



# Public Employees for Environmental Responsibility

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September 23, 2014

Ms. Regina McCarthy  
Administrator  
U.S. Environmental Protection Agency  
1200 Pennsylvania Ave., NW  
Washington, DC 20460

**Re: Petition for rulemaking to address the harmful surface discharge of hydraulic fracturing chemicals in the Western United States**

Dear Administrator McCarthy,

After the introduction of horizontal fracturing, the last two decades have seen a steep increase in the use of hydraulic fracturing technology to extract natural gas from underground shale deposits. When Congress enacted the National Energy Act of 2005, P.L. 109-58, it removed hydraulic fracturing practices, also called “fracking,” from certain regulations issued by the Environmental Protection Agency (“EPA”) pursuant to the Clean Water Act (“CWA”), 33 U.S.C. § 1251, *et seq.* This spurred the oil and gas industry to expand fracking operations further. Under the National Energy Act, EPA does not regulate the underground injection of fracking fluids. However, EPA remains responsible for regulating surface discharges under the CWA and issuing discharge permits to any companies drilling on federal land.

Despite its responsibility to protect surface waters and the people and animals that rely on them, EPA currently allows drilling companies to freely discharge water produced during fracking operations (known as “produced water”) in Western States. This water contains a large number of toxic chemicals used in the drilling and extraction process. To support its position, EPA invokes a regulatory provision promulgated under the CWA, 40 C.F.R. § 435, Subpart E. However, Subpart E was intended to allow the discharge of produced water only when it is pure enough to use for agriculture or for watering livestock or wildlife. EPA’s reliance on Subpart E to allow the discharge of fracking-produced water is contrary to reason because this water is utterly unfit for human or animal consumption and exposure to it can cause severe health problems and, in some cases, even result in

death. EPA must rectify its position and take action to prevent the further discharge of these dangerous chemicals.

All existing evidence indicates that the chemicals used in hydraulic fracturing operations are extremely dangerous and should be regulated and monitored with the utmost scrutiny. By taking the position that Subpart E allows for the discharge of these chemicals, EPA not only ignores the danger this water poses but also the fact that it is highly unlikely that the rampant use of these chemicals were contemplated when Subpart E was first promulgated in 1976 – before hydraulic fracturing became anywhere near as prevalent or powerful as it is today, due to the National Energy Act of 2005, discussed above, and technological advances.

EPA must take immediate action to prevent the significant danger that the discharge of these toxic chemicals poses to citizens and animals across the Western United States, as well as those elsewhere who rely on potentially affected livestock as a food source. EPA's current practice of permitting these discharges miscarries its duty to protect the nation's waters, as well as its trust obligation to the Native American tribes that live on the federal lands where this drilling is conducted.

Pursuant to the Administrative Procedure Act, 16 U.S.C. § 533(e), Public Employees for Environmental Responsibility (“PEER”) hereby petitions the EPA to (a) amend the language of 40 C.F.R. § 435, Subpart E, to clarify that it does not cover produced water that contains inorganic chemicals introduced downhole before, during, or after the extraction process, or (b) cease its erroneous reliance on Subpart E to permit the discharge of fracking-produced water, or (c) enforce Subpart E and require fracking-produced water to meet the expressed standard of use in agriculture or wildlife propagation.

PEER is a 501(c)(3) non-profit organization with offices in the District of Columbia and member chapters across the country. As part of its mission, PEER is engaged in advocacy, research, education, and litigation relating to key current public policy issues, focusing on the environment, public lands, and natural resource management.

For the reasons discussed below, EPA must repair the mismanagement of its responsibilities and prohibit the surface discharge of toxic fracking chemicals into the waters of the Western United States.

### **Regulatory Background**

The Clean Water Act, 33 U.S.C. § 1251, *et seq.*, establishes effluent limitations guidelines for issuing permits under the Act's National Pollution Discharge Elimination System (“NPDES”) permitting program. EPA established the effluent limitations guidelines applicable to onshore oil and gas drilling operations in 40 C.F.R. § 435.30-.32 (“Subpart C”). Subpart C provides, in relevant part, “there shall be no discharge of waste water pollutants into navigable waters from any source associated with production, field exploration, drilling, well completion, or well treatment (*i.e.*, produced water, drilling muds, drill cuttings, and produced sand).” 40 C.F.R. § 435.32.

Subpart E carves an exception from Subpart C's prohibition of produced water discharge. Onshore facilities located west of the 98th meridian may discharge qualifying produced water. 40 C.F.R. § 435.50-.52 ("Subpart E") Seventeen states, approximately the western half of the continental United States, contain qualifying facilities: Arizona, California, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Texas, Utah, Washington, and Wyoming. Subpart E reads, in relevant part:

“There shall be no discharge of waste pollutants into navigable waters from any source (other than produced water) associated with production, field exploration, drilling, well completion, or well treatment (*i.e.*, drilling muds, drill cuttings, and produced sands).” 40 C.F.R. § 435.52(a)

This exception to the effluent limitations set out in Subpart C applies only to produced water that has a use in agriculture or wildlife propagation. 40 C.F.R. § 435.50 Importantly, to qualify for the exception, the produced water must be “of good enough quality to be used for wildlife or livestock watering or other agricultural uses” and must be “actually put to such use during the periods of discharge.” 40 C.F.R. § 435.51(c)

In 1979, when EPA finalized Subpart E, it explained the reasoning behind the provision as follows:

“Subcategory E was initially established [in the interim final rulemaking promulgated on October 13, 1976, *see* 41 Fed. Reg. 44942,] in response to comments from certain western states asking that the Agency allow the use of produced water for agricultural or wildlife purposes. Investigation showed that in arid portions of the western United States low salinity produced waters were often the only, or at least a significant, source of water used for those purposes. Although not required by the Clean Water Act, the Agency chose to accommodate this situation by the creation of Subpart E. It is *intended as a relatively restrictive subcategorization based on the unique factors of prior usage in the region, arid conditions and the existence of low salinity, potable water.* Thus, all sources subject to regulation under [the discharge prohibition and water quality standards established in] the Act which use produced water for agricultural or wildlife watering purposes at all times during their operations may be included in the subcategory.” 44 Fed. Reg. 22069 at 22072 [emphasis added]

As the text of Subpart E and the EPA's own articulation of its purpose clearly show, the provision is intended to allow companies drilling for oil and gas to discharge produced water only when it is safe for use in and is in fact used in agriculture or for watering livestock or wildlife. Further, because Subpart E was first promulgated as part of the interim regulations issued in 1976, long before hydraulic fracturing reached the

prevalence it enjoys today due to the National Energy Act of 2005, it is highly unlikely that it was intended to cover produced water that contains fracking fluids.

Nonetheless, EPA has taken the position that Subpart E allows drilling companies to discharge produced water from fracking operations, which contains a number of inorganic chemicals found in the maintenance fluids and fracking fluids used in the process of drilling and extraction. As of the filing of this petition, EPA is reviewing five NPDES permits to be issued to companies drilling on the Wind River Reservation in Wyoming, and, although EPA's proposed evaluations of these permits rely on Subpart E, not one of the evaluations considers whether fracking and maintenance fluids are safe for consumption by wildlife and livestock or for any other agricultural use.<sup>1</sup> For the reasons discussed below, produced water discharged from hydraulic fracturing operations cannot reasonably be considered to be "of good enough quality" to be put to these uses. As a result, EPA is issuing NPDES permits without giving adequate account for the significant risk the discharge of these chemicals poses to the health and well-being of animals and American citizens alike.

### **The danger posed by fracking-produced water**

Produced water discharged from fracking operations contains a number constituents, including salts, oils and greases, inorganic and organic chemicals, and naturally occurring radioactive material. Two types of fluids used in this type of natural gas extraction should be of particular concern to EPA in evaluating the contents and toxicity of produced waters: workover fluids – in particular, well maintenance fluids – and well treatment fluids – in particular, fracking fluids.

The effects these fluids have on people, livestock, and wildlife that are exposed to them is not thoroughly understood, but the evidence collected thus far points directly to the conclusion that these fluids are extremely harmful and must be regulated and monitored with the utmost scrutiny. Thus, it is unreasonable for EPA to maintain that produced water that contains maintenance and fracking fluids qualifies for the exception under 40 C.F.R. § 435, Subpart E, because this water is unequivocally not "of good enough quality to be used for wildlife or livestock watering or other agricultural uses."

There have been relatively few studies examining the potential health effects of exposure to the chemicals employed in natural gas extraction. Further, some of the chemicals used in drilling operations remain undisclosed, being treated under regulations as trade secrets. However, one study, led by Theo Colborn, which evaluated 353 chemicals used during

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<sup>1</sup> See ENVIRONMENTAL PROTECTION AGENCY, PERMIT WY-0020338: STATEMENT OF BASIS - EAGLE OIL AND GAS COMPANY AT SHELDON DOME FIELD (2013); ENVIRONMENTAL PROTECTION AGENCY, PERMIT WY-0024953: STATEMENT OF BASIS - PHOENIX PRODUCTION COMPANY AT SHELDON DOME FIELD (2013); ENVIRONMENTAL PROTECTION AGENCY, PERMIT WY-0024945: STATEMENT OF BASIS - PHOENIX PRODUCTION COMPANY AT ROLFF LAKE UNIT (2013); ENVIRONMENTAL PROTECTION AGENCY, PERMIT WY-0025232: STATEMENT OF BASIS - WESCO OPERATING AT TENSLEEP #1 (2013); ENVIRONMENTAL PROTECTION AGENCY, PERMIT WY-0025607: STATEMENT OF BASIS - WESCO OPERATING AT SHELDON DOME FIELD (2013). Copies of these permit evaluations have been attached to this petition. See Attachment Set 1.

natural gas operations, found cause for serious concern.<sup>2</sup> The study found that “[m]ore than 75% of the chemicals could affect the skin, eyes, and other sensory organs, and the respiratory and gastrointestinal systems; approximately 40-50% could affect the brain/nervous system, immune and cardiovascular systems, and the kidneys; 37% could affect the endocrine system [*i.e.*, hormonal glands critical to normal reproduction and development]; and 25% could cause cancer and mutations.”<sup>3</sup>

Livestock, a purported direct beneficiary of this use of produced water, suffers from exposure to these chemicals. A study conducted by Michelle Bamberger and Robert Oswald that evaluated the health impacts suffered by livestock exposed to drilling chemicals makes clear that produced water cannot be reasonably considered safe for animal consumption.<sup>4</sup> The study’s findings are distressing:

“The most commonly reported symptoms were associated with reproduction. Cattle that have been exposed to wastewater (flowback and/or produced water) or affected well or pond water may have trouble breeding. When bred cows were likewise exposed, farmers reported an increased incidence of stillborn calves with and without congenital abnormalities (cleft palate, white and blue eyes). In each case, farmers reported that in previous years stillborn calves were rare (fewer than one per year). . . . Of the seven cattle farms studied in most detail, *50 percent of the herd, on average, was affected by death and failure of survivors to breed.* . . . The most dramatic case was the death of 17 cows within one hour from direct exposure to hydraulic fracturing fluid. The final necropsy report listed the most likely cause of death as respiratory failure with circulatory collapse. . . . In one case, a creek into which wastewater was allegedly dumped was the source of water for 60 head, with the remaining 36 head in the herd kept in other pastures without access to the creek. Of the 60 head that were exposed to the creek water, 21 died and 16 failed to produce calves the following spring. Of the 36 that were not exposed, no health problems were observed, and only one cow failed to breed. At another farm, 140 head were exposed when the liner of a wastewater impoundment was allegedly slit, as reported by the farmer, and the fluid drained into the pasture and the pond used as a source of water for the cows. Of those 140 head exposed to the wastewater, approximately 70 died and there was a high incidence of stillborn and stunted calves.”<sup>5</sup> [Emphasis added]

The studies above indicate that fracking-produced water can in no way be considered safe for watering livestock and wildlife, nor should it be considered safe for any other

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<sup>2</sup> See Theo Colborn, Carol Kwiatkowski, Kim Schultz & Mary Bachran, *Natural Gas Operations from a Public Health Perspective*, 17.5 INT’L JOURNAL OF HUMAN AND ECOLOGICAL RISK ASSESSMENT 1039, 1039 (September 2007).

<sup>3</sup> *Id.*

<sup>4</sup> Michelle Bamberger & Robert Oswald, *Impacts of Gas Drilling on Human and Animal Health*, 22 NEW SOLUTIONS: A JOURNAL OF ENVIRONMENTAL AND OCCUPATIONAL HEALTH POLICY 51 (January 2012).

<sup>5</sup> *Id.* at 60.

agricultural purpose. Moreover, this water poses a severe risk to human health, as evidenced in Colborn's findings. Bamberger and Oswald confirm this conclusion:

“In the majority of cases, owners of animals were exposed upon using their well or spring water for drinking, cooking, showering and bathing. Upper respiratory symptoms (including burning of the nose and throat) and burning of the eyes were the most commonly reported. Headaches and symptoms associated with the gastrointestinal (vomiting, diarrhea), dermatological (rashes), and vascular (nosebleeds) systems were commonly reported.”<sup>6</sup>

Despite the significant harm that produced water is likely to cause the people and animals exposed to it, EPA continues, against all reason, to rely on Subpart E, and thus evaluates NPDES permits without even mentioning any of the chemicals found in maintenance or fracking fluids.

For instance, of the five permits currently proposed for drilling operations on the Wind River Reservation in Wyoming, only one evaluation – for the Phoenix-Sheldon Dome Permit – provides even the trade names of maintenance fluids, much less the chemicals contained in those fluids.<sup>7</sup> In evaluating the Material Safety Data Sheets (“MSDS”) for these fluids, which PEER obtained from the manufacturing company, PEER found that these maintenance fluids contain a number of toxic chemicals, such as ethylene glycol, benzyl chloride, isopropanol, naphthalene, and xylene, among others.<sup>8</sup> These chemicals produce a wide range of potential side effects, including permanent eye damage, burns to the gastro-intestinal tract, and nervous system depression, among others.<sup>9</sup>

These findings only serve to further emphasize that produced waters that contain these maintenance fluids are not safe for animal consumption or for any other agricultural use. Thus, this water should not and, indeed, does not qualify for exemption from regulation under 40 C.F.R. § 435, Subpart E.

### **State Programs Contrasted with EPA regulation**

States subject to the Subpart E EPA exception also promulgate their own permitting requirements and environmental standards. Several states have issued requirements for disclosure or technology more stringent than EPA's enforcement of the produced water standard. These states are Arizona, California, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Texas, Utah, Washington, and Wyoming.

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<sup>6</sup> *Id.* at 61.

<sup>7</sup> *See* note 1 and Attachment Set 1.

<sup>8</sup> PEER has compiled these fluids, their hazardous chemical contents, and correlating exposure effects and health hazard estimations. *See* Appendix, Table 1. This information is also available in the individual MSDSs, which are attached to this petition. *See* Attachment Set 2.

<sup>9</sup> *See id.*

Of the seventeen states the EPA may permit discharge produced water onto farmland or animals, a few have applicable regulations in spite of very little hydraulic fracturing. Idaho, Oregon, and Washington report little drilling activity. Arizona generates a negligible amount of produced water.<sup>10</sup>

In spite of their reduced need for protection, all four states have facially stricter regulations than the EPA NPDES permits. Idaho requires disclosure of stimulation fluids data,<sup>11</sup> and Oregon prohibits produced water disposal in “porous pits.”<sup>12</sup> This may contemplate no surface discharge, and the statutory authority for the regulation mandates “[t]o require the disposal of salt water and oil field waste so as not to damage land or property unnecessarily.”<sup>13</sup> Washington is the only state of this group that does not add to NPDES requirements.

Three states generate produced water but do not regulate it in ways outside the EPA’s NPDES permits. Nevada and South Dakota stick to the EPA NPDES requirements, and Nebraska explicitly excludes the possibility of reporting or compliance for produced water being enforced through permits.<sup>14</sup> Nevada has no system now for regulating hydraulic fracturing, but the state is working on a regulatory program for hydraulic fracturing.<sup>15</sup>

Wyoming generates a large amount of produced water, and does not have specific restrictions on surface discharges or the fluids themselves. However, the state is given a great deal of discretion to review permits with stricter terms. Certain factors must be considered to permit well construction, including the corrosiveness of the fluids themselves.<sup>16</sup> Although this requirement is not of full disclosure, the corrosiveness of the chemicals makes an impact upon the final damage produced water application may wreak.

The far greatest group by numbers of states is those states that generate produced water also regulate it in some fashion. California, Colorado, Kansas, Montana, New Mexico, North Dakota, Oklahoma, Texas, and Utah all fall into this fourth category. At the very least, several states require disclosure of the chemicals contained in produced water:

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<sup>10</sup> See U.S. DEPT. OF THE INTERIOR, BUREAU OF RECLAMATION, *Reclamation: Managing Water in the West*, Science and Technology Program Report No. 157 36 (2011), available at <http://www.usbr.gov/research/AWT/reportpdfs/report157.pdf>. In available data, Arizona generated .01 acre-feet (around 2,700 gallons) per year. As a reference, the city of Mesa, Arizona, requires 3,000^ gallons of water use per month before it provides water service. See Utility Rates, Mesa Arizona, available at <http://www.mesaaz.gov/custserv/pdf/Utilityratebook.pdf>.

<sup>11</sup> IDAHO ADMIN. CODE r. 20.07.02.056(02) (2012).

<sup>12</sup> OR. ADMIN. R. 632-010-0192(1) (2014).

<sup>13</sup> OR. REV. STAT. § 520.095 (2009).

<sup>14</sup> 267 NEB. ADMIN. CODE § 3-022.12F (2014).

<sup>15</sup> NEV. LEG. COUNSEL, *Third Revised Proposed Regulation of the Division fo Minerals of the Commission on Mineral Resources*, LCB File No. R2011-14 1 (July 24, 2014) available at [http://minerals.nv.gov/uploadedFiles/mineralsnv.gov/content/Programs/Oil\\_and\\_Gas/R\\_011-14\\_V7\\_RevisedHF\\_Regs.pdf](http://minerals.nv.gov/uploadedFiles/mineralsnv.gov/content/Programs/Oil_and_Gas/R_011-14_V7_RevisedHF_Regs.pdf).

<sup>16</sup> ENV LQNC ch. 11 WYO. CODE R. § 6(g)(E)

California, Colorado, and Texas all having disclosure schemes.<sup>17</sup> Kansas requires “feasible” disposal plans, North Dakota just requires plans,<sup>18</sup> and Utah surface dischargers must file a proof of the beneficial use the produced water will be used for. Oklahoma limits surface discharge to land that meets certain criteria: low slope, minimum depth to bedrock, “Exchangeable Sodium Percentage” max, water tables deeper than six feet unless water table is perched, and 100 feet from designated streams, fresh water ponds, lakes, and wetlands, and requires sampling and requires sampling.<sup>19</sup> Montana evaluates produced water uses in the permit application, and only allows waters with fewer than 15,000 ppm total dissolved solids to possibly qualify as produced water.<sup>20</sup> And New Mexico prohibits surface discharge outright.<sup>21</sup> Although these states regulate produced water uses and generation in different ways, those that regulate place higher standards on hydraulic fracturing than the EPA does in its NPDES program.

Some states ensure or may ensure (depending upon the exercise of discretion) that produced water does not mean fracking fluids. New Mexico has stopped in-state reliance on Subpart E altogether, alongside those who de facto do not permit fracking operations under Subpart E. Kansas, North Dakota, and Utah all may tighten requirements for a given operation or every operation so that fracking fluids do meet the expressed standard, and Oklahoma restricts discharge to areas that meet certain requirements.

Thus, of the seventeen states that may discharge produced water on the surface, most require something above and beyond the EPA’s NPDES permits. But the piecemeal nature of these regulations, and the severity of produced water’s harms, justifies a federal standard.

### **Conclusion**

For all the reasons explained above, EPA’s current construction of 40 C.F.R. § 435, Subpart E, which allows the discharge of produced water by companies conducting hydraulic fracturing operations, is improper and counterfactual. EPA must take immediate action to correct it and (a) amend the language of 40 C.F.R. § 435, Subpart E, to clarify that it does not cover produced water that contains inorganic chemicals introduced downhole before, during, or after the extraction process, (b) cease its erroneous reliance on Subpart E to permit the discharge of fracking-produced water, or (c) enforce Subpart E and require fracking-produced water to meet the expressed standard of use in agriculture or wildlife propagation. States are already making decisions to correct the loophole.

Fracking-produced water contains numerous chemical components that are highly toxic and utterly unsafe for the uses for which Subpart E was intended to apply. EPA’s

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<sup>17</sup> CAL. PUB. RES. CODE § 3215; 2 COLO CODE REGS. § 404-1.900(1)-(3) (LexisNexis 2014); 16 TEX. ADMIN. CODE § 3.29(c)(2)(A)(x) (2014). Texas allows companies to claim trade secrets, but explicitly adopts a several-factor test to determine whether the disputed information is a trade secret. *Supra*.

<sup>18</sup> N.D. ADMIN. CODE §43-02-03-19.2 (2014).

<sup>19</sup> OKLA. ADMIN. CODE § 165:10-7-17.

<sup>20</sup> Mont. Admin. R. 36.22.1226 (2014)

<sup>21</sup> N.M. CODE R. § 19.15.32.11 (LexisNexis 2014).



decision to permit the discharge of this produced water under Subpart E is a dereliction of its duty to protect the nation's waters and the people and animals that rely on them. Further, it is a miscarriage of its trust obligation to the Native American tribes that live on the federal lands where this drilling takes place. EPA must curer its mismanagement of these responsibilities.

Thank you for your consideration of this issue.

Sincerely,

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