HYDRAULIC FRACTURING AND OUR FOOD SYSTEM: EMERGING ISSUES RELATED TO RECYCLING WASTEWATER FOR AGRICULTURAL PURPOSES

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I. INTRODUCTION

Development of mineral resources, energy production, and the need for water for human consumption are all intimately connected in a relationship called the "water-energy nexus."[1] The United States has recently experienced enormous growth in oil

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1. U.S. DEP'T OF ENERGY, DOE/EPSA-0002, THE WATER-ENERGY NEXUS: CHALLENGES AND OPPORTUNITIES 1 (June 2014), http://www.energy.gov/sites/prod/files/2014/07/f17/Water%20Energy%20Nexus%20Full%20Report%20July%202014.pdf ("Water plays a critical role in the generation of electricity and the production of fuels; energy is required to treat and distribute water.").

and gas production over the past decade,[2] tracking the increase in "unconventional" well development through the process of hydraulic fracturing or "fracking."[3] At the same time, many regions of the United States, including oil- and gas-producing regions, have experienced severe to record-breaking drought.[4] The dread of water scarcity is intensified when oil- and gas-producing regions are home to a water-dependent agricultural industry.[5] Wasteful management of water, fuel, and energy will likely strain the interconnected systems dependent upon these resources if we fail to adopt sustainable practices.

Concerns about the diversion of water resources for oil and gas development are well-founded. Legal scholars[6] have already addressed in depth the energy-water nexus, including the enormous need for water to facilitate the hydraulic fracturing process[7] and

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2. *See* Edward McAllister, *Shale Drilling Boosted U.S. Oil and Gas Reserves in 2014: EIA*, REUTERS (Nov. 23, 2014, 3:41 PM), http://www.reuters.com/article/us-usa-energy-reserves-idUSKBN0TC2BJ20151123; *see also* U.S. ENERGY INFO. ADMIN., ANN. ENERGY REV. 179 (2011), http://www.eia.gov/totalenergy/data/annual/pdf/sec6_5.pdf (table showing U.S. natural gas usage for selected years between 1949 and 2011), *and* U.S. ENERGY INFO. ADMIN., MONTHLY ENERGY REV. 49 (Oct. 2016), http://www.eia.gov/totalenergy/data/monthly/pdf/sec3_3.pdf (table showing monthly U.S. petroleum usage between Jan. 2014 and Sept. 2016, as well as yearly usage from selected years prior).

3. Sorell E. Negro, *The Thirst of Fracking: Regulating to Protect the Linchpin of the Natural Gas Boom*, 77 ALB. L. REV. 725, 725 (2014) ("The natural gas boom was ignited by the development of high-volume hydraulic fracturing (fracking) with horizontal drilling, which has enabled oil and gas companies to extract oil and gas from a significantly larger underground area through a single well.").

4. MONIKA FREYMAN, CERES, HYDRAULIC FRACTURING & WATER STRESS: WATER DEMAND BY THE NUMBERS 6 (Feb. 2014), https://www.ceres.org/resources/reports/hydraulic-fracturing-water-stress-water-demand-by-the-numbers ("Nearly half of the wells hydraulically fractured since 2011 were in regions with high or extremely high water stress, and over 55 percent were in areas experiencing drought."). In Texas, for example, drilling in Eagle Ford Shale requires 125,000 gallons of water per well and hydraulic fracturing requires between 2 million and 13.7 million gallons per well. GUANYU MA, MENGISTU GEZA, & PEI XU, REVIEW OF FLOWBACK AND PRODUCED WATER MANAGEMENT, TREATMENT AND BENEFICIAL USE FOR MAJOR SHALE GAS DEVELOPMENT BASINS 9 (2014), http://www.rpsea.org/media/files/project/8377f7ac/11122-53-PA-Review_Flowback_PWM_Treatment_Beneficial_Use_Major_Shale_Gas_Development_Basins-Ma-01-10-14.pdf. However, "[d]uring the 2011 drought, many operators in Eagle Ford Shale were forced to buy water from farmers, irrigation districts, and municipalities . . . [a]nd with the startup of Eagle Ford Shale, water shortage in Texas is very likely to occur." *Id.* at 9 (internal citations and quotation marks omitted).

5. FREYMAN, *supra* note 4, at 59-60 ("[B]etween groundwater concerns and[California's] recently declared 'drought emergency,' any expansion of water use for hydraulic fracturing in this region will likely spark strong public concern that could jeopardize the industry's social license to operate.").

6. *See generally* Hannah J. Wiseman, *Risk and Response in Fracturing Policy*, 84 U. COLO. L. REV. 729 (2013); *see also* Negro, *supra* note 3, at 725.

7. Negro, *supra* note 3, at 725 ("The fracking process . . . requires huge amounts of water, in essence trading one resource for another."); Kate Galbraith, *As Fracking Increases, So Do Fears About Water Supply*, N.Y. TIMES (Mar. 7, 2013), http://www.nytimes.com/2013/03/08/us/as-fracking-in-texas-increases-so-do-water-supply-fears.html ("In 2011, Texas used a greater number of barrels of water for oil and natural gas fracking (about 632 million) than the number of barrels of oil it produced (about 441 million), according to figures from . . . the

the risks associated with contamination resulting from drilling, hydraulic fracturing, and the disposal of wastes.[8] Nevertheless, analysis is lacking with respect to available legal strategies to regulate the practice of recycling treated wastewater for irrigation purposes, and any need for tighter regulations on this alternative. The option to recycle wastewater presents an attractive solution in mitigating the impacts of drought and increased pressure on the allocation of limited water resources. However, determining the appropriate level of proposed regulation will likely proceed as a balancing act between industry and consumer interests, because the degree of risk associated with recycling wastewater for agricultural irrigation has not been well studied.

Equally germane to this analysis of recycling wastewater from hydraulic fracturing operations is whether, and to what extent, consumers should be informed of the use of that wastewater as a production method in their food system. One method of informing consumers is through mandated disclosures on food labels; however, different legal implications arise from the government's interests in requiring labeling when that decision is challenged in court. Under a First Amendment challenge, a government interest in satisfying consumer curiosity or the "right to know" what food is or how it is made might not withstand review compared to a government interest in *adopting* the public's concerns about a certain product or production method.[9] Additionally, government food labeling requirements operate under a set of assumptions that may not always be correct.[10] Aside from the question of whether a warning or disclosure label could withstand judicial review is the broader issue concerning the efficacy of food labels in general.

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state's oil and gas regulator."). *See also* FREYMAN, *supra* note 4, at 6 ("In Colorado and California, 97 and 96 percent of [hydraulically fractured wells], respectively, were in regions with high or extremely high water stress.").

8. *See generally* OHIO ENVTL. PROT. AGENCY, DRILLING FOR NATURAL GAS IN THE MARCELLUS AND UTICA SHALES: ENVIRONMENTAL REGULATORY BASICS 1, 3 (Jan. 2014), http://www.epa.ohio.gov/portals/0/general%20pdfs/generalshale711.pdf ("Flowback water picks up minerals from the shale formation . . . [and] may contain low levels of naturally occurring radioactive elements such as radium. It also contains high concentrations of total dissolved solids (TDS) . . . [which] can impair water quality and kill aquatic life" if TDS levels are elevated in streams, rivers or lakes.).

9. *See* Int'l Dairy Foods Ass'n v. Amestoy, 92 F.3d 67, 73 n.1 (2d Cir. 1996).

10. Mandated food labeling assumes that (1) the required disclosure contains "good" information, (2) the consumer will benefit from this information in some way, and (3) the consumer will adjust his or her behavior accordingly in a way that benefits the consumer. For a summary of recent studies critical of information disclosure as a regulatory strategy, see Diana R. H. Winters, *The Magical Thinking of Food Labeling: The NLEA as a Failed Statute*, 89 TUL. L. REV. 815, 843-846 (2015). For a comparative analysis of federal policies combatting obesity and tobacco use through disclosure and labeling, *see* Josef Weimholt, *"Bringing a Butter Knife to a Gun Fight"? Salience, Disclosure, and FDA's Differing Approaches to the Tobacco Use and Obesity Epidemics*, 70 FOOD & DRUG L.J. 501 (2015).

Building on a California state assemblyman's recent proposal to label food products irrigated with treated wastewater from hydraulically fractured wells,[11] this Note urges that the time is ripe to address potential risks arising from putting this wastewater back into our food system and the need to inform consumers of those risks. This Note will analyze the current regulatory framework for disposal and recycling of flowback[12] and produced water,[13] first by outlining the process of hydraulic fracturing in Section II. This section also summarizes current options for handling wastewaters produced from hydraulically fractured wells. Next, Section III will review federal laws that apply to the disposal and recycling of wastewater, as well as relevant federal laws regulating production methods and food labeling. This section will highlight certain gaps in the federal regulatory system with respect to the practice of recycling wastewater for agricultural irrigation. Part IV follows with a comparative analysis of state regulatory law and proposals addressing recycling wastewater for agricultural irrigation, looking primarily to recent developments in Texas, Oklahoma, and California.

The focus of Section IV will center on California's proposed bill to label food irrigated with recycled wastewater in order to inform consumers of potential risks associated with contamination. While the proposed food labeling bill subsequently died in the California legislature in March 2016,[14] the policy provides a useful example of government action aimed at preventing harm to consumers. However, the efficacy of such proposed labeling requirements, as well as potential challenges to these requirements, necessitates analysis.

Section V will investigate the value of food labeling laws in general. Additionally, Section V will determine the strength of food labeling laws, like California's proposed measure, to withstand legal challenges under the First Amendment. This section will apply relevant case law addressing challenges to food labeling laws primarily concerned with genetically modified food products to potential laws addressing disclosure of agricultural irrigation with recycled wastewater. Ultimately, Section V concludes that this type

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11. *Mike Gatto Proposes Bill to Label Food Irrigated with Contaminated Fracking Water*, CAL. ST. ASSEMB. DEMOCRATIC CAUCUS (Aug. 17, 2015, 3:07 PM), http://asmdc.org/members/a43/news-room/press-releases/mike-gatto-proposes-bill-to-label-food-irrigated-with-contaminated-fracking-water [hereinafter Gatto].

12. *The Hydraulic Fracturing Water Cycle*, U.S. ENVTL. PROT. AGENCY, http://www.epa.gov/hfstudy/hydraulic-fracturing-water-cycle (last visited Nov. 27, 2016).

13. *Id.*

14. *Bill History AB-14 Food Labeling: Wastewater from Oil and Gas Field Activities*, CAL. LEGIS. INFO., http://leginfo.legislature.ca.gov/faces/billHistoryClient.xhtml?bill_id=201520162AB14 (last visited Nov. 27, 2016) [hereinafter *AB-14 Bill History*].

of mandatory labeling law would likely violate the First Amendment; however, a voluntary labeling system likely would not run afoul of the First Amendment the same way mandatory requirements would.

Finally, this Note concludes that food-labeling measures, like California's proposed bill, offer valuable starting points to begin addressing heightened protection of public health and the environment in light of the practice of recycling wastewater for irrigation and its associated and unknown risks. A hypothetical mandatory state food labeling law probably will not withstand First Amendment scrutiny and is potentially preempted by federal food labeling regulations; however, voluntary labeling that discloses the use or non-use of recycled wastewater presents a creative alternative for food manufacturers. Food labeling should not be the primary method of attempting to minimize any risks caused from recycling hydraulic fracturing wastewater. Nonetheless, I am optimistic that further study of water treatment technologies, potential contamination risks, and increased consumer access to information will allow for recycled wastewater to become a resourceful solution that helps to mitigate the impacts of drought in water-stressed agricultural regions.

II. WASTES PRODUCED BY HYDRAULICALLY FRACTURED WELLS

The process of hydraulic fracturing involves a number of steps ultimately resulting in the production of minerals and large volumes of wastewater.[15] Oil and natural gas wells are drilled vertically thousands of feet below the surface and sometimes horizontally, extending thousands of feet through the source rock formation.[16] Once the well is drilled, the source rock is fractured when large quantities of water are pumped at high pressure into the wellbore and out of perforations at the bottom of the well casing.[17] The water pumped into the well usually contains a unique mixture of chemicals, which serves various specific purposes,[18] along with additives like sand or ceramic pellets, called "proppants," which help prop up the fractures in the rock.[19]

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15. *The Process of Hydraulic Fracturing*, U.S. ENVTL. PROT. AGENCY, https://www.epa.gov/hydraulicfracturing/process-hydraulic-fracturing (last visited Nov. 2, 2016).

16. *Id.*

17. *Id.*

18. *See* U.S. ENVTL. PROT. AGENCY, EPA/601/R-14/003, ANALYSIS OF HYDRAULIC FRACTURING FLUID: DATA FROM THE FRACFOCUS CHEMICAL DISCLOSURE REGISTRY 1.0 39-42 (Mar. 2015), https://www.epa.gov/sites/production/files/2015-03/documents/fracfocus_analysis_report_and_appendices_final_032015_508_0.pdf.

19. *See The Hydraulic Fracturing Water Cycle*, *supra* note 12.

Once the source rock is fractured and the process is completed, oil and gas escape up through the wellbore; additionally, the pressure of the rock forces fracking fluid to return to the surface through the wellbore.[20] This fluid often contains both "flowback" water and "produced water."[21] "Flowback" refers to water used to fracture the rock, which flows back up the wellbore and contains the chemicals and proppant used in the process of hydraulic fracturing.[22] "Produced water" is naturally found within the rock, which is produced along with the minerals.[23] This water moves up through the surface and through the wellhead with the oil or gas.[24] Produced water is sometimes very salty; however, it can "exhibit significant variations in salinity, sodicity, trace element composition, and organic geochemistry resulting from differences in environmental and geologic conditions."[25]

Oil and gas developers have multiple options available for disposing or reusing wastewater generated after fracturing.[26] These options include disposal or treating and recycling water for reuse to fracture other oil and gas wells.[27] Another choice, which has been utilized by fossil fuel producers and almond, pistachio, and citrus farmers in California,[28] involves treating the water and recycling it for use in irrigation for agricultural purposes. Recycling and reusing wastewater, either in other wells or for purposes like irrigation, present preferred creative alternatives over disposal in light of the water-energy challenge and the scarcity of water resources in the arid West.[29] Each of these methods, described in

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20. *Id.*
21. *Id.*
22. *Id.*
23. *Id.*
24. *Id.*
25. *Produced Waters — Overview*, U.S. GEOLOGICAL SURV., http://energy.usgs.gov/EnvironmentalAspects/EnvironmentalAspectsofEnergyProductionandUse/ProducedWaters.aspx#3822110-overview (last visited Nov. 27, 2016) [hereinafter *Produced Waters Overview*].
26. *See* Wiseman, *supra* note 6, at 790-91.
27. AM. PETROLEUM INST., WATER MANAGEMENT ASSOCIATED WITH HYDRAULIC FRACTURING 17-18 (June 2010), http://www.shalegas.energy.gov/resources/HF2_e1.pdf ("Produced reservoir water and recycled flow back water can be reused for fracturing, depending on the quality of the water.").
28. Ellen Knickmeyer, *Experts to Study Use of Oilfield Wastewater on Food Crops*, MERCED SUN-STAR (Jan. 13, 2016, 6:43 PM), http://www.mercedsunstar.com/news/article54601950.html.
29. The history of recycling treated municipal wastewater provides a useful analogy to the issue of recycling treated oil and gas wastewater for irrigation and fracturing wells. Municipal wastewater contains a variety of chemical and microbial contaminants, for which it is treated and later reused for irrigation and other purposes. *See* Ginette Chapman, *From Toilet to Tap: The Growing Use of Reclaimed Water and the Legal System's Response*, 47 ARIZ. L. REV. 773, 773 (2005). Sewage was once considered a nuisance, but now treated municipal wastewater presents many benefits associated with meeting water demands. *Id.* at 776-81. However, costs associated with recycling municipal wastewater include environmental and

more detail below, has its costs and benefits and is subject to differing levels of regulation by both federal government and states.

A. Disposal

Wastewater is usually initially stored on-site in pits or tanks.[30] Sometimes wastewater is sent off-site to a disposal company.[31] In western states, wastewater is permitted to be treated and discharged into navigable waters.[32] One of the most common and controversial methods of wastewater disposal is the process of injecting wastewater into underground control wells.[33] Additionally, some states permit "landfarming" and "landtreatment," disposal methods that involve spreading or mixing low-toxicity wastes and produced water into soils on permitted parcels of land.[34]

Each of these steps in the process of disposal (storage, off-site disposal, discharge, and underground injection) poses its own special environmental risks to varying degrees.[35] Storage in open pits creates an attractive-looking (but often chemically contaminated and lethal) pond that birds might wish to wade in.[36] Lining of open pits might tear and allow for contaminated wastewater to leak onto the ground and leach down into groundwater.[37] Disposal off-site through the process of underground injection has been linked to increased seismic activity in states

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health risks, negative public opinion, and financial demands for implementation and treatment. *Id*. at 781-85.

30. *The Hydraulic Fracturing Water Cycle*, *supra* note 12.

31. *See* Wiseman, *supra* note 6, at 790-91 (wastewater may be sent to a wastewater treatment plant, spread on roads for dust or ice control, or disposed of in an underground injection control well).

32. 40 C.F.R. §§ 435.30, 435.50, 435.52 (2016).

33. Wiseman, *supra* note 6, at 791 (noting risks of underground injection control wells, including causing small, localized earthquakes and contaminating nearby aquifers used for drinking water).

34. *See Landfarms and Landtreatment Facilities*, R.R. COMM'N OF TEX., http://www.rrc.state.tx.us/oil-gas/applications-and-permits/environmental-permit-types-information/landfarms-and-landtreatment-facilities/ (last visited Nov. 27, 2016).

35. For an excellent discussion of the broad category of environmental risks posed by hydraulically fractured wells and disposal sites, *see* Wiseman, *supra* note 6.

36. PEDRO RAMIREZ, JR., U.S. FISH & WILDLIFE SERV., RESERVE PIT MANAGEMENT: RISKS TO MIGRATORY BIRDS 9 (2009), https://www.fws.gov/migratorybirds/pdf/management/reservepitmanagementriskstomigbirds.pdf ("Birds, including hawks, owls, waterfowl, and songbirds, are attracted to reserve pits by mistaking them for bodies of water. Reserve pits also attract other wildlife such as insects, bats, small mammals, amphibians, and big game. Wildlife can fall into oil-covered reserve pits while attempting to drink along the pits' steep sideslopes. The steep, synthetically-lined pit walls make it almost impossible for entrapped wildlife to escape. Insects entrapped in the oil can also attract songbirds . . . . [t]he struggling birds . . . in turn attract hawks and owls to the oil-covered pit. The sticky nature of oil entraps birds in the reserve pits and they die from exposure and exhaustion.").

37. Wiseman, *supra* note 6, at 789.

like Oklahoma and Ohio.[38] Compromised well casing might also lead to leaks in disposal wells that result in contaminating drinking water aquifers. Finally, disposing of wastewater in sealed tanks or through underground injection takes the contaminated water entirely out of the water system, preventing the treatment and reuse of that water for another beneficial use (which could have otherwise resulted in a decrease in the demand for more fresh water withdrawals).

B. Recycling to Fracture More Wells

Oil and gas companies are increasingly treating and reusing flowback water from wells to fracture other wells with good results.[39] A push for this type of recycling is due in part to exploration and production in dry areas.[40] Additionally, producers prefer to cut down on costs associated with hauling millions of barrels of water to oil and gas wells and later to underground disposal wells.[41] A study prepared for the Ground Water Protection Council indicates that Pennsylvania recycles wastewater for reuse as hydraulic fracturing fluid in new wells more than any other state.[42] In addition to Pennsylvania, other states, like Texas, have allowed for reuse to fracture wells.[43]

C. Recycling for Agricultural Irrigation

Produced water has been characterized as a valuable resource due to mounting concerns about diminishing water resources and

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38. *See generally* Justin L. Rubinstein & Alireza Babaie Mahani, *Myths and Facts on Wastewater Injection, Hydraulic Fracturing, Enhanced Oil Recovery, and Induced Seismicity*, 86 SEISMOLOGICAL RES. LETTERS 1 (2015), https://profile.usgs.gov/myscience/upload_folder/ci2015Jun1012005755600Induced_EQs_Review.pdf.

39. Nichola Groom, *Analysis: Fracking Water's Dirty Little Secret Recycling,* REUTERS (July 15, 2013, 12:53 PM), http://www.reuters.com/article/us-fracking-water-analysis-idUSBRE96E0ML20130715.

40. *Id.*

41. *Id.*

42. JOHN VEIL, PRODUCED WATER VOLUMES AND MANAGEMENT PRACTICES IN 2012, 93 (Apr. 2015), http://www.gwpc.org/sites/default/files/Produced%20Water%20Report%202014-GWPC_0.pdf.

43. Wiseman, *supra* note 6, at 770. *See also* Al Pickett, *New Solutions Emerging to Treat and Recycle Water Used in Hydraulic Fracs*, AM. OIL & GAS REPORTER (Mar. 2009), http://www.aogr.com/magazine/cover-story/new-solutions-emerging-to-treat-and-recycle-water-used-in-hydraulic-fracs; *Is it Possible for Oil and Gas Operators to Use Recycled Water? – Water Use in Association with Oil and Gas Activities*, R.R. COMM'N OF TEX. http://www.rrc.state.tx.us/about-us/resource-center/faqs/oil-gas-faqs/faq-water-use-in-association-with-oil-and-gas-activities/ (last visited Nov. 27, 2016) (listing state-authorized water recycling projects that have been permitted by the Railroad Commission).

the need for next generation energy sources.[44] Recycling wastewater for further fracturing is not the only way this fluid may be put to beneficial reuse. As previously mentioned, produced waters may be discharged into navigable waters for agricultural or wildlife propagation purposes.[45] In California, flowback may be treated and blended with fresh water to reduce the number of total dissolved solids (contaminants) and used for irrigation. [46] Additionally, produced water in Montana and Wyoming may need little to no treatment before it is used for irrigation or watering livestock and wildlife, depending on the character of the rock formation from which it is produced.[47]

However, over the past few years, public concern about the potential impacts of hydraulic fracturing on fresh water resources has prompted government action.[48] Specifically, much concern has focused on the chemicals used in the process of hydraulic fracturing and environmental impacts associated with spills, leaks, and inadequate treatment of water once it resurfaces as a byproduct of mineral production.[49] Concern about the risks to human health has also driven government action like the proposed bill in California requiring food labeling for food products containing ingredients that were irrigated with "oil-field wastewater."[50] Section III will discuss current and proposed federal regulation associated with these disposal and recycling practices, serving as a backdrop to additional proposals that states, like California, might undertake to regulate the ultimate reuse and recycling of flowback and produced waters.

III. FEDERAL REGULATIONS

While Congress and the U.S. Environmental Protection Agency (EPA) have exempted oil and gas activities from federal legislation

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44. *See Produced Waters Overview*, *supra* note 25.

45. *See supra* note 32.

46. *See* Pam Boschee, *Operators Explore Agricultural Options for Reuse of Flowback and Produced Water*, OIL AND GAS FACILITIES 10 (Feb. 2015).

47. *See* NAT'L RES. COUNCIL, MANAGEMENT AND EFFECTS OF COALBED METHANE PRODUCED WATER IN THE WESTERN UNITED STATES 101-04 (2010), http://www.nap.edu/read/12915 [hereinafter EFFECTS OF CBM WATER].

48. *See* OFFICE OF RES. & DEV., U.S. ENVTL. PROT. AGENCY, EPA 601/R-12/011, STUDY OF THE POTENTIAL IMPACTS OF HYDRAULIC FRACTURING ON DRINKING WATER RESOURCES: PROGRESS REPORT 1 (2012) ("In response to public concern, the US House of Representatives requested that [EPA] conduct scientific research to examine the relationship between hydraulic fracturing and drinking water resources . . . .").

49. *Id.* Additionally, a number of states have adopted regulations requiring disclosure of the chemicals used in the process of fracking. Matthew McFeeley, *Falling Through the Cracks: Public Information and the Patchwork of Hydraulic Fracturing Disclosure Laws*, 89 VT. L. REV. 849, 859 (2014).

50. Gatto, *supra* note 11.

and regulation under a number of environmental programs,[51] a few important aspects of wastewater disposal and reuse are subject (or potentially subject) [52] to federal oversight. Regulations include prohibitions on certain unpermitted discharges under the Clean Water Act (CWA) [53] and regulation of disposal by underground injection wells through the Safe Drinking Water Act (SWDA).[54]

Relatedly, the Food and Drug Administration (FDA) is tasked with regulating the quality of water used for irrigation[55] and "developing policy, regulations, guidance documents, and enforcement strategies governing all aspects of food labeling."[56] The United States Department of Agriculture (USDA) is authorized to promulgate national standards governing the voluntary marketing of organic produce under the Organic Foods Production Act of 1990.[57] The organic standards prohibit the use of synthetic substances not listed on USDA's National List of permitted synthetic substances for use as crop nutrients or soil amendments.[58] Satisfying USDA's organic standards allows for producers to use the "organic" label to market their products.[59]

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51. For example, EPA issued a federal regulation in 1988 that exempted most wastes generated during the process of exploring for and producing oil and gas resources from regulation under the hazardous waste portion of the Resource Conservation and Recovery Act. *See* Regulatory Determination for Oil and Gas and Geothermal Exploration, Development and Production Wastes, 53 Fed. Reg. 25,446, 25,456 (July 6, 1988). Additionally, Congress explicitly exempted hydraulic fracturing from the definition of "injection" under the Safe Drinking Water Act (SDWA), which seeks to protect underground sources of drinking water from degradation caused by surface and underground activities. 42 U.S.C. § 300h(d)(1). Hydraulic fracturing with diesel fuel, however, is an exception to this exemption, and thus subject to regulation under the SDWA. *Id.*; for a description of the states' and oil and gas industry's lobbying effort for this exemption, *see* Hannah J. Wiseman, *Untested Waters: The Rise of Hydraulic Fracturing in Oil and Gas Production and the Need to Revisit Regulation*, 20 FORDHAM ENVTL. L. REV. 115, 144 n.153 (2009).

52. The Department of Interior's Bureau of Land Management recently issued a final rule regulating hydraulic fracturing on federal and Indian lands. Oil and Gas: Hydraulic Fracturing on Indian and Federal Lands, 80 Fed. Reg. 16,128-16,222 (Mar. 26, 2015) (to be codified at 43 C.F.R. pt. 3160); *see also* Jessica Kershaw, *Interior Department Releases Final Rule to Support Safe, Responsible Hydraulic Fracturing Activities on Public and Tribal Lands*, BUREAU OF LAND MGMT. (Mar. 30, 2015), http://www.blm.gov/wo/st/en/info/newsroom/2015/march/nr_03_20_2015.html. However, the U.S. District Court for the District of Wyoming recently granted a motion for preliminary injunction, enjoining the Department of Interior from enforcing the rule pending court review. *See generally* Wyo. v. U.S. Dept. of Interior, 136 F. Supp. 3d 1317 (D. Wyo. 2015). However, as of the date of publication, this injunction was vacated and the case was remanded to the district court.

53. 40 C.F.R. §§ 435.30, 435.32 (1979).

54. *See* 40 C.F.R. §§ 144.6(b), 144.22 (2011).

55. 21 U.S.C. § 350h (2012).

56. Steve Keane, *Can a Consumer's Right to Know Survive the WTO?: The Case of Food Labeling*, 16 TRANSNAT'L L. & CONTEMP. PROBS. 291, 294 (2006) (citation omitted).

57. Organic Foods Production Act of 1990, Pub. L. No. 101-624, §§ 2101-2123, 104 Stat. 3935 (codified at 7 U.S.C. §§ 6501-6522).

58. *See* 7 U.S.C. § 6504 (2012).

59. *Id.*

FDA regulates water quality for irrigation of agricultural products; however, it appears that FDA has not yet critically examined the practice of recycling wastewater from hydraulically fractured oil and gas wells for irrigation purposes.[60] After Congress passed the Food Modernization and Safety Act[61] amending the Federal Food, Drug, and Cosmetic Act (FFDCA), FDA was directed to conduct rulemaking to establish "science-based minimum standards for the safe production and harvesting of those types of fruits and vegetables, including specific mixes of categories of fruits and vegetables, that are raw agricultural commodities for which the Secretary has determined that such standards minimize the risk of serious adverse health consequences or death."[62]

FDA issued a final rule in November 2015 addressing, in part, minimum standards for the quality of agricultural water.[63] Essentially, "[a]ll agricultural water must be safe and of adequate sanitary quality for its intended use."[64] The rule implements water treatment and minimum quality standards with a focus on microbial quality only,[65] despite FDA's acknowledgement that "[p]roduce is vulnerable to contamination with microorganisms of public health significance . . . *as well as physical and chemical (including radiological) contaminants*."[66]

Oil and gas activities have been exempted or excluded from a number of environmental regulations; however, many federal programs have sought to address negative impacts posed by the waste products and disposal methods associated with mineral production. Gaps in the federal scheme allow for states to take their own various approaches in regulating this aspect of the industry. Section IV will address how some states have utilized recycled wastewater for agricultural purposes and any regulatory requirements or research endeavors in place to assist states in prudently developing the practice.

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60. Moreover, Clean Water Act regulations already permit discharges of produced water into navigable waters west of the 98th meridian when that produced water "has a use in agriculture or wildlife propagation." 40 C.F.R. § 435.50.

61. FDA Food Safety and Modernization Act of 2010, Pub. L. No. 111-353 (2011).

62. 21 U.S.C. § 305h(a)(1)(A) (2012).

63. *See* Standards for Growing, Harvesting, Packing, and Holding of Produce for Human Consumption, 80 Fed. Reg. 74,354, 74,554 (2015).

64. *Id.*

65. *See id.* at 74,359.

66. *Id.* at 74,358 (emphasis added).

IV. DIFFERENT STATE APPROACHES TO RECYCLING WASTEWATER

Many western states, including California, Texas, Oklahoma, Wyoming, and Montana, are major players in the United States' oil and gas industry and are also experiencing abnormally dry conditions[67] in some regions. However, these states have taken different approaches to recycling well wastewater for beneficial reuse in irrigation for agricultural purposes. California has been "experimenting" with recycling treated wastewater for irrigation for at least twenty years, while researchers in Texas are only beginning to explore this option and its effects.[68] Oklahoma's governor recently formed a "fact-finding group" to investigate potential beneficial reuse options for produced water, including crop irrigation.[69] Meanwhile, Montana and Wyoming permit irrigation and watering of livestock and wildlife with produced water from coalbed methane gas wells, with no stringent consumer information disclosure requirements. This section will discuss each of these states' approaches in relation to California's proposed approach to labeling food irrigated with recycled wastewater.

A. California

Wastewater from five oil fields in California is treated and recycled for beneficial reuse.[70] For example, the Cawelo Water District has been accepting oilfield-produced water at its facilities since it executed agreements with the Valley Waste Disposal Company in 1980, Chevron USA Inc. in 1996, and the Schaefer Oil Company in 2003.[71] Some areas in the San Joaquin Valley have

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67. *See, e.g.*, U.S. DROUGHT MONITOR-CALIFORNIA (Mar. 17, 2016), http://droughtmonitor.unl.edu/data/jpg/20160315/20160315_CA_trd.jpg; U.S. DROUGHT MONITOR-TEXAS (Mar. 17, 2016), http://droughtmonitor.unl.edu/data/jpg/20160315/20160315_TX_trd.jpg; U.S. DROUGHT MONITOR-OKLAHOMA (Mar. 17, 2016), http://droughtmonitor.unl.edu/data/jpg/20160315/20160315_OK_trd.jpg.

68. Brandon Mulder, *Researchers Experiment with Oilfield Wastewater to Irrigate Crops*, MIDLAND REPORTER-TELEGRAM (Jan. 14, 2016), http://www.mrt.com/news/top_stories/article_308ceaee-bb21-11e5-85b2-afbdb2b9f8a6.html.

69. *Gov. Fallin Forms Fact-Finding Group to Look at Ways "Produced Water" Can Be Reused*, OFFICE OF GOV. MARY FALLIN (Dec. 1, 2015), http://services.ok.gov/triton/modules/newsroom/newsroom_article.php?id=223&article_id=17069 [hereinafter, Fallin].

70. MATTHEW HEBERGER & KRISTINA DONNELLY, PAC. INST., OIL, FOOD, AND WATER: CHALLENGES AND OPPORTUNITIES FOR CALIFORNIA AGRICULTURE 31 (Dec. 2015). The oilfields include Deer Creek, Jasmin, Kern River, Kern Front and Mount Poso.

71. *Agricultural Water Management Plan*, CAWELO WATER DIST. 52 (Feb. 2014), http://www.water.ca.gov/wateruseefficiency/sb7/docs/2014/plans/Cawelo%20Final%202012%20AWMP.pdf.

been irrigated by recycled produced water for the past thirty years.[72] As previously noted, almond, pistachio, and citrus growers are among those farmers who have already been watering crops with recycled wastewater.[73] At least one producer that also markets certain food products as "organic" under USDA's National Organic Program has been identified as a user of recycled wastewater in this region.[74]

California has implemented a recycled water policy through the creation of its State Water Resources Control Board and Regional Boards.[75] Recycled water is defined as water treated for waste, and which is "suitable for a direct beneficial use or a controlled use that would not otherwise occur and is therefor [sic] considered a valuable resource."[76] Recycling wastewater from oil and gas production appears to be consistent with the definition and broader intent of water policy in California, as long as it is carried out in a way that does not negatively impact human or environmental health.[77] The Cawelo Water District currently tests produced water supplies intended for agricultural reuse on a monthly basis.[78] The District provides test results to the Central Valley Regional Water Quality Control Board for review and monitoring.[79]

Despite the consistency that recycling wastewater from hydraulic fracturing for use in irrigation has with state water policy, some groups have voiced concern about the need to inform consumers of the practice.[80] Acting on this concern, California

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72. CAL. ST. WATER RES. CONTROL BD., PROJECT CHARTER: FOOD SAFETY OIL FIELD WASTEWATER REUSE PANEL 1 (Jan. 12, 2016), http://www.waterboards.ca.gov/centralvalley/water_issues/oil_fields/food_safety/meetings/2016_0112_fs_of_water_proj_charter.pdf.

73. Knickmeyer, *supra* note 28.

74. *See* Alexander Rony, & Mark A. Kastel, *Letter to Miles V. McEvoy, Deputy Administrator National Organic Program*, CORNUCOPIA INST. (Mar. 9, 2016), http://www.cornucopia.org/wp-content/uploads/2016/03/organic-wastewater_160309.pdf; *see also* Trudy Bialac, *Comments to the National Organic Standards Board*, PCC NATURAL MARKETS (Oct. 5, 2015), http://www.pccnaturalmarkets.com/issues/statements/organics/comments-to-nosb-2015-10-05.html.

75. *See generally Recycled Water Policy*, CAL. ST. WATER RES. CONTROL BD. (Sept. 9, 2015), http://www.swrcb.ca.gov/water_issues/programs/water_recycling_policy/.

76. CAL. WATER CODE § 13050(n) (2012).

77. MICHAEL KIPARSKY & JAYNI FOLEY HEIN, WHEELER INST. FOR L. & POL'Y, REGULATION OF HYDRAULIC FRACTURING IN CALIFORNIA: A WASTEWATER AND WATER QUALITY PERSPECTIVE 27 (Apr. 2013), https://www.law.berkeley.edu/files/ccelp/Wheeler_HydraulicFracturing_April2013.pdf.

78. *Cawelo and Produced Water*, CAWELO WATER DIST., http://www.cawelowd.org/PrdWater.html (last visited Nov. 27, 2016).

79. *Id.*

80. *See generally* Josh Harkinson, *These Popular Fruit and Veggie Brands May Be Grown with Oil Wastewater*, MOTHER JONES (July 24, 2015), http://www.motherjones.com/environment/2015/07/oil-wastewater-fruits-vegetables-farms. Representatives from the Sierra Club and the Cornucopia Institute have also called on the USDA to take a proactive step in regulating the use of recycled wastewater on foods bearing the "organic" label under

Assemb. Mike Gatto, introduced Assembly Bill 14 on August 17, 2015.[81] This bill proposes to amend California's Health and Safety Code to include "Article 5: Products Irrigated with Oil and Gas Field Wastewater," which would include food labeling requirements (along with some exceptions) for manufacturers who produce packaged foods containing plants irrigated with wastewater from hydraulically fractured wells. The label would require the following statement: "This product was produced using plants irrigated with recycled or treated hydraulic fracturing or oilfield wastewater."[82] Since the introduction of the bill, no official action was taken since it was first read. The bill subsequently died in March 2016.[83]

B. Texas and Oklahoma

Texas has been slow to adopt widespread reuse and recycling policies due to the low cost of disposal wells: the cheapest option for disposing of flowback and produced water. [84] However, researchers from Texas A&M AgriLife Research, in conjunction with the Texas Railroad Commission, Anadarko Petroleum Corporation, Gibson Energy, and Energy Water Solutions, have formed a coalition to study the effects of irrigating cotton with recycled produced water from nearby oil and gas production in Pecos, Texas.[85]

Oklahoma, like Texas, has also undertaken a preliminary investigation into the potential beneficial reuse of produced waters for crop irrigation, among other uses.[86] Developing state regulation of irrigation with treated wastewater may become a popular policy choice in Oklahoma due to the dramatic increase in small earthquakes throughout the state over the past decade. Studies

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the National Organic Program. *Environmental Advocates and Organic Industry Watchdog ask USDA to Ban Use of "Produced" Wastewater from Oil and Gas Exploration in Organics*, THE CORNUCOPIA INST. (Mar. 22, 2016), http://www.cornucopia.org/2016/03/environmental-advocates-and-organic-industry-watchdog-ask-usda-to-ban-use-of-produced-wastewater/; *see also* Rony & Kastel, *supra* note 74.

81. Gatto, *supra* note 11.

82. *AB-14 Bill History, supra* note 14.

83. *Id.*

84. "The ubiquity of disposal wells and their lower cost compared to reuse has made them the primary option . . . [r]ecycling water has been slow to gain traction in Texas, but should increase in the long term." Jackie Benton, *Recycling Fracking Water: Drillers Reuse, Repeat*, TEX. COMPTROLLER OF PUB. ACCOUNTS (Oct. 2015), https://www.comptroller.texas.gov/economy/fiscal-notes/2015/october/fracking.php (internal quotation marks omitted).

85. *Growing Cotton in Texas with Recycled Produced Water*, PR NEWSWIRE (Nov. 9, 2015, 10:37 AM), http://www.prnewswire.com/news-releases/growing-cotton-in-texas-with-recycled-produced-water-300174798.html.

86. Fallin, *supra* note 69.

have tied this increase in earthquakes to the proliferation of underground injection control wells throughout the state.[87] The Oklahoma Corporation Commission, the state agency in charge of regulating disposal wells, recently expanded a prior "response strategy" requiring a decrease in fluid volumes injected underground to curtail further risks of triggering earthquakes.[88] While the order to reduce injection of wastes threatens oil and gas well operators with production decreases and financial losses,[89] this result may incentivize alternative forms of disposal or reuse if the state continues with this strategy. For now, however, integrating treatment and recycling alternatives are not an economical strategy for many producers.[90]

C. Wyoming and Montana

Produced water from coalbed methane wells is currently used to irrigate over 8,000 acres of agricultural cropland in the Powder River Basin of Wyoming and Montana.[91] However, in 2008, only 8% of the coalbed methane water produced in the Wyoming Powder River Basin was used for managed surface irrigation.[92] A permit from the Wyoming Department of Environmental Quality is required for surface irrigation if the produced water is obtained directly from the well head.[93] However, if the produced water

87. *See, e.g.*, *Induced Earthquakes Numerical Monitoring,* U.S. GEOLOGICAL SURV., https://earthquake.usgs.gov/research/induced/modeling.php (last visited Nov. 27, 2016) ("Fluid pressure increases within faults are believed to be the main cause of induced earthquakes.").

88. OKLA. CORP. COMM., MEDIA ADVISORY - REGIONAL EARTHQUAKE RESPONSE PLAN FOR CENTRAL OKLAHOMA AND EXPANSION OF THE AREA OF INTEREST (Mar. 7, 2016), http://www.occeweb.com/News/2016/03-07-16ADVISORY-AOI,%20VOLUME%20REDUCTION.pdf.

89. *See* Matthew Phillips, *Boom Times for Fracking's Toxic Wastewater Come to a Shaky End*, BLOOMBERG BUSINESSWEEK (Mar. 17, 2016, 6:00 AM), http://www.bloomberg.com/news/articles/2016-03-17/boom-times-for-fracking-s-toxic-wastewater-come-to-a-shaky-end ("Not only have oil prices continued to slide, causing a slowdown in the entire oil and gas industry, but regulations aimed at reducing quakes have put tight restrictions on hundreds of disposal wells . . . For the past year, the Oklahoma Corporation Commission . . . has been layering on restrictions aimed at cutting the amount of water disposed underground. On March 7, the OCC took its most aggressive step yet by ordering the operators of 400 disposal wells in central Oklahoma to cut the amount of water they inject underground. The goal is to reduce total wastewater volume in the area by 40 percent, or about 300,000 barrels a day").

90. *Id.* ("[Estimates for costs of treating and recycling wastewater range from $2.50 to $5 a barrel] . . . . Given the state's 10-to-1 ratio of water to oil production, that would mean oil prices need to be at least in the $50-a-barrel range for producers to cover their water treatment costs . . . . 'Can they do it? Absolutely. Can they do it economically? No.'").

91. EFFECTS OF CBM WATER, *supra* note 47, at 102 ("This area comprises approximately 6,000 acres in Wyoming and 2,000 acres in Montana.").

92. *Id.*

93. *Id.*

derives from "permitted surface impoundments," no permit is necessary to apply it to agricultural fields.[94]

Coalbed methane produced water is reused to water livestock in a number of coalbed methane projects in the Powder River Basin in Wyoming.[95] After the initial "flowback period," produced water tends to exhibit the same characteristics of the naturally occurring salty water found in the fractured rock formation.[96] Sometimes, this water needs little treatment because it is less contaminated than the initial flowback, which contains chemicals and proppant used in injection; however, some formations produce briny waters that require a certain level of treatment or blending to allow for safe consumption by livestock and wildlife. [97] Additionally, salty produced waters may not be suitable for irrigation.[98] Salts may accumulate in the crop's root zone, preventing the plants from taking up sufficient volumes of water, which reduces crop yields.[99]

While some states already allow for recycling wastewater for agricultural purposes, this practice is prudently limited to water that meets certain water quality standards. [100] Despite the standards already in place, many people are still skeptical of the practice.[101] Concerned consumers are already demanding action to address the practice in the context of regulating organic produce standards, while lawmakers have considered requiring food labels to disclose the use of wastewater for irrigation on any produce, organic or conventional.[102] Section V will look further in depth at the federal food labeling regulatory system already in place and the types of challenges that state labeling requirements may face as a result of federal preemption and First Amendment limitations.

V. FOOD LABELING REQUIREMENTS FOR FOOD IRRIGATED WITH OIL AND GAS WASTEWATER

So far, this Note has summarized the process of hydraulic fracturing and outlined the general background regulatory framework in place for dealing with waste fluids that return to the surface once oil and gas well operations have commenced. While

94. *Id.*

95. *Id.* at 103-04.

96. *Frac Water Reuse Technologies*, ANGUIL AQUA SYSTEMS, http://www.anguil.com/frac-water-recycling (last visited Nov. 27, 2016).

97. *See* EFFECTS OF CBM WATER, *supra* note 47, at 103-04.

98. *See generally* R.S. AYERS & D.W. WESTCOT, WATER QUALITY FOR AGRICULTURE (1985), http://www.fao.org/docrep/003/T0234E/T0234E00.htm.

99. Id. at § 1.2.1.

100. *Cawelo and Produced Water*, *supra* note 78.

101. *See supra* note 80.

102. *Id.*; *see also* Gatto, *supra* note 11.

some aspects of federal law touch on wastewater in relation to irrigation, there are apparent gaps in the law with respect to this practice. For example, national organic standards issued by USDA have not kept pace with the growing practice of irrigation with wastewater. Section IV detailed different state approaches concerning alternative uses for recycled wastewater, primarily focusing on California's proposed bill to label foods irrigated with wastewater. This section will now discuss the broader legal framework for food labeling requirements and prohibitions, the substance of potential food labeling laws related to the use of recycled wastewater for irrigation, and the strength of any legal challenges to food labeling laws, like California's proposed policy.

Laws addressing disclosure of irrigation by recycled wastewater could include mandated labeling or provide a framework for voluntary labeling, similar to FDA's voluntary labeling guidelines for genetically engineered food products.[103] Both mandated and voluntary labeling might include disclosure of either the use or non-use of recycled wastewater as an agricultural production method. These laws may be challenged both on First Amendment grounds and federal preemption grounds, with the strength of such claims turning critically on whether the labeling is mandatory or voluntary. The general federal regulatory background for food labeling is discussed below, followed by an analysis of the strengths and weaknesses of proposed labeling laws when challenged under the First Amendment.[104]

A. Food Labeling Legal Framework

The FDA regulates food labeling requirements at the federal level under the Federal Food, Drug, and Cosmetic Act, and the Nutrition Labeling and Education Act. The FFDCA requires mandated food labeling to be truthful and not misleading.[105] The FFDCA specifically prohibits "[t]he introduction or delivery for

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103. *See* U.S. FOOD & DRUG ADMIN., GUIDANCE FOR INDUSTRY: VOLUNTARY LABELING INDICATING WHETHER FOODS HAVE OR HAVE NOT BEEN DERIVED FROM GENETICALLY ENGINEERED PLANTS (2015), http://www.fda.gov/food/guidanceregulation/guidancedocumentsregulatoryinformation/ucm059098.htm.

104. This Note will focus solely on First Amendment implications and analysis. While preemption principles and relevant statutory provisions are outlined below, analysis related to their application to a hypothetical "irrigated with fracking water" label is beyond the scope of this Note. Nonetheless, a recent decision from the U.S. District Court for the District of Vermont, now on appeal to the Second Circuit, provides a useful example of federal preemption analysis applied to a state-mandated food label requirement. *See* Grocery Mfrs. Ass'n v. Sorrell, 102 F. Supp. 3d 583 (D. Vt. 2015).

105. Karen A. Goldman, *Labeling of Genetically Modified Foods: Legal and Scientific Issues*, 12 GEO. INT'L & ENVTL. L. REV. 717, 757 (2000).

introduction into interstate commerce any food . . . that is adulterated or misbranded."[106] "[L]abeling means all labels and other written, printed, or graphic matter (1) upon any article or any of its containers or wrappers, or (2) accompanying such article."[107] Material changes in the composition of food must be disclosed.[108] Voluntary labeling is also permitted so long as it is truthful and not misleading.[109]

Since the passage of the FFDCA, food labels have been required to include a list of the "accurate name of the food, the name and the address of the manufacturer, a statement of the quantity of contents, and, under most circumstances, a list of ingredients."[110] Other requirements include information about whether the food product is an imitation, whether it includes artificial flavors, colors, or chemical preservatives, and the presence of any "major food allergens."[111]

The Nutrition Labeling and Education Act of 1990 (NLEA) amended the FFDCA and established mandatory nutrition labeling for packaged foods. Accordingly, a food is misbranded unless its label bears certain nutrition information like the serving size, total number of servings, and calorie content per serving.[112] The NLEA amendments to the FFDCA also added an express preemption provision applying to state labeling requirements not identical to those required under the FFDCA and the NLEA.[113] The express preemption provision does not preempt state requirements identical to those required under the NLEA and FDCA.[114] Further, implied preemption may apply to state labeling requirements if not expressly preempted by the statute. The two types of implied preemption that are of most consequence to food labeling are conflict preemption and objective and purposes preemption.[115] Determining whether either form of implied federal preemption applies to a state requirement involves the aid of two important principles: (1) considering Congress's purpose in enacting a particular federal statute and (2) applying a "presumption against preemption" of the state law in issue.[116]

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106. 21 U.S.C. § 331(a) (2012).
107. 21 U.S.C. §321(m) (2012) (internal quotations omitted).
108. Goldman, *supra* note 105, at 757.
109. *Id.*
110. Winters, *supra* note 10, at 823 (internal citations omitted).
111. *Id.* at 824.
112. 21 U.S.C. § 343(q) (2012).
113. 21 U.S.C. §343-1 (2012).
114. Winters, *supra* note 10 at 832-33.
115. *Id.* at 834.
116. *Id.* at 834-35.

The "organic" food label is separately regulated under USDA's National Organic Program.[117] Labeling a food product as "organic" is entirely voluntary under the National Organic Program, but USDA assumes that "producers and handlers choose to label their organic products and display the USDA seal to the extent allowed [by regulation] . . . to improve the marketability of their organic product[s]."[118] In order to place the "organic" label on a product, the production and handling of the product must meet certain standards. These standards include the requirement that any synthetic substances applied to crops as a crop nutrient or soil amendment must be on the National List of synthetic substances allowed by USDA.[119]

Synthetic substances allowed for use in organic crop production include various substances for use as disinfectants, herbicides, compost feedstocks, slug or snail bait, and soil amendments, among many other uses.[120] Synthetic substance present in recycled oil- and gas-production wastewater, even after treatment, might not fall within this list of permitted substances and uses. Indeed, in 2015, testing for wastewater intended for treatment and irrigation in California detected the presence of benzene and acetone.[121] Thus, applying recycled wastewater on products that producers intend to market as "organic" might in fact not satisfy current standards.

B. Potential Challenges to State Food Labeling Requirements

Food labeling requirements are often challenged both on First Amendment and federal preemption grounds, given the FFDCA's and NLEA's complicated preemptive effects. This Note will primarily focus its analysis on potential First Amendment challenges; however, whether an "irrigated with fracking water" state law is federally preempted remains an open question. Food

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117. *See* NAT'L ORGANIC PROGRAM, PREAMBLE TO FINAL RULE, https://www.ams.usda.gov/sites/default/files/media/NOP%20Preamble%20Full%20Version.pdf ("Except for exempt and excluded operations, each production or handling operation or specified portion of a production or handling operation that produces or handles crops, livestock, livestock products, or other agricultural products that are intended to be sold, labeled, or represented as '100 percent organic,' 'organic,' or 'made with organic (specified ingredient or food group(s))' must be certified. Certified operations must meet all applicable requirements of these regulations.").

118. NAT'L ORGANIC PROGRAM, PREAMBLE TO LABELING, https://www.ams.usda.gov/sites/default/files/media/NOP%20Labeling%20Preamble.pdf.

119. *Id.*

120. *See* 7 C.F.R. § 205.601 (2015).

121. AMEC FOSTER WHEELER ENVT. & INFRASTRUCTURE, INC., TECHNICAL REPORT: RECLAIMED WATER IMPOUNDMENTS SAMPLING (2015), http://www.waterboards.ca.gov/centralvalley/water_issues/oil_fields/information/disposal_ponds/chevron/2015_0615_com_chevron_cawello.pdf.

manufacturers may use the First Amendment as a shield from food-labeling requirements, like California's proposed bill that demanded consumer notification of the production method for produce irrigated with wastewater through food labeling. The First Amendment declares that "Congress shall make no law . . . abridging the freedom of speech, or of the press . . . ."[122] This prohibition is generally understood to apply to any official of the federal government.[123] Moreover, through incorporation by the due process clause of the Fourteenth Amendment, the First Amendment also applies to government action at the state and local level.[124] The right to free speech also includes the right not to speak.[125] Thus, if California's bill had become law and mandated labeling of manufactured food products containing produce irrigated with wastewater, manufacturers could have challenged the labeling requirement as a violation of their First Amendment protection from "compelled speech."

Commercial advertising is a form of commercial speech that is protected by the First Amendment.[126] However, commercial speech is not afforded the same level of protection as other forms of speech, like political or artistic speech. In 1980, the Supreme Court, in *Central Hudson Gas and Electric Corp. v. Public Service Commission of New York,* adopted a test for intermediate scrutiny of restrictions on commercial speech, rather than apply stricter rules that test restrictions on political and artistic speech.[127]

Under *Central Hudson*'s intermediate scrutiny test, courts must first consider whether the speech concerns lawful activity and whether that speech is false or misleading.[128] Assuming the speech concerns lawful activity and it is neither false nor misleading, the speech may be restricted only if the regulation "directly advances a substantial governmental interest" and the restriction is "not more extensive than necessary to serve that interest."[129] While this test

122. U.S. CONST. amend. I.

123. RICHARD J. BONNIE & RUTH GAARE BERNHEIM, PUB. HEALTH L., ETHICS, AND POL'Y 829 (Robert C. Clarke et al. eds., 2015).

124. *Id.*

125. United States v. United Foods, Inc., 533 U.S. 405, 410 (2001) ("Just as the First Amendment may prevent the government from prohibiting speech, the Amendment may prevent the government from compelling individuals to express certain views.") (citations omitted).

126. Zauderer v. Office of Disciplinary Counsel of Sup. Ct. of Ohio, 471 U.S. 626, 637 (1985).

127. *See* Cent. Hudson Gas & Elec. Corp. v. Pub. Serv. Comm'n. of N.Y., 447 U.S. 557, 573 (1980).

128. *Id.* at 564.

129. *Id.* at 573. This last requirement essentially demands "narrow tailoring" that will achieve a "reasonable fit" between the government's objective and the means chosen to reach that objective. *Id.* However, the means chosen need not be the least restrictive. *Id.*

has largely been applied to *restrictions* on marketing of products that affect the public health, it is not clear whether the *Central Hudson* test applies to other types of regulation like *mandated disclosures* of information about particular products, such as food labeling for production methods.[130]

The Supreme Court has not yet definitively ruled on whether the *Central Hudson* test applies to mandated speech; however, the Second Circuit has addressed the issue in at least two cases reaching inapposite results.[131] First, the Second Circuit applied the *Central Hudson* test to a Vermont law requiring disclosure of the use of a protein growth hormone used in dairy production, ultimately holding that the government's interest was not substantial enough to withstand review.[132] Years later, the Second Circuit reached a different result in addressing a New York law mandating disclosure of calorie information on chain restaurant menus, ultimately deferring to the local government's public health rationale for the requirement.[133] These cases demonstrate that the strength of a First Amendment attack on an "irrigated with fracking water" label requirement depends on whether the court applies the less stringent test under *Zauderer* or the heightened review under *Central Hudson*.

An ongoing discussion about mandating food labeling for products containing "genetically modified organisms" or "GMOs" provides a relevant example for how challenges to an "irrigated with fracking water" food label might play out in court. Historically, in regulating food labeling under the FFDCA, FDA has not required disclosures or labeling of information related to a products method of manufacture.[134] Rather, food-labeling requirements have

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130. BONNIE & BERNHEIM, *supra* note 123, at 832.

131. These different results may be due to a different make-up of judges on the Second Circuit or in different interpretations of the types of information requiring disclosure under the different state laws. Compelled disclosures of factual information that are reasonably related to preventing consumer deception are reviewed under a rational basis test. *See* Zauderer, 471 U.S. at 651 ("[I]n virtually all our commercial speech decisions to date, we have emphasized that because disclosure requirements trench much more narrowly on an advertiser's interests than do flat prohibitions of speech, warnings or disclaimers might be appropriately required in order to dissipate the possibility of consumer confusion or deception . . . We recognize that unjustified or unduly burdensome disclosure requirements might offend the First Amendment by chilling protected commercial speech. But we hold that an advertiser's rights are adequately protected as long as disclosure requirements are reasonably related to the State's interest in preventing deception of consumers.") (internal citations and quotation marks omitted).

132. *See* Int'l Dairy Foods Ass'n v. Amestoy, 92 F. 3d 67, 72 (2d Cir. 1996). Whereas, compelled disclosures for other purposes (besides preventing consumer deception) appear to be reviewed under *Central Hudson*'s intermediate scrutiny test.

133. *See* N.Y. St. Rest. Ass'n v. N.Y.C. Bd. of Health, 556 F. 3d 114, 136 (2d Cir. 2009).

134. Goldman, *supra* note 105, at 724.

historically focused on the composition of the food product rather than the method of its production.[135] Mandated disclosures that food has been irradiated is the only instance in which FDA has required disclosures informing consumers of a method of manufacture.[136] However, this requirement is limited only to irradiated food when the characteristics of that food as a whole are affected by the irradiation.[137] With this precedent in mind, FDA has generally treated genetically engineering food products "like other traditional or modern techniques of food crop production or development; the method of development need not be disclosed in the label."[138]

Disclosing the use of an injectable protein growth hormone, which stimulates milk production in dairy cows, highlights First Amendment implications in the context of food labeling for GMOs.[139] While the milk itself is not genetically modified, public outcry against the use of the injectable growth hormone led Vermont to pass a law mandating food labeling on milk that disclosed the manufacturer's use of the hormone for milk production.[140] This law was successfully challenged on First Amendment grounds by a group of dairy manufacturers' associations when the Second Circuit held that the law failed the *Central Hudson* test.[141] According to the Second Circuit, Vermont failed to establish that it had a substantial government interest in requiring the food label.[142] According to the Second Circuit, Vermont's sole expressed interest for the requirement was "consumer curiosity."[143] While the court sympathized with the consumers' curiosity, it could not "permit the state of Vermont to compel dairy manufacturers to speak against their will."[144]

Challenging a *voluntary* food labeling law under the First Amendment would likely yield a different result. A law merely

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135. *Id.*; *see also* United States v. Ninety-Five Barrels (More or Less) Alleged Apple Cider Vinegar, 265 U.S. 438, 445 (1924) ("When considered independently of the product, the method of manufacture is not material. The [Food and Drugs Act of June 30, 1906, Pub. L. No. 59-384, 34 Stat. 768] requires no disclosure concerning it.")

136. Goldman, *supra* note 105, at 724-25.

137. *Id.* at 725 (for example, changing flavors or shelf life).

138. *Id.* at 726.

139. Genetically engineered bacteria produce bovine somatotrophin (BST), which is injected into cows for milk production. "Recombinant bovine somatotropin ('rBST') is a version of BST produced in laboratories through recombinant DNA technology. rBST is injected into the bloodstream of a cow to supplement the amount of BST naturally produced. It stimulates lactation and boosts milk production in treated cows by increasing the efficiency with which supplemented cows convert feed into milk." Int'l Dairy Foods Ass'n v. Amestoy, 898 F. Supp. 246, 248 (D. Vt. 1995).

140. Int'l Dairy Foods Ass'n v. Amestoy, 92 F. 3d 67, 73 (2d Cir. 1996); *See also* VT. STAT. ANN. TIT. 6, § 2754 (terminated).

141. *Int'l Dairy Foods Ass'n*, 92 F. 3d at 73.

142. *Id.*

143. *Id.* at n.1.

144. *Id.* at 74.

permitting voluntary labeling to inform consumers of the use or non-use of recycled wastewater in production likely does not result in "compelled speech," so the intermediate scrutiny test under *Central Hudson* might not even apply at all. However, food product manufacturers may seek to market their products with labels disclosing that they have not been irrigated with recycled wastewater. Depending on the requirements of a voluntary labeling law and how much it regulates standards or restrictions associated with this type of marketing, manufacturers may resort to challenging those requirements as a restriction on commercial speech.

If a labeling law restricted labels voluntarily disclosing the use or non-use of recycled wastewater in the production process to irrigation practices meeting specific statutory definitions, that restriction would likely withstand a *Central Hudson* analysis. This type of restriction is analogous to a California law restricting manufacturers from labeling consumer goods as "ozone friendly," "biodegradable," "photodegradable," "recyclable," or "recycled" unless the goods meet the law's statutory definitions of those specific terms.[145] The Ninth Circuit noted that the California law sought to restrict potentially misleading speech, and the state's interests in protecting consumers and the environment were "substantial," thus satisfying the government interest factor of the *Central Hudson* test.[146]

The Ninth Circuit also agreed that California's restriction on eco-labeling "directly advance[d]" the state's substantial governmental interests.[147] Specifically, the court held that the restriction satisfied this prong of the *Central Hudson* test because it provided more than "ineffective or remote support" for the interest in protecting consumers and the environment.[148] Finally, the Ninth Circuit agreed with the district court in holding that the restriction met the "narrow tailoring" prong of the *Central Hudson* test.[149] In doing so, the court applied a more flexible approach to narrow tailoring, under a "more deferential 'far-less-restrictive-means' test for commercial speech."[150]

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145. *See* Ass'n of Nat. Advertisers, Inc. v. Lungren, 44 F.3d 726, 727 (9th Cir. 1994).

146. *Id.* at 731-35.

147. *Id.* at 732-33.

148. *Id.* at 732 ("California seeks to guard against a direct, predictable and ongoing result of green marketing-increased sales of goods as a result of potentially specious claims or ecological puffery about products with minimal environmental attributes. This supposition is sufficiently reasonable and substantiated to support the district court's finding of an adequate fit under the third prong of the *Central Hudson* test.").

149. *Id.* at 735.

150. *Id.*

Applying the Ninth Circuit's analysis in *Lungren* would likely sustain a state law restricting voluntary food labeling for disclosure of the use or non-use of recycled oil and gas wastewater for irrigation, if it restricts such labeling only to products whose production methods comply with statutory definitions. A state must clearly articulate its substantial interest in protecting consumers and the environment from misleading claims that a product has not been irrigated with such water. Producers may wish to market their food products as "frack-water free" to consumers wary of recycled wastewater in their food system. Conversely, producers may decide to advertise their products as part of a "sustainable" system that treats and recycles water from other industries. Either way, states have a legitimate interest in ensuring that unreliable statements do not mislead consumers. Statutory definitions for what constitutes "use" or "non-use" of wastewater in irrigation may help to ensure consistency in marketing food products. Ensuring consistency appears to "directly advance" the substantial government interest, and it is likely less restrictive than other methods of protecting consumers and the environment, like restricting the use of recycled wastewater in irrigation altogether. Thus, in the First Amendment context, states may be more successful in defending a voluntary labeling law than mandating disclosure of this specific production method.

VI. CONCLUSION

Despite the enormous consumption of water used in the hydraulic fracturing process,[151] along with increased drought conditions across oil- and gas-producing states, it is unlikely that hydraulic fracturing will cease in the United States anytime soon. However, further development of alternatives, like recycling wastewater for irrigation, may help develop safer, creative solutions to the water-energy challenge. These future solutions may help mitigate the impacts of drought in agricultural oil- and gas-producing regions; however, this response is riddled with gaps in federal and state law, policies subject to a number of plausible legal challenges, and little research quantifying specific risks posed by recycling wastewater for agricultural purposes.

This Note has discussed some of the ways that different states are responding to the water-energy challenge in the context of recycling wastewater for irrigation. With little federal regulation guiding this sort of recycled wastewater program, states are left

151. Additionally, this consumption is merely representative of a portion of the water involved in the energy-water nexus.

experimenting with what level of regulation will best protect their citizens' health, welfare, and environment. States must balance this interest with the interest in encouraging the oil, gas, and agricultural industries to develop economically feasible solutions. California, Texas, and Oklahoma have all endeavored to study the potential impacts of recycling wastewater; moreover, water districts in California have already condoned this practice for two decades, while Wyoming and Montana have allowed for high quality produced waters to be used in agricultural irrigation and to propagate livestock and wildlife.

This Note has also explained that consumer education remains an important tool in implementing successful and accountable water recycling programs. The public's reaction to California's practices has varied widely, even prompting proposed regulation that appears to be based on the consumer's "right to know." This Note concludes that such a policy is moving the law in the right direction toward protecting human health and the environment; nonetheless, a law like Assemb. Gatto's would likely fail court review pending a First Amendment challenge. Additionally, the effectiveness of any kind of food label depends upon consumers making the ultimate informed choice to purchase or avoid the product at issue.[152] Notifying the public of the use of recycled wastewater for irrigation in their food products may help educate consumers and hold producers accountable; however, this strategy should certainly not be the only method of regulating the practice.

Further research and development of optimal water treatment technologies will contribute to decreased risks associated with potential contamination resulting from irrigation with recycled wastewater. In the meantime, however, proposals like Assemb. Gatto's bill requiring labeling of such production methods for the purpose of informing consumers of potential risks represent valid policy choices. Requiring an informative food label is good policy in light of the fact that the existence of potential risks is still under review in states already irrigating crops with treated wastewaters. This situation is distinguishable from the milk-labeling context in Vermont, discussed in Section V of this Note. In the Vermont case, there was explicit scientific record evidence concluding that protein growth hormone milk was just as safe as milk produced without the

152. *See* Elise Golan et al., *Do Food Labels Make a Difference?...Sometimes,* U.S. DEP'T OF AGRIC. (Nov. 1, 2007), http://www.ers.usda.gov/amber-waves/2007-november/do-food-labels-make-a-difference-sometimes ("Empirical studies have found mixed results on the efficacy of labels in educating consumers and changing consumption behavior. These studies highlight the observation that consumers often make hasty food choices in grocery stores and usually do not scrutinize food labels.").

hormone.[153] However, this Note makes clear that a mandatory labeling law might still lose out under a First Amendment challenge if states only rely on "consumer curiosity" for the law's legislative purpose. Ultimately, increasing consumer information regarding the use of recycled wastewater in our food system, in conjunction with technological developments and further study of risks, will help make this practice a valuable alternative to wastewater disposal and further fresh water withdrawals. In turn, this may help to allay at least one facet of the water-energy challenge.

153. *See* Int'l Dairy Foods Ass'n v. Amestoy, 92 F. 3d 67, 73 (2d Cir. 1996) ("Vermont does not claim that health or safety concerns prompted the passage of the Vermont Labeling Law . . . but instead defends the statute on the basis of strong consumer interest and the public's right to know . . . These interests are insufficient to justify compromising protected constitutional rights.") (internal quotation marks and citations omitted).