Produced Water Management in New Mexico

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Produced Water Management in New Mexico

- Meeting Overview
- Meeting Objectives

Meeting Overview

- **6:00 – 6:45 p.m. Presentation**
  - Produced Water Overview
  - The Produced Water Act (HB546)
  - Produced Water Treatment: Science and Technology
  - State Agency Roles
  - Public Engagement

Public meeting schedule	
Oct. 15	National Hispanic Cultural Center Bank of America Theatre Albuquerque, NM
Oct. 30	St. Francis Auditorium Santa Fe, NM
Nov. 14	Pecos River Village Conf. Center Carousel House Carlsbad, NM
Nov. 19	San Juan College Little Theatre Farmington, NM
Nov. 25	New Mexico Farm & Ranch Heritage Museum Ventana Room Las Cruces, NM

Meeting Overview

- **6:45 – 7:15 p.m. Questions/Answers**
  - Audience questions about the presentation, including state agency activities related to produced water management.
- **7:15 – 7:30 p.m. Break**
- **7:30 – 8:30 p.m. Public Input**
  - Please sign-up to make a public statement.
  - All speakers will have up to 2 minutes to make remarks.
  - Written input can be shared tonight (drop box) and by email to pw.environment@state.nm.us.

Meeting Objectives

- Meaningful public engagement to:
  - Build a common understanding around produced water
  - Clarify state agencies' roles/responsibilities regarding produced water
  - Inform the public about our plans to implement the Produced Water Act (HB 546)
  - Provide answers to questions
  - Listen to public concerns and interests

Produced Water Overview

What is produced water?

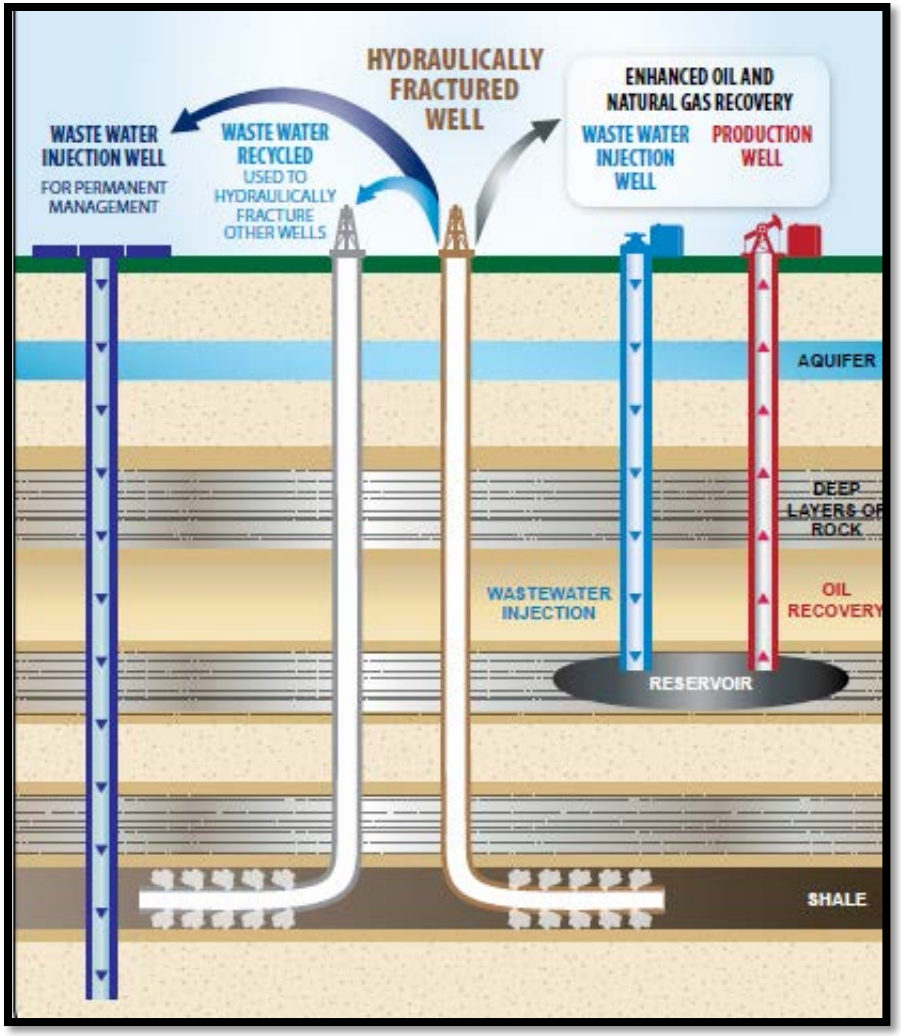
Where does produced water come from?

What's in produced water?

Produced Water Overview

- What is produced water?

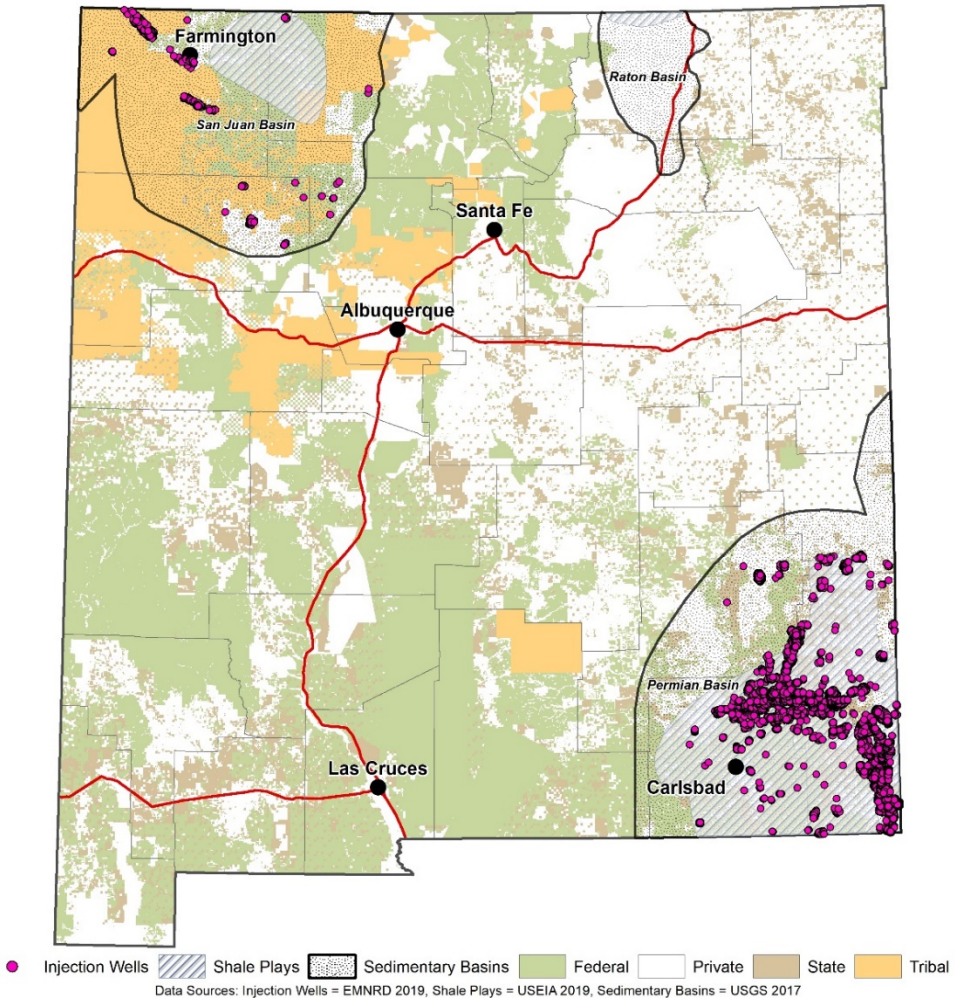
Photos: OilandGas360.com



Graphic: Independent Petroleum Association of America, "Induced Seismicity."

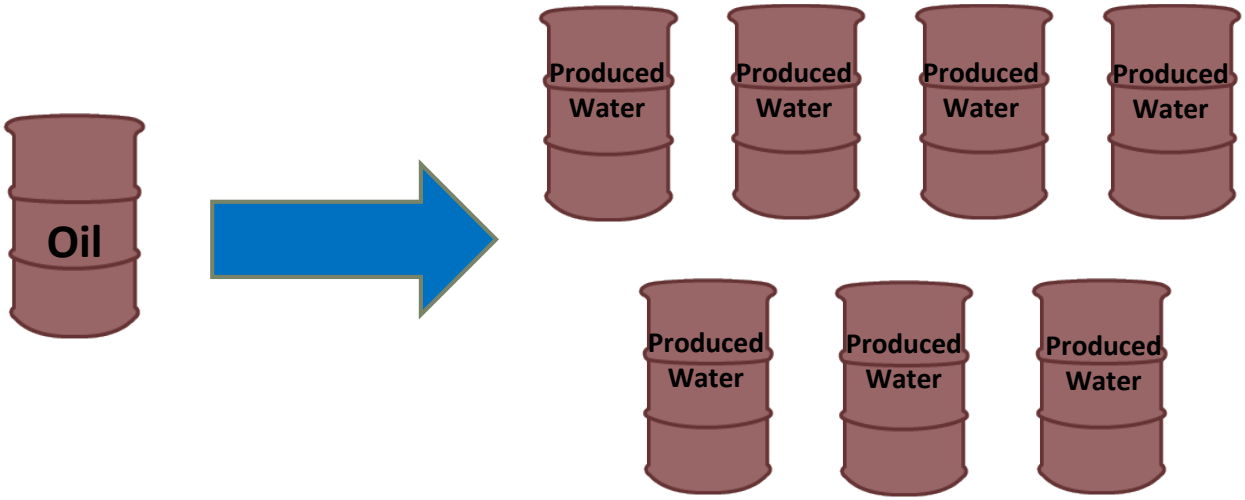
Produced Water Overview

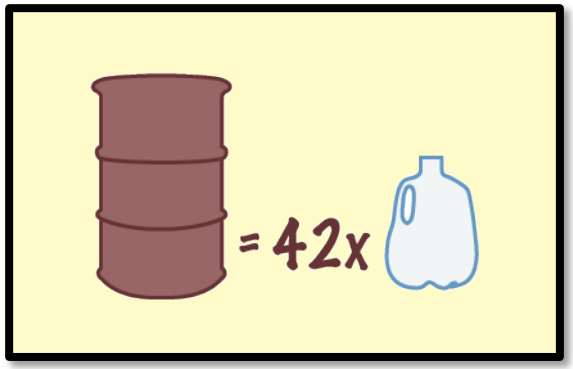
- Where does produced water come from?



Produced Water Overview

- For every barrel of oil produced, four to seven barrels of produced water are generated:





Produced Water Overview

- In 2018, New Mexico became the third-largest oil producing state, generating 248 million barrels (10 billion gallons) of oil along with produced water totaling:
  - One billion barrels (or 42 billion gallons) in SW corner of the state.
  - Twenty-two million barrels (or 946 million gallons) in the NW corner of the state.

Photos: Carlsbad Current-Argus

Produced Water Overview

Common Constituents

- ***Oil residues***
- ***Sand/mud***
- ***Metals***
- ***Organic compounds***
- ***Naturally occurring radioactive materials***
- ***Fracturing fluids***
- ***Bacteria***

- What's in produced water?
  - Geology dependent
  - Age of well dependent
  - Differences in composition affect how produced waters are treated, used, and/or disposed
  - U.S. Geological Survey database of produced water compositions with over 165,000 measurements

Produced Water Act (HB546)

Current practices

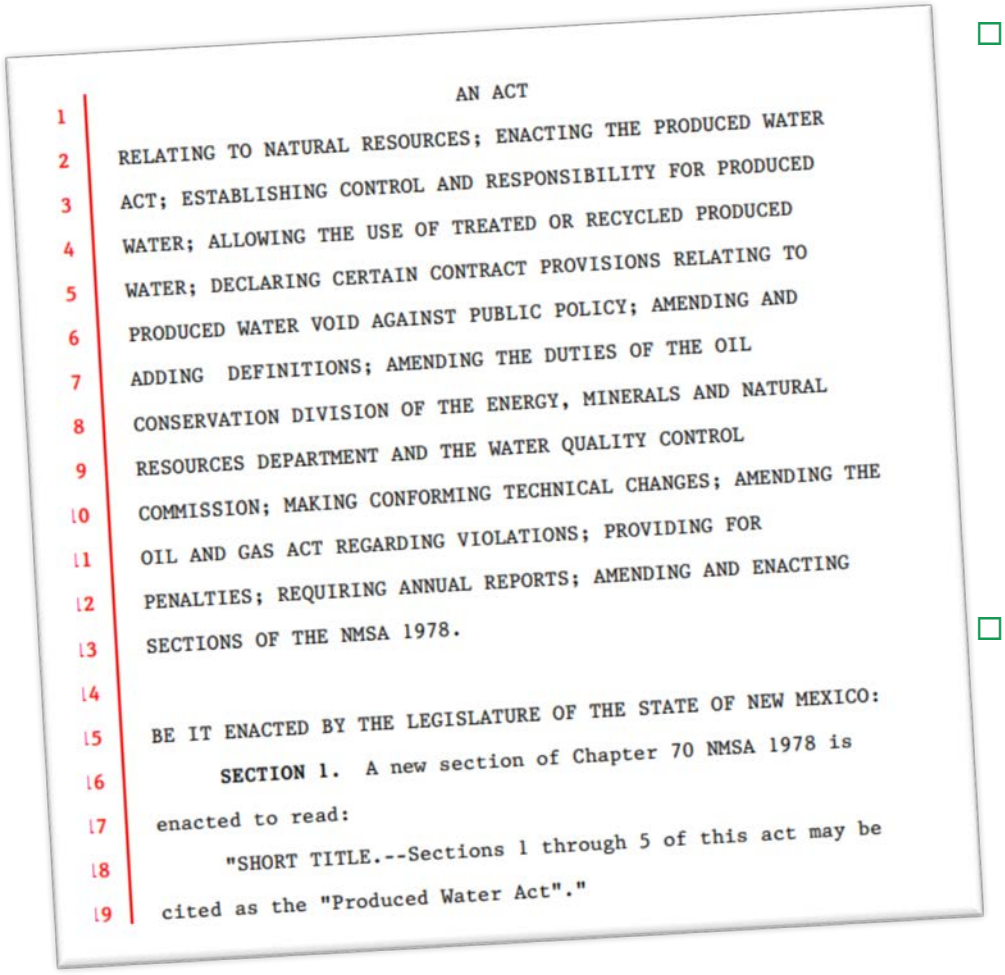
Key provisions

State implementation

Produced Water Act (HB546)

- Current practices:
  - Most common practice of disposal is through underground injection into deep, isolated geologic formations.
  - On average, only about 10% of produced water generated in New Mexico is recycled within the oil and gas field.
- Related environmental concerns:
  - Induced seismicity
  - Permanently removes water from hydrologic cycle
  - Accidents, such as truck spills and pipeline ruptures
  - Illegal injection and/or dumping
  - Leaks from impoundments and wildlife exposure

Produced Water Act (HB546)



AN ACT

RELATING TO NATURAL RESOURCES; ENACTING THE PRODUCED WATER ACT; ESTABLISHING CONTROL AND RESPONSIBILITY FOR PRODUCED WATER; ALLOWING THE USE OF TREATED OR RECYCLED PRODUCED WATER; DECLARING CERTAIN CONTRACT PROVISIONS RELATING TO PRODUCED WATER VOID AGAINST PUBLIC POLICY; AMENDING AND ADDING DEFINITIONS; AMENDING THE DUTIES OF THE OIL CONSERVATION DIVISION OF THE ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT AND THE WATER QUALITY CONTROL COMMISSION; MAKING CONFORMING TECHNICAL CHANGES; AMENDING THE OIL AND GAS ACT REGARDING VIOLATIONS; PROVIDING FOR PENALTIES; REQUIRING ANNUAL REPORTS; AMENDING AND ENACTING SECTIONS OF THE NMSA 1978.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF NEW MEXICO:

SECTION 1. A new section of Chapter 70 NMSA 1978 is enacted to read:

"SHORT TITLE.--Sections 1 through 5 of this act may be cited as the "Produced Water Act"."

- Eliminated legal vulnerabilities to New Mexico's surface/ground waters that existed prior to July 1, 2019, through:
  - Affirmative state permitting requirements
  - Affirmative requirements for financial assurance
  - Clarified liability for spills
- Prioritizes recycling of produced water over the use of fresh water

Produced Water Act (HB546): Implementation

- Phase 1
  - Public engagement meetings
  - Collaboration with technical experts to fill science and technology gaps

- Phase 2
  - Developing regulations after public meetings and informed by research
  - Propose draft regulations for formal rulemaking before the Water Quality Control Commission (WQCC), including public notice and comment period

Produced Water Act (HB546): Implementation

For Immediate Release
Sept. 12, 2019

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Justin Bannister, Marketing and Communications
New Mexico State University
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Consortium formed by New Mexico State University, Environment Department to lead nation in filling scientific gaps in produced water treatment

Gov. Michelle Lujan Grisham on Thursday announced the New Mexico Environment Department (NMED) and New Mexico State University (NMSU) have entered into a memorandum of understanding, which will create a produced water research consortium. Through this consortium, New Mexico will continue to lead the country in advancing scientific and technological solutions related to the treatment and reuse of produced water generated by the oil and gas industry.

The consortium will develop a framework to fill scientific and technical knowledge gaps necessary to establish regulations and policies for the treatment of produced water. Such regulations and policies must be protecti public health and the environment while encouraging the oil and natural gas industry to rely less on fresh w and more on reuse of produced water. The memorandum of understanding spurs economic investment opportunities in New Mexico through NMSU, which will rely on public and private funding to carry out thi research.

"New Mexico's innovation in this area is and will continue to be the envy of other states," Gov. Lujan said. "Turning this waste product into a commodity is good for preserving fresh water resources, goo compact requirements with other states, good for conservation purposes, good for local and county it's good for small and large producers, it's good for agriculture. It's good for New Mexico, and it re exciting leap forward."

NM Produced Water Research Consortium

BE BOLD. Shape the Future.

A Public-Private Partnership to Advance Produced Water Research

Background

Oil and natural gas production is a major contributor to New Mexico's economy, with upstream production principally occurring in the Permian Basin in the southeast and the San Juan Basin in the northwest. While technological advancements like directional drilling and hydraulic fracturing fostered additional production in the respective regions, a need exists to identify emerging conceptual frameworks for produced water management, recycling, reuse, and treatment for use outside the oil and gas industry by examining the nexus between (a) production, (b) consumption, (c) transboundary flows, (d) characterization, and (e) environmental and human health impacts of treated produced water uses. With the 2019 passage of the Produced Water Act, House Bill 546, New Mexico is poised to ensure a national leadership role in identifying emerging trans-disciplinary research to fill scientific and technological gaps to effectively aid the establishment of future regulatory and policy frameworks for produced water treatment and use outside of the oil and gas industry. This trans-disciplinary research is specifically needed to fill gaps in data availability in areas such as characterization of produced water from New Mexico oil and gas production activity, understanding removal efficiencies from certain types of treatment trains, analytic sampling methods for constituents in New Mexico produced water, understanding use of treated produced water for various purposes other than hydraulic fracturing, and ensuring surface and ground water are not adversely impacted from the use of treated produced water.

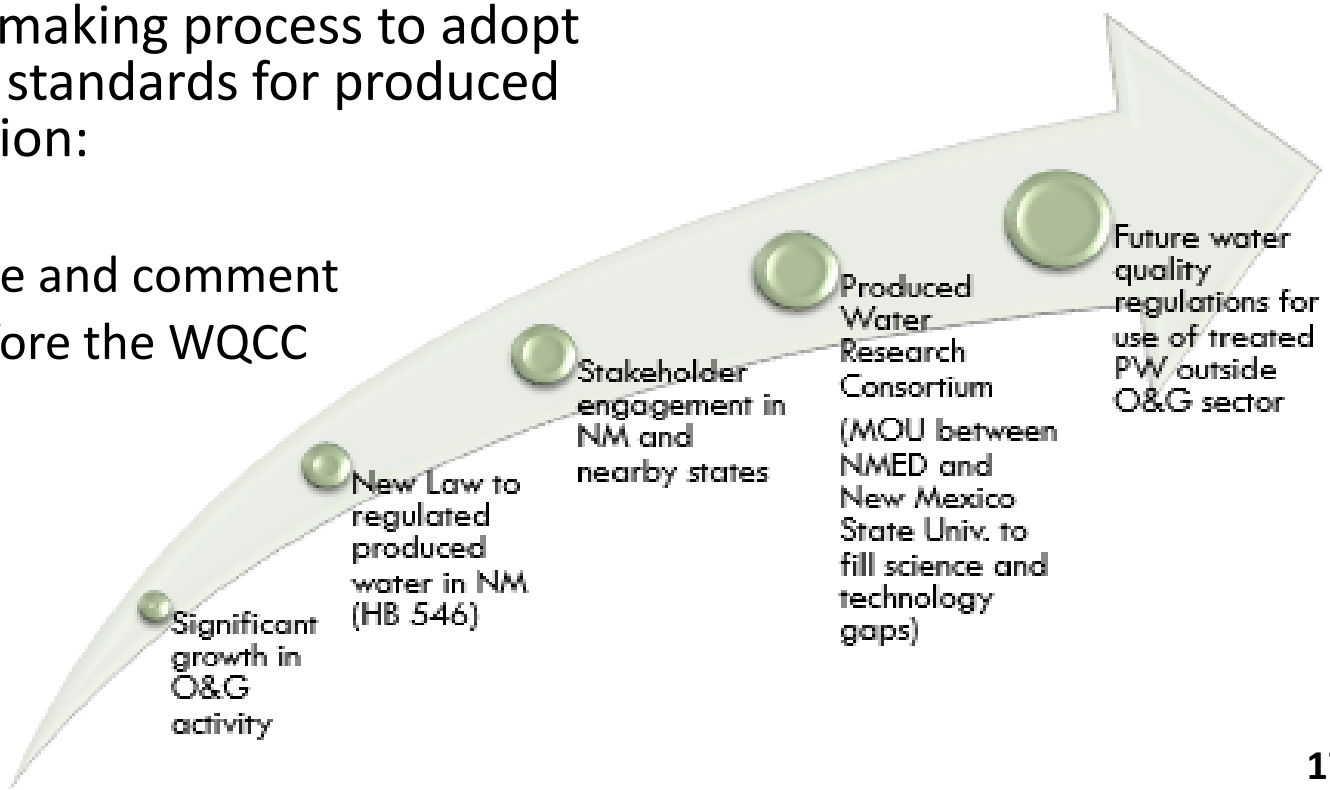
The New Mexico Environment Department (NMED) and Regents of the New Mexico State University (NMSU) entered into a Memorandum of Understanding (MOU) to establish and manage a public-private Consortium to advance produced water research and policy. Through the MOU and Scope of Work described below, NMED and NMSU will direct a collaborative research process to support NMED's implementation of House Bill 546.

Scope of Work

In coordination with NMED, NMSU, a land grant university, will create a trans-disciplinary, public-private Produced Water Research Consortium (PWRC) to advance scientific research and technology development necessary to guide statewide regulation of treated produced water uses outside the oil and gas industry. As a recognized leader in transdisciplinary water research, NMSU has extensive expertise in development and assessment of water technologies for multi-use application (e.g., energy-smart water infrastructure and produced water treatment

Produced Water Act (HB546): Implementation

- Promote public outreach and engagement
- Support the NMSU Research Consortium to fill science and technology gaps
- Develop science-based standards for treated produced water
- Initiate a rulemaking process to adopt water quality standards for produced water regulation:
  - Draft rules
  - Public notice and comment
  - Hearing before the WQCC



Produced Water Act (HB546): Implementation

- In adopting regulations, the Water Quality Act **requires** the WQCC to consider:
  - **Character and degree** of injury to or interference with health, welfare, environment and property;
  - **Public interest**, including the social and economic value of the sources of water contaminants;
  - **Technical practicability and economic reasonableness** of reducing or eliminating water contaminants from the sources involved and previous experience with equipment and methods available to control the water contaminants involved;
  - **Successive uses**, including domestic, commercial, industrial, pastoral, agricultural, wildlife and recreational uses;
  - **Feasibility** of a user or a subsequent user treating the water before a subsequent use;
  - **Property rights** and **accustomed uses**; and
  - **Federal water quality requirements**.

Produced Water Act (HB546): Implementation

What is NMED doing?

- ✓ Encouraging reuse and recycling within the oil field
- ✓ Considering potential pathways to treat produced water for uses outside the oil field
- ✓ Partnering with NMSU to fill critical science and technology gaps related to produced water treatment
- ✓ Engaging the public to talk about the Produced Water Act

What is NMED NOT doing?

- × Authorizing the discharge of <u>treated</u> produced water for <u>any purpose</u>, including:
  - × Surface waters
  - × Drinking water and aquifer storage
  - × Livestock watering
  - × Irrigation for any crops, including food crops
  - × Dust or ice control on roads
  - × Construction
- × Authorizing <u>untreated</u> produced water to be used outside of oil and gas for <u>any purpose</u>

https://www.env.nm.gov/new-mexico-produced-water/

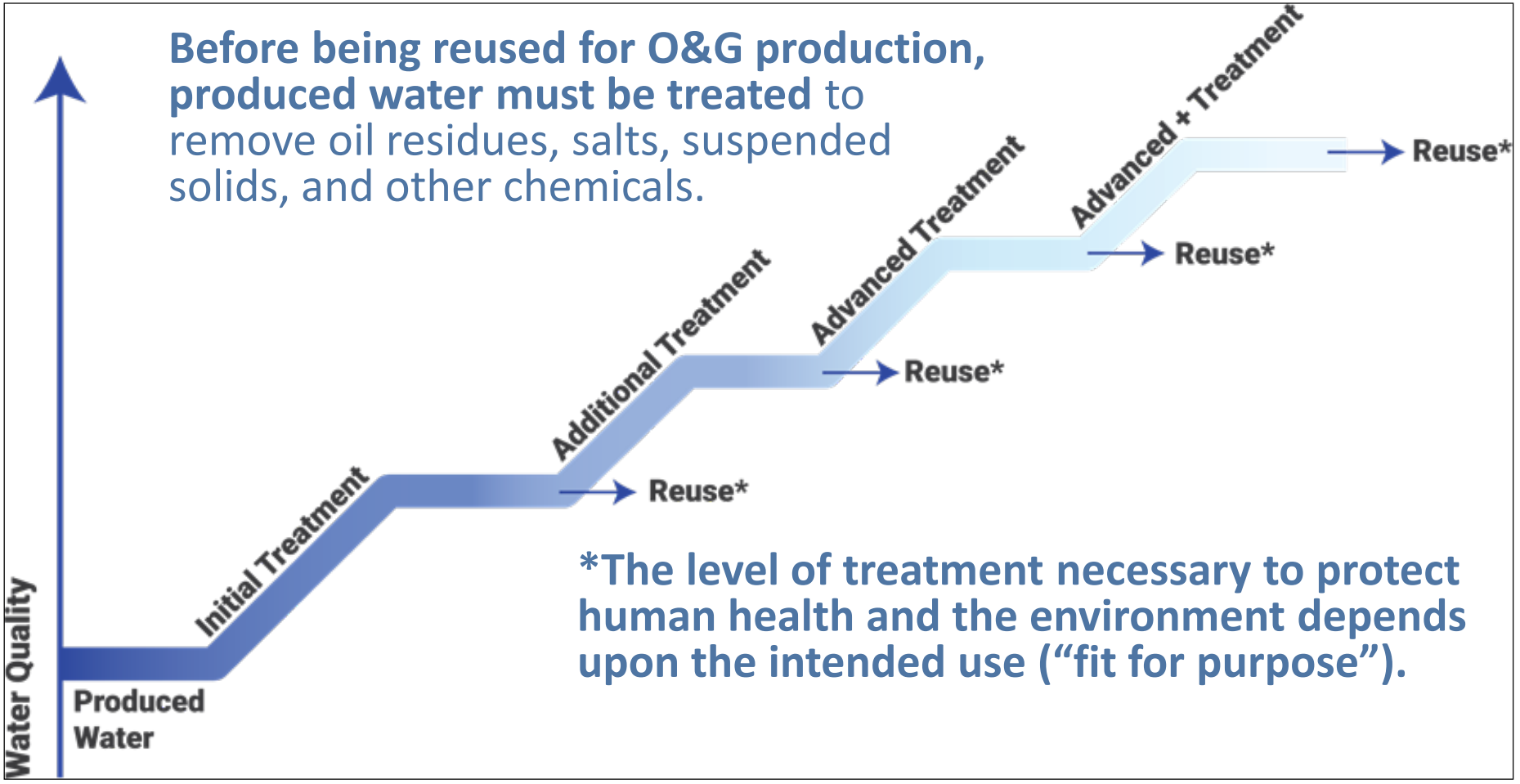
Produced Water Treatment: Science and Technology

Treatment levels

Research needs

Produced Water Treatment: Science and Technology

Before being reused for O&G production, produced water must be treated to remove oil residues, salts, suspended solids, and other chemicals.



***The level of treatment necessary to protect human health and the environment depends upon the intended use ("fit for purpose").**

http://www.gwpc.org/producedwater, Produced Water Report

Produced Water Treatment: Science and Technology

- Currently less than 1% of produced water in the U.S. is reused outside of the oil field.
- Produced water reuse depends on:
  - the water's chemistry (level of treatment required) and quantity of water produced;
  - the cost/level of treatment, transportation, and storage versus the cost of disposal (e.g., underground injection); and
  - state and federal regulations (i.e., regulatory certainty and clear understanding of liability).

https://www.aogr.com/web-exclusives/exclusive-story/water-recycling-enhances-well-economics

Produced Water Treatment: Science and Technology

Produced water characterization in New Mexico

- ✓ physical, chemical, microbiological, and environmental toxicity analysis

Technology development, feasibility, and deployment

- ✓ understanding removal efficiencies from certain types of treatment trains
- ✓ analytic sampling methods for constituents in New Mexico produced water

Policy, regulations, and economics

- ✓ understanding use of treated produced water for various purposes other than oil and gas industry
- ✓ ensuring surface and ground water are not adversely impacted from the use of treated produced water
- ✓ creating opportunities for economic development (e.g., technology application, technology commercialization and new business creation)

State Agency Roles

State Agency Roles: EMNRD

State Agency Roles: OSE

State Agency Roles: Contacts

State Agency Roles

Produced Water Regulation

Disposal/reuse within oil & gas industry

NEW MEXICO emnrd Energy, Minerals and Natural Resources Department

- **Statute: Oil and Gas Act**
- **Waste Resources**
- **Rulemaking Body: Oil Conservation Commission**

Use outside of oil and gas industry

NMED New Mexico Environment Department

- **Statute: Water Quality Act**
- **Ground & Surface Water Pollutants**
- **Rulemaking Body: Water Quality Control Commission**

Use outside of oil and gas industry

Office of the State Engineer nm Interstate Stream Commission

Statutory or regulatory changes as needed to facilitate the reuse of produced water in conjunction with existing permitted water rights

State Agency Roles: EMNRD

- Under the Oil and Gas Act, the Oil Conservation Division (OCD) regulates the handling and disposal of produced water within the oil and gas industry in New Mexico:
  - Underground injection control (UIC) wells
  - Reuse through enhanced recovery operations
  - Recycling and reuse in oil and gas drilling operations

- EMNRD anticipates minor changes to existing rules to comply with HB 546

State Agency Roles: EMNRD

- Disposal and enhanced recovery operations are permitted by OCD under both the Oil and Gas Act and federal Safe Drinking Water Act
  - Injection wells must be sited and constructed to avoid any potential contact with drinking water supplies
  - Injection wells must avoid zones that have greater seismic potential
- Recycling facilities within the oil field are separately permitted to encourage such uses
  - Recycling facilities and containments, 19.15.34 NMAC
  - Multi-well fluid management pits, 19.15.17 NMAC

State Agency Roles: OSE

- The New Mexico State Engineer is charged with administering the state's water resources.
- State Engineer's authority: the supervision, measurement, appropriation, and distribution of all surface and groundwater in New Mexico, including streams and rivers that cross state boundaries.
- Water is being withdrawn from underground water basins at an increasing rate due to oil and gas production.
- HB 546 and OSE permitting confirm that parties do not need a permit from the State Engineer to use produced water, and the use of produced water does not establish a water right.
  - Use of produced water is considered "disposition by use".
  - In contrast, a "beneficial use" is the constitutional basis for establishing and maintaining a water right.

State Agency Roles: Contacts

NMED contacts for treatment of produced water for off oil field use:

- Rebecca Roose, Water Protection Division Director, Rebecca.Roose@state.nm.us
- Annie Maxfield, Assistant General Counsel, Annie.Maxfield@state.nm.us

EMNRD contacts for management of produced water within the oil field:

- Adrienne Sandoval, Oil Conservation Division Director, Adrienne.Sandoval@state.nm.us
- Bill Brancard, General Counsel, Bill.Brancard@state.nm.us

OSE contacts for water rights issues related to produced water management:

- John Romero, Water Rights Allocation Program Director, John.Romero2@state.nm.us
- Owen Kellum, Administrative Litigation Unit Attorney, Owen.Kellum@state.nm.us

Public Engagement

Opportunities

Transition to Q&A and Public Input

Opportunities

- Thank you for engaging with us!
- For more information contact NMED at pw.environment@state.nm.us.
- Join the NMED Produced Water listserv
  - Find link at https://www.env.nm.gov/new-mexico-produced-water/ or go directly to https://public.govdelivery.com/accounts/NMED/subscriber/new.
- On Social Media
  - @NMEnvDep on Twitter
  - @NMEnvironmentDepartment on Facebook

Transition to Q&A and Public Input

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