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Re: Oil and Natural Gas Produced Water Governance in the State of New Mexico – Draft White Paper

Environmental Defense Fund (EDF) appreciates this opportunity to submit comments on the Draft White Paper developed by EPA Region VI and the State of New Mexico regarding oil and natural gas produced water governance. EDF is an international environmental organization with over 2,000,000 members and activists worldwide including over 22,000 New Mexicans, many of whom are deeply concerned about the impacts of oil and gas development on human health and the environment, including water resources. EDF has a depth of expertise on the issues analyzed in this white paper, particularly with respect to the characterization, treatment, and assessment of health and toxicological risks related to produced water and its reuse or discharge. We look forward to ongoing engagement with EPA and New Mexico towards ensuring that any new produced water management strategies that may be pursued are done so in a way that first and foremost prioritize the protection of both human health and existing ecosystem, wildlife, land, and water resources.

EDF believes that the first draft of this joint white paper requires additional effort if it is to provide substantive answers on a protective path forward for produced water management and regulation. A majority of the theorized scenarios for reuse or discharge in this document would demand more advanced economic and scientific investigation in order to support appropriately informed, risk-based decision making on implementing policies. EDF believes that this white paper is a useful outline of the current regulatory landscape for produced water in New Mexico for some key agencies involved, and could serve as an interesting and informative conversation starter for potential future reuse options. However, it is clear from this draft, and numerous other similar state and federal efforts, that the data and information available to New Mexico and EPA today are not yet adequate to support and appropriately inform policy making on reuse and release scenarios outside the oilfield in the near-term.

With this in mind, EDF offers the following comments on the white paper and its implications.

Part I: Overarching Recommendations

- A. New leadership review:** Finalization of this white paper should not proceed without review and consideration by New Mexico’s newly elected administration officials. It makes practical sense that the individuals that will be tasked with decision-making and any potential implementation of concepts discussed in the paper have an opportunity to weigh in before a final paper is released.
- B. Prioritization of oilfield reuse:** It is clear that the low hanging fruit in terms of water conservation opportunity comes from reuse of produced water in oil and gas operations (other states, like Oklahoma, have reached similar conclusions).¹ The knowledge and regulatory structures to support broader reuse and recycling of produced water within the oilfield are well within reach and deserve prioritization over other scenarios that come with greater health and environmental exposure potential. A final draft should more realistically distinguish between this near-term opportunity and other options that demand more extensive investigation before implementation. Given the limited resources available to New Mexico agencies, concentrating on a known, discrete opportunity makes sense today.
- C. More transparency with respect to regulatory challenges and data limitations:** The draft white paper downplays both scientific and regulatory challenges that would be associated with decision-making and permitting for reuse and release of produced water outside of oilfield operations. While EDF understands the need to develop manageable text, this document should be careful not to create a false impression with public or other stakeholders by glossing over significant obstacles in exchange for simplicity.

Some examples include:

- a. *Generic references to “permits,” “reviews,” “approval,” “guidelines,” and “principles” as regulatory components designed to reduce environmental and health risks.* Noting that these processes are in place without further explanation of the time, data, effort, and information involved can imply that these are quick and simple processes – they are not. This draft makes clear that New Mexico agencies do not yet have produced water-specific programs in place, and developing the appropriate programs, guidelines, permitting schemes, and standards demands time and data. Such challenges cannot be glossed over. Two illustrative examples:
 - i. The discussion on discharges references consultation with NMED and “antidegradation reviews.” How would an antidegradation assessment proceed without adequate knowledge regarding produced water constituents of concern, background characterization of those

¹ Oklahoma Produced Water Working Group Study (2017).

constituents in the water, necessary analytical methods, or appropriate water quality or other standards for assessment and comparison?

- ii. In Section One, the draft notes in passing that “the bureau’s approval would be required for any use of treated produced water as a drinking water source by a public water system.” This is a seemingly obvious statement that provides little information as to the actual safety and feasibility of produced water as a drinking water source. What would go into an “approval” process? Are the standards or programs in place to ensure the approval process is informed and appropriately tied to the characteristics of produced water?
- b. *Quality and approval requirements for numerous reuse scenarios are vaguely deferred to other governing bodies or guidelines beyond those included in the MOU.* This limitation should be well represented in defining the scope and applicability of this project. “Produced water governance in the State of New Mexico” will involve jurisdiction beyond the agencies included and demand consideration of implications beyond the water cycle such as soil, livestock, food safety, infrastructure, etc. These additional jurisdictional bodies will need to weigh in on numerous considerations, including the development or modification of applicable standards or guidelines ranging from drinking water to irrigation standards.
- c. *The need for advancements in chemical and toxicological characterization and risk assessment should be better prioritized – otherwise scenarios represented are misleading as to their feasibility.* While scientific questions about human health and environmental implications are recognized in the draft, these challenges are not appropriately associated and incorporated into the discussion of regulatory processes and opportunities for the future. Furthermore, recommendations to seek delegation, provide incentives, or reduce regulatory burdens for approval should not be separated from these scientific limitations.

In summary – while EPA and New Mexico make clear they are “interested in encouraging greater scientific understanding” in the last pages of this draft, the implications of this acknowledged lack of understanding on regulatory programs today are vastly understated. The pursuit of scientific and technological advancements and the development of permitting programs should not be represented as objectives that can be achieved separately and concurrently. One must inform the other. EPA and New Mexico must improve the final document to more substantively recognize that the advancement of programs for produced water use – including the development of new, more appropriate standards and tools (for water quality, irrigation, municipal use, etc.) – is likely to demand data, resources, staff, investment, and time. Recommendations by this white paper to seek delegation, develop “permit-by-rule” programs, create incentives for use outside the oilfield must recognize a first step requirement to better understand produced water itself and any risks from new practices that must be addressed. Otherwise, this entire effort is putting the cart before the horse.

D. Care to avoid giving the public false impressions regarding the opportunity:
Building on the above point regarding transparency in the challenge ahead, the final

version of this document should endeavor to be more direct and realistic regarding the opportunity presented by produced water and the realities of its reuse. Two key examples:

- a. *Use of the term “renewable water” is inaccurate, misleading, and unnecessary.*
 - i. Inaccurate: From a basic definitional sense, produced water is a deep groundwater with a negligible rate of recharge, produced only as a by-product of the extraction of a non-renewable energy source. The treatment or desalination and reuse of saline or industrial wastewaters like produced water may qualify as a non-conventional source of water, but that does not make them ‘renewable.’ We could find no reputable resources, including those on similar subjects such as wastewater treatment and reuse, which would apply the term “renewable water” to this context – even where the reuse of wastewater is being actively encouraged. In fact, nearly every document we reviewed explicitly defined groundwater as a non-renewable, and non-sustainable water resource.²
 - ii. Misleading: The creation of this term, previously unused in any other dialogue on this subject, provides more in the way of marketing than substance. Applying a new label such as this presupposes or implies that the appropriate standards for protective reuse both exist and are met. There is no fault in representing the potential positive outcomes and water quantity gains from reusing produced water, but the terminology and conversation around this process must be accurate and transparent.
 - iii. Unnecessary: Many other wastewater reuse initiatives, even potable municipal wastewater reuse, have proceeded in practice without being defined as “renewable.” The dialogue for many years around produced water reuse, recycle and discharge itself has taken shape without the use of this term. In fact, in this draft white paper, the term “renewable water” is put to use only where it is defined, where it is mentioned alongside reuse and recycle as a list, or as a subheading – *not* in applied discussion or analysis. The simple explanation for this is that the term is unnecessary, and not of common usage by existing stakeholders engaged in this work that predominantly use the terms reuse, recycle, and discharge. EDF sees no need for additional terminology.
- b. *Produced water as a presumptive solution to New Mexico’s drought should be anchored in fact rather than wishful thinking.* The draft paper establishes a strong presumption for the reader that produced water presents a significant solution to New Mexico’s drought. This presumption is valid only if produced water can meet quantity, quality, reliability, and long-term sustainability requirements for water users in the state. For many produced water reuse scenarios hypothesized this is yet to be seen or realized in fact, and this paper should more transparently recognize for the citizens of New Mexico the actual role produced water may play in the state’s future. The State of New Mexico uses about 3.4 trillion gallons of water a day, with about 75% of that total going to

² See, e.g., Food and Agriculture Organization (FAO) of the United Nations, Review of World Water Resources by Country (2003); The United Nations World Water Development Report 2017: Wastewater – The Untapped Resource (2017).

agricultural use. Operators in New Mexico produced a total of less than 40 billion gallons of produced water last year, and it is unrealistic to presume that all of this water would be available for reuse and even further that it will meet quality and quantity demands in the long-term without potential risk to the end user of a change in circumstance. While there may be real opportunity for produced water to contribute to drought solutions, that opportunity should be realistically presented to the reader.

Part II: Specific Comments and Questions by Section

EDF has a number of additional, more detailed comments on the various sections of the white paper as well as a number of questions on areas where further clarification may be necessary. Those comments and questions are included here as bulleted points, organized by section.

Section One

- State Land Office: The State Land Office is likely to play a significant role in determining the feasibility and implementation of any produced water reuse scenario. Future drafts should incorporate the SLO's role in more than a footnote.
- Water Rights: This report makes clear very early that the state engineer has concluded "one cannot obtain a water right for the disposition or use of produced water in New Mexico." For example, on page 8: "no water right is acquired through the disposition by use of produced water at any time, regardless of the type of use or whether the produced water is treated." However, later in the document there are numerous references to water rights associated with produced water, seemingly presenting a conflict absent clarifying discussion. Water rights considerations should be better summarized and clarified. If full clarity on this issue is not currently possible, or too complex for the scope of this white paper, its importance and intricacy should be acknowledged as an area for further work.
- Groundwater Discharges: The references to groundwater discharge permits required for land application should be further explained and clarified with respect to their utility and usefulness in reducing risk associated with produced water reuse, particularly in an agricultural context. It should be made clear whether the state: (1) believes the existing process is adequate for produced water/wastewater as a land application, and (2) has enough data to describe the quality of the water used as required by the permit. Furthermore, these permits only address groundwater and are only intended to protect groundwater, not soil, worker or food safety, crop health, etc. This limitation, its implications for knowledge of risk to human health and the environment, and the need for more robust standards should be made clear.

Section Two

- See Section I.D.a above for EDF comments on use of the term "renewable water."
- Solids and Landfills: a broader discussion is necessary.
 - An assumption is made in this draft that treatment will "likely" result in commodity products for sale in interstate commerce. However, there is no

indication that there are standards or regulations regarding the quality control and use of these products in New Mexico beyond the MOU agencies (which “do not regulate products”). This should be addressed.

- Landfills play a major role in all of the figures, but the regulatory considerations for landfills are not fully addressed. Other states have estimated that the salt from produced water treatment alone would present a significant landfill infrastructure challenge. Not all solids will be saleable products, in fact some concentrated residual wastes and solids may pose contamination risks. Management of treatment wastes should be more substantively addressed.
- **Infrastructure**: Transportation is addressed briefly, but broader infrastructure considerations for the implementation of various reuse, recycling, and discharge scenarios should be acknowledged in more depth as they are a potentially significant component of decision making. Moving water from the producer to an eventual end-user can be costly, can create a risk for release, and call for approvals or permits from other agencies.
- **Surface discharges**
 - See discussion above regarding categorization as “renewable water.” Industrial wastewater discharges are not typically given special classification as ‘renewable.’
 - See discussion above regarding water rights. The indication that discharged produced waters require a permit from OSE to appropriate or divert could be interpreted to conflict with the earlier statement that treated produced waters cannot be appropriated for a right.
 - **Table 1**: the CBM subcategory is [Reserved] and should either be clarified or removed this chart.
 - **98th meridian standard**: This document needs to make clear that the “good enough quality” standard is not defined. While the discussion recognizes that the standard is unlikely to be met without treatment, it does not make clear how the appropriate New Mexico agencies (or EPA) will define the standard itself. What agency will be charged with defining this standard, what considerations will be incorporated into permits, and which agency will determine whether discharges are actually put to ag or wildlife uses?
 - **Limitations on characterization, analytical methods, and applicable standards**: This section includes a discussion of the basic process for establishing discharge permit requirements, but does not address the scenario where chemicals of concern in produced water do not have applicable water quality standards, analytical methods, or other standards. This document should address the implications of these limitations, and describe how those standards will be written, how long standard development takes, how new methods are developed, etc. This would better represent for the reader the challenge that may be faced in developing protective discharge programs that are appropriate for produced water discharges in the state.
- **Industrial Use/Commercial Sales**
 - **Figure 7**: what agency is charged with regulating the pipelines and trucks that leave treatment facilities to transport treated produced water for uses outside of the oil and gas industry?

- Treatment and quality goals: this document vaguely indicates that “the quality of the effluent is likely dictated by the industrial/commercial user specifications and possibly other government agencies.” Quality control and risk reduction should be primary considerations in determining the feasibility and appropriateness of a use of treated produced water in another industrial sector. The steps necessary and/or challenges associated with this objective should be further explored in the final draft. There are a number of regulatory considerations that are missed – for example, if the second industrial user has their own NPDES permit for discharge, are there implications given a change in feedstock to their discharge limitations and monitoring requirements? Questions such as these may need to be acknowledged more fully.
- Agricultural Use
 - Quality objectives: As above, this important consideration is vaguely referenced by saying that the agricultural use “quality of water may be dictated by industry standards and/or a federal or state agency other than the EPA or NMED.” This does not fully describe the governance structure in a helpful manner.
 - Major gap in soil, crop, livestock, food, and health safety: This document makes clear that the MOU agencies do not have jurisdiction or permitting programs to address human or animal health implications or other agricultural considerations regarding issues such as soil and crop health. There appear to be no standards in place in New Mexico to address these issues, presenting a significant concern as the potential for agricultural use is being touted in this document, in the media, and elsewhere as a significant opportunity for “renewable water” use. The effort to recommend incentives, less burdensome permitting programs, and the like to encourage this use without apparent programs or policies in place to understand and mitigate health and environmental risks is conflicting and raises serious concerns.
- Municipal Use
 - Separating potable vs. non-potable uses. The MOU agencies should consider whether it would be more appropriate to discuss these uses separately given the significant difference in regulatory requirements and health risk.
 - Gap in authority to test for appropriate contaminants with respect to human health risk. This document indicates that the NMED has “no mechanism to require testing for contaminants except as required by regulations.” We know for a fact that drinking water standards and regulations are the wrong standards³ to assess the health risks for consumption of treated produced water. Further, it is clear that in order to make sound, informed decisions on any reuse of produced water outside of the oil and gas industry more research will need to be completed on chemical and toxicological characterization, method development, and regulatory standard development. New Mexico must take seriously the implications of this lack of ability to require assessment and analysis of currently unregulated contaminants of concern. Otherwise a majority of constituents that

³ Nichole Saunders, *Why drinking water standards are the wrong standards for oil and gas wastewater* (May 29, 2018), <http://blogs.edf.org/energyexchange/2018/05/29/why-drinking-water-standards-are-the-wrong-standards-for-oil-and-gas-wastewater/>.

may be problematic in produced water, including treated produced water, may go undetected. Voluntary sampling will be necessary but not sufficient to protect human health.

Section Three

- Title and Goals – Putting the Cart before the Horse: The title and introductory text of this section should be clarified. The section is devoted “streamlin[ing]” and “facilitate[ing]” broader produced water management options that “improve the quantity and quality of water in New Mexico.” This is adequate language with respect to oilfield recycling, however, there is a serious lack of representation for the scientific unknowns and regulatory limitations for other reuse and release scenarios. First and foremost on the minds of regulators should be an effort to determine the feasibility and safety of any reuse scenario, and this effort should be prioritized over incentivizing, streamlining, and removing industry barriers to new disposal and management options. As mentioned above, a move to incentivize or promote a new produced water management option for which health and environmental risks are poorly understood and the appropriate regulatory programs are not in place puts the cart before the horse. Given the unknowns at hand it is premature to make such policy recommendations, and EDF strongly recommends that the next draft reconsider the way in which these recommendations are framed in relationship to these unknowns. For example:
 - A permit-by-rule scheme for disposition by use outside of oil and gas does not currently appear feasible given knowledge and existing authorities. Implying that such a practice is a potential near-term option is unrealistic. Produced water is highly variable as are the demands and risks associated with a wide variety of potential end-uses outside of the oil and gas industry. A permit-by-rule scheme without further study and understanding would be highly unlikely to address the appropriate variables to reduce risk.
- Clearly distinguish between oilfield reuse and other scenarios. This document misses an opportunity to more clearly distinguish the changes needed to “streamline” and “incentivize” practices that reduce oilfield consumption of fresh water from the research and work needed to consider the feasibility of other potential options.
- Recommendations should address the need to develop new standards and incorporate other jurisdictional roles. Current recommendations for continued collaboration focus only on incentives, not reducing risk. Section Two clearly acknowledges unknowns about soil impacts, livestock considerations, food safety, etc. and also establishes that there is no standard or system in place to address these potential impacts from produced water reuse. Section Two also acknowledges a lack of authority on the part of regulatory agencies to gather data on currently unregulated chemicals. A full assessment of “produced water governance” across the state for the scenarios addressed will demand further analysis, study, and collaborative effort. This section should highlight that need and where appropriate propose mechanisms to address those gaps.
- Better recognize the role data gaps will play in the development of safe regulatory programs. This section acknowledges data limitations, noting that New Mexico and EPA are “interested in encouraging greater scientific understanding of the constituents in produced water, the development of analytical methods, and the treatment effectiveness

for broad groups of chemical compounds found in produced water generated in New Mexico.” However, the tone and prioritization of this messaging does not appropriately tie it back to the role these research needs must play in the development of appropriate, protective regulatory programs for reuse or discharge. A mere “interest” in “encouraging” science does not equate with prioritizing human and environmental health in the consideration of produced water management options. EDF hopes that EPA and the State of New Mexico more carefully consider this framing.

- Recognize resource and enforcement realities. Many of the recommendations made here, such as the delegation of NPDES program, development of appropriate expertise, engaging with the public, and creating incentives – alongside those points not made in this section, such as the need for improved water quality and agricultural standards, new regulatory programs and monitoring and enforcement procedures – will all require significant time and resources. As New Mexico makes decisions in the near-term on next steps based on this white paper, the costs to the state to take on new practices while protecting the health of its communities and environments will need to be addressed.

Conclusion

In conclusion, while EDF focused these comments on opportunities for improvement, both EPA and New Mexico should be praised for taking a first step toward better understanding these issues. But, this is only a first step. Managing produced water in a manner that addresses industry realities while also protecting human health and the environment is no easy task and should not be portrayed as such by regulatory leaders. This review presents an opportunity for New Mexico and EPA to contribute to the dialogue occurring at a national level with groups like the Groundwater Protection Council to clearly define the research necessary to answer the questions raised and develop protective produced water governance programs in New Mexico. If a final white paper is to serve as a truly useful tool, it must be more transparent about the task ahead.

EDF looks forward to the opportunity to participate in this process as it moves forward.

Respectfully submitted,

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