COMMENT

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Defending Water Against a Fractured Body of Law: A Case Study of California's Monterey Shale Formation

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> "We were trying to believe that everything would get better.
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> We've been lying to each other . . .
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> Let's just call it what it is!
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> Oil and water . . ."[1]

At a molecular level, oil and water do not mix.[2] Yet in the context of oil extraction, Americans have largely ignored this scientific principle, engaging in decades of mixing, injecting, and discarding of water in the pursuit of oil. The process of hydraulic fracturing, or "fracking," used to recover oil and gas trapped in shale formations, is notorious for consuming tremendous quantities of water and producing contaminated water.[3] With an estimated fifteen billion gallons of shale oil trapped in California's Monterey shale formation, which amounts to sixty-four percent of the total discovered oil shale resources remaining in the United States,[4] the State of California is rich with oil, but lacks a vastly more vital resource—fresh water. There is no doubt that it is easier to protect California's water now than to attempt to salvage it after pollution and depletion occur. Governments and environmentalists are using environmental laws and regulations to effectively limit fracking in many ways. Where these approaches fall short of protecting California's water, however, concerned citizens should harness the power of state water laws to turn off the water that fracking operations need to function.

This Comment provides a broad overview of how comprehensive regulation of the water used for fracking can be achieved using California's water laws. Its two goals are to provide a basic map of the legal landscape governing the effects of fracking operations on

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1 INCUBUS, *Oil and Water*, *on* LIGHT GRENADES (Epic Records 2006). Incubus is a rock band from Calabasas, California, not far from the Monterey shale formation.

2 *Why Don't Oil and Water Mix?*, MOCOMI.COM, http://mocomi.com/why-oil-and-water-dont-mix/ (last visited Mar. 22, 2014).

3 FOOD & WATER WATCH, FRACKING: THE NEW GLOBAL WATER CRISIS 4–7 (2012), *available at* http://documents.foodandwaterwatch.org/doc/FrackingCrisisUS.pdf.

4 U.S. ENERGY INFO. ADMIN., REVIEW OF EMERGING RESOURCES: U.S. SHALE GAS AND SHALE OIL PLAYS 5 (2011), *available at* http://www.eia.gov/analysis/studies/usshalegas/pdf/usshaleplays.pdf.

water quality and quantity and to present creative ideas for future challenges to the use of fracking under California water law. Part I of this Comment provides a background of fracking practices and effects. Part II examines federal and state regulations concerning fracking and water use in California as well as current litigation over fracking in the state. Part III proposes ways that water users can apply California water law to supplement federal and state regulations. The discussions in these three Parts show that a holistic application of government regulations and citizen challenges under environmental and water laws may be the key to achieving the separation of oil and water that California needs.

I
THE PROCESS OF FRACKING AND POTENTIAL RISKS

The active shale oil area of the Monterey shale formation stretches approximately 1,752 square miles (1,121,280 acres) across the San Joaquin and Los Angeles Basin.[5] On December 12, 2012, the Bureau of Land Management (BLM) auctioned off 17,832.80 acres[6] for oil and gas exploration,[7] though subsequent litigation may invalidate or postpone these leases.[8] Conventional drilling techniques often cannot extract the oil tightly trapped in shale deposits[9] like the Monterey shale formation—but fracking can. The specific method of fracking used depends on the formation and whether the operator wants to extract oil or gas.[10] Generally, the process involves pumping a

5 *Id.* at 75.

6 Roughly 14,091 of those acres are public mineral resources underlying private surface land. BUREAU OF LAND MGMT., DECISION RECORD: DECEMBER 12, 2012 OIL AND GAS COMPETITIVE LEASE SALE ENVIRONMENTAL ASSESSMENT #DOI-BLM-CA-0900-2012-40-EA, at 1–2 (2012), *available at* http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/pa/energy/minerals.Par.12371.File.dat/CA-0900-2012-40-EA-DR-508.pdf.

7 BUREAU OF LAND MGMT., RESULTS OF DECEMBER 12, 2012 COMPETITIVE OIL & GAS LEASE SALE (2012), *available at* http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/pa/energy/minerals.Par.21717.File.dat/508-SaleResults2-12-12.pdf.

8 *See infra* Part II.D.

9 Stephanie M. Lee, *U.S. to Auction State Shale for Drilling*, SFGATE, http://www.sfgate.com/science/article/U-S-to-auction-state-shale-for-drilling-3850852.php (last updated Sept. 18, 2012, 5:28 PM).

10 Hannah 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, 120 (2009).

mixture of ninety-eight to ninety-nine percent water,[11] "proppants" (sand or ceramic beads),[12] and chemicals at a high pressure into the shale, causing it to fracture.[13] The proppants literally prop open the fissures in the shale, allowing oil or natural gas to flow through the cracks for harvest.[14] Immediately after fracking, some of the fracking fluid flows up to the surface at the wellhead, called "flowback."[15] As the well produces oil or gas over time, water from the formation continues to resurface, called "produced water."[16] Oil companies already use fracking in California[17] and will likely continue using some variation of this process to extract oil from the Monterey shale formation.

Fracking can create serious problems for water quantity and quality. Though there is a lack of credible and comprehensive data on fracking,[18] it undeniably uses large quantities of water. The Western States Petroleum Association reports that the average fracking operation in California uses 164,000 gallons of water per well.[19] For context, an average resident of San Diego County used 48,545 gallons of water in 2012.[20]

Fracking also creates large amounts of polluted water. In 2010, California's onshore oil wells produced 12.7 barrels of produced water for each barrel of oil—about 2.39 billion barrels of produced

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11 Jeremy Brown, *BLM Fracking Rules and Water Supply*, ENERGY CENTER (July 20, 2013), http://www.utexas.edu/law/centers/energy/blog/2013/07/blm-fracking-rules-and-water-supply/.

12 MICHAEL KIPARSKY & JAYNI FOLEY HEIN, REGULATION OF HYDRAULIC FRACTURING IN CALIFORNIA: A WASTEWATER AND WATER QUALITY PERSPECTIVE 14 (2013), *available at* http://law.berkeley.edu/files/ccelp/Wheeler_HydraulicFracturing_April2013.pdf.

13 Wiseman, *supra* note 10, at 117–18.

14 *Id.*

15 KIPARSKY & HEIN, *supra* note 12, at 14.

16 *Id.*

17 *Id.* at 11.

18 HEATHER COOLEY & KRISTINA DONNELLY, HYDRAULIC FRACTURING AND WATER RESOURCES: SEPARATING THE FRACK FROM THE FICTION 6 (2012), *available at* http://www.pacinst.org/wp-content/uploads/2013/02/full_report35.pdf.

19 W. STATES PETROLEUM ASS'N, HYDRAULIC FRACTURING IN CALIFORNIA 7 (2012), *available at* http://energyindepth.org/wp-content/uploads/2012/09/GRAC-HF-Presentation-7-24-12-Compatibility-Mode1.pdf.

20 Per capita municipal and industrial water use in San Diego County was 133 gallons per day in 2012. *Regional Dashboard*, EQUINOX CENTER, http://www.equinoxcenter.org/Regional-Dashboard/water.html (last visited Mar. 22, 2014).

water.[21] Fracking fluids injected into the ground have included chemicals that are known or possible carcinogens or are recognized as posing a risk to human health under the Safe Drinking Water Act (SDWA).[22] Many of the chemical additives are intended to foster proppant circulation and prevent bacteria from forming that could block the well.[23] But when those chemicals and other hazardous materials found naturally in shale formations[24] enter water sources through injection, leeching, or surface dumping, they seriously jeopardize water quality. Californians are familiar with this risk. In 2009, a jury awarded a farmer in Kern County $8.5 million in damages against Aera Energy (a joint venture of Shell and ExxonMobil) for dumping 96,096,512 gallons of produced water from oil and gas operations into unlined ponds, contaminating local well water and decimating the farmer's crops.[25]

The Environmental Protection Agency (EPA) is currently completing a study assessing the large volumes of water used by fracking operations and the impacts of well injection on drinking water.[26] The BLM is also preparing an Environmental Impact Statement (EIS) and potential Resource Management Plan (RMP) to study oil and gas leasing development of public mineral resources in the Monterey shale formation.[27] A peer-reviewed, interdisciplinary report on oil and gas practices in California will inform the BLM's

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21 CAL. DEP'T OF CONSERVATION, 2010 PRELIMINARY REPORT OF CALIFORNIA OIL AND GAS PRODUCTION STATISTICS 12 (2011), *available at* ftp://ftp.consrv.ca.gov/pub/oil/annual_reports/2010/PR03_PreAnnual_2010.pdf.

22 MINORITY STAFF OF H.R. COMM. ON ENERGY & COMMERCE, 112TH CONG., CHEMICALS USED IN HYDRAULIC FRACTURING 1 (2011), *available at* http://democrats.energycommerce.house.gov/sites/default/files/documents/Hydraulic-Fracturing-Chemicals-2011-4-18.pdf.

23 CAL. DEP'T OF CONSERVATION, NARRATIVE DESCRIPTION OF HYDRAULIC FRACTURING DRAFT REGULATIONS 2 (2012), *available at* http://www.conservation.ca.gov/dog/general_information/Documents/121712NarrativeforHFregs.pdf.

24 KIPARSKY & HEIN, *supra* note 12, at 14.

25 Starrh & Starrh Cotton Growers v. Aera Energy LLC, 153 Cal. App. 4th 583 (2007), *aff'd with respect to compensatory damages*, Nos. F058778, F059660, 2012 WL 210452 (Cal. Ct. App. 5th Dist., Jan. 25, 2012).

26 EPA, STUDY OF THE POTENTIAL IMPACTS OF HYDRAULIC FRACTURING ON DRINKING WATER RESOURCES: PROGRESS REPORT 1 (2012), *available at* http://www.epa.gov/hfstudy/pdfs/hf-report20121214.pdf.

27 Notice of Intent to Prepare an Environmental Impact Statement for Oil and Gas Leasing and Development on Public Lands and Federal Mineral Estate and Potentially Amend the Hollister Resource Management Plan, CA, 78 Fed. Reg. 47,408, 47,408 (Aug. 5, 2013).

EIS and RMP.[28] The process could take years, and California's governor has indicated his intent to continue allowing fracking in the interim.[29]

It is undeniable that oil development in the Monterey shale formation will provide immense economic benefits for the State of California.[30] But Californians cannot afford to pay for those benefits in water. As governments implement new regulations and environmental groups continue challenging mineral auctions and permitting decisions under environmental laws, citizens concerned about conserving fresh water in the Monterey shale formation should fill the remaining gaps in water protections with challenges under California's water laws.

II
THE LEGAL LANDSCAPE OF FRACKING IN CALIFORNIA

A rapidly changing framework of federal laws, state laws, and environmental litigation overlies fracking in the Monterey shale formation. This framework requires information disclosures, water quality monitoring, and wastewater treatment, but does not effectively limit the amount of water used for fracking; thus, water laws are a critical final element of comprehensive protections of water in the Monterey shale formation.

A. Federal Laws Regulate Aspects of Water Quality but Not Water Quantity

The SDWA[31] regulates the underground injection of fluid under the Underground Injection Control program[32] to protect drinking water sources. Underground injections of oil and gas production fluids are managed as Class II wells.[33] But Congress expressly excluded "the underground injection of fluids or propping agents (other than diesel

28 *Id.*

29 *See* Lynn Doan, *California Fracking Study May Take 18 Months, Brown Says*, BLOOMBERG (Oct. 28, 2013, 9:00 PM), http://www.bloomberg.com/news/2013-10-29/california-fracking-study-may-take-18-months-brown-says.html.

30 Oil development in the Monterey shale formation could create 2.8 million jobs by 2020 and increase state and local government tax revenue by 24.6 billion dollars. GLOBAL ENERGY NETWORK, UNIV. OF S. CAL., THE MONTEREY SHALE & CALIFORNIA'S ECONOMIC FUTURE 27–28 (2013), *available at* http://gen.usc.edu/assets/001/84955.pdf.

31 42 U.S.C. §§ 300f–300j-26 (2012).

32 Underground Injection Control Program, 40 C.F.R. §§ 144.1–144.89 (2013).

33 *Id.* § 144.6(b).

fuels)[34] pursuant to hydraulic fracturing operations related to oil, gas, or geothermal production activities"[35] from the definition of "underground injection." Thus, the SDWA regulates underground injections of diesel fuels and wastewater—but not fracking fluids—by fracking operations.

The Clean Water Act (CWA)[36] applies to discharges of flowback and produced water into surface waters. Operators must obtain a National Pollutant Discharge Elimination System (NPDES) permit for discharges of pollutants into navigable waters,[37] with the exception of "produced water that has been disposed of in a state-approved reinjection well."[38] The narrowness of this exception means that most operators discharging produced water into navigable waters without a NPDES permit violate the CWA.[39] Rather than discharge produced waters directly into navigable waters under a NPDES permit, fracking operators may deliver their wastewater to publicly owned treatment works (POTWs), which treat the waste and discharge it subject to their own NPDES permits.[40] Not all POTWs are designed to handle or monitor the types of waste created by fracking operations, however, raising concerns that the pollutants merely pass through the system without treatment into navigable waters.[41]

Four federal laws regulating the handling, disclosure, disposal, and cleanup of hazardous substances may also apply to fracking operations; however, all four include important exemptions for oil and gas operations. Under the Resource Conservation and Recovery Act (RCRA),[42] "[d]rilling fluids, produced waters, and other wastes associated with the exploration, development, or production of crude

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34 Operators can inject diesel fuels with an EPA permit. *See id.* § 144.11.

35 42 U.S.C. § 300h(d)(1)(B)(ii) (2012).

36 33 U.S.C. §§ 1251–1387 (2012).

37 *Id.* § 1342.

38 Sierra Club v. Cedar Point Oil Co., 73 F.3d 546, 568 (5th Cir. 1996) (citing the exception in 33 U.S.C. § 1362(6)(B) and holding that produced water is a "pollutant" if disposed of in a bay, instead of a state-approved reinjection well).

39 *See id.* at 568–69; N. Plains Res. Council v. Fidelity Exploration & Dev. Co., 325 F.3d 1155, 1161 (9th Cir. 2003) (produced water from coal bed methane extraction is a "pollutant" under the CWA).

40 *See* 33 U.S.C. § 1317(b)(1) (2012); 40 C.F.R. §§ 403.1–403.20 (2013).

41 Leigh Krietsch Boerner, *Sewage Plants Struggle to Treat Wastewater Produced by Fracking Operations*, CHEMICAL & ENGINEERING NEWS (Mar. 18, 2013), http://cen.acs.org/articles/91/web/2013/03/Sewage-Plants-Struggle-Treat-Wastewater.html.

42 Resource Conservation and Recovery Act, 42 U.S.C. §§ 6901–6992k (2012).

oil, natural gas or geothermal energy" are not regulated as hazardous wastes.[43] The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)[44] contains a similar petroleum and natural gas exclusion, providing that the term hazardous substance "does not include petroleum, including crude oil or any fraction thereof which is not otherwise specifically listed or designated a hazardous substance . . . [or] natural gas . . . ."[45] But because this exemption only applies to oil and gas, the release of other hazardous substances resulting from oil production could nonetheless fall under CERCLA's requirements.[46] CERCLA's liability and reporting provisions do not apply to federally permitted releases.[47]

The Emergency Planning and Community Right-to-Know Act (EPCRA)[48] sometimes overlaps with CERCLA's reporting requirements,[49] but more generally governs information reporting on uses, inventories, and releases of hazardous and toxic substances above certain quantities.[50] Though EPCRA applies to fracking operators if they meet the statutory reporting threshold, operators are exempt from reporting toxic chemicals in the Toxic Release Inventory.[51] Finally, the Toxic Substances Control Act (TSCA)[52] authorizes the EPA to regulate manufacturing, processing, use,

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43 40 C.F.R. § 261.4(b)(5) (2013); *see also* EPA, EXEMPTION OF OIL AND GAS EXPLORATION AND PRODUCTION WASTES FROM FEDERAL HAZARDOUS WASTE REGULATIONS 5 (2002), *available at* http://www.epa.gov/osw/nonhaz/industrial/special/oil/oil-gas.pdf.

44 Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. §§ 9601–9675 (2012).

45 *Id.* § 9601(14).

46 ADAM VANN, ET AL., HYDRAULIC FRACTURING: SELECTED LEGAL ISSUES 13 (2013), *available at* http://digital.library.unt.edu/ark:/67531/metadc227887/m1/1/high_res_d/R43152_2013Oct22.pdf.

47 *See* 42 U.S.C. § 9601(10), 9603 (2012).

48 Emergency Planning & Community Right-to-Know Act, 42 U.S.C. §§ 11001–11050 (2012).

49 GOV'T ACCOUNTABILITY OFFICE, GAO-12-874, UNCONVENTIONAL OIL AND GAS DEVELOPMENT: KEY ENVIRONMENTAL AND PUBLIC HEALTH REQUIREMENTS 179-80 (2012), *available at* http://www.gao.gov/assets/650/647782.pdf.

50 *See* 42 U.S.C. §§ 11004, 11021, 11022 (2012).

51 42 U.S.C. § 11023. The EPA has the authority to decide which industries must report on the Toxic Release Inventory and has chosen not to regulate oil and gas companies. *See Toxics Release Inventory (TRI) Program*, ENVTL. PROTECTION AGENCY, http://www2.epa.gov/toxics-release-inventory-tri-program/my-facilitys-six-digit-naics-code-tri-covered-industry (last updated Oct. 18, 2013).

52 Toxic Substances Control Act, 15 U.S.C. §§ 2601–2697 (2012).

distribution, and disposal of chemical substances and mixtures.[53] The EPA regulates several chemicals used in oil and gas operations under TSCA.[54]

B. Proposed Federal Regulations Provide More Information but No Restrictions

The EPA and the BLM have taken significant steps toward regulating fracking in the last three years. The EPA granted a citizen petition[55] to consider "requir[ing] manufacturers and processors of oil and gas exploration and production (E&P) chemical substances and mixtures to maintain certain records and submit reports on those records" under section 8(a) of TSCA.[56]

The BLM is also moving forward to revise its outdated fracking regulations. Currently, these regulations merely require an operator to obtain the BLM's prior approval to "perform nonroutine fracturing jobs" and provide a subsequent report on these operations.[57] Partly in reaction to public concern about whether fracturing leads to or causes the contamination of groundwater,[58] in May 2012, the BLM published its first proposed rule updating these regulations. In response to more than 177,000 public comments,[59] the BLM amended some of those proposed regulations and held a notice and comment period that closed on August 23, 2013.[60]

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53 *See id.* § 2601(a)(2), 2605.

54 GOV'T ACCOUNTABILITY OFFICE, *supra* note 49, at 188–89.

55 Citizen Petition under Toxic Substances Control Act Regarding the Chemical Substances and Mixtures Used in Oil and Gas Exploration or Production from Deborah Goldberg & Megan Klein, Earthjustice, to Lisa P. Jackson, Administrator, Envtl. Prot. Agency (Aug. 4, 2011), *available at* http://www.vorysenergy.com/uploads/file/Earth justice%20TSCA%20Petition.pdf.

56 Chemical Substances and Mixtures Used in Oil and Gas Exploration or Production; TSCA Section 21 Petition; Reasons for Agency Response, 78 Fed. Reg. 41,768, 41,768 (July 11, 2013). The EPA is not taking action on the petition's requests for requiring manufacturers, processors, or distributors of E&P chemicals to release current safety and health records and conduct toxicity testing of E&P chemicals. *Id.*

57 43 C.F.R. § 3162.3-2(a)-(b) (2013). The prior approval and subsequent report is filed on Form 3160-5, which is available at http://www.blm.gov/pgdata/etc/medialib/blm /noc/business/eforms.Par.87753.File.dat/3160-005.pdf.

58 Oil and Gas; Hydraulic Fracturing on Federal and Indian Lands, 78 Fed. Reg. 31,636, 31,636 (May 24, 2013).

59 *Id.* at 31,639.

60 Oil and Gas; Hydraulic Fracturing on Federal and Indian Lands, 78 Fed. Reg. 34,611 (June 10, 2013).

The proposed regulations apply only to federal and Indian lands.[61] To avoid duplicity, if the BLM determines that state or tribal regulations meet or exceed the BLM requirements, it may issue a variance for wells within those jurisdictions.[62] Summarily, the proposed regulations would protect water sources from the potential effects of fracking by requiring operators to:

- Locate[63] and isolate usable water sources[64] from fracking operations.
- Disclose information concerning the source and location of water supply for fracking operations before fracking.[65]
- Estimate the amount of fracking fluid the operator expects to use.[66]
- Provide a plan for handling and disposing of recovered fluids (flowback and produced water), including the estimated expected volume of those fluids.[67]
- Store all recovered fluids in tanks or lined pits.[68]
- Disclose the chemicals in the fracking fluid[69] and report on how recovered fluids were handled and disposed of[70] *after* fracking is finished.
- Disclose the total volume of water used[71] and the total volume of flowback fluid recovered[72] after fracking.

The BLM plans to use information on water sources as part of its environmental assessment of how water is supplied to a fracking operator, but it explicitly stated that it is not regulating Indian, state, or private water rights.[73] Thus, if the EPA and the BLM adopt their

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61 43 C.F.R. § 3161.1(a) (2013).

62 78 Fed. Reg. at 31,677 (May 24, 2013) (to be codified at 43 C.F.R. § 3162.3-3(k)).

63 *Id.* at 31,675 (to be codified at 43 C.F.R. §§ 3162.3-3(d)(2), 3162.3-3(d)(4)(v)).

64 *Id.* at 31,677, 31,674 (to be codified at 43 C.F.R. §§ 3160.0-5, 3162.5-2(d)).

65 *Id.* at 31,675 (to be codified at 43 C.F.R. § 3162.3-3(d)(3)).

66 *Id.* (to be codified at 43 C.F.R. § 3162.3-3(d)(4)(I)).

67 *Id.* (to be codified at 43 C.F.R. § 3162.3-3(d)(5)(i)–(iii)). The BLM has proposed regulating the storage of flowback and produced water as one for the purposes of storage. *Id.* at 31,655. The BLM's Onshore Order No. 7 already sets out requirements for disposal of produced water, however, and the BLM is considering applying that order for produced water from fracking instead of the proposed regulation. *Id.*

68 *Id.* at 31,676 (to be codified at 43 C.F.R. § 3162.3-3(h)).

69 *Id.* (to be codified at 43 C.F.R. § 3162.3-3(i)(1)).

70 *Id.* (to be codified at 43 C.F.R § 3162.3-3(i)(5)(i)).

71 *Id.* (to be codified at 43 C.F.R. § 3162.3-3(i)(1)).

72 *Id.* (to be codified at 43 C.F.R. § 3162.3-3(i)(5)(i)).

73 *Id.* at 31,644.

proposed regulations, citizens will have more information on water used for fracking, but may still lack enforceable limits on water use. California's water laws remain critical to limiting the quality and quantity of water used for fracking.

C. California's First Step Toward Managing Fracking's Effects on Water: SB-4

On September 20, 2013, California signed Senate Bill 4 (SB-4) into law,[74] supplementing the state's existing oil and gas regulations to create some of the nation's strongest regulations on fracking. Its passage hurdled the state into an ambitious timeline for developing regulations, reports, and monitoring systems that will leave California's law on fracking in a state of flux for the next few years.[75]

Under SB-4, an operator must apply for a permit to conduct a well stimulation treatment, which includes fracking.[76] The permit application requires the operator to submit a water management plan[77] under which the operator must:

- Include "[a]n estimate of the amount of water to be used in the treatment," including water to be recycled following fracking.[78]
- Disclose anticipated water sources and disposal methods for flowback water.[79]
- Dispose of produced water according to section 3227 of the California Public Resources Code.[80]
- List the names, Chemical Abstract Service numbers, and estimated concentrations of "each and every chemical

74 S. 4, 2013–2014 Leg., Reg. Sess. (Cal. 2013).

75 The following timeline may be helpful for determining what updates to look for: CAL. DEP'T OF CONSERVATION, SENATE BILL 4 IMPLEMENTATION PLAN (2013), *available at* http://www.conservation.ca.gov/index/Documents/Senate%20Bill%204%20Implementation%20Plan%2020131114%20final.pdf.

76 CAL. PUB. RES. CODE § 3160(d)(1) (West, Westlaw through ch. 4 of 2014 Reg. Sess. and all propositions on the June 3, 2014 ballot).

77 *Id.* § 3160(d)(1)(C).

78 *Id.* § 3160(d)(1)(C)(i).

79 *Id.* § 3160(d)(1)C)(ii).

80 *Id.* § 3227. This requires the well owner to file with the California Division of Oil, Gas, and Geothermal Resources a monthly statement containing information about the amount of wastewater produced and the disposal of the produced water. *Id.*

constituent of the well stimulation fluids anticipated to be used in the treatment" *before* fracking.[81]

- Provide for a groundwater monitoring plan, [82] which may be (1) a regional monitoring program developed pursuant to Water Code section 10783 for an existing oil and gas field,[83] (2) a regional or field-specific monitoring program developed and implemented by the well owner in an existing oil and gas field that meets the model criteria in Water Code section 10783[84] (explained below), or (3) a "well-specific monitoring plan implemented by the owner or operator meeting the model criteria established pursuant to [s]ection 10783 of the Water Code, and submitted to the appropriate regional water board for review."[85]
- Estimate of the amount of treatment-generated waste materials not reported as flowback water and identify the disposal method for review by the California Division of Oil, Gas, and Geothermal Resources (DOGGR).[86]

SB-4 also amended California's Water Code to create a groundwater monitoring system, reflecting the legislature's "paramount concern" for "protecting the state's groundwater for beneficial use."[87] The State Water Resources Control Board (SWRCB) is charged with developing monitoring criteria before January 1, 2015,[88] and implementing regional groundwater monitoring programs by January 1, 2016.[89] The legislature instructed the SWRCB to "prioritize monitoring of groundwater that is or has the potential to be a source of drinking water," but to nonetheless

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81 *Id.* § 3160(d)(1)(D). This is more protective than the proposed BLM regulation, which only requires chemical disclosure after fracking.

82 *Id.* § 3160(d)(1)(F). The monitoring requirement does not apply to oil and gas wells that "do not penetrate groundwater of beneficial use, as determined by" the State Water Resources Control Board, or do not penetrate underground sources of drinking water that qualify as exempt aquifers under section 146.4 of title 40 of the Code of Federal Regulations. CAL. WATER CODE § 10783(j) (West, Westlaw through ch. 4 of 2014 Reg. Sess. and all propositions on the June 3, 2014, ballot).

83 PUB. RES. § 3160(d)(1)(F)(i) (Westlaw).

84 *Id.* § 3160(d)(1)(F)(ii).

85 *Id.* § 3160(d)(1)(F)(iii).

86 *Id.* § 3160(d)(1)(G).

87 WATER § 10783(a) (Westlaw).

88 *Id.* § 10783(c).

89 *Id.* § 10783(h)(1).

"protect all waters designated for any beneficial use."[90] In developing the groundwater criteria, the SWRCB *shall* determine the following:

> (1) An assessment of the areas to conduct groundwater quality monitoring and their appropriate boundaries.
>
> (2) A list of the constituents to measure and assess water quality.
>
> (3) The location, depth, and number of monitoring wells necessary to detect groundwater contamination at spatial scales ranging from an individual oil and gas well to a regional groundwater basin including one or more oil and gas fields.
>
> (4) The frequency and duration of the monitoring.
>
> (5) A threshold criteria indicating a transition from well-by-well monitoring to a regional monitoring program.
>
> (6) Data collection and reporting protocols.
>
> (7) Public access to the collected data under paragraph (6).[91]

In making these determinations, the SWRCB may also consider, among other things:

> (1) The existing quality and existing and potential use of the groundwater.
>
> (2) Groundwater that is not a source of drinking water consistent with the [EPA's] definition of an Underground Source of Drinking Water as containing less than 10,000 milligrams per liter total of dissolved solids in groundwater (40 C.F.R. 144.3), including exempt aquifers pursuant to Section 146.4 of Title 40 of the Code of Federal Regulations.
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> (3) Proximity to human population, public water service wells, and private groundwater use, if known.
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> (4) The presence of existing oil and gas production fields, including the distribution, physical attributes, and operational status of oil and gas wells therein.
>
> (5) Events, including well stimulation treatments and oil and gas well failures, among others, that have potential to contaminate groundwater, appropriate monitoring to evaluate whether groundwater contamination can be attributable to a particular event, and any monitoring changes necessary if groundwater contamination is observed.[92]

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90 *Id.* § 10783(c).

91 *Id.* § 10783(f)(1)–(7).

92 *Id.* § 10783(g)(1)–(5).

Outside of the water management plan, SB-4 requires fracking operators to provide surface property owners and tenants near fracking operations a copy of the permit and information on water sampling and testing thirty days before commencing operations.[93] A property owner or tenant may request water quality sampling and testing at the well owner's or operator's expense.[94] If "the tenant has lawful use of the ground or surface water . . . the tenant may independently contract for similar groundwater or surface water testing."[95] Finally, within sixty days after the completion of "drilling, rework, well stimulation treatment, or abandonment of operations, or the date of suspension of operations," the operator must file with the DOGGR "copies of the log, core record, and history of work performed, and, if made, true and reproducible copies of all . . . chemical logs, tests, or surveys."[96]

The DOGGR's proposed regulations echo SB-4's protections for water, with a few additions. On the application for a permit to perform well stimulation, the DOGGR requires an applicant to disclose the "[d]epth of the base of protected water," the anticipated volume of fluid to be injected, and the "identification of all water within the area of the well stimulation treatment," in addition to the water management plan.[97]

As federal and state regulations expand, enforcement authority becomes increasingly complex. Approximately 14,091 acres in the Monterey shale formation are split estates, in which the federal government owns the mineral rights and a private party owns the surface rights.[98] To address regulatory overlap, the DOGGR and the BLM currently operate under a 2012 Memorandum of Understanding that instructs the agencies to collaborate on enforcement.[99]

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93 PUB. RES. § 3160(d)(6)(A)–(C) (Westlaw).

94 *Id.* § 3160(d)(7)(A)–(B).

95 *Id.* § 3160(d)(7)(C).

96 *Id.* § 3215(a).

97 DIV. OF OIL, GAS & GEOTHERMAL RES., CAL. DEP'T. OF CONSERVATION, SB 4 WELL STIMULATION TREATMENT REGULATIONS: TEXT OF PROPOSED REGULATIONS (2013) (specifically, those sections to be codified at CAL. CODE REGS. 14, § 1783.1(16), (17), (21), & (23)), *available at* http://www.conservation.ca.gov/index/Documents/Text%20of%20Proposed%20Regulations%20-%20SB%204%20Well%20Stimulation%20Treatment%20Regulations.pdf.

98 BUREAU OF LAND MGMT., *supra* note 6, at 1–2.

99 Memorandum of Understanding between Cal. State Office U.S. Bureau of Land Mgmt. and Cal. Dep't of Conservation Div. of Oil, Gas, and Geothermal Res. (Oct. 16, 2012), *available at* ftp://ftp.consrv.ca.gov/pub/oil/regulations/DOGGR-BLM-%20MOU

D. Environmental Litigation Enforces Informed Government Decisions

Just as the Monterey shale formation has attracted attention from oil companies, it has also become a magnet for anti-fracking litigation. Most notably, in early 2013 the Center for Biological Diversity (CBD) won a landmark case against the BLM under the National Environmental Policy Act (NEPA).[100] The case arose out of the BLM's September 14, 2011 lease of 2,700 acres of mineral rights in the Monterey Shale formation.[101] Prior to the auction, the BLM prepared an environmental assessment, made a finding of no significant impact, and concluded that a full environmental impact assessment was not required at the leasing stage.[102] The court held that the "BLM violated NEPA in its environment [*sic*] assessment of the leases by unreasonably relying on an earlier single-well development scenario," which did not consider the impacts of modern fracking practices.[103] Thus, "it was unreasonable for BLM not to at least consider reasonable projections of drilling in the area that include fracking operations, or else limit its sale to leases with NSO [(no surface occupancy)] provisions that would permit it to prohibit all surface disturbances until more specific information becomes available."[104]

The judge did not cancel the September 2011 leases, leaving the CBD and the BLM to reach a joint plan of action, the resolution of which is ongoing.[105] On April 18, 2013, the CBD and Sierra Club sued the BLM again in the same court, applying their winning argument to the BLM's December 12, 2012 lease of 17,832.80 acres

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%202012.pdf. The DOGGR reported that it "is in regular dialogue with the BLM for the purpose of ensuring harmonized and efficient implementation of the two agencies' respective regulations." 46-Z Cal. Regulatory Notice Reg. 1176 (Nov. 15, 2013).

100 Ctr. for Biological Diversity v. BLM, 937 F. Supp. 2d 1140, 1144 (N.D. Cal. 2013).

101 *Id.* at 1147, 1150.

102 *Id.* at 1147–49.

103 *Id.* at 1144.

104 *Id.* at 1157.

105 Joint Status Report, Ctr. for Biological Diversity v. BLM, 937 F. Supp. 2d 1140 (2013) (No. C 11-06174 PSG), *available at* http://californiafrackinglaw.com/wp-content/uploads/2013/09/2013-1204-Joint-Status-Report-Center-for-Biological-Diversity-v.-Bureau-of-Land-Management-00050496xBC89F.pdf.

in the Monterey shale formation.[106] Resolution of the 2011 leases will likely dictate the outcome for the 2012 leases.

Moving forward, the BLM can issue leases in the Monterey shale formation without conducting further environmental analyses if the lease has an NSO stipulation or an "absolute right to deny exploitation of [the] resources"[107] because leases with these provisions do not constitute "irreversible and irretrievable commitments of resources."[108] But even then, the BLM likely must conduct a full NEPA analysis before granting a permit to drill.[109] As mentioned in Part I, the BLM plans to conduct a full EIS for the 284,000 acres of public land managed by the BLM's Hollister Field Office[110] as well as a statewide scientific review of the effects of oil and gas operations on California's environment and geology.[111]

Reaching farther than federal laws, California's fracking laws provide robust informational requirements regarding the sources of water, quantities of water used, wastewater management, groundwater quality monitoring, and chemical use. Moreover, environmental litigation has required the government to gather more information before permitting future fracking operations. With more information and monitoring, the DOGGR, the BLM, and the SWRCB can make better-informed permitting decisions that should protect water resources. But where these decisions nonetheless fall short of conserving a specific water source, citizens should use California's water laws to place concrete restrictions on the use of that water for fracking.

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106 *New Lawsuit Aims to Protect More California Public Lands from Fracking*, CENTER FOR BIOLOGICAL DIVERSITY (Apr. 18, 2013), http://www.biologicaldiversity.org/news/press_releases/2013/fracking-04-18-2013.html.

107 *Ctr. for Biological Diversity*, 937 F. Supp. 2d at 1152.

108 *Id.*

109 Tyler Welti, CBD v. BLM, *BLM's Revised Proposed Regulations, and the Thorny Way Forward for Fracking*, 43 ELR 10,550, 10,553 (2013), *available at* http://www.perkinscoie.com/files/upload/07_22_2013_ELR_welti.pdf.

110 Notice of Intent to Prepare an Environmental Impact Statement for Oil and Gas Leasing and Development on Public Lands and Federal Mineral Estate and Potentially Amend the Hollister Resource Management Plan, CA, 78 Fed. Reg. 47,408, 47,408–47,409 (Aug. 5, 2013).

111 *Id.*

III
THE FINAL PIECE TO COMPREHENSIVE WATER PROTECTION: CALIFORNIA'S WATER LAWS

In the words of the Chief Executive Officer at Breitling Oil and Gas Corporation, the public concern with fracking operations "used to be, 'Are you going to contaminate my water;' now, the concern is, 'You're going to use up all my water.'"[112] This Part outlines a few of the many opportunities to use California's current water laws to limit the use of water for fracking in the Monterey shale formation. It focuses on just three of the ways that a fracking operator in California might secure its water: (1) acquiring a surface water permit, (2) drawing on groundwater, or (3) entering into water contracts with water districts. Fracking operators may acquire water by other means, such as using recycled water (which the state legislature expressly recommended)[113] or trucking in water from outside sources.[114] But by focusing on the most basic acquisitions of surface, ground, and contract water, this Comment aims to provide a foundational springboard for challenging the use of these and other sources of water for fracking.

A. The Public Nature of Water Underlying California's Water Laws

The public owns all water in the State of California.[115] This fundamental principle underlies limitations on water use imposed by the California Constitution and the Public Trust Doctrine. The California Constitution requires that:

> [T]he water resources of the State be put to beneficial use to the fullest extent of which they are capable, and that the waste or unreasonable use or unreasonable method of use of water be prevented, and that the conservation of such waters is to be

112 Mike Lee, *Parched Texans Impose Water-Use Limits for Fracking Gas Wells*, BLOOMBERG (Oct. 6, 2011), http://www.businessweek.com/news/2011-10-06/parched-texans-impose-water-use-limits-for-fracking-gas-wells.html (quoting Chris Faulkner).

113 California's legislature "encourages the use or reuse of treated or untreated water and produced water for well stimulation treatments." S. 4, 2013-2014 Leg., Reg. Sess. (Cal. 2013).

114 *See* Nicholas Kusnetz, *The Bakken Oil Play Spurs a Booming Business–in Water*, HIGH COUNTRY NEWS (Aug. 6, 2012), http://www.hcn.org/issues/44.13/the-bakken-oil-play-spurs-a-booming-business-in-water.

115 CAL. WATER CODE § 102 (West, Westlaw through ch. 4 of 2014 Reg. Sess. and all propositions on the June 3, 2014 ballot) ("All water within the State is the property of the people of the State. . . .").

> exercised with a view to the reasonable and beneficial use thereof *in the interest of the people and for the public welfare*. The right to water or to the use or flow of water in or from any natural stream or water course in this State is and shall be limited to such water as shall be reasonably required for the beneficial use to be served, and such right does not and shall not extend to the waste or unreasonable use or unreasonable method of use or unreasonable method of diversion of water.[116]

In essence, all uses of the state's water must be reasonable and beneficial and cannot be wasteful or unreasonable. Water rights in California are also subject to the Public Trust Doctrine,[117] under which the state acts as trustee of state resources held in trust for the benefit of the public.[118] The state owes a fiduciary duty to the public to protect California's streams, lakes, marshlands, and tidelands, straying only from this duty in the rare instance that doing so coincides with the purpose of the trust.[119] A party cannot acquire a "vested right to appropriate water in a manner harmful to the interests protected by the public trust."[120] If the state needs to grant permits for water uses that will harm the trust, it bears an affirmative duty to consider and protect the public trust to the fullest extent possible before issuing the permits.[121]

B. Limiting the Use of Surface Water and Groundwater for Fracking Operations

There are two main natural sources of water in California: surface water and groundwater.[122] California recognizes conjunctive management of these sources,[123] but regulates each differently.

1. Surface Water: Constitutional and Statutory Limits

California recognizes both riparian and appropriative surface water rights.[124] A riparian water right is "a right to use the natural flow of

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116 CAL. CONST. art. 10, § 2 (emphasis added).

117 Nat'l Audubon Soc'y v. Superior Court, 658 P.2d 709, 712 (Cal. 1983).

118 *Id.* at 718–19.

119 *Id.* at 724.

120 *Id.* at 727.

121 *Id.* at 728.

122 "'Groundwater' means all water beneath the surface of the earth within the zone below the water table in which the soil is completely saturated with water, but does not include water that flows in known and definite channels." CAL. WATER CODE § 10752(a) (West, Westlaw through ch. 4 of 2014 Reg. Sess. and all propositions on the June 3, 2014 ballot).

123 *Id.* § 1011.5.

water" on land that touches the watercourse.[125] Although riparian rights are not obsolete in California, this Comment focuses only on appropriative rights because, comparatively, they are more versatile and easier to acquire. Unlike riparian rights, appropriative rights do not attach to the land and can be transferred between water users.[126] This transferability separate from property ownership makes it more likely that an operator would pursue appropriative rights than riparian rights to surface water.

California manages its appropriative water rights under prior appropriation, a "first in time, first in right" water allocation system.[127] Historically, appropriative rights vested at the time the water was diverted and put to beneficial use.[128] Senior appropriators (holding the oldest appropriation dates) have the right to draw their full water allotments from the watercourse before junior appropriators (holding newer appropriation dates) may draw from the watercourse.[129] In over-appropriated states like California, this system creates a division between "wet" water rights that receive water and "paper" water rights that do not.[130] Today, the SWRCB administers all surface water rights through a permit system,[131] except rights obtained before 1914.[132] The SWRCB also regulates the beneficial uses that appropriative water rights holders may use surface water for underwater basin plans.[133] Oil extraction operations require surface

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124 *Id.* § 101.

125 *Water Rights*, STATE WATER RESOURCES CONTROL BOARD, http://www.waterboards.ca.gov/waterrights/board_info/faqs.shtml#toc178761088 (last visited Mar. 23, 2014). Land managed by the BLM does not have riparian rights. *Id.*

126 STATE WATER RES. CONTROL BD., A GUIDE TO WATER TRANSFERS 3-3 (1999), *available at* http://www.waterrights.ca.gov/watertransferguide.pdf.

127 4 CAL. DEP'T OF WATER RES., CALIFORNIA WATER PLAN 2 (2009), *available at* http://www.waterplan.water.ca.gov/docs/cwpu2009/0310final/v4c01a06_cwp2009.pdf.

128 STATE WATER RES. CONTROL BD., INFORMATION PERTAINING TO WATER RIGHTS IN CALIFORNIA 3 (1990), *available at* http://www.waterboards.ca.gov/waterrights/water_issues/programs/hearings/millview/docs/hgaa.pdf.

129 *See* WATER § 1450 (Westlaw).

130 *See Paper Water*, CALIFORNIA WATER IMPACT NETWORK, http://www.c-win.org/paper-water.html (last visited Mar. 23, 2014).

131 WATER §§ 1200–1851 (Westlaw).

132 *Water Rights*, *supra* note 125. Any increase in the volume of water used under a pre-1914 water right requires a new water permit for that additional volume of water. *Id.*

133 *See, e.g.*, REG'L WATER QUALITY CONTROL BD., CENT. COAST REGION, STATE WATER RES. CONTROL BD. WATER QUALITY CONTROL PLAN FOR THE CENTRAL COAST BASIN, II-1 (2011), *available at* http://www.waterboards.ca.gov/centralcoast/publications_forms/publications/basin_plan/docs/basin_plan_2011.pdf.

water rights designated for the beneficial use of mining,[134] a subset of "Industrial Service Supply" use.[135]

This structure provides two general routes for fracking operators to secure surface water rights. First, an operator can apply for a permit. But because the SWRCB does not grant new permits for fully allocated watercourses and the permit application process can take years to complete,[136] fracking operators may be deterred from securing water this way. Second, an operator can purchase an existing water right and transfer the right into its name. The operator may acquire a transferred water right directly from a pre-1914 water rights holder or administratively from a post-1914 water rights holder through the SWRCB.[137]

The complex process for transferring a water right collapses into two main concerns for water rights holders: whether there is a change of use and whether the transfer harms other water rights holders.[138] By way of example, the Salinas River runs through San Ardo, California, which is situated over the Monterey shale formation and already experiences fracking.[139] The water basin plan for that area lists Industrial Service Supply as a beneficial use of the Salinas River where it runs past San Ardo.[140] Accordingly, the water from that portion of the river can be used for fracking.

To transfer a water right and change its use, an operator must establish that the change—for example, from agricultural to industrial—would not injure the beneficial uses of other water rights

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134 "Mining use" includes "any use of water . . . for mining processes such as hydraulicing, drilling, and on concentrator tables." CAL. CODE REGS. tit. 23, § 664 (West, Westlaw through Mar. 7, 2014 Register 2014, no. 10).

135 WATER § 13050(f) (Westlaw). *See* CAL. REG'L WATER QUALITY CONTROL BD., CENT. VALLEY REGION, WATER QUALITY CONTROL PLAN (BASIN PLAN) FOR THE SACRAMENTO RIVER AND SAN JOAQUIN RIVER BASINS II-1.00 (4th ed. 1998), *available at* http://www.waterboards.ca.gov/rwqcb5/water_issues/basin_plans/sacsjr.pdf.

136 *Water Rights*, *supra* note 125.

137 FISH & WILDLIFE SERV., SUMMARY OF CALIFORNIA WATER RIGHTS, at 1-9, *available at* http://www.fws.gov/cno/fisheries/docs/Section1SummaryofCAWaterRights.pdf.

138 *Id.*; *Water Rights*, *supra* note 125.

139 Sara Rubin, *Community Group Seeks Answers to Regulatory Loopholes*, MONTEREY COUNTY WEEKLY, http://www.montereycountyweekly.com/news/2011/feb/10/fracking-ordeal/ (last updated May 16, 2013).

140 REG'L WATER QUALITY CONTROL BD., CENT. COAST REGION, *supra* note 133, at II-8 (Table 2-1 lists the Salinas River, Chular River-Nacimiento River segment, which runs by San Ardo, California).

holders.[141] "Injury" includes degradation of either water quantity or quality.[142] A downstream water rights holder opposing the transfer can argue that the transfer harms her beneficial use of the *quantity* of water she relies upon. For example, if the upstream water rights holder used his agricultural water right for irrigation, it probably created runoff that downstream users relied upon to irrigate their crops. Transferring the water right to use for fracking instead of agriculture would likely eliminate the runoff return flow by pumping the water underground, preventing downstream users from receiving water that they previously relied on. Thus, the transfer would harm the downstream user's quantity of water.

If the water does return to the watercourse after fracking, a water rights holder could instead argue that increased pollution from fracking harms the beneficial use of her water right by reducing the *quality* of her water. For example, a downstream farmer might argue that fracking chemicals running off into the watercourse would make the quality of her water unsuitable for agricultural use. If the transfer involves a pre-1914 water right, a court hears these claims, whereas a transfer involving a post-1914 water right is heard by the SWRCB.[143]

If the transfer of water rights does not change the beneficial use, the water rights holders can still oppose *wasteful* use of the water.[144] Even if an operator puts its water to beneficial use, applying it in a way that uses an unreasonable and wasteful amount of water violates California's prohibition on waste. Waste challenges can ensure that operators only use water reasonably needed, no more.

2. Groundwater: Local and Common Law Limits

Fracking operators may also use groundwater. California manages its groundwater under the correlative rights doctrine without a statewide permit system.[145] Though there are twelve groundwater

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141 CAL. WATER CODE § 1228.7(a) (West, Westlaw through ch. 4 of 2014 Reg. Sess. and all propositions on the June 3, 2014 ballot).

142 STATE WATER RES. CONTROL BD., *supra* note 126, at 3-7 to 3-8.

143 FISH & WILDLIFE SERV., *supra* note 137, at 1-9.

144 CAL. CONST. art. 10, § 2.

145 *The Water Rights Process*, STATE WATER RESOURCE CONTROL BOARD, http://www.waterboards.ca.gov/waterrights/board_info/water_rights_process.shtml#rights (last visited Mar. 23, 2014). Groundwater is subject to the reasonable use requirement. Katz v. Walkinshaw, 74 P. 766, 766 (1903).

districts or agencies that manage certain groundwater aquifers,[146] none of these groundwater districts regulate the portions of Monterey, San Benito, or Kern counties in which the Monterey shale formation fracking is expected to occur.[147] Instead, these counties all have local ordinances regarding groundwater,[148] which water users should investigate for potential restrictions on the use of local groundwater for fracking.

Water users can also apply the correlative rights doctrine in two ways to limit groundwater use for fracking. First, under the correlative rights doctrine, the right to use groundwater runs appurtenant to the ownership of the overlying land.[149] Thus far, fracking operators are leasing only the mineral rights in the Monterey shale formation, not the overlying surface rights.[150] This poses a difficult question as to who holds the right to groundwater—just the surface rights owner or the mineral rights holder too? If the right to groundwater attaches solely to the surface rights, the surface owner, in theory, could challenge an operator's water use for failing to lease the right to use groundwater from the overlying surface owner. Second, the correlative rights doctrine prohibits groundwater use on a non-overlying property unless the water user proves that a *surplus* of groundwater exists.[151] Thus, a groundwater user could oppose a fracking operator's use of groundwater on a non-overlying property by alleging that the operator failed to demonstrate that a surplus of water existed. Aquifers in California are already so depleted[152] that a

146 CAL. DEP'T OF WATER RES., WATER FACTS: GROUNDWATER MANAGEMENT DISTRICTS OR AGENCIES IN CALIFORNIA 1-3, *available at* http://wwwdpla.water.ca.gov/sd/groundwater/publications/water_facts_4.pdf.

147 This conclusion is based on comparing a map of the Monterey shale formation and a map of the groundwater districts. *Compare id.* at 2 (map of the California groundwater districts), *and* John Cox, *Monterey Shale Brightens Kern's Oil Prospects*, THE BAKERSFIELD CALIFORNIAN (June 9, 2012), http://www.bakersfieldcalifornian.com/business/oil/x65918320/Monterey-Shale-brightens-Kerns-oil-prospects (map of the Monterey shale formation).

148 *Local Groundwater Ordinances*, CAL. DEPARTMENT OF WATER RESOURCES, http://www.water.ca.gov/groundwater/gwmanagement/local_gw_ordinances.cfm (last visited Mar. 23, 2014) (listing Monterey, San Benito, and Kern counties as "[c]ounties with ordinances addressing groundwater management").

149 FISH & WILDLIFE SERV., *supra* note 137, at 1-7.

150 For an explanation of split estates, *see* Andrew C. Mergen, *Surface Tension: The Problem of Federal/Private Split Estate Lands*, 33 LAND & WATER L. REV. 419, 419–20 (1998).

151 FISH & WILDLIFE SERV., *supra* note 137, at 1-8.

152 *NASA Data Reveal Major Groundwater Loss in California*, JET PROPULSION LABORATORY (Dec. 14, 2009), http://www.jpl.nasa.gov/news/news.php?release=2009-194

fracking operator would likely have a difficult time proving this surplus.

C. Opportunities for Limiting Water Contracts with Fracking Operators

The fastest and easiest way to acquire water for fracking may be contracting with a water district.[153] In an economy where "water flows uphill toward money,"[154] an oil and gas company can outbid most other users in the water district for contracts that secure as much of that district's water allocation as the operation needs.[155] Although water districts generally have broad authority to distribute their allocated water within their district,[156] the water is still subject to beneficial use limitations[157] and may be subject to restrictions imposed by the local county or water districts. Concerned citizens should lobby local governments and water districts to adopt limitations on water contracts with oil and gas operators. For example, local governments could follow Southlake, Texas, whose town ordinance bans summertime fracking to eliminate industry competition for drinking water.[158] Or water districts could implement restrictions on the use of district water for fracking, as the High Plains

(observing depletion of the water in California's Sacramento and San Joaquin drainage basins at unsustainable rates).

153 California has two types of water districts, county water districts and irrigation districts. CAL. WATER CODE §§ 30013, 20513 (West, Westlaw through ch. 4 of 2014 Reg. Sess. and all propositions on the June 3, 2014 ballot).

154 Susan J. Tweit, *Must Our Water Always Flow Uphill Toward Money?*, HIGH COUNTRY NEWS (Apr. 2, 2009), http://www.hcn.org/wotr/must-our-water-always-flow-uphill-toward-money. In 2010 the West Kern Water District sold about eighty-three percent of its water allocation to oil companies and co-generation plants. Jeremy Miller, *California Drought is No Problem for Kern County Oil Producers*, CIRCLE OF BLUE (Aug. 24, 2010), http://www.circleofblue.org/waternews/2010/world/california-drought-is-no-problem-for-kern-county-oil-producers/.

155 Miller, *supra* note 154 ("[The oil industry] gets all the water it needs . . . even in times of extreme scarcity.").

156 *See* CAL. WATER CODE § 22075 (West, Westlaw through ch. 4 of 2014 Reg. Sess. and all propositions on the June 3, 2014 ballot) ("A district may do any act necessary to furnish sufficient water in the district for any beneficial use."); *id.* § 22078 ("A district may control, distribute . . . any water . . . for the beneficial use or uses of the district or its inhabitants or the owners of rights to water therein.").

157 CAL. CONST. art. 10, § 2.

158 Lee, *supra* note 112.

Underground Water Conservation District in Lubbock, Texas did.[159] While Californians have started numerous petitions for moratoriums on fracking,[160] so far no counties have imposed limitations specifically on water use.

Starting with the fundamental ideas outlined above, citizens seeking to protect their water should dive into California's deep body of water law to look for restrictions that apply specifically to their individual water rights issues. Using California's water laws as a check on fracking operators' use of water may be the final piece in the regulatory puzzle necessary to effectively guard California's water against the potential damaging effects of fracking.

IV
A COMPREHENSIVE FUTURE FOR CALIFORNIA'S WATER

If this Comment achieves its goals, citizens can use the concepts presented as a launching point for generating additional ideas on how to use water laws to limit the use of water for fracking when federal and state regulations fall short. California's citizens should look carefully at the consequences of fracking on both water quality and quantity and plan ahead for water allocation controversies that might arise from a fracking boom in the Monterey shale formation. Through a combination of regulations and individual challenges under environmental and water laws, California can develop the legal structure needed to balance the powerful needs of energy development and water conservation. In California and across the United States, as oil companies continue to dig deep for black gold, citizens and their governments must actively prevent the negative effects, for "[a]ll the water here on Earth now is all the water there ever was, and ever will be."[161]

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159 HIGH PLAINS UNDERGROUND WATER CONSERVATION DIST. NO. 1, RULES OF THE HIGH PLAINS UNDERGROUND WATER CONSERVATION DISTRICT NO.1 § 3.2(b) (Feb. 12, 2012), *available at* http://hpwd.com/public/pdfs/HPWDRules.pdf#page=25 ("No person shall operate a well within the District's boundaries at a rate of production higher than the maximum allowable production granted in a permit, District rules, or other applicable law.").

160 David R. Baker, *Petitions Would Ban Fracking in 15 CA Cities, Counties*, SFGATE (July 23, 2013), http://blog.sfgate.com/energy/2013/07/23/petitions-would-ban-fracking-in-15-ca-cities-counties/.

161 Sandra Postel, *Honest Hope*, *in* WRITTEN IN WATER: MESSAGES OF HOPE FOR EARTH'S MOST PRECIOUS RESOURCE 46, 59 (Irene Salina ed., 2010).