

# Energy, Minerals and Natural Resources Department, Oil Conservation Division Produced Water Use & Reuse

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# Refresher on Produced Water

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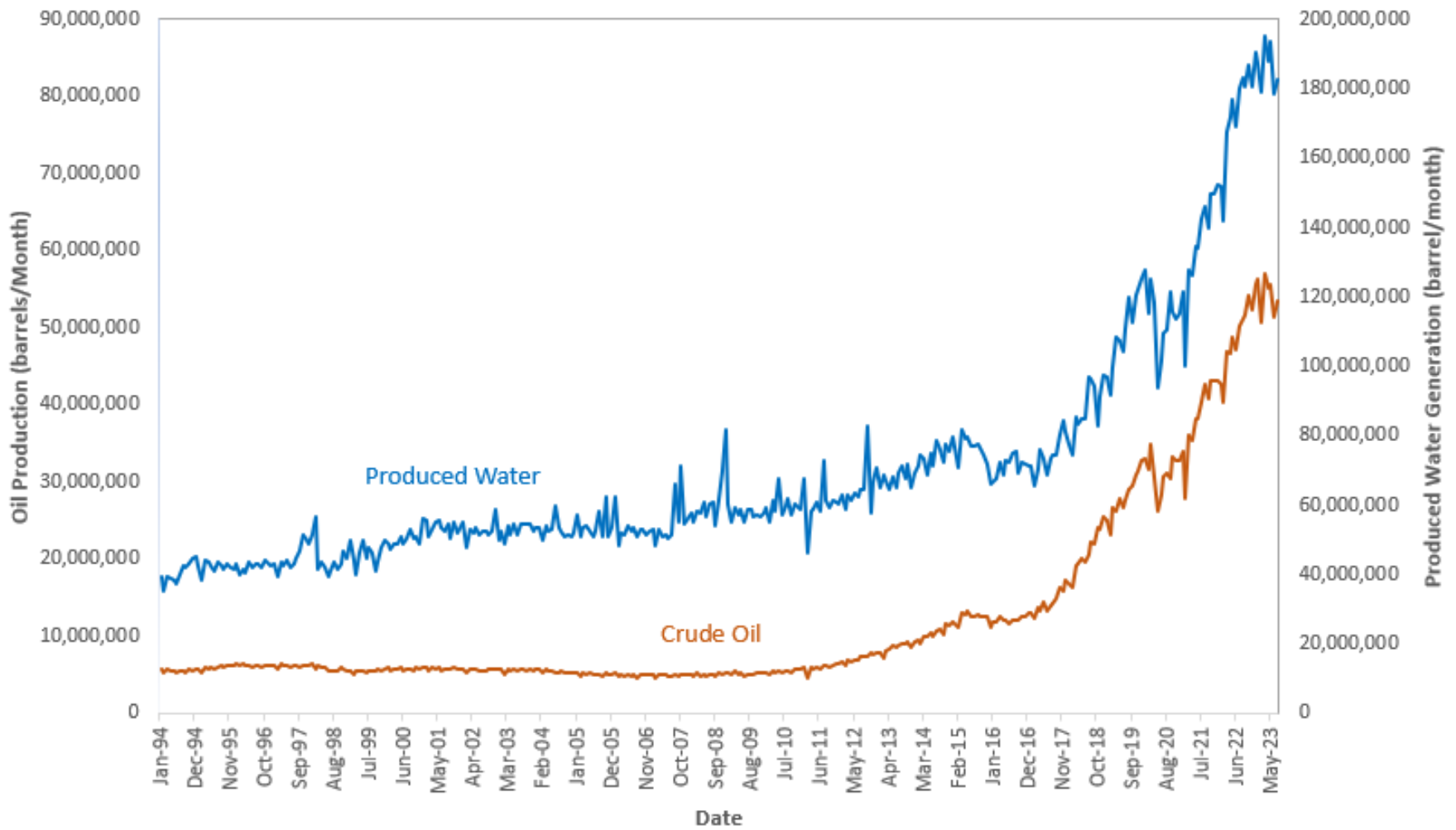
- What is it? “Produced water” means a fluid that is an incidental byproduct from drilling for, or the production of, oil and gas.
  - It is primarily ‘formation water,’ but can also include ‘flowback water’.
    - Formation water is “water that co-existed with oil and gas in geologic formations and is produced with the oil and gas.”
    - Flowback water is “water that was used in drilling and completing a well that flows back during production.”
  - Often highly saline and can also contain drilling and completion chemicals.
- **Produced Water Act:**
  - Passed in 2019 legislative session.
  - Clarifies administrative authority over the reuse of produced water.
  - OCD is charged with reuse and disposal within oil and gas.
  - New Mexico Environment Department (NMED) responsible for all other uses.
- **OCD Rules:**
  - Volume Reporting (19.15.16.20 NMAC; added 2020)
  - Storage (19.15.17 NMAC, revised 2013 & 19.15.34 NMAC, revised 2020)
  - Injection wells (19.15.26 NMAC, revised 2018 & 40 CFR 144: Safe Drinking Water Act)
  - Spills (19.15.29 NMAC, revised 2021)
  - Clean-up (19.15.30 NMAC)

# How much is generated annually?

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- Because it is a byproduct of production, the amount of produced water generated annually is a function of the amount of oil and natural gas produced.
  - 6.1 million barrels of produced water are generated each day (256 million gallons/day), compared to:
    - 1.8 million barrels of oil, and
    - 8.6 billion cubic feet of natural gas.
- The water to oil ratio (known as the “water cut”) determines how much produced water is produced.
  - It has been as high as 11 to 1; however, currently it is around 3.4 to 1.

### Monthly Crude Oil Production and Produced Water Generation in New Mexico Since 1994



# Where does it go?

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- **In CY 2022, industry handled produced water as follows:**
  - **Total volume:** 2,080 million barrels
  - **Reinjected into Reservoirs for Enhanced Oil Recovery and Pressure Maintenance**
    - Volumes not tracked, but occurs in significant quantities
  - **Injected into Deep Wells in New Mexico for Permanent Disposal**
    - 1,168 million barrels = 49.056 billion gallons
    - Unknown volume disposed of in Texas.
  - **Recycled Within the Industry for Drilling and Completions**
    - 269 million barrels = 11.298 billion gallons
  - **Reported as Spilled and Not Recovered**
    - 68 thousand barrels = 2,856 million gallons

# Progress on Produced Water Reuse

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- Following enactment of the Produced Water Act, OCD has:
  - additional insight into how much produced water is generated each year; and.
  - how much progress has been made on produced water reuse within oil and gas.
- Compared to the period prior to passage of the Act and OCD's enactment of its rules:
  - Today at least 66% of the water used in drilling and completion activities comes from produced water (previously <50% came from such sources).
    - In 2023 only 4% of non-produced water used is <1,000 TDS; down from 23% in 2020.
      - 12% waters > 10K TDS
      - 18 % water 1 – 10K TDS
    - Notes:
      - A typical frac takes 275,000 barrels (11.55 million gallons).
      - For some operators, the percentage of produced water used is even higher.
- While we have made significant progress on produced water reuse, reducing the volumes of freshwater going to oil and gas, recent production increases have enhanced other challenges, including:
  - maintaining adequate disposal capacity, and
  - managing induced seismicity.

# OCD's Induced Seismicity Management



**Oil Conservation Division  
Energy, Minerals and Natural Resources Department  
State of New Mexico**

**Seismicity Response Protocol (rev. date November 23, 2021)**

**Category 1: Seismicity Response Protocol:**

**Effective when Two M2.5 Events Occur Within 30 Days and Within a 10 mile Radius**

**Within 10 Miles**

**Monitoring & Reporting Protocols**

- Weekly reporting of daily injection volumes and average daily surface pressure
  - Reporting in addition to C-115 reporting, on form provided by OCD
  - Digitally measure injection volume and pressure. The Data must be recorded on an hourly basis at a minimum. Operator shall archive digital injection data and deliver upon request
- Operators must provide an analysis identifying the perforated injection interval and formation tops.
- Operator must monitor seismicity (magnitude >~M2.5 for 10 miles around well using USGS/NMSTSO data)
  - Operators shall share monitor data with OCD when requested
- Additional requirements may be added if determined appropriate by the OCD.

**Category 2: Seismicity Response Protocol:**

**Effective with one M3.0+ Event**

**M3.0+ event**

**All Category 1 Monitoring & Reporting protocols, and**

- 50% rate reduction within 0-3 miles
- 25% reduction between 3-6 miles
- Reductions to rate should start immediately and be completed within a week
- Notify OCD of pertinent information within 24 hours or next business day, whichever is latest, of an event using the OCD form.

**M3.5+ event**

**All Category 1 Monitoring & Reporting protocols, and**

- Shut in at 0-3 miles
- 50% rate reduction at 3-6 miles
- 25% rate reduction at 6-10 miles
- Reductions to rate should start immediately and be completed within a week
- Notify OCD of pertinent information within 24 hours or next business day, whichever is latest, of an event using the OCD form.

- ❖ All rates should be reduced from the previous 6-month daily average of active injection days
- ❖ Notifications should be made to the OCD by submitting to the [OCD Permitting](#) within 24 hours of receiving monitoring data of a seismic event within 10 miles of its facility.
- ❖ Such notification can be based on private or public seismic network data; however, final actions will be determined by USGS data concerning magnitude and location. All distances in this document are based on determined Epicenter.
- ❖ Pertinent information will be submitted to the OCD by an OCD form which is in development and will be submitted to the OCD via [OCD.Engineer@state.nm.us](mailto:OCD.Engineer@state.nm.us)
- ❖ OCD may reduce or eliminate disposal volumes within the curtailment radii above, at its sole discretion, if after 6 months no M3.0 events have occurred within 10 mi. of the original triggering event and/or OCD approves an operator/industry response plan within the response radii.

# Other Issues under Consideration

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- Shallow disposal pilot project currently pending before the Oil Conservation Commission.
- Oil and Gas Act Reform Discussions
  - The New Mexico and Oil & Gas Act has been around for a long time and has not been meaningfully updated since the late 80s/early 90s.
  - OCD is working with key stakeholders to see if we can arrive at a consensus reform package for the upcoming session in the following areas:
    1. **Freshwater Use,**
    2. Lock-in 98% gas capture by 2026 target,
    3. Setbacks,
    4. Financial Assurance/Civil Penalty Updates,
    5. Fee Increases,
    6. Redirecting OCD Civil Penalties to Reclamation Fund, and
    7. Tighten well transfer rules/limits.



# Thank You & Questions

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