

# PRODUCED WATER MANAGEMENT SURVEY OF STATES

Produced Water Working Group - Aug 29, 2016

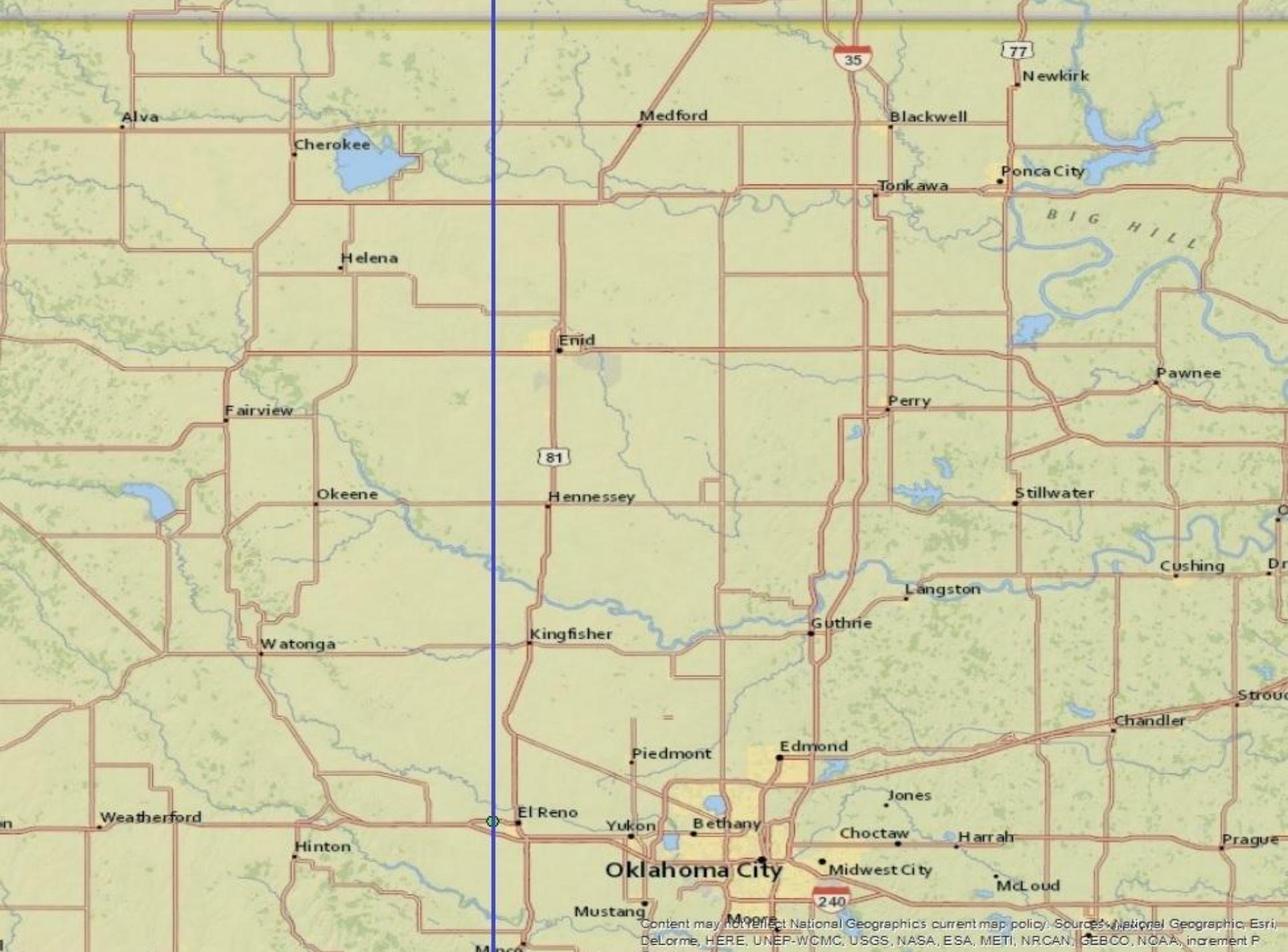
# 26 States Contacted

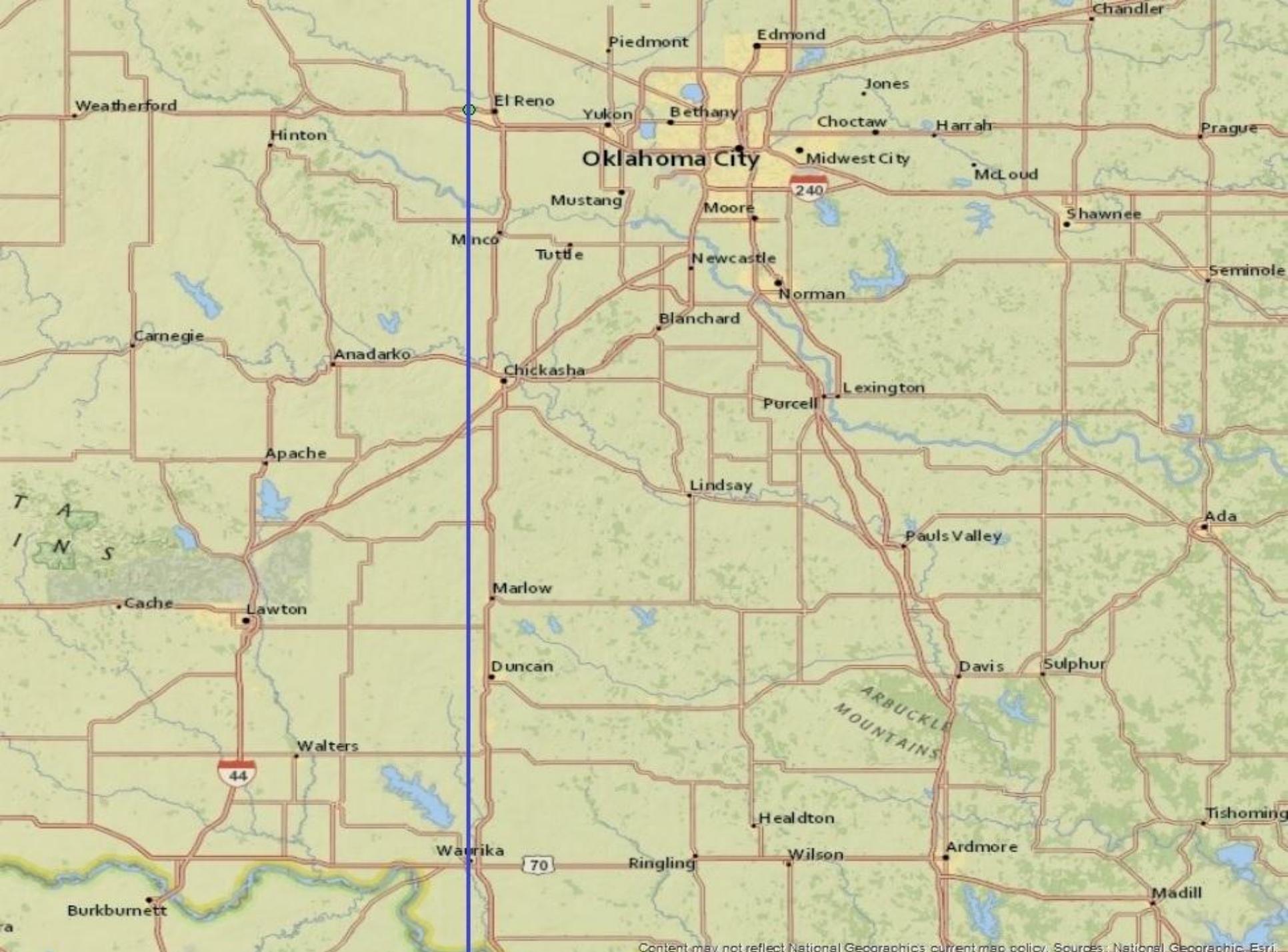
- Alaska
- Arkansas
- California
- Colorado
- Idaho
- Illinois
- Indiana
- Kansas
- Kentucky
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- Michigan
- Mississippi
- Missouri
- Montana
- Nebraska
- New Mexico
- North Dakota
- Ohio
- Oklahoma
- Pennsylvania
- South Dakota
- Tennessee
- Texas
- Utah
- Virginia
- Wyoming

# 98<sup>TH</sup> Meridian



Source: [www.permaculturemarin.org](http://www.permaculturemarin.org) (modified), retrieved from [bing.com/images](http://bing.com/images)





# Oklahoma City

# Section I: Discharge

1. How is produced water managed in your state? (e.g., deep well injection, discharge, reuse, etc.)
2. Do you allow direct discharge of treated produced water?
3. Is produced water discharged indirectly through a Publicly Owned Treatment Works (POTW)?
4. How are water rights/ownership addressed for the treated produced water in your area?
  - Property owner has rights/ownership; mineral owner; operator, state

**5. Is discharge pursuant to state authority or EPA?**

- State authority; EPA [40 CFR 435: Oil and Gas Extraction Point Source; 40 CFR 437: Centralized Waste Treatment]

**6. Does your agency have additional requirements beyond what is required by federal regulations?**

**7. Is produced water discharged in areas of the state to benefit agriculture and/or wildlife?**

**8. Do you allow discharges East/West of the 98th Meridian?**

**9. What agency(s) have permitting authority for discharge of produced water?**

- 10.** Does your agency have monitoring requirements for discharge of produced water?
  
- 11.** If your state permits discharge of produced water, what pollutants are regulated within the permits?
  - Hydrocarbons; Metals; Radionuclides; Minerals/Total Dissolved Solids (TDS); Toxic Organics/Toxic Inorganics; Whole Effluent Toxicity (WET); Other (please specify)
  
- 12.** Approximately what volume fraction of the produced water is from unconventional activities? (e.g., fracking, horizontal drilling, etc.)
  
- 13.** What technologies have been used in treating produced water in your state?

# Section II: Deep Well Injection

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- 14.** Is deep well injection used to dispose of produced water in your state?
- 15.** Is induced seismicity an issue in your state?

# Section III: Reuse

- 16.** Is produced water reused?
- 17.** For what applications is produced water used? (e.g., industrial, agricultural, aquifer storage and recovery (ASR), etc.)
- 18.** Does your agency have technical standards for reuse of produced water?
- 19.** For applications other than E&P, after reuse, does the produced water retain its regulatory status as produced water?
- 20.** After reuse does produced water get discharged?

# Section IV: Radioactivity

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**21.** Are there any considerations for dealing with radioactive produced water or treatment residuals?

- Section V: Contact Information

# Summary of Responses

## 1. PW is managed by:

- Deep well disposal/injection
- Surface water discharge
- Regional disposal facilities
- Hauling to a CWT
- Recycling
- Reuse
- Evaporation
- Discharge overboard

## 2. Direct/Indirect discharge:

- No state discharges east of the 98<sup>th</sup> (except per Part 437)
- Some states discharge west of the 98<sup>th</sup>
- Some states have permits for centralized waste treatment
- Some states claim to indirectly discharge through a POTW

### 3. Water rights/ownership for the treated PW

- In some states the property owner has rights/ownership
- In some states the operator has rights/ownership
- In MOST states water rights/ownership is unknown or not addressed

### 4. In some states, discharge/management is pursuant to state authority, in others EPA

### 5. Some states have monitoring requirements and limits beyond 40CFR. Monitoring parameters include:

- Hydrocarbons, minerals/TDS, metals, radionuclides, whole effluent toxicity, toxic organics and inorganics

### 6. Other limits and parameters in state permits:

- pH, DO, oil and grease, flow rate, total alkalinity, conductivity, chloride, sulfate, temperature, hardness, radium, strontium, thallium, beta radiation

7. Volume fraction of PW from unconventional activities ranges from <10% to >75%
8. Various technologies have been used for treating PW
9. Several states use deep well injection to dispose of PW
10. Induced seismicity is a concern for seven states
11. PW is reused in several states
  - EOR/water flood, Oil & Gas production operations/well stimulation, fracking, recharge, drilling fluid for oil/gas wells, beneficial reuse: dust suppression, ice control, livestock watering, agriculture/irrigation, wildlife, land farming

- 12.** Some states have technical standards for reuse
- 13.** PW retaining its regulatory status as produced water after reuse
  - Yes, No, Unknown
- 14.** Discharging produced water after reuse
  - Yes, No, Unknown
- 15.** In some states there are considerations for dealing with radioactive produced water or treatment residuals
  - Monitoring, effluent limits, limits based on reuse, disposal of residuals

# Conclusions

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- The survey generated detailed primary data from the responding states.
- The results could be used to help us chart some of our future activities.
- Based on the survey results, we may want to consider forming subcommittees to address the following areas.

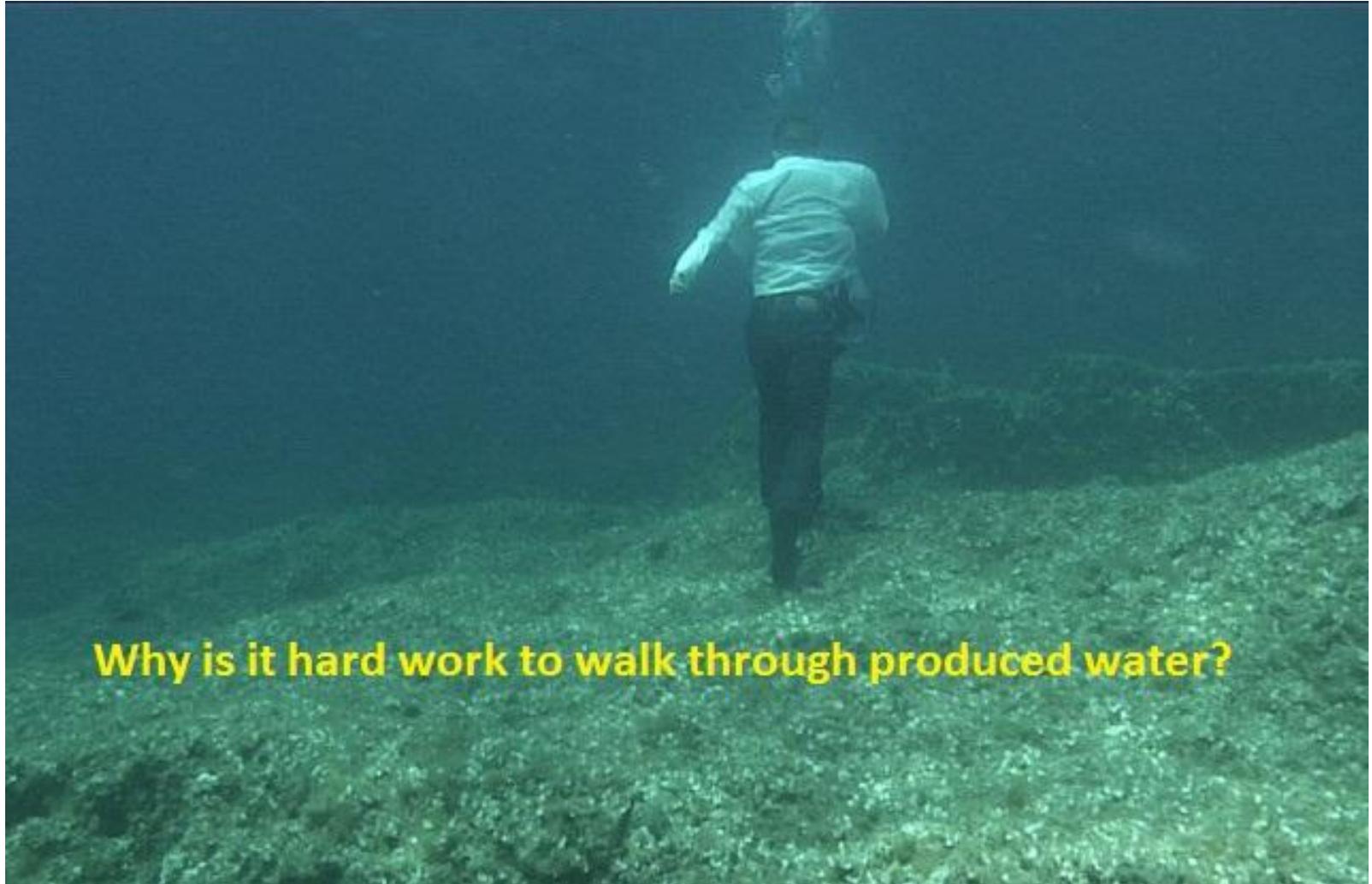
# Possible next steps for regulators

- Identify and remove regulatory/administrative obstacles for the reuse of PW in the field.
- Identify all possible reuse options. Recommend ways of developing a “fit for use” criteria. Recommend how PW standards may be developed for the intended reuse. Case-by-case basis?
- Identify obstacles regarding water rights/ownership. Recommend actions (regulatory, statutory) to address the obstacles.
- Work with federal counterparts to help define the regulatory status of PW after reuse.

# Possible next steps...

- Work on easing federal regulatory obstacles for discharges east of the 98<sup>th</sup> (perhaps work with ECOS? Start with R6?)
- Work on removing the designated use restrictions for discharges west of the 98<sup>th</sup>.
- Seek NPDES delegation from EPA for the discharge of produced water.
- Recommend administrative ways of handling prospective NPDES applications by agencies.
- Come up with ideas for technology evaluations.

# Questions – Feedback?



**Why is it hard work to walk through produced water?**