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Cormac Bloomfield*

**FRACKING THE BAKKEN: INTERPRETING THE
PUBLIC TRUST DOCTRINE AND STATE
CONSTITUTIONAL LAW TO RESTRICT
FRACKING UNDER BENEFICIAL USE
PRINCIPLES**

ABSTRACT

This Note tackles the intersection of state constitutional law, the Public Trust Doctrine, prior appropriation case law, and insufficient safeguards around fracking's water-intensive practices. Typically operating with lax state oversight, modern day fracking depletes needed water resources from water-scarce regions while simultaneously contaminating public water resources that remain. Conservationists should, and must, turn to state constitutional law and common law public trust doctrine developments to achieve judicial intervention of a poorly regulated industry. By advancing modern understandings of beneficial use and anti-waste principles under western states' prior appropriation systems of water ownership, courts can ensure greater protections of public water resources while building upon precedent. This Note uses the Bakken Formation as a case study to highlight the stark differences among states' constitutional case law surrounding water resource protections. Contrasting Montana's robust constitutional protections for natural resources with North Dakota's more limited case law, this Note seeks to spark a conversation among conservationists on harnessing state-specific constitutional law to protect water resources from insufficient fracking regulations.

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I. INTRODUCTION

Nobody would contest that the United States (“U.S.”) is “in the midst of [an] ‘unconventional revolution in oil and gas’” driven by fracking.¹ But with this expansion of a water-hungry practice comes greater uncertainty for the future of the water-starved West. If nothing is done, then more water will be contaminated for drinking and recreation, and less water will generally be available, leading the American West into an avoidable disaster. As one rancher succinctly put it: “If you lose water, you lose everything.”² It is time that a rigorous application of the Public Trust Doctrine and state constitutional law be applied to expand the understanding of beneficial use and put meaningful safeguards on fracking in water-scarce Western states.

Hydraulic fracturing, or fracking, has taken the U.S. energy industry by storm in recent years, becoming so dominant that over two-thirds of natural gas output is now derived from fracking.³ However, fracking continues to be controversial. From widespread contamination of groundwater⁴ to exorbitant water usage,⁵ there are ongoing debates on the appropriateness of this practice, especially in the water-scarce American West.⁶ Compounding the risks is the lack of meaningful oversight or regulatory regime by the federal government.⁷ This paper lays out why fracking should be more closely examined in the American West under state constitutional law, state public trust jurisprudence, and the Public Trust

1. Eric Lipton & Hiroko Tabuchi, *Driven by Trump Policy Changes, Fracking Booms on Public Lands*, N.Y. TIMES (Oct. 27, 2018), <https://www.nytimes.com/2018/10/27/climate/trump-fracking-drilling-oil-gas.html>.

2. *Id.*

3. Jack Perrin & Troy Cook, *Hydraulically Fractured Wells Provide Two-Thirds of U.S. Natural Gas Production*, TODAY IN ENERGY (May 5, 2016), <https://www.eia.gov/todayinenergy/detail.php?id=26112#>.

4. See generally Heather Whitney-Williams & Hillary M. Hoffman, *Fracking in Indian Country: The Federal Trust Relationship, Tribal Sovereignty, and the Beneficial Use of Produced Water*, 32 YALE J. ON REG. 451, 458–49 (2015) (listing contamination concerns from fracking).

5. See generally *How Much Water Does the Typically Hydraulically Fractured Well Require?*, AM. GEOSCIENCES INST., <https://www.americangeosciences.org/critical-issues/faq/how-much-water-does-typical-hydraulically-fractured-well-require> (last visited Feb. 19, 2020) [hereinafter AM. GEOSCIENCES INST.]; (listing different water usages in wells across the U.S.); GROUNDWATER PROTECTION COUNCIL & ALL CONSULTING, MODERN SHALE GAS DEVELOPMENT IN THE UNITED STATES: A PRIMER 64–66 (2009), https://www.energy.gov/sites/prod/files/2013/03/f0/ShaleGasPrimer_Online_4-2009.pdf (explaining demand for water in fracking) [hereinafter GROUNDWATER PROTECTION].

6. See Melissa S. Keanery et al., *In Times of Drought: Nine Economic Facts about Water in the United States*, BROOKINGS (Oct. 20, 2014), <https://www.brookings.edu/research/in-times-of-drought-nine-economic-facts-about-water-in-the-united-states/> (providing overview on water issue in American West); MARC RESINER, CADILLAC DESERT: THE AMERICAN WEST AND ITS DISAPPEARING WATER (2d ed. 1993) (one of the most famous writings on water in the American West); see also Caleb Hall, *Water, Water, Nowhere: Adapting Water Rights for a Changing Climate*, 16 SUSTAINABLE DEV. L. & POL’Y 25 (2016) (explaining how climate change is compounding water issues in the West).

7. See Hanna Wiseman, *Untested Waters: The Rise of Hydraulic Fracturing in Oil and Gas Production and the Need to Revisit Regulation*, 20 FORDHAM ENVTL. L. J. 115, 142–46 (2009) (describing lack of federal regulation). But see Alexandra B. Klass, *Fracking and the Public Trust Doctrine: A Response to Spence*, 93 TEX. L. REV. 47, 47 (2015) (explaining how oil and gas regulation is typically left up to the states).

Doctrine to determine whether it should truly be considered a beneficial use in prior appropriation states.

While prior appropriation offers few controls on senior water right-holders, some do exist. Water right-holders are required to restrict their water usage to only beneficial uses.⁸ The concept of beneficial use restricts water users to only those uses that are productive to society, an idea that “has evolved over time and varies from state to state.”⁹ Instead of the traditional sole focus on “[m]aximizing monetary net benefits, [and] productivity,” beneficial use requirements have evolved over time to protect other non-commercial activities such as recreation,¹⁰ scenic beauty,¹¹ and preserving waterfowl and wildlife habitat.¹² Additionally, water taken for beneficial use cannot be put to undue waste, meaning there are some requirements on efficiency of water usage.¹³

Prior appropriation may place few restrictions on senior water right-holders, but this doctrine exists in the backdrop of state constitutional law and state public trust doctrine principles, which guarantee certain protections of common resources, principal among them being navigable waters.¹⁴ While Western states have developed their own case law concerning the sort of environmental protections due for certain water bodies, all Western states can more rigorously apply state constitutional and common law principles to the proper definition of beneficial use. These public trust and state constitutional protections can put meaning behind the anti-waste principles and apply stringent beneficial use requirements as justifications for restricting the massive quantities of water fracking demands and contaminates. Additionally, as states’ conceptions of beneficial use develop with more care toward environmental concerns, state constitutional protections and common law should be aggressively litigated to argue that fracking cannot be considered a beneficial use without greater safeguards put in place.

8. See ROBIN CRAIG, *WATER LAW (CONCEPTS AND INSIGHTS)* 53–57 (2017) (explaining beneficial use).

9. *Id.* at 53; see also Janet C. Neuman, Symposium, *Beneficial Use, Waste, and Forfeiture: The Inefficient Search for Efficiency in Western Water Law*, 28 ENVTL. L. 919, 923–62 (1998) (providing detailed overview of beneficial use doctrine).

10. CRAIG, *supra* note 8, at 49 (citing *In re Adjudication of the Existing Rights to the Use of All the Water*, 55 P.3d 396 (Mont. 2002)).

11. Carol Necole Brown, *Drinking from a Deep Well: The Public Trust Doctrine and Western Water Law*, 34 FLA. ST. U. L. REV. 1, 8 n.48 (2006) (citing *Nat’l Audubon Soc’y v. Superior Court*, 658 P.2d 709, 719 (Cal. 1983) (*En banc*); *R.W. Docks & Slips v. State*, 628 N.W.2d 781, 788 (Wis. 2001)).

12. Neuman, *supra* note 9, at 927 (citing *In re Water Right Claim No. 1927-2*, 524 N.W.2d 855 (S.D. 1994)).

13. See CRAIG, *supra* note 8, at 54 (“In practice, however, incentives for efficiency are weak and infrequently and inconsistently enforced.”); *But see* Hennings v. Water Res. Dep’t, 622 P.2d 333, 334 (Or. Ct. App. 1981) (holding that “wetting the dry ground” to make plowing easier was wasteful); *Tulare Irrigation Dist. V. Lindsay-Strathmore Irrigation Dist.*, 45 P.2d 972, 1007 (Cal. 1935) (in famous example of water use, court finding waste in drowning gophers).

14. See generally Joseph L. Sax, *The Public Trust Doctrine in Natural Resources Law: Effective Judicial Intervention*, 68 MICH. L. REV. 471 (1970) (The most seminal work on the modern Public Trust Doctrine); MICHAEL C. BLUMM & MARY C. WOOD, *THE PUBLIC TRUST DOCTRINE IN ENVIRONMENTAL AND NATURAL RESOURCES LAW* (2d ed. 2015); Michael C. Blumm, *The Public Trust Doctrine: A Twenty-First Century Concept*, 16 HASTINGS W.-NW. J. ENVTL. L. & POL’Y 105 (2010); Ill. Cent. R.R. Co. v. Illinois, 146 U.S. 387 (1892) (The seminal case on the Public Trust Doctrine).

This Note approaches these intertwined considerations—the Public Trust Doctrine paired with state constitutional law and modern understandings of beneficial use—toward fracking in the Bakken Formation. It uses the Bakken Formation as a case study for the reorientation of beneficial use principles, tackling hydraulic fracturing in Montana and North Dakota. While Montana has environmental protections enshrined into its constitution and a rigorous application of public trust doctrine case law,¹⁵ North Dakota holds no such constitutional protections and has sparse, yet ample, case law on the topic.¹⁶ Yet, both states are involved in the fracking boom, particularly North Dakota. This Note lays out why stronger restrictions on fracking are more likely to muster weight in Montana as opposed to North Dakota, despite the far higher rate of fracking in the latter.¹⁷

Section I of this Note will dive into how fracking is performed, describe its rise in the American West, and explain why it is harmful to Western water because it depletes water resources and contaminates water supplies. Section II will explain what the Public Trust Doctrine is and provide a primer on the prior appropriation system, along with its beneficial use and undue waste components. Section III will then explain how applying state constitutional law and state public trust doctrine principles in Montana can lead to stricter understandings of what constitutes a beneficial use and put teeth into the undue waste principle. It will chart out how there are worthwhile arguments applying these concepts that put meaningful safeguards on fracking in the state of Montana. Section IV will apply state public trust principles within North Dakota, where fracking is far more dominant, and where less protections have been provided in the state's sparse public trust doctrine case law.

Additionally, North Dakota has no constitutional protection for a clean environment which would impose greater challenges to ban the practice via application of precedent. This Note will explain that, although fracking is so widespread, has such strong support, and remains at the economic core in North Dakota, there are still compelling arguments as to why the use of lower quality, non-potable water should be required for fracking. Furthermore, North Dakota should apply greater checks against water contamination, although there is immense support for fracking within the state.

15. MONT. CONST. art. II, § 3 (“All persons are born free and have certain inalienable rights. They include the *right to a clean and healthful environment*. . . .”) (emphasis added); see William C. Mumby, *Trust in Local Government: How States' Legal Obligations to Protect Water Resources can Support Local Efforts to Restrict Fracking*, 44 *ECOLOGY L.W.* 195, 226–33 (explaining Montana Public Trust Doctrine case law).

16. Andrew D. Lewis, *The Ever-Protruding Stick in the Bundle: The Accommodation of Groundwater Rights in Texas Oil and Gas*, 2 *TEX. A & M L. REV.* 79, 101–02 (2014) (providing brief overview of North Dakota's bare Public Trust Doctrine case law); Lily Ricci, *Two Ideas, Many Outcomes: How Anti-Waste Sentiments and the Public Trust Doctrine Support Varied Interests in Fracking-Related Litigation*, 30 *GEOR. ENVTL. L. REV.* 499, 515–16 (2018).

17. ENVIRONMENT AMERICA RESEARCH AND POLICY CENTER, *FRACKING BY THE NUMBERS: THE DAMAGE TO OUR WATER, LAND AND CLIMATE FROM A DECADE OF DIRTY DRILLING* 22 (2016) (as of April 2016, Montana had approximately 539 wells fracked since 2005 while North Dakota had 8,224 wells); N.D. WATER COMM'N, *NORTH DAKOTA FRACKING & WATER USE: FACTS* (2019), https://www.swc.nd.gov/pdfs/fracking_water_use.pdf [hereinafter N.D. WATER COMM'N] (as of January 2019 North Dakota had 15,409 active wells).

II. CONTINUED CHALLENGES OF FRACKING IN THE AMERICAN WEST

As fracking becomes a staple of many Western economies, including that of North Dakota and eastern Montana, it will continue to plague the West with water-related concerns. This Section lays out background information on fracking, its rise in the American West, and two water-related concerns with the practice: first, the vast quantities of water required for fracking from already water-stressed regions; and second, the contamination it produces on water supplies.

A. What is Fracking?

Fracking is a method of extraction that seeks to reach lucrative oil or gas deposits in “subterranean formations” that were previously not economically viable.¹⁸ Before fracking, it simply did not make economic sense for an extractor to reach oil or gas deposits more than a few hundred feet into the ground.¹⁹ Now, engineers can “[c]reate fractures in the formation” by “inject[ing] a fluid into the well bore at high pressures” in order to “expand existing natural fractures,” or create new ones.²⁰ Next, proppants, which are “sand or other granular substances,” are injected to keep the newly created or expanded fractures open to allow the wellbore to reach the shale, thus “allowing the gas or oil to flow into the well.”²¹ The injection fluid may be pure water or consist of solvents.²² Gas as far underground as 2,000–5,000 feet below the surface are now extractable because of fracking, opening up new deposits for extraction that were previously not practical to reach.²³ Working alongside fracking is the practice of horizontal drilling. Horizontal drilling allows the drill to go further than a mere vertical 100 feet but instead to have the drill bit turned to “extend the well out . . . horizontally,” so that the extension can now stretch over a mile longer and reach previously unattainable gas deposits.²⁴

This new technology has “spurr[ed] efforts to produce gas in many other areas and geological formations that were previously considered unrecoverable or uneconomic,” changing the landscape of oil and gas drilling in the U.S.²⁵ It has

18. Wiseman, *supra* note 7, at 115, 117 (2009).

19. Jeff Brady, *Focus on Fracking Diverts Attention from Horizontal Drilling*, NPR (Jan. 27, 2013), <https://www.npr.org/2013/01/27/170015508/focus-on-fracking-diverts-attention-from-horizontal-drilling>.

20. Wiseman, *supra* note 7, at 118, 120 (explaining that it is hard to “predict the length, type, or extent of fractures that will occur using this technique”).

21. *Id.* at 118.

22. *Id.* at 118–19 (explaining that even hydrochloric acid may be used).

23. Mohammed S. Hashem M. Mehany et al., *A Literature Survey of the Fracking Economic and Environmental Implications in the United States*, 118 *PROCEDIA ENGINEERING* 169, 170 (2015).

24. Brady, *supra* note 19; *see also* EPA, *HYDRAULIC FRACTURING FOR OIL AND GAS: IMPACTS FROM THE HYDRAULIC FRACTURING WATER CYCLE ON DRINKING WATER RESOURCES IN THE UNITED STATES 3-1–3-38* (2016) (explaining background information on hydraulic fracturing).

25. Wiseman, *supra* note 7, at 122; *see also* DEP’T. OF ENERGY, *HOW IS SHALE GAS PRODUCED?* 1–3, https://www.energy.gov/sites/prod/files/2013/04/f0/how_is_shale_gas_produced.pdf (last visited March 21, 2020) (charting out how hydraulic fracturing is used in natural gas extraction); OFF. OF FOSSIL ENERGY, DEP’T OF ENERGY, *SHALE RESEARCH & DEVELOPMENT*, <https://www.energy.gov/fe/science->

become so prevalent that two-thirds of natural gas output in the country is now derived from fracking methods.²⁶ To put it in perspective: in 2000, there were approximately 276,000 natural gas wells in the U.S. before fracking became widespread.²⁷ Today, there are over two million wells.²⁸

The total quantity of water used in fracking is variable and simply unknown. Each well requires different amounts of water based on the geological formation and the specific well that is fracked. The EPA estimates that the average fracking well uses 1 million gallons of water.²⁹ However, for the Bakken Formation in North Dakota and Montana, a given well uses approximately 1.5 million gallons of water.³⁰ While fracking becomes ever more prevalent, this water-intensive practice continues to receive very little federal regulation.³¹

B. Fracking's Rise in the West

The American West has seen a rapid rise in fracking, with one of the largest sources of the newfound practice occurring in the Bakken Formation.³² The Bakken Formation, which is primarily in North Dakota, but also in Montana, Saskatchewan, and Manitoba, first had oil discovered in 1951.³³ However, because much of the deposits were nearly two miles into the ground, there was no readily available and economically efficient means to get the oil drilled out, leaving it mostly untouched for decades.³⁴ Yet, developments in horizontal drilling and hydraulic fracturing technologies made previously unattainable deposits economically viable to extract.³⁵ From producing 40–50 million barrels of oil per year in the 1980's,³⁶ the state of North Dakota now produces over 466 million barrels annually, a drastic increase in production.³⁷ This dramatic increase in oil production has permanently altered the

innovation/oil-gas-research/shale-gas-rd (last visited March 21, 2020) (providing background information on shale gas extraction and fracking).

26. Perrin & Cook, *supra* note 3.

27. Marc Lallanilla, *Facts About Fracking*, LIVESCIENCE (Feb. 10, 2018), <https://www.livescience.com/34464-what-is-fracking.html>.

28. NATHALIE DE MARCELLIS-WARIN & ANN BACKUS, SHALE GAS EXTRACTION IN THE UNITED STATES: PERSPECTIVES FROM ACADEMIC PUBLICATIONS AND GEO-LOCATED TWITTER CONVERSATIONS 3 (2019) (noting that because there is no national database it is hard to know how many wells there are to a precise degree).

29. Romany M. Webb, *Changing Tides in Water Management: Policy Options to Encourage Greater Recycling of Fracking Wastewater*, 42 WM. & MARY ENV'T L. & POL'Y REV. 85, 93 (2017); *see also* GROUNDWATER PROTECTION, *supra* note 5 (explaining demand for water in fracking).

30. AM. GEOSCIENCES INST., *supra* note 5.

31. *See* Wiseman, *supra* note 7, at 142–46 (describing lack of federal regulation); *see also* Klass, *supra* note 7.

32. North Dakota Studies, *Section 4: Bakken Formation*, STATE HIST. SOC'Y. OF NORTH DAKOTA, <https://www.ndstudies.gov/gr4/geology-geography-and-climate/part-1-geology/section-4-bakken-formation> (last visited March 21, 2020).

33. *Id.*

34. *Id.*

35. *Id.*

36. Robert E. Beck, *Water Resources and Oil and Gas Development: A Survey of North Dakota Law*, 87 N. D. L. REV. 507, 508 (2011).

37. NORTH DAKOTA DEP'T. OF NAT. RESOURCES, NORTH DAKOTA ANNUAL OIL PRODUCTION (2019) <https://www.dmr.nd.gov/oilgas/stats/annualprod.pdf>.

Bakken Formation and drastically reshaped surrounding North Dakotan and Montanan communities.

The Bakken Formation has been forever changed thanks to fracking. The oil and gas industry now employs approximately 55,000 people in North Dakota,³⁸ which has led to a massive population increase in previously small western North Dakota and eastern Montana towns, leading to concerns of increased crime and inadequate social services.³⁹ Towns like Williston and Watford City, North Dakota have witnessed their communities double in population in less than a decade, and local economies held hostage to the boom-and-bust fluctuations of oil prices.⁴⁰

The U.S. Geological Survey approximates an additional “6.7 trillion cubic feet of associated/dissolved natural gas and 0.53 billion barrels of natural gas” in the Formation that is now reachable thanks to fracking. This leads to estimates of 4.4–11.4 billion barrels of undiscovered oil in the Bakken Formation.⁴¹ While the exact amounts of untapped reserves may be unknown, what is certain is that fracking will continue to deplete and degrade water resources of the surrounding area, leading to greater stress on an already water-scarce region.

C. Why Fracking is Harmful 1: Depletion of Western Water Resources

Fracking takes up exorbitant amounts of water. The Bakken Formation uses approximately 1.5 million gallons per well.⁴² North Dakota alone has over 15,000 wells and likely tens of thousands more will exist in the near future.⁴³ While most of the water used in fracking comes from surface water sources, like lakes and rivers, it is also derived from groundwater.⁴⁴ Fracking may be less water intensive than coal and dwarfed by agriculture, but, as of 2014, it still uses 38–45 billion gallons of water annually. Although a lack of reporting requirements makes it hard to know exactly how much water each well is using, this only increases the difficulty of adequately

38. North Dakota Studies, *supra* note 32.

39. Jeff Brady, *After Struggles, North Dakota Grows into its Ongoing Oil Boom*, NPR (Nov. 23, 2018), <https://www.npr.org/2018/11/23/669198912/after-struggles-north-dakota-grows-into-its-ongoing-oil-boom>; see also Nicholas Kusnetz, *The Bakken Oil Play Spurs a Booming Business – In Water*, HIGH COUNTRY NEWS (Aug. 6, 2012), <https://www.hcn.org/issues/44.13/the-bakken-oil-play-spurs-a-booming-business-in-water>; see also Joe Eaton, *Bakken Oil Boom Brings Growing Pains to Small Montana Town*, NAT'L GEOGRAPHIC (July 8, 2014), <https://www.nationalgeographic.com/news/special-features/energy/2014/07/140709-montana-oil-boom-bakken-shale/>.

40. See Mark Abadi, *North Dakota's Oil Boomtowns are Facing an Uncertain Future – Here's What it's Like to Live There*, BUSINESS INSIDER (June 10, 2018), <https://www.businessinsider.com/oil-north-dakota-towns-2018-6>.

41. *How Much Oil and Gas are Actually in the Bakken Formation?*, U.S. GEOLOGICAL SUR. https://www.usgs.gov/faqs/how-much-oil-and-gas-are-actually-bakken-formation?qt-news_science_products=0#qt-news_science_products (last visited March 21, 2020); see also STEPHANIE B. GASWRITH ET AL., U.S. GEOLOGICAL SUR., ASSESSMENT OF UNDISCOVERED OIL RESOURCES IN THE BAKKEN AND THREE FORKS FORMATIONS, WILLISTON BASIN PROVINCE, MONTANA, NORTH DAKOTA, AND SOUTH DAKOTA, 2013 1–3 (explaining geological formation of the Bakken Formation).

42. AM. GEOSCIENCES INST., *supra* note 5.

43. Tom Steward, *Gusher! North Dakota has Four Times More Water than Estimated*, CTR. OF THE AM. EXPERIMENT (Sept. 25, 2018), <https://www.americanexperiment.org/2018/09/gusher-north-dakota-four-times-oil-estimated/>.

44. See *Learn*, FRACFOCUS, <https://www.fracfocus.org/learn> (last visited March 21, 2020).

preserving already limited water resources.⁴⁵ With fracking only expected to rise in use nationwide, continued concerns of water scarcity is likely, especially in regions already strapped for water.⁴⁶

Some of the areas where fracking is most prevalent are areas of the country where water is most scarce. The Bakken Formation is a good example because parts of the Formation are seen as high risk for water scarcity in the coming years.⁴⁷ The lack of widespread recycling of the liquids used in fracking exacerbates scarcity concerns because the chemicals that are typically added to the water mixture make it difficult to recycle the used water.⁴⁸ The “water is permanently removed from the hydrological cycle, and thus unavailable for use in other applications,” unlike other uses of water, such as irrigation where water remains within the cycle even after being put to productive use.⁴⁹ Making matters worse, water stress can lead to loss of biodiversity.⁵⁰ These concerns of water resources will only worsen as fracking rises in use and climate change compounds the issues facing the West.⁵¹

D. Why Fracking is Harmful 2: Water Contamination

In addition to stressed water supplies, there are serious and inadequately addressed concerns of water contamination. The liquid solution used to crack open the shale includes methane, chemicals that may be carcinogenic,⁵² and chemicals that can cause “skin, eye, or sensory irritation . . . [and] affect the brain and nervous system, the immune and cardiovascular systems, and the kidneys . . . [and others that] could affect the endocrine system . . . [or] can cause reproductive, mutagenic,

45. See Webb, *supra* note 29, at 87–88.

46. See R.B. Jackson et al., *The Environmental Costs and Benefits of Fracking*, 39 ANNU. REV. ENV'T. RES. 327, 337 (2014) (explaining the water resources used in fracking); Ricci, *supra* note 16, at 503–04 (fracking’s water usage is also dwarfed by agriculture).

47. See generally Andrew J. Kondash et al., *The Intensification of the Water Footprint of Hydraulic Fracturing*, 4 SCI. ADVANCES 1, 4 (Aug. 15, 2018) (noting that concern over water use “is especially high in semiarid regions”); David Parham, *Why Water Scarcity is a Major Risk for Oil Producers*, GREENBIZ (March 9, 2017), <https://www.greenbiz.com/article/why-water-scarcity-major-risk-oil-producers>.

48. Alexander Bukac, Comment, *Fracking and the Public Trust Doctrine: This Land is Their Land, but after Robinson, Might this Land Really be our Land?*, 49 UNIV. S. F. L. REV. 361, 365 (2015).

49. *Id.* at 88 n.18; see also Anna Driver & Terry Wade, *Fracking Without Freshwater at a West Texas Oilfield*, REUTERS (Nov. 21, 2013), <https://www.reuters.com/article/us-apache-water/fracking-without-freshwater-at-a-west-texas-oilfield-idUSBRE9AK08Z20131121> (explaining water issues in Texas fracking); Kondash et al., *supra* note 47, at 1–8 (explaining intensive water use in fracking); Paul G. Neilan & Fintan L. Dooley, *Salt of the Earth: Salt, Water and Damage to Land in the Bakken and the Williston Basin*, 252 INTL. ENERGY L. REV. 252, 252–54 (listing out water-related issues surrounding fracking); Webb, *supra* note 29, at 89 (this has become such a concern in Texas that the Texas Railroad Commission has asked companies to stop using freshwater in their fracking operations).

50. See Buchanan et al., *Environmental Flows in the Context of Unconventional Natural Gas Development in the Marcellus Shale*, 27 ECOLOGICAL APPLICATIONS 37, 48 (2017) (discussing fracking in Marcellus Shale leading to “declines in fish species richness, the prevalence of disturbance-intolerant taxa, and indicators of specific functional traits.”); see also Sally Entekin et al., *Water Stress from High-Volume Hydraulic Fracturing Potentially Threatens Aquatic Biodiversity and Ecosystem Services in Arkansas, United States*, 52 ENVIRON. SCI. TECHNOL. 2349, 2349–2358 (explaining biodiversity concerns related to water stress).

51. See Hall, *supra* note 6.

52. David B. Spence, *The Political Economy of Local Vetoes*, 93 TEX. L. REV. 351, 358 n.33 (2014).

or cancerous complications.”⁵³ A major concern with fracking is that the “oil or gas well is improperly cased or sealed, allowing contaminants to escape the well near the surface at the groundwater layer,” which infects groundwater used for drinking supplies.⁵⁴ Additionally, fracking chemicals can spill onto the surface, finding their way into drinking water.⁵⁵ Some stored contaminated water is “simply covered and forgotten,”⁵⁶ or inadequate storage casings are used that allow contaminants to seep into the ground.⁵⁷

Worryingly, fracking is allowed incredibly close to communities. “[I]n spite of any local zoning laws that would otherwise prohibit industrial activity near homes, schools, parks, shopping centers, and other places where people spend much of their time,” fracking is allowed in many states and towns to develop mere yards from where one lives and recreates.⁵⁸

As too often is the case,⁵⁹ those already marginalized by society are frequently the ones most harmed and least likely to profit.⁶⁰ For example, on the Fort Berthold Indian Reservation in North Dakota there are over 500 wells, yet 84% of residents have claimed they have not experienced any revenue related to the drilling.⁶¹ Instead, they continue to endure land on their reservation, infected with fracking-related spills, that has gone years without being cleaned.⁶² This fracking-related water contamination will continue to haunt communities in the future because some fracking fluids are trapped in formations already drilled, and thus groundwater contamination can worsen over time as water tables rise.⁶³ As there is a continued

53. Bukac, *supra* note 48, at 365.

54. Spence, *supra* note 52, at 359.

55. *Id.* at 358–59.

56. Bukac, *supra* note 48, at 359.

57. Spence, *supra* note 52, at 364; *see, e.g., id.* at n.36 (citing *Cases Where Pit Substances Contaminated New Mexico's Ground Water*, N.M. OIL CONSERVATION DIVISION, <http://www.emnrd.state.nm.us/ocd/documents/GWImpactPublicRecordsSixColumns20081119>, archived at <http://perma.cc/L4VR-DYZK> (listing examples of incidents where storage pits caused groundwater pollution)); *see also* ENVIRO. PROTECT. AGENCY, *Hydraulic Fracturing for Oil and Gas: Impacts from the Hydraulic Fracturing Water Cycle on Drinking Water Resources in the United States, Main Report* (EPA/600/R-16/236fa) (A well-known example of fracking-related water infecting people's drinking supplies is the documentary *Gasland*. The EPA has also admitted that fracking continues to lead to groundwater contamination).

58. Kevin J. Lynch, *Fracking the Public Trust*, 10 SAN DIEGO J. OF CLIMATE & ENERGY L. 69, 72 (2019).

59. *See, e.g.,* DORCETA TAYLOR, *TOXIC COMMUNITIES: ENVIRONMENTAL RACISM, INDUSTRIAL POLLUTION, AND RESIDENTIAL MOBILITY* (2014); ROBERT D. BULLARD, *DUMPING IN DIXIE: RACE, CLASS, AND ENVIRONMENTAL QUALITY* (2000).

60. Mumby, *supra* note 15, at 201 (citing Spear, *infra* note 61); *see also* Jill E. Johnston et al., *Wastewater Disposal Wells, Fracking, and Environmental Injustice in Southern Texas*, 106 AJPH 550, 550–56 (2016) (explaining environmental justice concerns related to fracking in southern Texas).

61. Stefanie Spear, *Fracking Boom in North Dakota Has Heavy Impact on Native Americans*, ECOWATCH (Dec. 6, 2012), <https://www.ecowatch.com/fracking-boom-in-north-dakota-has-heavy-impact-on-native-americans-1881673245.html>.

62. Jen Shannon, *3 Tribes at the Heart of the Fracking Boom*, SCIENTIFIC AM. (Oct. 10, 2018), <https://blogs.scientificamerican.com/voices/3-tribes-at-the-heart-of-the-fracking-boom/>.

63. *Id.* at 140–41 (Thankfully, this is not a major crisis in the Bakken because the underground sources used for drinking water have a “strong barrier between the formation and the water where sources exist.”); *Id.* at 141 (The Administrator of Montana's Oil and Gas Board stated there is a “7,000 feet of

lack of federal regulation, these water-related concerns are only likely to grow over time.

III. PUBLIC TRUST DOCTRINE, STATE CONSTITUTIONAL LAW, AND PRIOR APPROPRIATION: BACKGROUND LEGAL PRINCIPLES

To understand how state constitutional law and the Public Trust Doctrine can apply greater safeguards on fracking in the Bakken Formation, and in Western states more generally, a brief overview of the Public Trust Doctrine and prior appropriation is necessary. Therefore, this Section lays out such background legal principles, before diving into specific state law challenges.

A. Public Trust Doctrine and State Constitutional Law

The Public Trust Doctrine is a background principle of natural resource protection generally geared towards navigable waters that has often struggled to find its place in American law.⁶⁴ Emerging in the time of Justinian, the Public Trust Doctrine originally rested on the idea that governments hold “trust obligations over important common natural resources.”⁶⁵ More specifically, from ancient Rome: “[T]he following things are by natural law common to all—the air, running water, the sea, and consequently the sea-shore.”⁶⁶ Obligations of natural resource protection continued through Roman times, finding its way into English common law, and ultimately into the U.S.⁶⁷ The specific concern towards submerged lands along a shore emerged centuries later in a landmark U.S. Supreme Court decision.

In 1892, the U.S. Supreme Court clarified the role of the Public Trust Doctrine for the United States in its decision *Illinois Central Railroad Co. v. Illinois*,⁶⁸ where the state of Illinois sought to regain claim of title from the railroad company over submerged lands along Lake Michigan.⁶⁹ The Supreme Court held that there are “limitations on government’s ability to alienate public trust resources,” which can only be done if: 1) it would “promote public interests in the transferred land;” or 2) the public’s interest in the resource would not be “substantially

separation between the shale that is fracked and the lowest portion of the drinking water” and that “there are several hundred feet of salt between the shale and drinking water formations,” creating an “effective barrier to contamination”); Wiseman, *supra* note 7, at 137.

64. See generally CRAIG, *supra* note 8, at 123–42 (providing overview of public trust doctrine and its underpinning as source of protection for navigable waters, expanding in breadth over time); Richard M. Frank, *The Public Trust Doctrine: Assessing its Recent Past and Charting its Future*, 45 U. CAL. DAVIS L. REV. 665, 671–86 (2012).

65. Danielle Spiegel, Note, *Can the Public Trust Doctrine Save Western Groundwater?*, 18 NEW YORK U. ENVTL. L. J. 412, 424 (2010) (citing Scott Reed, *The Public Trust Doctrine: Is it Amphibious?*, 1 J. ENVTL. L. & LITIG. 107, 109 (1986)).

66. Lynch, *supra* note 58, at 76 (quoting EMPEROR CAESAR FLAVIUS JUSTINIAN, *THE INSTITUTES OF JUSTINIAN* (J.B. Moyle trans. Oxford ed. 1911)).

67. *Id.*

68. Ill. Cent. R.R. Co. v. Illinois, 146 U.S. 387 (1892).

69. *Id.* at 433–34.

impaired.”⁷⁰ *Illinois Central* would become the bedrock of the Public Trust Doctrine in the U.S., limiting the ability of governments to release title to lands that relate to public trust resources, focusing specifically on navigable waters.⁷¹ Unlike in England, *Illinois Central* expanded the Public Trust Doctrine’s reach towards non-tidal navigable waters because of the unique situation of the Great Lakes operating as “‘inland seas’ upon which extensive interstate and foreign commerce is conducted.”⁷²

The foundation for the Public Trust Doctrine in the U.S. is unclear. There is ongoing debate whether its proper place is as a background principle of the Constitution or derived from federal and/or state common law. Supreme Court decisions after *Illinois Central* indicated that the doctrine is “constituted [from] a judicial explication of state, rather than federal, law principles,” meaning it may be different for each specific state.⁷³ Thus, the Public Trust Doctrine has been considered by its opponents as “perhaps the single most controversial development in natural resources law” because there is no discernable source from which it is specifically derived.⁷⁴

The Public Trust Doctrine endured a “resurgence”⁷⁵ in the late 1960’s with Joseph Sax’s famous article, *The Public Trust Doctrine in Natural Resources Law: Effective Judicial Intervention*.⁷⁶ Sax urged courts to use the Public Trust Doctrine more aggressively to protect the public from “rent-seeking politicians” who may not have the public’s interests as their principal concern.⁷⁷ Sax advocated for an expansion of the doctrine from navigable waters to other uses, such as air pollution and wetlands destruction.⁷⁸ Since Sax’s influential article, states have continued to expand the scope of the Public Trust Doctrine, from public access to private

70. Lynch, *supra* note 58, at 77 (citing *id.* at 453); see also Anthony Dan Tarlock & Jason Anthony Robison, *The Public Trust—Illinois Central Railroad v. Illinois*, L. OF WATER RIGHTS & RES. § 8.19 (2019) (explaining the holding of *Illinois Central*).

71. *Ill. Cent. R.R. Co.*, 146 U.S. at 452–53; Spiegel, *supra* note 65, at 426–27.

72. CRAIG, *supra* note, 8, at 124–25 (2017).

73. FRANK, *supra* note 64, at 684; *PPL Mont. v. Montana*, 565 U.S. 576, 589–93 (2012) (describing because this is a state law principle, different states have been expanding it in new ways); see Brown, *supra* note 11, at 7–9 (listing different expansions of the Public Trust Doctrine for specific states, however, not all states agree that it stems from state, and not federal, law); see CRAIG, *supra* note 8, at 126 (explaining how Arizona continues to consider the Public Trust Doctrine as derived from federal law).

74. Brown, *supra* note 11, at 6 (quoting Charles F. Wilkinson, *The Headwaters of the Public Trust: Some Thoughts on the Source and Scope of the Traditional Doctrine*, 19 ENVTL. L. 425, 426 (1989) (describing there are ongoing concerns on the friction between the Public Trust Doctrine and other legal principles such as takings, regulatory takings, and limiting Congress’s Commerce Clause power); see FRANK, *supra* note 64, at 682–84 (listing out how the Public Trust Doctrine works against these other principles).

75. Mumby, *supra* note 15, at 204.

76. See generally Sax, *supra* note 14.

77. Spiegel, *supra* note 65, at 429 (citing Sax, *supra* note 14, at 556).

78. Spiegel, *supra* note 65, at 429.

beaches,⁷⁹ recreational use,⁸⁰ wildlife protection,⁸¹ fishing,⁸² ecological concerns,⁸³ drinking water,⁸⁴ groundwater,⁸⁵ and even to non-navigable inland bodies of water.⁸⁶

These expanded protections under the Public Trust Doctrine have also been enshrined in some states' constitutions, ensuring its place in state natural resource protection.⁸⁷ A recent case that has received significant public interest is that of *Juliana v. U.S.*, or the "Kids Climate Change Case," which has advocated the existence of a federal Public Trust Doctrine as opposed to the common law that "imposes a duty on the federal government to prevent the lease of atmospheric greenhouse gases."⁸⁸ Additionally, to fully understand the relationship of the Public Trust Doctrine to fracking in the Bakken Formation, one must also understand the principle of prior appropriation.

B. Prior Appropriation

The American water landscape has traditionally been divided into two differing legal regimes: the East's riparian model and the West's prior appropriation system.⁸⁹ The Western prior appropriation system rests on a "first in time, first in right"⁹⁰ model where those water right-holders who have possessed claims to a particular water body "are entitled to their full water rights before 'junior' right-holders receive any water at all."⁹¹ Under this model, certainty of ownership is valued, as opposed to a riparian model that weighs the *reasonableness* of competing water usage.⁹² Under prior appropriation, a Montanan farmer who is also a senior

79. Brown, *supra* note 11, at 8 n.40 (citing Carol Nicole Brown, *A Time to Preserve: A Call for Formal Private-Party Rights in Perpetual Conservation Easements*, 40 GA. L. REV. 85, 143–47 (2005)).

80. Brown, *supra* note 11, at 8 (citing *Esplanade Properties, LLC v. City of Seattle*, 307 F.3d 978, 987 (9th Cir. 2002)).

81. CRAIG, *supra* note 8, at 133 (citing ALAS. STAT. ANN. § 38.05.965 (18)).

82. Brown, *supra* note 11, at 8 (citing *Golden Feather Cmty. Ass'n v. Thermalito Irrigation Dist.*, 209 Cal.App.3d 1276, 1283–84 (1989)).

83. Brown, *supra* note 11, at 8 (citing *Nat'l Audubon Soc'y v. Superior Court*, 658 P.2d 709, 719 (Cal. 1983) (*En banc*)).

84. Brown, *supra* note 11, at 8–9 (citing WILKINSON, *supra* note 10, at 466).

85. Spiegel, *supra* note 65, at 430–32.

86. Bukac, *supra* note 48.

87. Brown, *supra* note 11, at 8; see Ricci, *supra* note 16, at 511–12 (overviewing of Montana's constitutional protections for natural resources).

88. See *Juliana v. United States*, 947 F.3d 1159 (9th Cir. 2020); Umair Irfan, *21 Kids Sued the Government over Climate Change. A Federal Court Dismissed the Case*, VOX (Jan. 17, 2020), <https://www.vox.com/2020/1/17/21070810/climate-change-lawsuit-juliana-vs-us-our-childrens-trust-9th-circuit> (explaining the case was ultimately dismissed by the 9th circuit on standing grounds); Zachary L. Berliner, *What About Uncle Sam? Carving a New Place for the Public Trust Doctrine in Federal Climate Litigation*, 21 U. PA. J. L. & SOC. CHANGE 339, 342–43 (2018).

89. See CRAIG, *supra* note 8, at 15–60 (2017) (explaining riparianism and prior appropriation). See generally Joseph Dellapenna, Symposium, *The Evolution of Riparianism in the United States*, 95 MARQUETTE L. REV. 53 (2011) (explaining into riparian water rights); 92 LONNIE E. GRIFFITH ET AL., RIPARIAN RIGHTS DEFINED, OHIO JUR. WATERS §1 (3d ed. 2019).

90. CRAIG, *supra* note 8, at 43.

91. *Id.*

92. *Id.* at 26; see *Dumont v. Kellogg*, 29 Mich. 420 (1874) (evaluating competing reasonable uses); *Red River Roller Mills v. Wright*, 15 N.W. 167 (Minn. 1883); *Mich. Citizens for Water Conservation v.*

rights-holder may divert large swaths of a river's water for irrigating his crops, which in effect can "substantially impair another party's water use and accompanying economic activity."⁹³

There are few restrictions on a senior water rights-holder under a prior appropriation jurisdiction, yet some limitations do exist: beneficial use and its anti-waste requirements. Beneficial use only allows water use that is deemed productive and acceptable by society. This is a concept that is constantly evolving with differing understandings through time and for different states.⁹⁴ Beginning with a focus on "[m]aximizing monetary net benefits, [and] productivity," it has shifted over time to include other interests, not driven by profits, but by natural resource preservation such as recreation,⁹⁵ scenic beauty,⁹⁶ flood control,⁹⁷ and the protection of waterfowl and wildlife habitats.⁹⁸ As states adopted other water-intensive practices beyond traditional economic uses, such as irrigation or mining, they began to impose greater restrictions on senior water rights-holders to respect these new interpretations of what constitutes beneficial use.⁹⁹

In addition to restricting senior water rights-holders' ability to use their water rights based on the type of activity being conducted, there are also limitations against wasting precious water resources. While anti-waste restrictions have been "weak and infrequently and inconsistently enforced,"¹⁰⁰ often times with little more than "flowery pronouncements about the importance of preventing waste" by courts, there are still restrictions that have been acknowledged.¹⁰¹

Anti-waste concerns look to: "1) the perceived use-to-scarcity ratio of the resource; and 2) societal values attached to the production and use of that resource," with more water-stressed communities "plac[ing] a higher value on water" than those where water is more readily available.¹⁰² An important case concerning waste is *Tulare Irrigation District v. Lindsay-Strathmore Irrigation District*.¹⁰³ This case describes the appropriate amount of use as the amount "reasonably necessary for beneficial purposes," which is "according to the general custom of the locality, so long as the custom does not involve unnecessary waste."¹⁰⁴ Looking to local custom means that those concerned with water usage may be disappointed by the lack of

Nestle Waters N. Am. Inc., 709 N.W.2d 174 (Mich. Ct. App. 2005), *aff'd in part, rev'd in part by Mich. Citizens for Water Conservation v. Nestle Waters N. Am. Inc.*, 737 N.W. 2d 447 (Mich. 2007)).

93. CRAIG, *supra* note 8, at 43.

94. *Id.* at 53–57.

95. See CRAIG, *supra* note 8, at 49 (citing *In re Adjudication of the Existing Rights to the Use of All the Water*, 55 P.3d 396 (Mont. 2002)).

96. See Brown, *supra* note 11, at 26.

97. Neuman, *supra* note 9, at 927 (citing *Pueblo W. Metro. Dist. v. Se. Colo. Water Conservancy Dist.*, 689 P.2d 594 (Colo. 1984)).

98. *Id.* (citing *In re Water Right Claim No. 1927-2*, 524 N.W. 2d 855 (S.D. 1994)).

99. See *Id.* at 927, 928 (explaining water uses not considered beneficial uses include drowning gophers, "soaking a field to make it easier to plow, [and] carrying off debris during the irrigation season").

100. See CRAIG, *supra* note 8, at 54.

101. See Neuman, *supra* note 9, at 928–29.

102. Ricci, *supra* note 16, at 501; see Neuman, *supra* note 9, at 933–46 (overviewing the anti-waste doctrine).

103. *Tulare Irrigation Dist. v. Lindsay-Strathmore Irrigation Dist.*, 45 P.2d 972 (Cal. 1935).

104. Neuman, *supra* note 9, at 933 (quoting *Tulare Irrigation Dist.*, 45 P.2d at 997).

waste restrictions acting as a “technology-forcing standard,” but instead cements the status quo until it slowly evolves over time.¹⁰⁵ While this case comes from the California Supreme Court, it is indicative of the understanding that conceptions of waste vary state-by-state based on their own traditions, common law, and concerns for natural resource protection.

C. Bringing These Laws Together

The Public Trust Doctrine’s traditional understanding in the U.S. began by protecting commerce on navigable waters.¹⁰⁶ Over time, public trust doctrine protections were expanded by state courts, offering new opportunities for conservationists to challenge inefficient commercial uses of water resources. As states like Montana codify natural resource protections, opportunities emerge to apply principles that have developed from the Public Trust Doctrine, through case law, to natural resource and water preservation more broadly. In the American West, where states operate under a prior appropriation system, the principles of the Public Trust Doctrine and natural resource case law generally can, and should, be applied to restrict reckless water usage by the fracking industry.

Ideas about how we utilize water in the public trust have evolved over time. The West no longer operates under an unfettered beneficial use system of maximum productivity, but instead is cognizant of non-economic values that stem from recreation and interests of the public good. Yet, fracking continues to consume large sums of water, pollutes what little remains, and thus fails to meet modern understandings of beneficial use principles. Additionally, states too often fail to provide meaningful oversight of the fracking industry. Therefore, beneficial use principles buoyed alongside evolving interpretations of state public trust principles, which preserve resources for drinking and recreation, and anti-waste standards, should apply to provide new restrictions on fracking.

Conservationists should push the envelope on state public trust doctrine principles and constitutional case law, alongside modern understandings of prior appropriation and its beneficial use principles, to find meaningful restrictions on fracking’s continued use of water resources. This Note shines a light on another source of regulation for the industry: modern understandings of long-standing principles of water resource preservation. Modern interpretations of beneficial use and public trust doctrine principles provides courts and conservationists the

105. *Id.* (“Technology-forcing regulations” are “those that mandate firms . . . meet performance standards that go beyond the existing technical capabilities of the industry or to adopt specific technologies that have not been fully developed.”); Jaegul Lee et al., *Forcing Technological Change: A Case of Automobile Emissions Control Technology Development in the US*, 30 *TECHNOVATION* 249 (2010) (explaining technology-forcing regulation “depends on environmental capitalism to invent the equipment needed to improve environmental quality” and reduce pollution beyond what is feasible with existing technology); Jim Wedeking, *Addressing Judicial Resistance to Reciprocal Reliance Standing in Administrative Challenges to Environmental Regulations*, 14 *NEW YORK U. ENVTL. L. J.* 535 (2006); see David Gerard & Lester B. Lave, *Implementing Technology-Forcing Policies: The 1970 Clean Air Act Amendments and the Introduction of Advanced Emissions Controls in the United States*, 72 *TECH. FORECASTING & SOC. CHANGE* 761 (2004) (explaining the technology-forcing regulations’ widespread and lauded role under the Clean Air Act Amendments and its effect on the auto industry).

106. See CRAIG, *supra* note 8, at 123–26.

opportunity and mandate to redefine state constitutional and common law for more stringent oversight of fracking practices.

States like Montana that have developed constitutional protections for natural resources have the opportunity to interpret greater protections against questionable water uses under long-standing prior appropriation principles. Other states like North Dakota, with less developed case law, pose greater challenges for conservation-oriented litigants. However, in both Montana and North Dakota, conservation groups may find avenues of litigation against the fracking industry's continued pollution of surface and groundwater and its over-usage of water through state restrictions on prior appropriation and their public trust doctrine case law. The following Sections will apply public trust doctrine case law and prior appropriation together in the two states that comprise the Bakken Formation: Montana and North Dakota.

IV. APPLYING MONTANA'S PUBLIC TRUST DOCTRINE AND STATE CONSTITUTIONAL LAW TO MANDATE MORE RESTRICTIVE BENEFICIAL USE PRINCIPLES

Montana's Supreme Court has not shied away from expanding understandings of the Public Trust Doctrine to fit the times, going beyond traditional American understandings of protecting navigable waters for commerce.¹⁰⁷ This Section provides an overview of the strong environmental protections derived from public trust doctrine traditions in Montana and how they may be applied toward more stringent beneficial use principles. By interpreting stronger restrictions into Montana's beneficial use doctrine, this Section proposes possible avenues of litigation for conservation-minded individuals and groups to restrict fracking through greater oversight of the industry.

A. Montana's Public Trust Doctrine and State Constitutional Protections

Montana holds one of the strongest state public trust doctrines in the Mountain West. It even goes so far as to enshrine natural resource protections and the Public Trust Doctrine into its state constitution.¹⁰⁸ The state constitution defines its public trust doctrine as “[a]ll surface, underground, flood, and atmospheric waters within the boundaries of the state are the property of the state for the use of its people and are subject to appropriation for beneficial uses as provided by law.”¹⁰⁹ Montana's constitution also provides explicit guarantees that all Montanans are entitled to a “clean and healthful environment,” of which all public and private parties must “maintain and improve . . . for present and future generations.”¹¹⁰ The following Section lays out the broad interpretations awarded these constitutional provisions by

107. *See supra* Section III.

108. MONT. CONST. art. IX, §§ 1, 3 (This is separate from federal public trust doctrine and is instead built around state common law concerning environmental and water resource protection. So, the parameters of what Montanan [or North Dakotan] courts may deem protected under state public trust principles may be markedly different than neighboring states.).

109. *Id.* at art. IX, § 3.

110. Ricci, *supra* note 16, at 511 (citing MONT. CONST. art. IX, § 1).

the Montana Supreme Court and how the codification of resource protection principles has strengthened the state's environmental case law.

Montana's Supreme Court has enshrined value in recreational uses of water, pursuant to its constitutional public trust doctrine provision.¹¹¹ Acknowledging other state supreme courts, which have held a right to recreational use of water as far back as 1893,¹¹² the Montana Supreme Court in *Montana Coalition for Stream Access, Inc. v. Curran* held that "any surface waters that are capable of recreational use may so be used by the public without regard to streambed ownership or navigability for nonrecreational purposes."¹¹³ Years later, the Court would strengthen state public trust doctrine to include "a state agency's water rights claims for fish [and] wildlife."¹¹⁴

Montana's highest Court has also read meaningful protections toward the state's water in another constitutional provision guaranteeing a "clean and healthful environment."¹¹⁵ In *Montana Environmental Information Center v. Department of Environmental Quality* ("MEIC"), the Montana Supreme Court recognized this mandate of a clean environment as a "fundamental right," and "any statute or rule which implicates that right must be strictly scrutinized and can only survive scrutiny if the State establishes a compelling state interest and . . . its action is closely tailored to effectuate that interest and is the least onerous path that can be taken to achieve the State's objective."¹¹⁶

MEIC concerned the constitutionality of the Montana Department of Environmental Quality's ability to craft rules that allowed Seven-Up Pete Joint Venture to obtain a permit where the mining corporation could "discharge arsenic-laden wastewater" into the Blackfoot and Landers Fork Rivers.¹¹⁷ The Court crucially held that the codification of state public trust doctrine in the Montana Constitution and the additional constitutional protection of a clean and healthful environment "cannot be interpreted separately," but instead "that the two provisions complement each other and [must] be applied in tandem."¹¹⁸ In doing so, the Court opens the door for strong public trust doctrine principles to be incorporated into broader understandings of the need for a clean and healthful environment going forward.¹¹⁹

MEIC also expanded the scope of standing to challenge actions harming the state's waters.¹²⁰ Rejecting the state's claim that the nonprofit challenger lacked

111. *Mont. Coal. for Stream Access, Inc. v. Curran*, 682 P.2d 163, 171 (Mont. 1984).

112. *Id.* at 169, 171.

113. *Id.*

114. Mumby, *supra* note 15, at 229.

115. MONT. CONST. art. IX, § 1.

116. Mumby, *supra* note 15, at 230 (quoting *Mont. Env'tl. Info. Ctr. v. Dep't of Env'tl. Quality*, 988 P.2d 1236, 1246 (Mont. 1999)).

117. *Id.*

118. *Mont. Env'tl. Info. Ctr.*, 988 P.2d at 1246.

119. Interestingly, thus far Montana is one of only three states that recognizes an environmental protection guarantee for future generations, alongside Hawaii and Illinois. Barton H. Thompson, Jr., *Constitutionalizing the Environment: The History and Future of Montana's Environmental Provisions*, 64 MONT. L. REV. 157, 166 (2003).

120. *Mont. Env'tl. Info. Ctr.*, 988 P.2d at 1242-43.

standing because it was unable to prove the arsenic level was unsafe in the rivers, the Montana Supreme Court held that the environmental protections codified into the constitution were meant to be “both anticipatory and preventative.” This led one scholar to note that the environmental provision now “embodied a precautionary principle” of protection.¹²¹ Following *MEIC*, “any degradation to the environment” now triggers such constitutional provisions and can lead to judicial review.¹²²

Two years after *MEIC*, the Montana Supreme Court went further in *Cape-France Enterprises v. Estate of Peed*, which opened the door to restrict private actions by the constitutional provisions when they could cause environmental harm.¹²³ Concerned about groundwater contamination from the installation of a well, the Court allowed rescission of the installation contract in Bozeman, which “is hardly the sort of compelling state interest” allowed to go against the mandates of the Constitution.¹²⁴ The *Cape-France* Court strengthened the protections provided by the clean and healthful constitutional privilege, noting that this is a “fundamental right that may be infringed only by demonstrating a compelling state interest.”¹²⁵ This “compelling state interest” must be “‘of the highest order and . . . not otherwise served’ or ‘the gravest abuse, endangering a paramount government interest.’”¹²⁶ While the full extent of what constitutes a “compelling state interest” within the water context remains yet to be defined by Montana’s courts,¹²⁷ *MEIC* and *Cape-France* provide conservationists with a route to restrict misguided public and private actions when they harm the state’s water supplies.

B. Defining Beneficial Use in Montana

Before applying these constitutional provisions toward fracking in Montana, one must understand the current definitions of beneficial use in the state. Montana’s state code currently defines beneficial use as “a use of water for the benefit of the appropriator, other persons, or the public, including but not limited to agriculture, stock water, domestic, fish and wildlife, industrial, irrigation, mining, municipal power, and recreational uses.”¹²⁸ While there is sparse case law explaining beneficial use and its corollary principle of anti-waste in Montana, one U.S. district court decision in Montana held in 1932¹²⁹ that irrigation with “excessive evaporation, seepage and absorption” was “unreasonably wasteful,” imposing a restriction on the farmer’s use of prior appropriated water.¹³⁰ While the Montana Supreme Court in *Montana Coalition for Stream Access, Inc. v. Curran* made clear that the public’s interest in recreational water use does not trump prior appropriation rights, there is still ample room for challenges on the water contamination and exorbitant amounts

121. Thompson, *supra* note 119, at 170.

122. *Id.*

123. *Cape-France Enterprises v. Estate of Peed*, 29 P.3d 1011, 1016 (Mont. 2001).

124. *Id.* at 1017.

125. *Id.* at 1016.

126. Thompson, *supra* note 119, at 172 (citing *Cape-France Enterprise*, 29 P.3d at 1016–17).

127. *Id.*

128. MONT. CODE ANN. § 85-2-102(4)(a) (2019).

129. Neuman, *supra* note 9, at 937 (citing *Dern v. Tanner*, 60 F.2d 626, 628 (Dist. Mont. 1932)).

130. *Id.*

of water used in fracking.¹³¹ While Montana's courts have held that "it is to the interest of the public that water be conserved for use, rather than be permitted to go to waste," there is little explanation of what waste means in this context. To date, it remains unclear what meaningful restrictions on beneficial use related to water contamination may apply.

C. Interpreting Restrictions into Montana's Beneficial Use Requirements

While recent actions have targeted municipalities' abilities to restrict fracking within their jurisdictions,¹³² this Note advocates for litigants to argue for wider-sweeping protections to be interpreted into the beneficial use requirements in Montana. This Section lays out how Montana's courts could read stronger protections into the state's beneficial use requirements by challenging existing fracking practices under beneficial use due to the large quantities of water required and concerns of water contamination.

First, conservation-oriented parties could challenge fracking under anti-waste principles. Because fracking wells in the Bakken Formation require over a million gallons of water per well, litigants could challenge the suitability of hydraulic fracturing when over half of the leases were in "extremely high-water stress" areas of the state.¹³³ However, because of *Curran* and the prior appropriator's right to vast quantities of water, conservationists are more likely to find success on challenges toward expanding beneficial use specifically toward water quality and contamination. At a minimum, litigants could advocate for requiring greater amounts of the recycling of water in fracking processes to fulfill Montana's (admittedly undefined) anti-waste requirements.

Second, litigants could raise challenges on the ongoing concerns of groundwater contamination caused by fracking.¹³⁴ Earth Justice, the Natural Resources Defense Council, and the Montana Environmental Information Center have already raised concerns to the state regarding "trade secret exemption[s]" that permit fracking companies to hide the full list of contaminants in fracking fluid under the guise of confidentiality.¹³⁵ As put forth by previous scholars, the strongest arguments against fracking-related contamination may be "geological limitations on adequate well casings," lack of supervision, and wells too close to important sources of surface water for drinking and other public usage.¹³⁶ Therefore, Montana's beneficial use principles should be interpreted to require further restrictions on fracking, in order to combat the toxicity of its wastewater, the ongoing issues of

131. Spiegel, *supra* note 65, at 445–46 (citing *Mont. Coal. for Stream Access, Inc. v. Curran*, 682 P.2d 163, 170 (Mont. 1984)).

132. Mumby, *supra* note 15, at 226–29.

133. Laura Lundquist, *Report: Surge in Fracking Endangers Montana's Most-Stressed Water Supplies*, MISSOULA CURRENT (Nov. 15, 2019), <https://missoulacurrent.com/outdoors/2019/11/fracking-water/>.

134. See Spiegel, *supra* note 65, at 444–46. See generally, *supra* Sections I–III (noting that even if Montana does not ultimately adopt public trust principles towards groundwater there is still the constitutional provision of a clean and healthful environment that can be applied towards contaminated groundwater due to fracking spillages and wastewater contamination).

135. Mumby, *supra* note 15, at 227.

136. *Id.* at 232.

contaminant seepage and spills, and the fracking wells' close proximity to neighboring communities. By giving teeth to its beneficial use principles, Montana's courts can bring its prior appropriation case law into the twenty-first century and combat one of the state's largest threats to water security.

Beneficial use principles evolved over time. Originally focused on total economic output, beneficial use now concerns a wider range of considerations, such as recreation and preservation of waterways. Therefore, it is time the Montana Supreme Court provides more protective interpretations of beneficial use within the fracking context. The Montana Supreme Court should hold that a clean and healthy environment is not possible without greater safeguards for modern fracking practices because the constitutional right to a clean and healthful environment operates "in tandem" with state public trust doctrine and beneficial use restrictions on prior appropriators' water rights. This extra protection is necessary because of the large amounts of water required per well—without a recycling requirement for fracking water—in an already water scarce region, and continued concerns of contamination.

Litigants can likely challenge existing, and future,¹³⁷ fracking wells as antithetical to the constitutional clean and healthful environment and public trust doctrine articles. However, the state would likely contend that fracking is a "compelling state interest,"¹³⁸ as a source of employment for many eastern Montanans and acts as a needed source of state revenue. While the state would undoubtedly prove successful in fending off a full and total ban on fracking, conservation interests could advocate to: 1) move fracking wells further from communities where spills and contamination are of great concern; 2) require state regulators to impose greater restrictions on fracking safety; 3) mandate higher rates of recycling water used for fracking-related purposes; and 4) remove overly broad trade secret exemptions of chemicals in fracking wastewater so that the public may be better informed of possible contamination in their water supplies. All of these suggestions would satisfy requirements under *MEIC* that fracking only proceed under the "least onerous path that can be taken to achieve the State's objective" of fracking-related jobs and revenue.¹³⁹

Under Montana's bold constitutional requirement that every citizen has a right to a "clean and healthful environment" and its history of strong public trust doctrine principles, the Montana Supreme Court should interpret further restrictions into beneficial use practices. Restrictions such as requiring more safeguards on fracking to ensure the continuation of the state's natural resource protection as a "fundamental right."¹⁴⁰

137. Mont. Envtl. Info. Ctr. v. Dep't of Envtl. Quality, 988 P.2d 1236, 1249 (Mont. 1999).

138. *Id.* at 1246.

139. *Id.*

140. *Id.*

V. STRENGTHENING NORTH DAKOTA'S BENEFICIAL USE PRINCIPLES

Unlike Montana, North Dakota holds no constitutional codification of environmental principles.¹⁴¹ Instead, the state has a sparse, yet present, public trust doctrine extended to cover groundwater.¹⁴² This Section lays out North Dakota's public trust doctrine precedent, current understandings of beneficial use, and how the state can strengthen its beneficial use principles to require greater safeguards on fracking and increased recycling of wastewater.

A. The Public Trust Doctrine in North Dakota

North Dakota's public trust doctrine case law is less pronounced than Montana's, yet still holds significant sway in the management of the state's water resources. While North Dakota has no constitutional protections toward environmental preservation or its notion of public trust doctrine,¹⁴³ it does have specific statutory provisions that enshrine water resources as a "public" good.¹⁴⁴ In *United Plainsmen Association v. North Dakota State Water Conservation Commission*, North Dakota's seminal public trust doctrine case, the North Dakota Supreme Court held that the state, as a "trustee of the public waters," may "permit alienation and allocation of such precious state resources only after an analysis of present supply and future need."¹⁴⁵ The *United Plainsmen* Court held that while the state code did not create any obligations of water conservation planning, it was included in North Dakota's public trust doctrine provision.¹⁴⁶

Notably, the North Dakota Supreme Court made clear that the public trust doctrine principles it was applying did not stem from the state's constitutional law, but instead from common law and the state code.¹⁴⁷ Furthermore, the Court noted that the legislature holds the ability to change these conservation-minded principles.¹⁴⁸ While North Dakota's public trust doctrine may not be protected by state constitutional law, it "was truly revolutionary"¹⁴⁹ to expand the doctrine to include not only assurances of navigability, but also "other important aspects of water supplies," such as short and long-term planning of its use.¹⁵⁰ Since water is a public good, North Dakotan conservation groups have standing to challenge government administration of water resources and can assert that they are improperly

141. Nancy Jean Strantz, *Rights to Ground Water in North Dakota: Trends and Opportunities*, 71 N.D. L. REV. 619, 638 (1995).

142. N.D. CENT. CODE § 61-02-01 (2013).

143. Strantz, *supra* note 141.

144. Ricci, *supra* note 16, at 515.

145. *United Plainsmen Ass'n v. N. D. State Water Conservation Comm'n*, 247 N.W.2d 457, 463 (N.D. 1976).

146. Spiegel *supra* note 65, at 451 (citing *United Plainsmen Ass'n*, 247 N.W.2d at 463).

147. *Id.*

148. *United Plainsmen Ass'n*, 247 N.W.2d at 463.

149. Spiegel, *supra* note 65, at 451.

150. *Id.* at 451 n.204 (citing a North Dakota Attorney General opinion acknowledging extra-navigation responsibilities for the management of public waters under public trust doctrine principles).

considering long-term concerns of water use within the state.¹⁵¹ North Dakota state code, acknowledged in *United Plainsmen*, specifically recognizes groundwater as a public water of the state.¹⁵² Meaning, public trust doctrine principles extend beyond the surface to underground waters as well.¹⁵³

B. North Dakota's Beneficial Use Principles

There is little case law or statutory analysis on North Dakota's specific understandings of beneficial use. However, beneficial use is defined as "a use of water for a purpose consistent with the best interests of the people of the state."¹⁵⁴ Ranking in descending priority, from highest to lowest, for competing uses of water are: domestic use; municipal use; livestock; irrigation; industrial use (which is where oil and gas presumably is situated); and finally, fish, wildlife, and recreational uses.¹⁵⁵ While no state court case or statute recognizes oil and gas as a beneficial use, the North Dakota State Engineer has classified it as such,¹⁵⁶ buoyed by strong legislative support for a policy of expansive oil and gas development.¹⁵⁷ Despite a strong state interest in oil and gas development, conservation groups have an opportunity to demand a more conservation-conscious principle of beneficial use within the fracking context.

C. Reading in Stronger Safety Standards into North Dakota's Beneficial Use Requirements

Conservation groups might find success in litigating for an interpretation of beneficial use that requires greater conservation of resources and stringent safeguards for fracking because North Dakota's public trust doctrine goes beyond mere navigability to require short- and long-term planning for water resources.

United Plainsmen is clear: State actors must determine "the potential effect of the allocation of water on the present water supply and future water needs of [North Dakota]."¹⁵⁸ The state's public trust doctrine requirement to keep an eye on future water concerns must be read into determinations of beneficial uses of public water resources. In doing so, North Dakota's fracking practices should not be deemed a beneficial use until adequate considerations are scrutinized as to the water use's affects, both in the short- and long-term. By updating the state's beneficial use practices, fracking could face greater restrictions on acceptable quantities of water used for wells and provide water contamination safeguards so that public water supplies are not further diminished by lax oversight.

151. Strantz, *supra* note 141, at 638–39.

152. *United Plainsmen Ass'n*, 247 N.W.2d at 461 (citing N.D. CENT. CODE § 61-02-01 (2013)).

153. *Id.*

154. Beck, *supra* note 36, at 518–19 (citing N.D. CENT. CODE § 61-04-01.1(1) (2020)).

155. *Id.* (citing N.D. CENT. CODE §§ 61-01-26(2), 61-04-06.1); *see also id.* at 519 n.100 (recognizing statutory requirement that the "[w]ell-being of all of the people of the state shall be the overriding determinant in considering the best use, or combination of uses, of water and related land resources").

156. Beck, *supra* note 36, at 519.

157. *Id.* (citing N.D. CENT. CODE § 38-08-01).

158. *United Plainsmen Ass'n*, 247 N.W.2d at 462.

First, North Dakotan courts should put actual meaning behind the anti-waste requirements of its beneficial use doctrine. While historically the “reasonable quantity inquiry . . . imposed few substantive constraints on water use” across the West,¹⁵⁹ *United Plainsmen* evidenced clear requirements of adequate considerations for the supply of water resources, both for today and for future generations.¹⁶⁰ Because the Bakken Formation operates in a water-scarce region,¹⁶¹ state fracking regulators should require greater standards on preserving water resources in the water-hungry extraction process.¹⁶²

One scholar has noted that the Northern Great Plains Water Consortium has already posited the idea of shifting water resources in fracking to using more of the plentiful amounts of non-potable groundwater, which can readily be made serviceable for fracking.¹⁶³ The fracking industry should be pushed to increase the recycling of fracking water, an area where North Dakota lags as compared to other fracking regions, such as the Marcellus Shale.¹⁶⁴ By advancing an understanding of anti-waste and beneficial use principles, North Dakotan courts can, and should, impose greater requirements on the recycling of water used in fracking to conserve an increasingly scarce resource. Additionally, North Dakota’s beneficial use principles should work alongside the state public trust principles to require those water uses that are deemed beneficial to have more stringent safeguards in order to avoid water contamination and preserve water quality, both in the short- and long-term.

Second, too often fracking practices have led to water contamination.¹⁶⁵ Continued degradation of the public’s water supplies is antithetical to *United Plainsmen*’s mandate of making adequate considerations for the short- and long-term well-being of the state’s water resources. Yet, by interpreting the state’s beneficial use requirements to impose more stringent quality control, fracking could continue with much needed assurances of preserving scarce water supplies in the Bakken Formation within North Dakota.

159. Spiegel, *supra* note 65, at 420.

160. *United Plainsmen Ass’n*, 247 N.W.2d at 462.

161. Parham, *supra* note 47; *see also* John McChesney, *Oil Boom Puts Strain on North Dakota Towns*, NPR (Dec. 2, 2011), <https://www.npr.org/2011/12/02/142695152/oil-boom-puts-strain-on-north-dakota-towns> (quoting chairman of Williams County Commission) (stating that the fracking industry is “‘consuming all of our people looking for jobs. All the employee base is used up. Our roads system is being used up. *All our water is being used up*’”) (emphasis added).

162. *See* CHRISTOPHER B. HARTO ET AL., NATIONAL ENERGY TECHNOLOGY LABORATORY, WATER USE AND MANAGEMENT IN THE BAKKEN SHALE OIL PLAY 4 (2014) (listing increasing average volume of water required per well in the Bakken formation); *see also* Patrick J. Kiger, *North Dakota’s Salty Fracked Wells Drink More Water to Keep Oil Flowing*, NAT’L GEOGRAPHIC (Nov. 11, 2013), <https://www.nationalgeographic.com/news/energy/2013/11/131111-north-dakota-wells-maintenance-water/> (explaining water-intensive hydraulic fracturing process in the Bakken formation); N.D. WATER COMM’N, *supra* note 17, at 1, 3 (explaining approximately 10.1% of water in 2018 was used in fracking-related purposes in North Dakota).

163. Beck, *supra* note 36, at 519.

164. *Id.* at 528.

165. Namita Shrestha et al., *Potential Water Resource Impacts of Hydraulic Fracturing from Unconventional Oil Production in the Bakken Shale*, 108 WATER RES. 1, 2–4, 14–21 (2016); Nancy E. Lauer et al., *Brine Spills Associated with Unconventional Oil Development in North Dakota*, 50 ENVTL. SCI. & TECH. 5389, 5395–96 (2016).

Fracking will not cease in North Dakota through a rigorous application of public trust doctrine principles and strengthening beneficial use principles within the state alone. There is a strong and clear policy interest imposed by the legislature toward fracking. Therefore, fracking likely will not be stopped through legislation in the near future either.¹⁶⁶ However, North Dakota's courts can apply existing precedent mandating adequate considerations of the state's water supply through its public trust doctrine toward a more conservation-conscious beneficial use understanding. Imposing heightened requirements for recycling fracking water to mitigate waste, as well as mandating greater oversight of fracking to fend off water contamination is not only permissible under existing case law, but also needed to protect North Dakota's water resources.

Opponents of a more expansive interpretation of requirements on the fracking industry would likely point out that *United Plainsmen* "resembles a common law equivalent of the National Environmental Policy Act ("NEPA") by only requiring the state to "consider conservation" without "demand[ing] that it manage its water resources in a manner which reflects this consideration."¹⁶⁷ However, a future North Dakotan court interpreting *United Plainsmen* amid increasing threats to water scarcity may expand public trust doctrine precedent to impose not only procedural requirements, but also substantive mandates. Even if future North Dakotan courts fail to identify substantive mandates in state public trust principles, strengthening the procedural requirements surrounding water-resource planning and weighing the efficacy of contamination safeguards around fracking may foster greater public debate on the risks of short-sighted drilling practices.¹⁶⁸

Fracking will not cease in North Dakota any time soon. Yet, a more conservation-conscious interpretation of beneficial use principles, stemming from *United Plainsmen* and the state's public trust doctrine provisions, may support implementing increased requirements on fracking interests in order to conserve more water and ensure less degradation of public water supplies from contamination.

VI. CONCLUSION

This Note lays out how challenges to existing fracking practices are often state-specific. Therefore, the constitution and case law of Montana may lead to noticeably different outcomes than that of its neighboring state North Dakota.

Fracking has become a core aspect of many state economies. This Note advocates for applying state constitutional law and state public trust case law to states like Montana and North Dakota in order to demand more stringent safeguards on fracking water use. High impact litigation will not likely halt fracking, but it may lead to implementing meaningful safety standards. As states expand their conception of beneficial use principles, restrictions can be distilled from existing fracking

166. Beck, *supra* note 155, at 519 (citing N.D. CENT. CODE §38-08-01).

167. Spiegel, *supra* note 65, at 452 (describing that the "court did not consider what impact, if any, the doctrine might have on existing rights, leaving open the possibility that it has none," meaning this purported expansion of public trust doctrine and beneficial use is perhaps only forward-looking).

168. See Kirk Emerson & Elizabeth Baldwin, *Effectiveness in NEPA Decision Making: in Search of Evidence and Theory*, 21 J. OF ENV'T POL'Y & PLAN. 427, 429-32 (2019) (giving an overview of studies comparing the effectiveness of NEPA's procedural requirements on federal agencies' environmental decision-making).

regulations and ultimately lead to safer operations. These restrictions may include imposing mandates on increased recycling of the voluminous amounts of water fracking demands, moving fracking wells further away from communities, and increasing safeguards to fend off contamination of public water supplies.

Going forward, conservation-minded groups should take greater interest in state case law to advocate that stronger interpretations of beneficial use principles apply to fracking. Otherwise, these states risk permitting even more needless waste of already scarce water and allowing further avoidable water contamination to occur.