


# Water and Produced Water Stewardship – 2024 Directions

NEW MEXICO PRODUCED WATER CONSORTIUM
2023 ANNUAL MEETING
DECEMBER 13-14, 2023 – ALBUQUERQUE

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**Consortium Member Input and Comments**

NM STATE
NEW MEXICO PRODUCED WATER RESEARCH CONSORTIUM

# NM Produced Water Research Consortium 2024 Efforts

- Slightly modified organizational structure
  - Community and Public Information Center
    - Public Education and Outreach information (webinars, info sheets, podcasts, news links, etc.)
    - State Coordinating Working Group (national info and outreach)
    - Produced Water Data Portal (produced water quantity and quality data and expanded GIS info) – close coordination with NMED, OCD, and NMOGA
  - Research Center
    - Risk and toxicology
    - Treatment Testing and Evaluation
    - Infrastructure and Socio-economic Modeling,  Analysis, and Implementation

# Proposed Consortium Operations and Funding for 2024

## Public and Community Info Center

- Funding - $150K/yr donations, grants, membership fees.
- Coordinate information programs - Data Portal upgrades, webinars, web page, pod casts, info sheets, outreach, etc.
- NMSU to hire full-time web portal support coordinator
- Consortium membership continues to includes participation on all working groups and access to all information developed through the research center efforts.

## Research Center

- Funding - $1-1.5 M/yr (combination of grants, research sponsors, research proposals, etc.)
- Expand national (DOE, state, other federal, and industry) produced water research efforts and funding through NMSU to coordinate research, students, subcontracts, salaries, etc.
- Research sponsors still team directly with NMSU to coordinate specific and directed research.
- Sponsorship can be annual or multi-year at $20K, $50K, $100 K+ per year

# Our National Produced Water Role for EPA – Outward vs Inward

- More national presence on produced water.  Governor has started a national recognition of produced water treatment and reuse to support the ‘energy transition’.
- We need to up our game on appropriate produced water treatment and reuse information.
- We need to up our game on the fact NM has reduced fresh water use in drilling and fracking to about 5% with 80% produced water recycle.
- Need technical experts to volunteer for webinars and pod casts
- When you Google produced water our web site should come up first with all sorts of DATA and INFORMATION for actual use as a real resource.
- That would fulfill our NATIONAL role for EPA.

# Better Produced Water Quality Data and Portal Improvements

- While quantity data is updated monthly, raw produced water quality data is collected about once a decade or less – though collected monthly or quarterly by industry.
- Work with NMOGA, industry, and the Water Quality Working Group to collect and QA/QC raw field data for select constituents.
- Raw produced water quality drives - mineral recovery potential, treatment needs decisions
- NMED has identified a dozen new GIS layers that would be helpful to users - seismic zones, depth to groundwater, state and federal land, infrastructure, that should added.
- Vendor engineering and analysis capabilities portal element level planned but not yet populated.

| Tier 1 Analytes<br>Produced Water Field Data |
|---|
| Temperature, $^0$C |
| API gravity oil |
| pH |
| Ox-Reduction Potential (ORP) |
| Total Suspended Solids (TSS) |
| Total Organic Carbon (TOC) |
| Total Petrol Hydrocarbons (TPH) |
| Total Dissolved solids (TDS) |
| Chlorides |
| Hardness |
| Ammonia |
| Total metals/XRF speciation |
| Iron (total, Fe / Fe2+ / Fe3+) |
| NORM – radium and uranium |
| Sulfide/Hydrogen Sulfide |
| Dissolved Oxygen (DO) |

# Integrated Technology Testing with OCD on Abandoned Wells

- Most immediate real technology implementation opportunities using federal funding for reasonable scale (100-200 bbls /day over 6 to 8 months) operational testing.
- Accelerates operational knowledge and access to significant treated water for risk and tox analysis.
- Opportunities to team with Texas PW Consortium to share data on similar abandoned or blighted areas - great demonstration sites for technologies using federal funding.
- Solving real problems.

# State of the Science Risk and Toxicology

## Developed Analysis Approach:

- Standardized Sampling Protocol w/USEPA
- Dual Standardized NPDES+ Analysis (~300 analytes)
- Tentatively Identified Compound (TIC) Analysis using High Res Liquid chromatography/ Mass Spec (HR-LCMS) @ NMSU
- Dual Whole Effluent Toxicity Testing
- Dual Human cell-line analysis
- Risk and Toxicity Analysis
  - Predicted Env. Conc. (PEC)
  - Predicted No-effect Conc (PNEC)

## 2024 Issues:

- NPDES+ and WET analysis over $40K for full suite analysis
- To date totally funded by Exxon Mobil
- Need funding to complete PEC/PNEC assessment and fate and transport modeling
- Need funding for non-target analysis and WET testing at NMSU

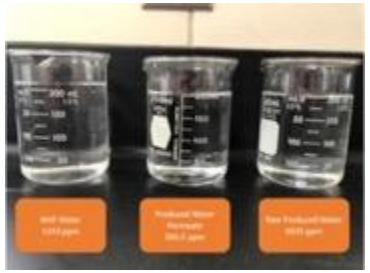
# More Disciplined Technology Testing and Coordination

- Have been extremely lenient on technology testing (or optimistic) but need to be more focused and dilligent
- Three or four technologies started and disappeared part way through over 4 years (missed treatment data opportunities)
- Longer-term projects might alleviate this problem - can do that if actual funding for water  treated.
- Why need to be innovative in setting up technology demonstrations/combined with bench-scale testing at BGNDRF.

Need more of this kind of data

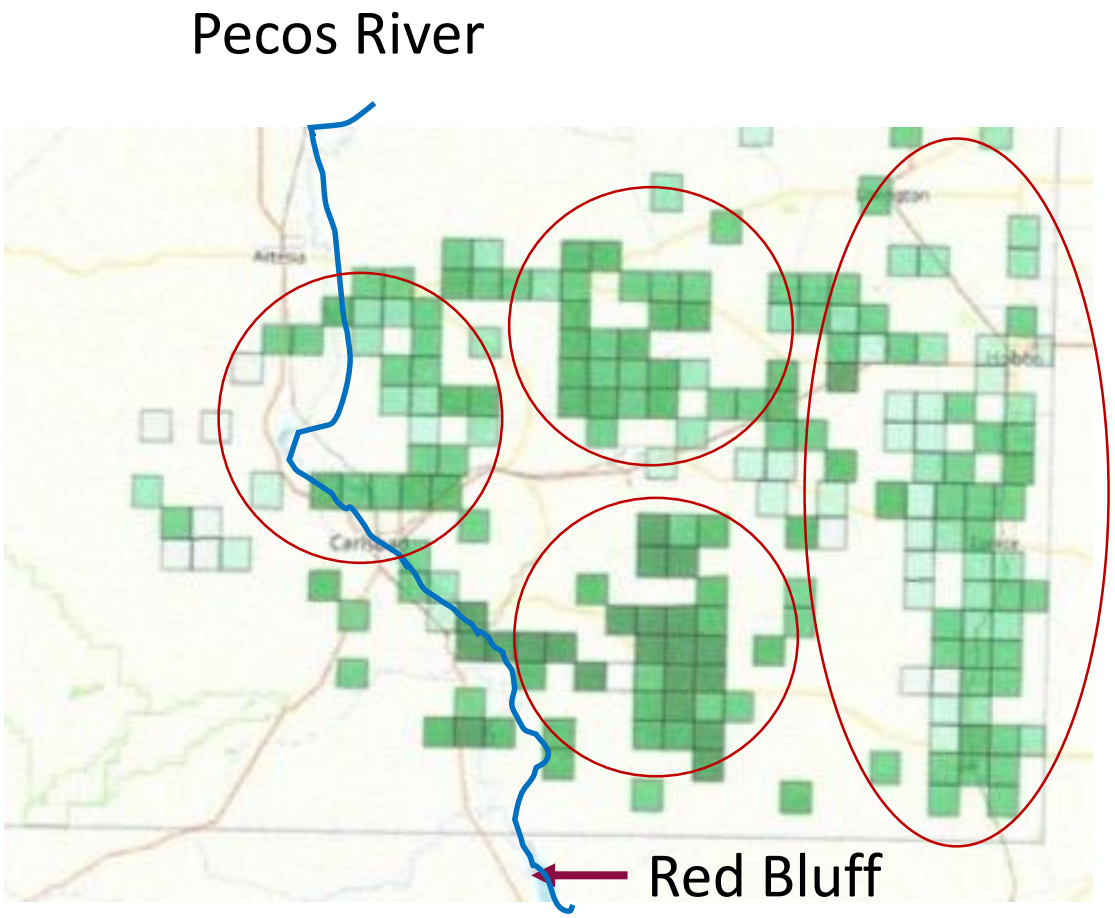
Znano
Permian Basin
pretreatment


ZwitterCo
Permian Basin
pretreatment



San Juan
RO
Treatment

# Support NM Produced Water Authorities




- Aggregating produced water for economic development and risk and liability reduction is important to NM
- Communities can best coordinate their own economic development opportunities and priorities
- Likely will need technical support and cooperation from the Consortium
- Coordinate with NMOGA