Produced Water Treatment Pilot Project
Background Information
For Use in NMED Treatment Permit Discussions

1. **Applicant Summary Information:**
   Company: (Name and Address) Stochastic Research Technologies (SRT) LLC, Crystal Lake, IL 60012,

Points of Contact	Company	Email	Phone
Dr. Urmila Diwekar	SRT	urmila@vri-custom.org	630-886-3047

Company Description and Produced Water Treatment Experience:

Stochastic Research Technologies LLC is a startup working on an NSF-funded SBIR project entitled "SBIR Phase II: Novel Adsorbents for Selective Removal of Naturally Occurring Radionuclide Materials (NORM) from Fracking-Produced Water." We have tested our adsorbents for NORM in the laboratory and found that the adsorbents are very effective in removing NORM. This is our first bench-scale test for these adsorbents.

Application Date: April 1, 2025
Pilot Date: May 15, 2025
Type and scale of Project: Bench Scale
Project Funding: National Science Foundation

Project Collaborators: (if any)

Group/Company	Role	Contact Info
OXY	Providing produced water	Through Dr. Mike Hightower

2. **Project Site Location and Description:**

- **Basin**:
- **Location**: BGNDRF
  Coordinates: (Lat/Long)
- **General Directions**: 500 Lavelle Rd, Alamogordo, NM 88310
- **Site Description**: BGNDRF
- **Land Status**: State Institute
- **Arial view of site**: (Need picture): Attached
- **Produced Water Source and Quality**: (produced water source and general quality in ppm TDS) OXY, 200,000 mg/l

3. **Executive Summary:**

Produced water is generated from conventional oil and gas production and unconventional sources, such as coal bed methane, tight sands, and gas shale. The geologic formations containing oil and gas deposits also contain radionuclides, referred to as Naturally Occurring Radioactive Materials (NORM). Stochastic Research Technologies is developing new (1) efficient, (2) easily disposable, (3) safe, (4) cost-effective, and (5) customizable clay-based adsorbents to remove Ra from produced water. This is a project funded by the National Science Foundation, and we now have two adsorbents, Ralite-1 and Ralite-2, to remove NORM. These adsorbents are effective in lab-scale experiments. At BGNDRF, we want to set up a bench-scale experiment to test the adsorbent from the waters produced by the Permian Basin. This will allow us to scale the equipment to an industrial scale.

4. Proposed Reuse Application of Treated Water:

For this test, there will be no discharge of the produced water. The treated water will be sampled in a holding tank before being blended back with the concentrated brine for reinjection into an approved SWD.

5. Similar or related permits/notification needed with other agencies, or nearby properties:

No additional permits/notifications are needed.

6. Pilot-System Process and Design:

The treatment process we envision is shown in Figure 1. There is a mixing tank with a stirrer where the water will be treated using a batch process. The residue is collected at the bottom and filtered. The treated water is taken for testing.

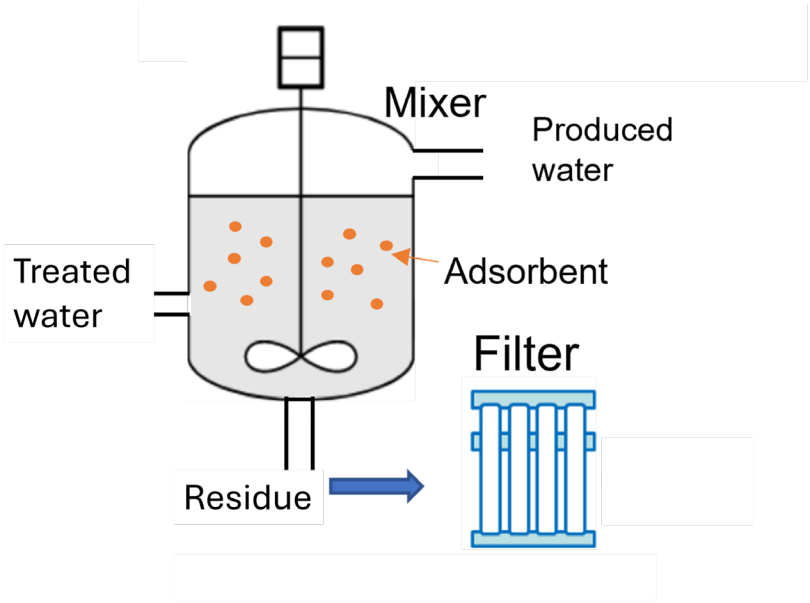


Figure 1: Schematic of Pilot System

7. Project Goals and Objectives: (Summary of objectives and KPI's similar to below)

The pilot project is expected to operate for up '10' weeks, treating up to '4' bbls/day of produced water. The treatment is expected to remove NORM levels to 30 pCi/liter (groundwater acceptable limit).

The following Key Performance Indicators (KPI's) will be evaluated to assess system and process cost effectiveness and overall performance:

Operational throughput - 4 bbls/day
Downtime - <10%
Meet water quality target - 95 % of time
Energy use/per bbl treated - ?
NORM concentration in treated water – x pCi/liter

The data collected will be utilized to help develop the design of larger-scale treatment systems to support enhanced operations efficiencies and reduce full-scale treatment costs.

8. Summary of Risk and Toxicology Sampling, Testing, and Analysis: (Following Statement Required)

The KPI's noted above will be measured daily on-site with simple field-testing systems and monitors.

Example - Risk and Toxicology testing and analysis of the treated produced water will be coordinated and managed through the same testing service as the consortium (Eurofins Lab. Houston). Samples will be taken and tested using the Consortium's sampling protocol and their Risk and Toxicology testing protocol.

9. Equipment Vendor and Associated Suppliers: (Identify as appropriate)

We do not expect to have any new equipment as BGNDRF has tanks for produced water treatment. We will be fixing a stirrer on the top of the tank. Filter will be provided by SRT.

10. Expected Produced Water Users:

None.

11. Disposal and Decommissioning: (Required information) Example given below

Water: All water will recombined with reside be disposed by SWD injection. The residuals (filter) will be handed over to Waste Control Specialists LLC, which handles waste with NORM.

12. Expected Operational Testing, Reporting, and Proposed Review Schedule

Pilot mobilization, set up, and shakedown: May 15 2025-June 30, 20205
Pilot Operations: May 20, 2025- June 30 2025
Draft Report: 15 August 2025

Company POC **Dr. Urmila Diwekar**
Date: April 11, 2025

