

<p>COLORADO SUPREME COURT 2 East 14th Avenue, Denver, CO 80203</p>	
<p>On Writ of Certiorari to Colorado Court of Appeals Case No. 2016 CA 564 Opinion by Fox, J.; Vogt, J., concurring; Booras, J., dissenting</p>	
<p>COLORADO OIL AND GAS CONSERVATION COMMISSION, Petitioner, and AMERICAN PETROLEUM INSTITUTE and COLORADO PETROLEUM ASSOCIATION, Petitioner-Intervenors, v. XIUHTEZCATL MARTINEZ, et al., Respondents.</p>	<p>▲ COURT USE ONLY ▲</p>
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<p>BRIEF OF AMICI CURIAE ALLIANCE OF NURSES FOR HEALTHY ENVIRONMENTS & PHYSICIANS FOR SOCIAL RESPONSIBILITY</p>	

CERTIFICATE OF COMPLIANCE

I hereby certify that this brief complies with all requirements of C.A.R. 28, 29 and 32, including all formatting requirements set forth in these rules.

Specifically, the undersigned certifies that the amicus brief complies with the applicable word limit set forth in C.A.R. 29(d) because it contains 4,746 words.

I acknowledge that my brief may be stricken if it fails to comply with any of the requirements of C.A.R. 28, 29 and 32.

/S/ Joel Minor
Joel Minor

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INTERESTS OF AMICI

Amici Alliance of Nurses for Healthy Environments (“ANHE”) and Physicians for Social Responsibility (“PSR”) (collectively, “Health Professionals”) are organizations whose members treat, study, and care for patients who suffer negative health impacts from unconventional oil and gas development in Colorado.¹ They submit this amicus brief to ensure that the Court does not lose sight of the mounting body of peer-reviewed scientific evidence that unconventional oil and gas development in Colorado negatively impacts public health. Public health is the science of protecting and improving the health of people and communities by researching and preventing disease.² It involves identifying the causes of diseases and implementing solutions at the community and population level.³ Health Professionals are uniquely qualified to assess the available research on unconventional oil and gas development.

Amicus **Alliance of Nurses for Healthy Environments**’ mission is to promote healthy people and healthy environments by educating and leading the

¹ This brief uses “unconventional oil and gas development” to reference hydraulic fracturing and all associated processes including well completion, well pad construction, and waste disposal.

² CDC Found., *Public Health in Action*, <https://www.cdcfoundation.org/what-public-health> (last visited May 24, 2018).

³ *See id.*

nursing profession, advancing research, incorporating evidence-based practice, and influencing policy. ANHE exists because nurses must be in a position to respond to questions about the environment and its relationship to health with credible, evidence-based information, and to provide leadership in making the necessary changes in our policies and practices.

Working for more than 50 years to create a healthy, just, and peaceful world for present and future generations, Amicus **Physicians for Social Responsibility** uses medical and public health expertise to educate and advocate on urgent issues that threaten human health and survival, with the goals of reversing the trajectory towards climate change, protecting the public and the environment from toxic chemicals, and addressing the health consequences of fossil fuels.

INTRODUCTION

Health Professionals submit this brief to highlight the importance of reaffirming the Colorado Oil and Gas Conservation Commission's ("COGCC") statutory obligation, and broad authority, to prioritize protecting public health. A ruling narrowing that authority would affect hundreds of thousands of Coloradans living in close proximity to oil and gas development. A growing body of peer-reviewed scientific research links unconventional oil and gas development to cancer, birth defects, and asthma attacks. Much of this research has been conducted in Colorado during the four years since COGCC issued a decision on

Appellees Xiuhtezcatl Martinez *et al.*'s ("Appellees") rulemaking petition. That new research makes clear that the public depends on COGCC meeting its statutory obligations to ensure that unconventional oil and gas development proceeds consistently with protecting human health.

Appellants inaccurately frame the issue in this case as whether COGCC must adopt Appellees' rulemaking petition, which they wrongly claim will bring a halt to all oil and gas development in Colorado. But affirming the Court of Appeals' ruling that COGCC must ensure that oil and gas operations be "consistent with" protecting public health does not require the agency to adopt any particular regulatory proposal—much less halt all oil and gas development. It merely requires COGCC to prioritize public health when considering drilling proposals.

ARGUMENT

I. Protecting Public Health Does Not Require Prohibiting Development.

Appellants attack a straw man by framing the issue presented as whether COGCC *must* grant Appellees' rulemaking petition, COGCC's Opening Br. 10-21 (Apr. 2, 2018) ("COGCC Br."), which they incorrectly claim would "categorically preclude oil and gas development" in Colorado, Opening Br. of Intervenor/Pet'rs Am. Petroleum Inst. & Colo. Petroleum Ass'n ("CPA") 26 (Apr. 2, 2018) ("CPA Br."); *see also* Br. of Amicus Curiae Vital for Colo. 19 (Apr. 2, 2018) ("Vital Br.") (arguing that Appellees seek "an effective shutdown in oil and gas permitting").

But this appeal is not about the merits of Appellees’ petition. Instead, this Court is considering a purely legal question: whether the Oil and Gas Conservation Act (“the Act”) imposes a threshold requirement that oil and gas development be “consistent with” protecting public health; or whether it allows COGCC to strike a “balance between oil and gas development and public health, safety, and welfare.” Order of Court 2 (Jan. 29, 2018) (granting certiorari). Resolving this question does not require rendering judgment about the merits of Appellees’ petition. Health Professionals urge the Court to affirm the Court of Appeals’ plain-language reading of the Act.

Contrary to Appellants’ attempt to conflate protecting public health with prohibiting development, affirming the Court of Appeals will not shut down Colorado’s oil and gas industry. Halting all oil and gas development is not the only way to ensure COGCC permitting decisions are “consistent with” protecting public health. The Court of Appeals’ decision simply recognizes that the Act makes adequate public health protections a threshold requirement for oil and gas development. Prioritizing public health and safety in this manner should not be problematic: COGCC and industry have long claimed that they already do so. *See* COGCC Br. 54-55; CPA Br. 3-4; Br. of Amicus Curiae Colo. Oil & Gas Ass’n (“COGA”) 1 (Apr. 2, 2018) (“COGA Br.”). In practice, COGCC regulations and permitting decisions fall short of those promises. But a variety of protections

addressing air toxics, water contamination, and other risks can readily be adopted to protect public health. *See infra* pp. 17, 22. Requiring that oil and gas approvals ensure an adequate margin of safety should be an uncontroversial step to implement the General Assembly’s command that development proceed “in a manner consistent with protection of public health.” Colo. Rev. Stat. § 34-60-102(1)(a)(I).

This Court also should reject CPA’s attempt to sharply limit COGCC’s statutory authority to protect public health. CPA asserts that COGCC cannot “prohibit” or “[c]ategorically [p]reclude [d]evelopment,” even where necessary to protect public health. CPA Br. 18, 20. The Court need not resolve this question, which is not presented by this appeal. *See supra* pp. 3-4. But CPA’s attempt to hamstring COGCC’s broad authority to deny drilling permits is wrong on the law.

The Act gives COGCC the power “to do whatever may reasonably be necessary to carry out the provisions of this article,” Colo. Rev. Stat. § 34-60-105(1), including provisions directing COGCC to protect public health.⁴ Further, companies have no statutory right to drilling permits. Rather, the Act forbids companies from commencing any “operations for the drilling of a well ... without

⁴ The Act also lists specific topics COGCC has authority to address, but clarifies that those grants of “specific power or authority shall not be construed ... to be in derogation of any of the general powers and authority granted” to COGCC. Colo. Rev. Stat. § 34-60-106(4).

first obtaining a permit from the commission.” *Id.* § 34-60-106(1)(f). Under this broad grant of authority, COGCC may deny permit applications if necessary to protect public health. *See State Dep’t of Health v. The Mill*, 887 P.2d 993, 1002 (Colo. 1994) (“[T]he right to make any use of the property that would create a hazard to public health ... was excluded from [t]he [facility’s] title at the onset.”); *Aztec Minerals Corp. v. Romer*, 940 P.2d 1025, 1032 (Colo. App. 1996) (“[P]laintiffs had no property right in permitting the continued degradation of the environment ... and thus creating a hazard to public health.”).

The Act’s provisions that CPA cites are not to the contrary. *See* CPA Br. 13, 15-17. CPA suggests that Section 34-60-106(2)(d) authorizes COGCC to address only “*significant* adverse environmental impacts.” *Id.* at 11. But that language does not narrow COGCC’s authority. Section 34-60-106(2)(d) authorizes COGCC to address those impacts “*to the extent necessary* to protect public health, safety, and welfare, including protection of the environment and wildlife resources.” (Emphasis added). This language tracks the language the Court of Appeals relied upon, which also requires development to occur “*consistent with* the protection of public health, safety, and welfare, including protection of the environment and wildlife resources.” Colo. Rev. Stat. § 34-60-102(1)(a)(I) (emphasis added). Whether using “to the extent necessary,” or “consistent with,” both provisions contemplate that COGCC will “protect public health, safety, and welfare, including

protection of the environment and wildlife resources.” There is no inconsistency between the two sections, and the Court should give effect to both. *See Morton v. Mancari*, 417 U.S. 535, 550-51 (1974) (where statutes can be reconciled, courts must interpret them to give both effect).

Other provisions CPA cites also direct COGCC to consider “cost-effectiveness and technical feasibility.” *See* Colo. Rev. Stat. §§ 34-60-103(5.5) (defining “minimize adverse effects” and advising that COGCC should “[t]ake into consideration cost-effectiveness and technical feasibility”), 34-60-106(2)(d) (similar). But the Act does not make those factors controlling, or let them override the directive that development must be consistent with protecting public health. It simply directs COGCC to consider them. If the General Assembly had wanted to limit public health protections only to those that are technically feasible or cost-effective, it could have substituted “taking into consideration” with “so long as all conditions are.” But the legislature did not do so. *See Lexington Ins. Co. v. Precision Drilling Co., L.P.*, 830 F.3d 1219, 1221 (10th Cir. 2016) (“It is not the court’s prerogative to usurp the power of the legislature by deciding what should have been said ... exceptions not made by the legislature in a statute cannot be read into it.” (quotation omitted)). Where necessary to protect public health, COGCC may deny permits, even if a company claims that stronger protections are not cost-effective or technically feasible.

CPA’s attempt to limit COGCC’s ability to protect public health fails even under the agency’s incorrect view that the Act requires it to “balance” public health and mineral development. Nothing in the Act forbids COGCC from exercising its broad statutory authority to strike that balance in favor of protecting public health by conditioning a particular permit or limiting a development practice. Even under a “balancing” regime, so long as the agency considers cost-effectiveness and technical feasibility, the Act does not prevent COGCC from denying a permit it determines would threaten public health. When an agency balances regulatory costs with protecting public health and the environment, in some cases a project’s economic benefits “will be great enough to justify a certain quantum of environmental costs; in other cases, they will not be so great and the proposed action may have to be abandoned or significantly altered so as to bring the benefits and costs into a proper balance.” *Calvert Cliffs Coordinating Comm., Inc. v. U.S. Atomic Energy Comm’n*, 449 F.2d 1109, 1123 (D.C. Cir. 1971). Even under a balancing regime, the Act gives COGCC authority to determine that protecting public health outweighs the benefits from any particular oil and gas development. *See California v. U.S. Bureau of Land Mgmt.*, 277 F. Supp. 3d 1106, 1122 (N.D. Cal. 2017) (assessing impacts of oil and gas development “requires an impartial look at the balance struck between the two sides of the scale. ... Merely to look at

only one side of the scales, whether the costs or solely the benefits, flunks this basic requirement”).

As the Court of Appeals correctly held, COGCC’s “balancing” interpretation is contrary to the statutory language, purpose, and legislative history. But even under a balancing framework, CPA is wrong that COGCC has limited authority to deny approval of drilling operations in order to protect public health.

II. Mounting Scientific Evidence Demonstrates the Need for COGCC to Exercise Its Authority to Protect Public Health.

This Court should not lose sight of the impacts its decision will have on nearly 250,000 Coloradans who live within a half-mile of oil and gas facilities.⁵ Upholding COGCC’s mandate to prioritize protection of public health is critical because a growing body of peer-reviewed research documents negative health impacts of unconventional oil and gas development.

A. A Rapidly Growing Body of Research Documents Unconventional Oil and Gas Development’s Health Impacts.

COGCC makes little effort to dispute the potential adverse effects of unconventional oil and gas development. COGCC cites a 2014 statement from a Colorado Department of Public Health and Environment (“CDPHE”) official that science does not “unequivocally” show that hydraulic fracturing adversely affects

⁵ Earthworks *et al.*, *Oil & Gas Threat Map 2.0: Colorado*, <http://oilandgasthreatmap.com/threat-map/colorado/> (last visited May 24, 2018).

human health. COGCC Br. 16-17. But this statement merely referenced a research paper indicating that more research was needed, and noted that relatively few studies of unconventional oil and gas development's health impacts had been conducted at the time. Administrative Record 18-19 (citing Addendum 1).⁶ The 2014 CDPHE statement was not a ringing endorsement of unconventional oil and gas development's safety.

Today, that statement is no longer true. Since the 2014 CDPHE statement, a large body of research has been published linking unconventional oil and gas development to various health impacts. Several groups, including Health Professionals, have compiled that recent research. Amicus PSR has released a comprehensive Compendium of 1,124 studies and articles documenting unconventional oil and gas development's health impacts. Addendum 15-266. Another group of Physicians, Scientists, and Engineers has compiled a repository with nearly 1500 peer-reviewed studies, including approximately 150 studies on overall health impacts, 100 on air quality, and 200 on water quality.⁷ Two researchers, Hays and Shonkoff, conducted a literature review of 685 peer-

⁶ The paper cited by the CDPHE official, and all other scientific research cited in this brief, is attached as a consecutively paginated Addendum.

⁷ See Physicians, Scientists, & Eng'rs for Healthy Energy, *Repository for Oil and Gas Energy Research*, <https://www.psehealthyenergy.org/our-work/shale-gas-research-library/> (last visited May 24, 2018).

reviewed papers published between 2009 and 2015. Addendum 281. They noted “a surge of peer-reviewed scientific papers published in the past several years,” and that by the end of 2015, 80% of peer-reviewed literature on the impacts of unconventional oil and gas development had been published since January 1, 2013, and 60% since January 1, 2014. *Id.* at 282.

Other groups also have observed the uptick in research published since 2014. Amicus PSR calculated that more than 90% of peer-reviewed publications in its March 2018 Compendium had been published since January 2013, with nearly a quarter of 1,300 available studies published in 2017 alone. *Id.* at 24.

Another research group noted that in 2014 “few other studies were available on the health impacts of [unconventional oil and gas].” *Id.* at 295. But “[t]hat has changed dramatically,” and “[i]n 2017 alone, 24 original research articles and 10 reviews/scientific commentaries were published,” and “[n]ineteen articles have already been published in 2018.” *Id.* at 295-96.

More important than the number of studies are their findings. The aforementioned literature reviews identify trends linking unconventional oil and gas development to negative health impacts. For example, Hays and Shonkoff calculated that 84% of the health studies they reviewed found public health hazards, elevated risks, or adverse health outcomes associated with unconventional oil and gas development; 87% of air quality studies found elevated air pollutant

emissions; and 69% of water quality studies found potential, positive association, or actual incidence of water contamination. *Id.* at 281.

This research illustrates why COGCC must retain its obligation and authority to prioritize health protection, even if that means sometimes denying drilling permits. Two examples are discussed below: air and water pollution. These areas are the subject of extensive recent research in Colorado and involve significant regulatory gaps that provide opportunities for better regulation based on the findings of recent scientific studies.

B. COGCC Regulations Provide Insufficient Protections Against Air Toxics.

Many hydrocarbons emitted by oil and gas development are classified as hazardous air pollutants (“HAPs” or “air toxics”). HAPs are toxic chemicals that cause cancer and other adverse health effects. *See* 42 U.S.C. § 7412(a)(6), (b)(1); 40 C.F.R. § 61.01(a)-(b). HAPs have localized effects, posing health risks to people living close to emission sources. Addendum 306. HAPs emitted by the oil and gas sector include benzene, toluene, ethylbenzene, xylene, and formaldehyde. *Id.* at 319. These chemicals are known human carcinogens and have well-documented impacts on the nervous, endocrine, and respiratory systems. *Id.* at 295. Numerous recent scientific studies conducted in Colorado link air toxics emitted by the oil and gas sector to negative health effects in vulnerable

populations like children and pregnant women, including birth defects and childhood cancer. *Id.* at 314-464.

COGCC “setback” requirements (the distance between oil and gas facilities and occupied buildings) do not account for HAPs emissions. COGCC regulations allow oil and gas facilities to be sited 500 feet (about one city block) from homes. 2 Colo. Code Regs. § 404-1:604(a)(1). Facilities must be 1,000 feet from high-occupancy buildings like hospitals and schools, but COGCC can grant operators exceptions. *Id.* § 404-1:604(a)(3).⁸ When COGCC adopted these standards in 2013, it acknowledged that “[t]hese Setback Rules are not intended to address potential human health impacts associated with air emissions related to oil and gas development. The Commission ... believes that there are numerous data gaps related to oil and gas development’s potential effect on human health and that such data gaps warrant further study.”⁹ Under these regulations, oil and gas facilities are often located very close to homes, schools, and hospitals. For example, COGCC has approved a project consisting of 22 wells, with associated petroleum

⁸ See also COGCC, *Statement of Basis, Specific Statutory Authority, and Purpose*, 2 CCR 404-1, Docket No. 1211-RM-04: Setbacks at 2 (Feb. 11, 2013), https://cogcc.state.co.us/documents/reg/Rules/2012/setback/Final_SetbackRules-StatementOfBasisAndPurpose.pdf (noting COGCC’s ability to grant exceptions).

⁹ *Id.*

storage tanks, within 1,000 feet of 13 homes in Greeley.¹⁰ Another proposed project in Garfield County would put 24 wells as close as 512 feet from some homes and less than 1,000 feet from dozens of others.¹¹

Since COGCC adopted its setback regulations in 2013, new research has linked HAPs emissions to health impacts for people living close to oil and gas facilities. Addendum 470-71. One recent peer-reviewed study analyzed air samples from Boulder and Weld Counties, and found that HAPs exposure elevated the cancer risk for people living within 500 feet of an oil and gas facility to 8.3 times the upper bound deemed acceptable by the U.S. Environmental Protection Agency (“EPA”). *Id.* at 471. The study concluded that “state and federal regulatory policies may not be protective of health for populations residing near [oil and gas] facilities.” *Id.* at 465.¹²

¹⁰ COGCC, *Oil & Gas Location Assessment No. 401040773* (Oct. 14, 2016) (Addendum 487); Neighbors Affected by Triple Creek, *Comment on Form 2A # 401040773 - Extraction Oil and Gas LLC’s Triple Creek Pad* at 1 (Sept. 2, 2016) (Addendum 497).

¹¹ Battlement Concerned Citizens, *Comment on Form 2A # 401234964 - Ursa A Pad* at 3 (Apr. 21, 2018) (Addendum 517).

¹² An amicus claims a 2017 study purportedly “reaffirm[s]” the safety of COGCC’s setbacks. Vital Br. 18. But that study is riddled with flaws, including, *inter alia*, addressing only air pollution; not considering neurological, ear/nose/throat, and respiratory health effects despite showing elevated exposure risks; and ignoring the health risks from unhealthy ozone (smog) levels. Letter from Julie Carpenter, M.D., *et al.*, to Colo. Gov. John Hickenlooper (Feb. 7, 2018) (Addendum 477-78).

Appellants and their amici argue that federal standards and state-level CDPHE rules adequately regulate air toxics. COGCC Br. 20, 52-54; CPA Br. 41-42; Vital Br. 12, 15-18. But clear gaps remain. For example, the federal Clean Air Act exempts the oil and gas sector from otherwise-applicable air toxics permitting requirements. 42 U.S.C. § 7412(n)(4). Moreover, federal HAPs emissions standards for the oil and gas sector cover only a limited subset of equipment and processes, and exclude many operations that emit air toxics, including pipelines, well completions, and unloading of petroleum liquids. 40 C.F.R. §§ 63.765, 63.766, 63.769; *see also* 77 Fed. Reg. 49,490, 49,501 (Aug. 16, 2012) (listing sources subject to oil and gas HAPs emissions standards).

At the state level, Appellants and their amici emphasize that CDPHE adopted oil and gas air quality standards in 2014. *See* CPA Br. 41-42; Vital Br. 12; COGA Br. 2 n.1.¹³ But the 2014 regulations addressed ozone-forming pollutants and greenhouse gas emissions, not HAPs. *See* 5 Colo. Code Regs. § 1001-9:XX.N. In fact, in the 2014 rulemaking, the Colorado Air Quality Control Commission

¹³ Appellants claim the 2014 regulations are the strongest nationwide. This may have been true in 2014, but other states have since adopted stronger standards. *Compare, e.g.,* Cal. Code Regs. tit. 17, § 95669(g) (requiring quarterly leak inspections for all facilities) *with* 5 Colo. Code Regs. § 1001-9:XVII.C.2.b(ii)(D), XVII.F.4.c (requiring quarterly leak inspections for only large facilities).

(“AQCC”) *rejected* a proposal to directly address air toxics emissions.¹⁴

Appellants also highlight a 2017 AQCC rulemaking. *See* CPA Br. 42; Vital Br.

16. But just as in 2014, the 2017 rulemaking focused on reducing ozone-forming pollutants, not air toxics. *See* 5 Colo. Code Regs. § 1001-9:XX.P. And in 2017, the AQCC once again rejected a proposal that would have extended emissions standards statewide to protect all Colorado communities from air toxics.¹⁵

While CDPHE (including the AQCC) has authority to address HAPs through air pollution control measures, that does not prevent COGCC from exercising its own authority to address the health threats posed by air toxics. COGCC’s statutory obligation is to ensure that oil and gas development is “consistent with” public health. Colo. Rev. Stat. § 34-60-102(1)(a)(I). Nothing in the Act bars COGCC from addressing risks that may also be regulated by other agencies. Contrary to CPA’s and amici’s claim that there would be a conflict between COGCC and CDPHE authority, CPA Br. 43; Br. of Amici Curiae The Nat’l Ass’n of Mfrs., *et al.* 19-21 (Apr. 2, 2018), such overlapping authority is common, *see Massachusetts v. EPA*, 549 U.S. 497, 531-32 (2007) (explaining that two agencies’ overlapping authority over auto emissions did not relieve EPA of its

¹⁴ *See* Prehearing Statement of Local Cmty. Orgs. 4-18 (Jan. 6, 2014) (Addendum 532-47).

¹⁵ *See* Prehearing Statement of Ctr. for Biological Diversity *et al.* 18 (Sept. 14, 2017) (Addendum 573).

obligation to “protect[] the public’s ‘health,’” because “[t]he two obligations may overlap, but there is no reason to think the two agencies cannot both administer their obligations and yet avoid inconsistency”).¹⁶

COGCC could fill the gaps in federal and state regulations in many ways. For example, COGCC could require larger setbacks from hospitals when scientific evidence shows that a facility’s proximity would threaten patients’ health. Or COGCC could require more frequent leak detection at facilities close to occupied homes.

These common sense actions would protect Coloradans not only from air toxics, but also from health risks caused by other types of oil-and-gas-related air pollution. In recent years, Colorado has functioned as a national laboratory for several studies of oil and gas sector emissions. The studies document emissions much higher than official estimates, including a range of hydrocarbons that pose health risks. Addendum 580-665.

¹⁶ In fact, COGCC already addresses some air pollution (though with vague and insufficient regulations), by forbidding “unnecessary or excessive venting or flaring,” 2 Colo. Code Regs. § 404-1:912, and requiring that odors shall “not constitute a nuisance or hazard to public welfare,” *id.* § 404-1:805(a).

For example, the Denver-Metro area has long had unsafe ozone levels, and continues to violate federal ozone health standards.¹⁷ High ozone levels cause asthma, heart attacks, and even premature death. *See* 80 Fed. Reg. 65,292, 65,343 (Oct. 26, 2015). “Children are particularly vulnerable [to ozone pollution] because their lungs are still developing until about age 18, and they don’t process chemicals as efficiently as adults.” Addendum 296. Hydrocarbons called volatile organic compounds (“VOCs”) contribute to ozone formation. *See* 80 Fed. Reg. at 65,299. Numerous studies published since 2014 link VOCs emitted by the oil and gas sector to Colorado’s unhealthy ozone levels. Addendum 692-763.

In addition, methane, the primary component of natural gas, is a greenhouse gas 86 times more powerful than carbon dioxide. *Id.* at 670. Climate change negatively impacts public health in many ways, such as increasing the spread of insect-borne diseases like West Nile Virus.¹⁸ In Colorado, climate change increases extreme temperatures, air pollution, and wildfires, contributing to health risks like heat stroke and asthma attacks, especially for vulnerable populations like children and the elderly. Addendum 680-84.

¹⁷ EPA, *Final Area Designations for the 2015 Ozone National Ambient Air Quality Standards: Colorado* 2, 6 (Apr. 30, 2018), https://www.epa.gov/sites/production/files/2018-05/documents/co_tsd_final_0.pdf.

¹⁸ Ctrs. for Disease Ctrl. & Prevention, *Climate Effects on Health* (July 26, 2016), <https://www.cdc.gov/climateandhealth/effects/default.htm>.

C. COGCC Regulations Provide Insufficient Protections for Drinking Water.

Many studies show that unconventional oil and gas development in Colorado frequently causes surface and groundwater pollution. These studies identify at least three main pollution pathways: surface spills, improper well construction, and hydraulic fracturing occurring at depths near (or within) drinking water aquifers.

Spills from ruptured pipelines, truck accidents, and leaking or overflowing pits can directly contaminate surface water and surface-level aquifers. Addendum 765. One study of 2014-2015 COGCC data documented 2893 spills in Colorado (about four per day). *Id.* at 768. Another study of the same data found that 2% of Colorado oil and gas wells (about 200) reported spills within the first three years of operation. *Id.* at 779, 791.

Poor well construction can also allow gas and fluids to leak into the surrounding groundwater. A 2016 study traced methane in Colorado drinking water wells to oil and gas operations, finding stray gas contamination in up to 4.5% of drinking water wells. *Id.* at 808. A 2017 study of data reported by 3923 oil and gas wells in Colorado found that inadequate casing on 270 wells allowed pressures high enough to indicate a risk of groundwater contamination. *Id.* at 814.

Industry often asserts that hydraulic fracturing occurs too deep underground to affect relatively shallow aquifers that supply drinking water.¹⁹ But a 2015 study of wells in several states, including Colorado, found that 16% of oil and gas wells nationwide are fractured less than a mile underground. *Id.* at 822-24. In fact, states, including Colorado, sometimes allow hydraulic fracturing to occur *within* drinking water aquifers. *Id.* at 832-33. A 2018 study noted that “[h]ydraulic fracturing in Colorado has already occurred in formations containing [drinkable groundwater]” in Huerfano and Las Animas Counties’ Raton Basin. *Id.* at 832.

Recent research also highlights health risks from these practices. A 2015 study of data from Colorado and other states found that three hydraulic fracturing chemicals identified as health risks by EPA were most likely to contaminate drinking water supplies: acrylamide, ethyl benzene, and xylene. *Id.* at 838-41. Another 2015 study of hydraulic fracturing flowback (waste) water in Colorado identified several chemicals that could contaminate groundwater. *Id.* at 844. And a 2014 water sampling study in Garfield County found contamination by several estrogen and androgen disruptors. *Id.* at 897.

The oil and gas industry enjoys exemptions from laws protecting water supplies. Hydraulic fracturing generally is exempt from the federal Safe Drinking

¹⁹ See COGA, *Hydraulic Fracturing*, <http://www.coga.org/energy-education/hydraulic-fracturing/> (last visited May 24, 2018).

Water Act, and is not regulated by EPA. 42 U.S.C. § 300h(d)(1)(B)(ii). At the state level, instead of protecting underground drinking water from hydraulic fracturing, CDPHE defers to COGCC as an “implementing agency.” *See* 5 Colo. Code Regs. §§ 1002-41:41.4(B)(5)(b), 1002-41:41.6(B), 1002-61:61.14(2)(c). CDPHE does not require most oil and gas activities to obtain water pollution permits. *Id.* § 1002-61:61.3(2)(c).

Despite Amici’s arguments that COGCC regulations adequately protect public health, *see* COGA Br. 2-3; Vital Br. 9-10, 18, COGCC’s water pollution regulations leave room for improvement. For example, in most areas COGCC allows waste fluids to be stored in pits, which often leak or overflow, rather than enclosed tanks. 2 Colo. Code Regs. §§ 404-1:903, 404-1:317B(d)(1)-(2) (requiring tanks only in designated areas). Further, COGCC regulations do not require companies to test for drinking water before completing and hydraulically fracturing a well. Nor is there a clear statewide requirement to ensure that all wells are constructed to protect every drinking water aquifer. *Id.* §§ 404-1:317(f)-(h) (setting different standards for well construction depending on known characteristics of freshwater aquifer), 404-1:317A(a)-(b) (standards for specific aquifer). As one 2018 study explained, in Colorado drinking water protection “depends on the location of the oil and gas field and hence [drinking waters] are unlikely to be uniformly protected.” Addendum 832.

COGCC could strengthen protections for surface and groundwater in several ways. For permit applications posing water contamination risks—those in areas where waste pits are allowed or there is less data on drinking water aquifers—COGCC could condition approval on operators storing waste in tanks, testing for usable groundwater, and using more protective well casing. These common-sense health protections would advance COGCC’s mandate to ensure that development is “consistent with” protecting public health.

CONCLUSION

Because additional regulatory safeguards are needed to protect Coloradans from unconventional oil and gas development’s health risks, as documented in a growing body of peer-reviewed scientific research, the Court should affirm the Court of Appeals.

Respectfully submitted this 25th day of May, 2018.

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CERTIFICATE OF SERVICE

I hereby certify that on this 25th day of May, 2018, a true and correct copy of **BRIEF OF AMICI CURIAE ALLANCE OF NURSES FOR HEALTHY ENVIRONMENTS & PHYSICIANS FOR SOCIAL RESPONSIBILITY** was served electronically served via the Colorado Courts E-Filing System upon all counsel of record.

/S/ Joel Minor