38TH AVE N, HILLSDALE ILLINOIS 61257 (ROCK ISLAND)	Hillsdale	IL	2,065,975	8
MCCAIN FOODS USA INC	MCCAIN FOODS USA INC	319 RICHARDSON RD, EASTON MAINE 04740 (AROOSTOOK)	Easton	ME	2,024,987	9
TYSON FOODS INC	TYSON FARMS INC - CARTHAGE MS PROCESSING PLANT	3865 HWY 35N, CARTHAGE MISSISSIPPI 39051 (LEAKE)	Carthage	MS	1,923,808	10
TYSON FOODS INC	TYSON FRESH MEATS INC	16198 HWY 70 N, COLUMBUS JUNCTION IOWA 52738 (LOUISA)	Columbus Junction	IA	1,811,690	11
TYSON FOODS INC	TYSON FRESH MEATS INC	1500 S PLUM CREEK PKWY, LEXINGTON NEBRASKA 68850 (DAWSON)	Lexington	NE	1,539,622	13
JBS USA LLC	JBS PLAINWELL	11 11TH ST, PLAINWELL MICHIGAN 49080 (ALLEGAN)	Plainwell	MI	1,478,758	14
CARGILL INC	CARGILL MEAT SOLUTIONS CORP	8295 ARENZVILLE RD, BEARDSTOWN ILLINOIS 62618 (CASS)	Beardstown	IL	1,361,993	15
E I DU PONT DE NEMOURS & CO	PRYOR SOLAE	5532 HUNT ST, PRYOR OKLAHOMA 74361 (MAYES)	Pryor	OK	1,279,941	16
PERDUE FARMS INC	PERDUE FARMS ACCOMAC PROCESSING PLANT	22520 LANKFORD HWY, ACCOMAC VIRGINIA 23301 (ACCOMACK)	Accomac	VA	1,266,025	17
MCCAIN FOODS USA INC	MCCAIN FOODS USA INC	10973 HWY 54 E, WISCONSIN RAPIDS WISCONSIN 54494 (PORTAGE)	Wisconsin Rapids	WI	1,258,939	18
TYSON FOODS INC	TYSON POULTRY INC- BROKEN BOW PROCESSING PLANT	HWY 70 S, BROKEN BOW OKLAHOMA 74728 (MCCURTAIN)	Broken Bow	OK	1,218,685	19
TYSON FOODS INC	TYSON FARMS INC - BLOUNTSVILLE PROCESSING PLANT	67240 MAIN ST, BLOUNTSVILLE ALABAMA 35031 (BLOUNT)	Blountsville	AL	1,183,681	20
SUN CAPITAL PARTNERS INC	CREEKSTONE FARMS PREMIUM BEEF LLC	604 GOFF IND US TRIAL PARK RD, ARKANSAS CITY KANSAS 67005 (COWLEY)	Arkansas City	KS	1,117,008	21
CONTINENTAL GRAIN CO	WAYNE FARMS LLC - ENTERPRISE FRESH PLANT	1020 COUNTY RD 114, JACK ALABAMA 36346 (COFFEE)	Jack	AL	1,050,292	22

Table A2: 50 Agribusiness Facilities with Highest Volume of Discharges to Waterways in 2014 (cont'd)

Parent	Name	Address	City	State	5.3 Surface Water Discharges	Rank
NA	SOUTHERN HENS INC	329 MOSELLE-SEMINARY RD, MOSELLE MISSISSIPPI 39459 (JONES)	Moselle	MS	976,285	23
GRASSLAND DAIRY PRODUCTS INC	GRASSLAND DAIRY PRODUCTS INC	N8790 FAIRGROUND AVE, GREENWOOD WISCONSIN 54437 (CLARK)	Greenwood	WI	976,000	24
CARGILL INC	CARGILL MEAT SOLUTIONS CORP	1505 E BURLINGTON AVE, FORT MORGAN COLORADO 80701 (MORGAN)	Fort Morgan	CO	948,902	25
TYSON FOODS INC	TYSON CHICKEN INC - HOPE PROCESSING PLANT	275 COUNTY RD 278, HOPE ARKANSAS 71801 (HEMPSTEAD)	Hope	AK	901,899	26
TYSON FOODS INC	TYSON POULTRY INC - PROCESSING PLANT	19571 WHITFIELD RD, SEDALIA MISSOURI 65301 (PETTIS)	Sedalia	MI	898,632	27
TYSON FOODS INC	TYSON FARMS INC	250 TYSON RD, BUENA VISTA GEORGIA 31803 (MARION)	Buena Vista	GA	834,389	28
PILGRIMS PRIDE CORP	PILGRIM'S PRIDE CORP NATCHITOCHES PROCESSING PLANT	7088 HWY S BY PASS, NATCHITOCHES LOUISIANA 71457 (NATCHITOCHES)	Natchitoches	LA	808,854	29
PECO FOODS INC	PECO FOODS INC	HWY 21 S, SEBASTOPOL MISSISSIPPI 39359 (SCOTT)	Sebastopol	MS	795,779	30
KOCH FOODS	JCG FOODS OF ALABAMA LLC	764 GEORGE CAGLE DR, COLLINSVILLE ALABAMA 35961 (DEKALB)	Collinsville	AL	754,448	31
TYSON FOODS INC	TYSON POULTRY INC - NASHVILLE PROCESSING PLANT	100 E CASSADY ST, NASHVILLE ARKANSAS 71852 (HOWARD)	Nashville	AK	679,239	32
CARGILL INC	CARGILL MEAT SOLUTIONS CORP	600 S IOWA AVE, OTTUMWA IOWA 52501 (WAPELLO)	Ottumwa	IA	655,953	33
KOCH FOODS	KOCH FOODS OF PINE MOUNTAIN VALLEY	14075 HWY 116, PINE MOUNTAIN VALLEY GEORGIA 31823 (HARRIS)	Pine Mountain Valley	GA	639,561	34
KOCH FOODS	KOCH FOODS OF GADSDEN	501 PADEN RD, GADSDEN ALABAMA 35903 (ETOWAH)	Gadsden	AL	631,768	35
TYSON FOODS INC	TYSON FOODS INC-CENTER TX P ROCESSING	1019 SHELBYVILLE ST, CENTER TEXAS 75935 (SHELBY)	Center	TX	615,811	36
PERDUE FARMS INC	PERDUE FARMS INC PERRY PROCESSING PLANT	250 GEORGIA HWY 247 SPUR, PERRY GEORGIA 31069 (HOUSTON)	Perry	GA	595,788	37
PILGRIMS PRIDE CORP	PILGRIM'S PRIDE PROCESSING PLANT	4693 COUNTY RD 636, ENTERPRISE ALABAMA 36330 (COFFEE)	Enterprise	AL	581,953	38
JBS USA LLC	JBS SOUDERTON INC - RENDERING DIV	741 SOUDER RD, SOUDERTON PENNSYLVANIA 18964 (MONTGOMERY)	Souderton	PA	519,668	39
UNITED GLOBAL FOODS US HOLDINGS INC	SMITHFIELD FARMLAND CORP-CRETE	2223 COUNTY RD I, CRETE NEBRASKA 68333 (SALINE)	Crete	NE	513,070	40
TYSON FOODS INC	TYSON FARMS INC	11634 HWY 80 W, FOREST MISSISSIPPI 39074 (SCOTT)	Forest	MS	482,791	41
NA	FARMER'S PRIDE INC	154 W MAIN ST, FREDERICKSBURG PENNSYLVANIA 17026 (LEBANON)	Fredericksburg	PA	452,202	42
CONTINENTAL GRAIN CO	WAYNE FARMS LLC - DOBSON FRESH PLANT	1018 E ATKINS ST, DOBSON NORTH CAROLINA 27017 (SURRY)	Dobson	NC	410,709	43

Table A2: 50 Agribusiness Facilities with Highest Volume of Discharges to Waterways in 2014 (cont'd)

Parent	Name	Address	City	State	5.3 Surface Water Discharges	Rank
PILGRIMS PRIDE CORP	PILGRIM'S PRIDE PROCESSING PLANT	19740 US HWY 90, LIVE OAK FLORIDA 32060 (SUWANNEE)	Live Oak	FL	379,641	44
NA	AGRI STAR MEAT & POULTRY LLC	220 W ST, POSTVILLE IOWA 52162 (ALLAMAKEE)	Postville	IA	363,770	45
OK INDUSTRIES INC	OK FOODS INC	4201 REED LN, FORT SMITH ARKANSAS 72904 (SEBASTIAN)	Fort Smith	AK	358,660	46
AMERICAN PROTEINS INC	AMERICAN PROTEINS INC/ HANCEV ILLE DIV	1170 COUNTY RD 508, HANCEVILLE ALABAMA 35077 (CULLMAN)	Hanceville	AL	348,071	47
KYOWA HAKKO BIO	BIOKYOWA INC	5469 NASH RD, CAPE GIRARDEAU MISSOURI 63701 (CAPE GIRARDEAU)	Cape Girardeau	MI	346,000	48
TYSON FOODS INC	TYSON CHICKEN INC - NOEL COMPLEX	ONE TYSON AVE, NOEL MISSOURI 64854 (MCDONALD)	Noel	MI	321,694	49
UNITED GLOBAL FOODS US HOLDINGS INC	SMITHFIELD-MILAN	22123 HWY 5, MILAN MISSOURI 63556 (SULLIVAN)	Milan	MI	308,817	50

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