



# Public Employees for Environmental Responsibility

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ENVIR. APPEALS BOARD

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U.S. Environmental Protection Agency  
Environmental Appeals Board  
1200 Pennsylvania Avenue, N.W.  
(Mail Code 1103M)  
Washington, D.C. 20460-0001

**Re: Petition for Review of National Pollutant Discharge Elimination System (NPDES) Permits**

**Via U.S. MAIL & FAX**

Under 40 C.F.R. § 125.15, Public Employees for Environmental Responsibility (PEER) is filing an administrative appeal of the following NPDES permits:

- Eagle Oil and Gas Company - Sheldon Dome Facility; NPDES Permit No. WY-0020338;
- Phoenix Production Company - Sheldon Dome Field; NPDES Permit No. WY-002495;
- Phoenix Production Company - Rolff Lake Unit; NPDES Permit No. WY-0024945;
- WESCO Operating, Inc. - Sheldon Dome Field; NPDES Permit. No. WY-0025607, and;
- WESCO Operating, Inc. - Tensleep #1 (also known as Winkleman Dome); NPDES Permit No. WY-0025232

PEER filed comments July 9, 2013 on the above permits, hereinafter referred to as the Wind River permits, when they were proposed in 2013. Comments can be found at [http://www.peer.org/assets/docs/epa/7\\_10\\_13\\_Wind\\_River\\_Permit\\_Comments.pdf](http://www.peer.org/assets/docs/epa/7_10_13_Wind_River_Permit_Comments.pdf).

The central issue of PEER's appeal is the non-compliance of Wind River permits to EPA requirements. The permits do not directly address effluents to be discharged. Further, due to the lack of stringency in the Wind River permits, wildlife and livestock who drink the produced water will be at risk.

**Summary:**

To ensure NPDES are protective of receiving waters designated uses, issuance of permits must first be contingent upon complete and accurate characterization of the discharged waste stream.

Oil and gas operations that were granted permits will discharge three distinct effluents:

- 1) "Produced water" that is ground water, absent human introduced chemicals;

- 2) Maintenance chemicals, which in the case of Phoenix/Sheldon dome will be applied downhole every two weeks. While small in quantity, the frequency is very high, and cumulative effects on the environment unknown but does include known carcinogens, and;
- 3) Stimulation chemicals from hydraulic fracturing (fracking) or acid treatment.

Wind River permits inadequately address the maintenance and stimulation chemical discharges by failing to—

- List both chemicals in the approved permits. Prior to approval, EPA made no inquiry as to which chemicals were to be discharged;
- Implement stringent discharge limitations, and;
- Properly monitor discharge waste streams to collect data accurately.

EPA's decision to issue these permits should be overturned because issuance is both improper and counterfactual.

### **I. Permits Do Not Meet EPA Standards<sup>1</sup>**

Because the Wind River permits omit an extensive amount of required information, the permits fail to meet minimum EPA standards. When NPDES permits are drafted, a permit writer has a duty to adhere to certain requirements, which were not followed. The NPDES Permit Writers' Manual outlines the following steps for characterization of effluent and receiving water:

1. Identify pollutants of concern in the effluent;
2. Determine whether water quality standards provide for consideration of a dilution allowance or mixing zone;
3. Select an approach to model effluent and receiving water interactions;
4. Identify effluent and receiving water critical conditions, and;
5. Establish an appropriate dilution allowance or mixing zone.<sup>2</sup>

The aforementioned steps were not completed by permit writers. The permit writers failed to include the maintenance or fracking chemicals to be used, as outlined in step one above. Because the first step was not addressed, the remaining steps only reflect the information that was provided, which led to the creation of sub-standard discharge limits – resulting in a regulatory “garbage-in-garbage-out” effect.

The permit writer also failed to adequately protect against Pollutants Otherwise Expected to be Present in the Discharge:

A final category of pollutants of concern includes those pollutants that are not in one of the other categories, but are otherwise expected to be present in the discharge. There might be pollutants for which neither the discharger nor the permitting authority have monitoring data but, because of the raw materials stored

<sup>1</sup> Based upon PEER comment 5, p.8.

<sup>2</sup> EPA, NPDES PERMIT WRITERS' MANUAL: CHAPTER 6 WATER QUALITY-BASED EFFLUENT LIMITATIONS 13 (2010), available at [http://www.epa.gov/npdes/pubs/pwm\\_chapt\\_06.pdf](http://www.epa.gov/npdes/pubs/pwm_chapt_06.pdf).

or used, products or by-products of the facility operation, or available data and information on similar facilities, the permit writer has a strong basis for expecting that the pollutant could be present in the discharge. Because there are no analytical data to verify the concentrations of these pollutants in the effluent, the permit writer must either postpone a quantitative analysis of the need for WQBELs and generate, or require the discharger to generate, effluent monitoring data, or base a determination of the need for WQBELs on other information, such as the effluent characteristics of a similar discharge.<sup>3</sup>

#### A. Many Chemicals Not Listed in Wild River Permits<sup>4</sup>

Of the five issued Wind River permits, four specify that produced water will be discharged to surface waters<sup>5</sup> and one claims to no longer discharge to surface waters.<sup>6</sup> Produced water contains a number of different constituents including: salt content, oil and grease, inorganic and organic chemicals, and naturally occurring radioactive material.<sup>7</sup> While some of these constituents are addressed in the permit, many are not, including chemicals and compounds found in maintenance and hydraulic fracturing (fracking) fluids.

None of the Wind River permits actually cite any of the maintenance or fracking chemicals used, which is extremely problematic because many maintenance and fracking fluids contain toxic chemicals.

Maintenance fluids used in fracking wells can be very dangerous themselves, in addition to the fracking fluids, which is why their dangerous properties need to be reflected in the Wind River permits. When maintenance fluids are dispersed in a well they eventually resurface in the produced water.<sup>8</sup> To guard against potential hazards, maintenance fluids need to be listed in every NPDES permit. The Phoenix-Sheldon Dome Permit provides the trade names of maintenance fluids used at the location.<sup>9</sup>

It is possible to obtain Material Safety Data Sheets (MSDS), which contain the names of hazardous chemicals and side effects in each product, from product trade names.

PEER requested MSDS forms in an email sent to NALCO, a manufacturing company. NALCO supplied the requested MSDS forms within 24 hours, pursuant to company policy.<sup>10</sup> Each

<sup>3</sup> *Id.* at 15.

<sup>4</sup> Based on PEER Comment 1, p.1.

<sup>5</sup> 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). (hereinafter "EPA Permits")

<sup>6</sup> ENVIRONMENTAL PROTECTION AGENCY, PERMIT WY-0025607: STATEMENT OF BASIS - WESCO OPERATING AT SHELDON DOME FIELD (2013).

<sup>7</sup> *About Produced Water (Produced Water 101)*, Produced Water Treatment and Beneficial Use Information Center, available at [http://aqwatec.mines.edu/produced\\_water/intro/pw/index.htm](http://aqwatec.mines.edu/produced_water/intro/pw/index.htm).

<sup>8</sup> *Wastewater*, Catskill Mountainkeeper: The Advocate for the Catskills, available at <http://www.catskillmountainkeeper.org/our-programs/fracking/whats-wrong-with-fracking-2/wastewater/>

<sup>9</sup> PERMIT WY-0024953, *supra* note 1, at 4-5.

<sup>10</sup> *Nalco MSDS and Product Bulletin Search*, NALCO (2013), available at <http://www.nalco.com/msds.htm>.

MSDS form contained chemical product and composition information, hazards identification, toxicological information, and protection measures.<sup>11</sup>

The six products listed on MSDS forms contain a number of toxic chemicals, such as ethylene glycol, benzyl chloride, isopropanol, naphthalene, and xylene, among others.<sup>12</sup> Chemicals in maintenance fluids could potentially produce a wide range of side effects including permanent eye damage, nervous system depression. Also, a number of chemicals have carcinogenic properties.<sup>13</sup> PEER provided EPA with a comprehensive list of chemicals and side effects from maintenance fluids in Appendix I of our comments.

Just as the maintenance fluids contain dangerous chemicals that need to be listed in the Wind River permits, fracking fluids contain even more dangerous chemicals. Not a single permit lists any of the chemicals used during the fracking process.<sup>14</sup> This means that the EPA is in the process of issuing permits without addressing the toxicity of fracking chemicals that may be discharged via produced water.

While no EPA requirement to list fracking chemicals in discharge permits currently exists,<sup>15</sup> these chemicals can be extremely dangerous. The chemicals contain known cancer causing carcinogens, contaminate water supplies, and destroy landscape and farmland.<sup>16</sup> The chemicals contained in fracking fluids are too dangerous to go undisclosed and unregulated in a permit that allows for surface water discharge.

Because neither maintenance chemicals nor fracking chemicals are listed in the permit, the proper precautions cannot be taken, leaving the permits woefully inadequate. Further, the permits violate 40 CFR 124.8 (b)(2), which requires the fact sheet to include, when applicable, "the type and quantity of wastes, fluids, or pollutants which are proposed to be or are being treated, stored, disposed of, injected, emitted, or discharged."<sup>17</sup>

Listing the type and quantity of maintenance and fracking fluids in Wind River permits is mandatory because these fluids have the potential to cause severe human and environmental harm.

According to 40 C.F.R. § 124.8(a): "the fact sheet shall briefly set forth the principal facts and the significant factual, legal, methodological and policy questions considered in preparing the draft permit." Implicit in this regulation is the responsibility of the EPA and the permit writers to

<sup>11</sup> NALCO, BREAXIT EC6033A, MSDS (2011); NALCO, BREAXIT EC2462A, MSDS (2011); NALCO, BREAXIT EC2007A, MSDS (2011); NALCO, EC1076A CORROSION INHIBITOR, MSDS (2010); NALCO, EC1317A CORROSION INHIBITOR, MSDS (2010); and NALCO, EC6485A, MSDS (2010). (hereinafter "MSDS").

<sup>12</sup> *Id.*

<sup>13</sup> *Id.*

<sup>14</sup> EPA Permits, *supra* note 1.

<sup>15</sup> See EPA, *National Recommended Water Quality Criteria*, Water (2013) available at <http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm> (hereinafter "WQC") and EPA, NPDES PERMIT WRITERS' MANUAL (2010), available at <http://cfpub.epa.gov/npdes/writermanual.cfm>.

<sup>16</sup> See Elizabeth Royte, *Fracking Our Food Supply*, THE NATION, Dec. 17, 2012, available at <http://www.thenation.com/article/171504/fracking-our-food-supply#axzz2YCTKxYZL>.

<sup>17</sup> 40 C.F.R. § 124.8 (b)(2).

provide oversight. Wind River permits show no indication of this. Instead the permits blatantly disregard significant facts and policy questions necessary to craft strong and effective permits.

This crippling weakness in the implemented permits brings into question the EPA's responsibility to the Wind River Reservation and residing tribes. Executive Order 13,175 requires the EPA to consult and coordinate with Indian Tribal governments,<sup>18</sup> Although EPA consulted with the Wind River Reservation, it is unclear whether the EPA was more forthcoming in its consultations with the tribes than it is in the permits.

Since the Wind River Reservation cannot establish and enforce its own environmental standards at this time, it relies on the EPA to do so. In President Obama's 2012 State of the Union address, he pledged to require "all companies that drill for gas on public lands to disclose the chemicals they use," and to, "develop this resource without putting the health and safety of our citizens at risk." If the EPA did not disclose additional information regarding fracking chemicals to the tribes than it did to the general public, then the EPA failed to participate in effective engagement with the Indian tribes and failed to comply with President Obama's pledge. In the absence of effective engagement, the Wind River tribes will not receive appropriate public health or water quality protection.

### **B. Lack of Discharge Limits<sup>19</sup>**

Not only do the Wind River permits fail to disclose the chemicals found in maintenance and fracking fluids, they also utterly fail to set limits for the discharge of toxic chemicals found in the fluids.<sup>20</sup> A number of the permits also fail to mention if or when fracking or other stimulation events occur,<sup>21</sup> which makes it impossible to accurately assess discharge limits and testing requirements. Permits need to include comprehensive disclosures of fracking practices at the facilities to better characterize discharge. Also, permits need to be more thorough by including the quantities of chemicals as well as discharge limitations for the many toxic chemicals found in fracking fluids.

Currently, the permits only reflect the National Recommended Water Quality Criteria (WQC). While at best preliminary, this criteria, does not include many of the dangerous chemicals used in fracking.<sup>22</sup> Thus, they should not be the only water quality criteria relied upon in the permit.

The current push for more comprehensive water criteria is a result of the growing recognition that fracking chemicals pose a significant threat to water supplies. Thus, the permits need to be reflective of a stronger set of criteria that limits a broader range of toxic chemicals: especially since Western produced water is allowed for wildlife and livestock consumption.

### **C. Inadequate Monitoring<sup>23</sup>**

In addition to the permits failure to disclose the chemicals in maintenance and fracking fluids or to impose discharge limits for these chemicals, the permits lack adequate monitoring standards. EPA requirements state, "limitations must control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be

<sup>18</sup>EPA, *EPA's Tribal Strategy*, Region 10: the Pacific Northwest (2013), available at <http://yosemite.epa.gov/R10/TRIBAL.NSF/Programs/EPA%27s+Tribal+Strategy>.

<sup>19</sup> Based on PEER Comment 2, p.4.

<sup>20</sup> EPA Permits, *supra* note 1 and Permit WY-0025607, *supra* note 2.

<sup>21</sup> PERMIT WY-0020338, *supra* note 1; PERMIT WY-0025232, *supra* note 1; and PERMIT WY-0025607, *supra* note 2.

<sup>22</sup> See WQC, *supra* note 11.

<sup>23</sup> Based on PEER Comment 4, p.7.

discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality."<sup>24</sup> The Water River permits do not fulfill these requirements because the permits do not test for many of the chemicals in the water. Instead, they rely on self-reporting and have woefully deficient monitoring requirements.

Because many of the chemicals used in fracking and maintenance are not listed in the WQC they are not tested for.<sup>25</sup> This means that numerous chemicals in produced water are not tested for or monitored and, thus, could be contaminating surface water on the Wind River Reservation.

Further, chemicals are insufficiently monitored, especially the toxic chemicals. Under Permit Part 1.3.4, Toxic Pollutants Screen, monitoring is only required three times over the life of the five year permit: once within the first year of the permit, once in the third year of the permit, and once to renew the permit.<sup>26</sup> Testing so few samples prevents gauging an accurate representation of the quantities of chemicals in the water.

Most detrimental to the permits is the complete absence of any correlation between fracking events and monitoring samples. Neither the Toxic Pollutants Screen nor the Whole Effluent Toxicity (WET) test under Permit Part 1.3.5 requires sampling after maintenance or fracking events. This is problematic because fracking events only occur every two years.<sup>27</sup>

If quarterly monitoring does not occur during a fracking year, then the WET test cannot accurately monitor toxicity samples. WET testing only requires quarterly monitoring for acute toxicity until four consecutive toxicity tests show no presence of acute toxicity,<sup>28</sup> which means quarterly monitoring may only occur for the first year of the permit. Once the permittee has shown no acute toxicity is present, then only yearly monitoring is required.<sup>29</sup> Yearly monitoring does not provide the best protection against toxic chemicals and does not reflect the nuances in toxic chemical levels that may occur.

Since neither test is performed after maintenance or fracking events there is potential for chemicals to be in the water that are not being tested. The most dangerous chemicals would appear after maintenance and fracking events, which is why monitoring would be ideal after these events.

Finally, the Wind River permits rely on self-monitoring, meaning the EPA has access only to whatever data the permitting gas and oil companies transmit. The monitoring data submitted may not be accurate because there is no EPA oversight and, thus, no incentive to comply with monitoring requirements. The current permits provide for monitoring when it is most convenient for the producer, not when it would provide the most protection for the Wind River Reservation.

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<sup>24</sup> 40 C.F.R. § 122.44 (d)(1)(i).

<sup>25</sup> WQC, *supra* note 11.

<sup>26</sup> PERMIT WY-0020338, *supra* note 1, at 16; PERMIT WY-0024953, *supra* note 1, at 21; PERMIT WY-0024945, *supra* note 1, at 21; PERMIT WY-0025232, *supra* note 1, at 19; and PERMIT WY-0025607, *supra* note 2, at 19.

<sup>27</sup> PERMIT WY-0024953, *supra* note 1, at 7 and PERMIT WY-0024945, *supra* note 1, at 3.

<sup>28</sup> PERMIT WY-0020338, *supra* note 1, at 11; PERMIT WY-0024953, *supra* note 1, at 16; PERMIT WY-0024945, *supra* note 1, at 17; PERMIT WY-0025232, *supra* note 1, at 15; and PERMIT WY-0025607, *supra* note 2, at 14.

<sup>29</sup> *Id.*

Even though many fracking fluids contain similar combinations of chemicals, the permits did not even attempt to account for pollutants otherwise expected to be present in the discharge. Also, the monitoring requirements in the permits lack the stringency to collect necessary data on other pollutants in the fracking discharge, both from maintenance and fracking events, to determine other pollutants in the discharge.

When establishing monitoring conditions a permit writer is supposed to consider several factors to avoid inappropriate or incomplete monitoring requirements.<sup>30</sup> The factors include:

- Applicability of effluent limitations guidelines and standards (effluent guidelines);
- Waste stream and process variability;
- Access to sample locations;
- Pollutants discharged;
- Effluent limitations;
- Discharge frequencies (e.g., continuous versus intermittent);
- Effect of flow or pollutant load or both on the receiving water;
- Characteristics of the pollutants discharged, and;
- Permittee's compliance history.<sup>31</sup>

The Wind River permits show no indication that even half of the above factors were considered in the permit process. Some of the most important factors were not considered at all: pollutants discharged, effluent limitations, discharge frequencies, and the characteristics of the pollutants discharged.

By including chemicals found in maintenance and fracking fluids, it would have forced the consideration of other factors and made a significant difference in the Wind River permits. The toxic chemicals in the maintenance and fracking fluids were not listed, effluent limitations nor were discharge frequencies for the toxic chemicals set, and the permits state nothing regarding characteristics of the toxic pollutants discharged.

Similarly, the permits do not meet EPA monitoring or frequency conditions:

"The permit writer should establish monitoring frequencies sufficient to characterize the effluent quality and to detect events of noncompliance, considering the need for data and, as appropriate, the potential cost to the permittee."<sup>32</sup>

The most important part of this requirement is to "establish monitoring frequencies sufficient to characterize the effluent quality." Wind River permits fail to establish monitoring frequencies because they do not account for maintenance procedures or fracking events. Monitoring frequencies are not sufficient unless samples are obtained subsequent to a maintenance or fracking event. It is impossible to determine effluent water quality if many of the chemicals in the water appear only once every two years after a fracking event.

<sup>30</sup>EPA, NPDES PERMIT WRITERS' MANUAL: CHAPTER 8 MONITORING AND REPORTING CONDITIONS (2010), available at [http://www.epa.gov/npdes/pubs/pwm\\_chapt\\_08.pdf](http://www.epa.gov/npdes/pubs/pwm_chapt_08.pdf).

<sup>31</sup>*Id.*

<sup>32</sup>*Id.* at 5.

Thus, overall, the permits do not reflect EPA standards put in place to ensure high water quality standards

## II. EPA Responses to Comments are Unpersuasive and Erroneous.

In its response to the above points, the EPA attempts to explain its circumvention of legal responsibilities to protect water quality.<sup>33</sup> The response begins with a general unpersuasive absolution of EPA's duty to look at the entire discharge stream:

*...the CWA gives EPA the authority to regulate the discharge of pollutants in wastewater. Thus, with these permits, EPA is not regulating the process of hydraulic fracturing, or directly monitoring that process or its effects.*<sup>34</sup> (Original in italics, Emphasis added)

This disingenuous statement seeks to shirk one of EPA's main responsibilities in writing a discharge permit: to characterize the nature of the discharge and ensure that permit limits safeguard protection of receiving waters. Central to this task is characterizing all processes that contribute to the quality and nature of the discharge.

Even if one accepts the argument that flowback after well maintenance and fracking events can be defined as produced water and allowable for discharge, that only reinforces, not excuses, the need to fully characterize what flowback consists of and what reasonable expectations are for concentrations that might be found in the discharge so that appropriate limits can be set.

*EPA developed the permit limitations and monitoring requirements after a thorough evaluation of available information sources including the tribally adopted water quality criteria for pollutants present in the discharge, and available data on the effects of these types of pollutant discharges on wildlife, aquatic life and livestock.*<sup>35</sup>

Permit writers are not limited to only "available information sources." EPA is taking the questionable stance that it will only use information that the permittees provide in their applications. It is inexplicable and unjustifiable that EPA permit writers did not ask permit applicants to identify what chemicals were to be used downhole.

The EPA's NPDES Permit Writers' Manual encourages permit writers to ask for supplemental information as needed in order to adequately characterize the nature and quantity of pollutants in the effluent.<sup>36</sup> Thus, EPA should not have confined its review to available information and excluded information that was easily attainable by request—especially if supplemental information is necessary to ensure that pollutant impacts on wildlife and aquatic life were protective.

*The regulation identifies five activities undertaken at oil and gas facilities: production, field exploration, drilling, well completion, and well treatment. The regulation also identifies, in parentheses, four sources of pollutants associated with oil and gas*

<sup>33</sup> Response to General Comments on Permits WY-0020338, WY-0024953, WY-0024945, WY-0025232, WY-0025607 (March 9, 2015).

<sup>34</sup> *Id.* at 5.

<sup>35</sup> *Id.* at 6.

<sup>36</sup> See sections 4.5, 4.5.1.



*activities: produced water, drilling muds, drill cuttings, and produced sands. EPA has historically read the parentheticals in the regulation to identify the sole four pollutant sources associated with oil and gas activities subject to Subpart E. Thus, all pollutants must be identified with a particular source. If a pollutant is contained in drilling muds, drill cuttings or produced sands, it may not be discharged. If a pollutant is contained in produced water, it may be discharged. Because the list of pollutant sources in Section 435.53 is fairly limited, for the purposes of permitting, produced water may contain a variety of pollutants including those present in the formation water and those arising out of well treatment activities. Such pollutants may be discharged with the produced water so long as that water is of good enough quality for wildlife or livestock water, or other agricultural uses (i.e., "is of good enough quality), and is actually put to that use."<sup>37</sup>*

In this response EPA articulates that legally discharged "produced water" includes any chemicals mixed within. This stance is significantly at odds with the oil and gas industry practice that distinguishes flowback from produced water.

But even if EPA's position is accepted, it does not excuse EPA from its duty to fully and accurately characterize the discharge, set protective discharge limits for these chemicals and ensure their concentrations are properly monitored. If anything, the inclusion of fracking and well maintenance fluids makes these permit responsibilities even more essential.

Commenters also noted that the chemicals the companies used are proprietary and are not released for review.<sup>38</sup>

EPA notes this point made by commentators but does not dispute it. Merely because the fluid ingredients are proprietary does not restrain EPA from requiring the applicant to provide this information to EPA in order for us to write the permits. EPA has methods it can use to shield this information from public release while using it to write permit conditions.

*EPA evaluated material safety data sheet (MSDS) chemical information for produced water treatment and well maintenance with usage frequency for one facility, Phoenix Production Sheldon Dome (WY-0024953).<sup>39</sup>*

This statement is puzzling for a number of reasons:

1. It shows that EPA viewed itself as capable of seeking supplemental information.
2. It limited this request to only one of the permits, but the agency does not explain why.
3. It limited this request only to maintenance fluids, not fracking fluids.
4. It references "produced water treatment" which is a misnomer. This is not a "treatment" other than separating out the oil from the rest of the wastewater is then discharged via the NPDES permit.

<sup>37</sup> Response to General Comments on Permits at 7.

<sup>38</sup> *Id.* at 9.

<sup>39</sup> *Id.* at 10.

5. It tacitly admits that EPA has decided not to ask the key question of what chemicals that are going downhole will come up in the discharge.

*The NPDES authority under Section 402 of the CWA and implementing regulations under 40 CFR Part 122 control the discharge of pollutants. In response to comments received on chemical usage at these facilities, EPA has added a new permit condition including a chemical inventory requirement to maintain records on the types, quantities and chemical formulations used in well treatment and workover activities and an additional reporting requirement for well treatment and workover fluids if these fluids are discharged.*

The actual permit provision added in response to comments reads:

“The Permittee shall maintain an inventory of the quantities and concentrations of the specific chemicals used to formulate well treatment and workover fluids. If there is a discharge of these fluids, the chemical formulation, concentrations and discharge volumes of the fluids shall be submitted with the DMR [quarterly Discharge Monitoring Report]. For discharges of well treatment and workover fluids, the type of operation that generated the discharge fluids shall also be reported.”<sup>40</sup>

However, this chemical inventory requirement is for the purpose of shaping potential permit conditions in future permits. The current Wind River permits that EPA is now issuing remain in effect until March 31, 2020. That means for the next five years there will be no management or limits on the discharge of these added chemicals, only monitoring.

Significantly, the permit does not require that inventory of chemicals be provided to EPA or anyone else. Nor is there a provision for verifying the accuracy and completeness of that inventory. Thus, EPA has chosen yet again to avoid knowing what chemicals are likely to be discharged.

The efficacy of this inventory and chemical discharge reporting requirement depends on the rigor of monitoring. But, as pointed out in PEER's comments and herein, the monitoring sampling can take place long after well maintenance and fracking events. This means that the presence and concentrations of these chemicals may be significantly under-reported.

*EPA found there were only two pollutants in the maintenance and produced water treatment fluids that may occur at a concentration in the discharge which demonstrated RP to exceed water quality criteria established by the Tribes or published EPA water quality criterion established under Section 304(a) of the CWA.*<sup>41</sup>

PEER obtained the same MSDS forms from by an email sent to the manufacturing company NALCO. Each form contained chemical product and composition information, hazards identification, toxicological information, and protection measures.<sup>42</sup>

<sup>40</sup> Sheldon Dome Permit, Section 1.3.9, p.12.

<sup>41</sup> *Id.* at 10.

<sup>42</sup> MSDS

Contrary to EPA's assertion, there were only two chemicals of concern. The MSDS sheets for the six products listed contain a number of toxic chemicals, such as ethylene glycol, benzyl chloride, isopropanol, naphthalene, and xylenc, among others.<sup>43</sup> These chemicals produce numerous potential side effects including permanent eye damage and nervous system depression. Also, a number of chemicals have carcinogenic properties.<sup>44</sup>

Moreover, EPA looked at MSDS sheets only for maintenance fluids but did not examine MSDS sheets for fracking fluids, which as discussed below, are of even greater concern.

Finally, even if there is only one chemical of concern, it should be addressed in the livestock and wildlife discharge permit, especially if the chemical is toxic and discharged in toxic quantities.

*For trimethyl benzene, an appropriate monitoring method could not be established due to the lack of an approved analytical method under 40 CFR Part 136 or other readily available analytical method.*<sup>45</sup>

WET methods were developed to test toxicity holistically.<sup>46</sup> WET is a well-developed and defined method to respond to toxicity questions. WET is particularly useful when there are so many novelty chemicals that EPA likely has little to no information about.

But rather than take a holistic approach, EPA has decided to discover as few chemicals as possible and take them one-by-one. EPA then complains it is not feasible to search for a needle in a haystack.

*For the other four permits, no specific information on chemicals used in the well maintenance and produced water treatment was provided in the permit applications.*<sup>47</sup>

This statement encapsulates the inappropriateness of EPA's approach to these permits. It is a permit writer's duty to ask for the identity of chemicals. The Permit Writers' Manual explicitly states that, "contents in a permit are based, *in part*, on information in the application."<sup>48</sup> Further, the permit writer may require supplementary information or more detailed production information or maintenance or operating data.<sup>49</sup>

Here, it appears conclusive that EPA has deliberately blinded itself to attainable information that is essential to write a legally defensible discharge permit.

*However, without the information from monitoring required in the renewal permit, a decision to include (or not) new permit limitations would be based on insufficient data (e.g. one point).*<sup>50</sup>

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<sup>43</sup> *Id.* at 10.

<sup>44</sup> *Id.* at 10.

<sup>45</sup> *Id.* at 10.

<sup>46</sup> EPA, WHOLE EFFLUENT TOXICITY (2014), available at <http://water.epa.gov/scitech/methods/cwa/wet/>.

<sup>47</sup> Response to General Comments on Permits at 10.

<sup>48</sup> Section 4.5 (Emphasis added).

<sup>49</sup> Section 4.5.1.

<sup>50</sup> Response to General Comments on Permits at 10.

By not asking for crucial information, EPA is avoiding necessary analysis to determine if there is a potential for pollutants to be present in quantities of concern during the current permitting term.

While PEER has no objection to EPA acquiring more data from monitoring to refine future permits that is not sufficient justification for EPA's failure to ask for as much information as needed to best inform the permit conditions for this permit term.

*Because of the likelihood that any pollutants in the well maintenance and produced water treatment fluids will be present at times during the monitoring event, the resulting monitoring data will be representative of the actual discharge.*<sup>51</sup>

As it relates to maintenance of chemicals, the above statement depends upon a number of factors, such as how large the settling pond is, and what that retention time is. Without information provided on the size of the settling pond, it is impossible to know holding times and whether proposed monitoring frequency would even capture chemicals being discharged after a downhole chemical treatment. It is possible that holding times are less than one day, in which case proposed sampling frequency would completely miss capturing pollutants present related to maintenance or stimulation, thus failing the stated monitoring objective of ensuring sampling is representative of the variability in the discharge.

Moreover, this concern is magnified many-fold for frack events that will occur every other year, and again, holding time is probably less than two days.

*Well Treatment: For other infrequent activities such as well treatment (e.g., acidizing, stimulation), EPA did not have sufficient information on quantities and concentrations of chemical substances either provided by the permittee or available from publically available information sources (e.g., websites such as FracFocus), to assess whether any of the pollutants potentially present in the well treatment fluids will cause or contribute to an excursion of Tribal water quality requirements or cause toxicity in the produced water discharge. In order to gather more information on chemical usage in well treatment and workover activities as discussed above, EPA has added a new chemical inventory requirement. The chemical inventory requires the permittee to maintain records on the types, quantities and chemical formulations used in well treatment and workover activities; as well as instituting an additional reporting requirement for well treatment and workover fluids if these fluids are discharged.*<sup>52</sup>

It is the permit writer's duty to obtain this information. As noted above, EPA is limited only to publically available sources. The agency has a clear regulatory authority to request this information directly from the facility.

*Additional monitoring to try and specifically monitor (i.e., target) a produced water discharge containing well treatment fluids after a treatment was performed would require a highly complex and very expensive testing scheme that would not guarantee accurate or*

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<sup>51</sup> *Id.* at 10.

<sup>52</sup> *Id.* at 11.

*representative results. Targeting those discharges would require calculating, or otherwise determining, when the produced water impacted by a treatment event would actually discharge from the outfall.*<sup>53</sup>

EPA's lack of initiative and imagination regarding this aspect is astounding. Many companies capture flowback. There are techniques commonly employed by these facilities to know when flowback ends and the transition to ground water begins. There is a whole industry that captures flowback and treats it for reuse.<sup>54</sup>

Moreover, NPDES permits have required targeted sampling, as in stormwater permits.<sup>55</sup> EPA Region 8 has also required targeted sampling to capture pollutants that are discharged in batches.

*Enhanced sampling of an indicator substance would require extended and frequent sampling which, given the factors described above, would be extremely difficult.*<sup>56</sup>

It is unclear what the basis for the above statement is. Other industries commonly use these techniques. The use of automatic samplers is also used commonly in areas such as stormwater monitoring.

Moreover, use of an indicator substance does not necessarily require injection of a substance underground. One can look at baseline parameters of the groundwater (e.g. TDS, pH) to get a sense of transition back to unadulterated groundwater.

In short, EPA appears to be grasping at straws for excuses as to why it will not monitor for toxic chemicals in surface discharge intended for consumption by wildlife and livestock.

### **III. These Discharges Are Too Toxic to Qualify for Produced Water Beneficial Use<sup>57</sup>**

The Wind River permits are premised on 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 and fracking fluids used in the process of drilling and extraction. As PEER and others<sup>58</sup> have argued in our comments, produced water discharged from hydraulic fracturing operations cannot reasonably be considered "of good enough quality" to be put to these uses.

Produced water discharged from fracking operations contains a number of 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

<sup>53</sup> *Id.* at 11.

<sup>54</sup> See <http://energy.gov/fe/science-innovation/oil-gas/shale-gas-rd/produced-water-rd>

<sup>55</sup> See 40 C.F.R. § 122 Subpart B.

<sup>56</sup> Response to General Comments on Permits at 12.

<sup>57</sup> Based on PEER Comment 3, p.5.

<sup>58</sup> See comments from the Natural Resources Defense Council, p.7.

concern to EPA in evaluating the contents and toxicity of produced waters: workover fluids and well treatment fluids.

The effects of exposure these fluids have on humans, livestock, and wildlife 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, and treated as trade secrets under regulations. However, one study, led by Theo Colborn, evaluated 353 chemicals used during natural gas operations, raised cause for serious concern.<sup>59</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>60</sup>

Livestock, a purported direct beneficiary 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 reasonably be considered safe for animal consumption.<sup>61</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

<sup>59</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>60</sup> *Id.*

<sup>61</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).

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>62</sup> [Emphasis added]

The studies above demonstrate 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 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>63</sup>

The wildlife most likely to be adversely affected are aquatic species since receiving waters designated for aquatic life. Presumably, fish, amphibians and other aquatic are more sensitive to toxic impacts than livestock or other large megafauna. Aquatic species generally have shorter life span, making study of chemical effects easier than on longer-lived livestock. Given the number of years these permits have been in development, it would have behooved EPA to have undertaken studies on aquatic life (whether using the WET protocol or not) *before* issuing these discharge permits rather than after.

Moreover, in another context EPA appears to explicitly admit these dangers. In a *Federal Register Notice* of April 7, 2015,<sup>64</sup> EPA proposed that fracking fluids and other “unconventional oil and gas (UOG)” resources be pre-treated before discharges are sent to municipal wastewater treatment facilities.<sup>65</sup> In its statement of purpose, EPA points out:

“UOG extraction wastewater can be generated in large quantities and contains constituents that are potentially harmful to human health and the environment. Wastewater from UOG wells often contains high concentrations of total dissolved solids...The wastewater can also contain various organic chemicals, inorganic chemicals, metals and naturally-occurring radioactive materials...This potentially harmful

<sup>62</sup> *Id.* at 60.

<sup>63</sup> *Id.* at 61.

<sup>64</sup> FR Vol. 80, No.66, p.18557.

<sup>65</sup> This was not raised in public comments as this proposal was made public only very recently, long after the public comments on the Wind River permits closed in 2013.

wastewater creates a need for appropriate wastewater management infrastructure and management practices.”<sup>66</sup>

By contrast when it comes to surface discharge of the same “potentially harmful wastewater,” EPA fails to even recognize these hazards let alone introduce proposals to manage them.

Despite the significant harm that produced water is likely to cause to humans and animals through exposure, EPA continues, against all reason, to issue NPDES permits without even mentioning any of the chemicals found in fracking fluids, let alone setting discharge limits and prudently monitoring outflows.

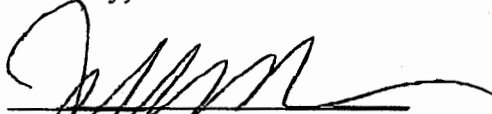
Fracking produced water contains numerous chemical components that are highly toxic, as acknowledged in EPA’s recent regulatory proposal. Consequently, they are also utterly unsafe for the uses for which Subpart E was intended to apply.

### Conclusion

PEER contests the issuance of the Wind River permits because they are based in errors of law and fact. EPA’s decision to permit the discharge of produced water under Subpart E is a dereliction of its duty to protect the nation’s waters and the humans and animals that rely on them. Moreover, these permits present important policy considerations which merit review by the Environmental Appeals Board. For these reasons, PEER requests the Environmental Appeals Board grant this petition for review.

Thank you for your consideration.

Sincerely,



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<sup>66</sup> FR at 18559-60.