New Mexico Environment Department

Ground Water Quality Bureau

Produced Water Pilot Project

Notice of Intent to Discharge

For Department Use Only:

Agency Interest Number_____
PRD Assigned _____

1. Name and mailing address of person or group performing research (Responsible Person):

Infinity Water Solutions
1250 South Capital of Texas Highway
Building 2-200
Austin, Texas 78746

Phone: (512) 710-1863
Email: Ashley@water.energy
Web: www.water.energy

2. Name and position of person completing form:

Ashley Kegley-Whitehead
Chief Communications & Government Affairs Officer

Phone: (512) 660-2898
Email: Ashley@water.energy
Web: www.water.energy

3. Research Focus (PWRC Research Category): Field project. Infinity proposes to complete a carefully controlled, small-scale, non-discharging pilot to measure the effects of treated produced water on non-consumptive agriculture. Particularly, hemp.

4. Is the proposed use of the treated produced water to be used inside or outside of the oil and gas industry? Outside the oil and gas industry.

5. Does the location for testing the technology take place inside or outside of the oil and gas field? Inside the oil and gas industry.

6. Physical location of the research site including size and boundaries of site (include, street address, township, range, section, county, distance from closest town or landmark, directions to facility. Provide as an attachment. Please see Attachment A

7. Topographic and aerial map(s) showing:
- **land status and adjacent land status**
- **100-year flood plain,**
- **dwellings and occupied establishments,**
- **watercourses including irrigation ditches, wetlands, lakes, karst and soils • water wells (types) or springs**
- **site security**
- **site plan showing locations of relevant structures**

Please see Attachment B

8. List any regulatory, governmental and non-governmental agencies, including municipalities or counties that have authority on the testing location. Provide as an attachment. Please see Attachment C

9. Provide a description of your signage plan for the testing site. Provide as an attachment. Please see Attachment D

10. Provide a description of your site security plan, including training and site restriction methods. The proposed location is a privately owned grazing ranch with fencing around its perimeter and security on-site daily. The Ranch Manager is Larry Stross at (570) 269-6499.

11. List of adjacent landowners and confirmation that adjacent landowners have been notified of the proposed pilot project. Provide as an attachment. Please see Attachment E

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12. **List the source(s) of the produced water including basin of origin. Describe how the produced water will be transported to and from the site including origin and disposal locations and onsite storage safety precautionary methods. Provide as an attachment.** Please see Attachment F

13. **Provide the disposal and decommissioning plan for the expected byproducts, waste products and other potentially contaminated materials. Plan should include disposition of equipment, soils, plants and piping requiring disposal and the expected disposal locations for each. Provide as an attachment.** Please see Attachment G

14. **Describe the expected contaminants in the untreated produced water and the treated produced water (e.g. contaminants being studied, known contaminants, known additives). Include estimated concentrations if known, and copies of laboratory analyses of untreated and treated produced water. Provide as an attachment.** Please see Attachment H

15. **Describe all components of the produced water processing, treatment, storage, secondary containment, and produced water system (e.g., pre-treatment units, above ground storage tanks, etc.). Include sizes, site layout map, closed loop processing plans, and specifications. Provide as an attachment.** Please see Attachment I

16. **Describe your disposal plan for all produced water, treated produced water, permeate or brine concentrate into a SWD. Provide as an attachment.** Please see Attachment J

17. **Describe your final closure plan after completion of the pilot project. Provide as an attachment.** Please see Attachment K

18. **Estimated depth to ground water (ft):** The estimated depth of groundwater is 250 feet. Source of information is from the New Mexico Institute of Mining and Technology, United States Geological Survey: https://geoinfo.nmt.edu/publications/water/gw/3/GW3.pdf

Direction of the groundwater flow is Southward and Southwestward. Source of information is from the New Mexico Institute of Mining and Technology, United States Geological Survey: https://geoinfo.nmt.edu/publications/water/gw/3/GW3.pdf

19. **Current Total Dissolved Solids Concentration in Groundwater:** 1,516 mg/L as sampled 2/24/23

Signature: Ashley Kegley **Date:** 9-19-23

Printed name: Ashley Kegley-Whitehead **Title:** Chief Communication Officer

Certification by Responsible Person

I, Ashley Kegley-Whitehead, **hereby certify that the information and data submitted in this application are true and accurate as possible, to the best of my knowledge and professional expertise and experience.**

Signed this 19th **day of** September, 2023 **upon my oath or affirmation, before a notary of the State of** Texas

CARRIE CATHERINE CAYLOR
Notary Public, State of Texas
Comm. Expires 08-23-2026
Notary ID 133923487

Carrie Catherine Caylor

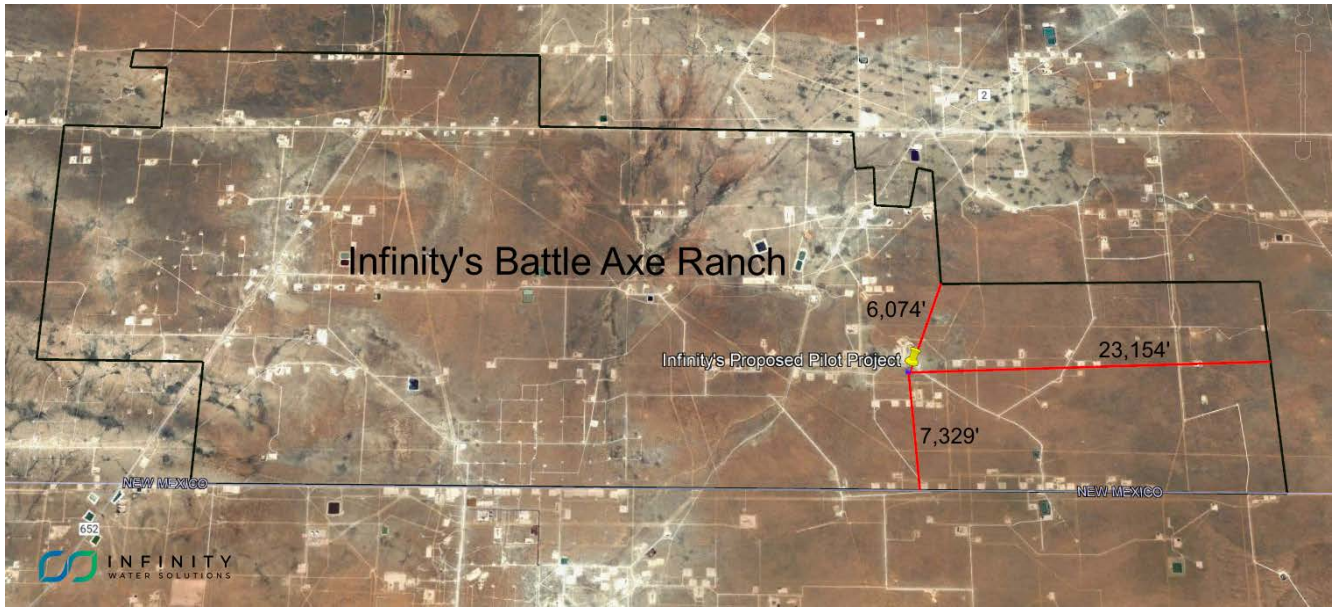
Attachment A

The proposed location of our pilot study is Infinity's Battle Axe Ranch, a privately-owned 33,000-acre grazing ranch that houses various oil and gas activities. It is located at 2430 Battle Axe Rd, Jal, NM 88252. The ranch is located across both Eddy and Lea County, New Mexico, though the proposed location of the pilot within the ranch, will be in Lea County, just north of the Texas border.

Directions: From Albuquerque, take I-40 E and US-285 S/US Hwy 285 S to NM-360 S in Eddy County (259 mi). Turn right onto NM-360 S (25 mi). Turn left onto US-180 E/US-62 E (14 mi). Take Louis Whitlock Rd, NM 128-E and J-1/Orla Rd to Battle Axe Rd/J-2 (43 miles).

The half-acre enclosed pilot project is located at coordinates 32.020727, -103.558989 within the Battle Axe Ranch. The fence line of the pilot to the ranch boundaries are as follows:

- 6,074' feet to the north
- 23,154' feet to the east
- 7,329' feet to the south

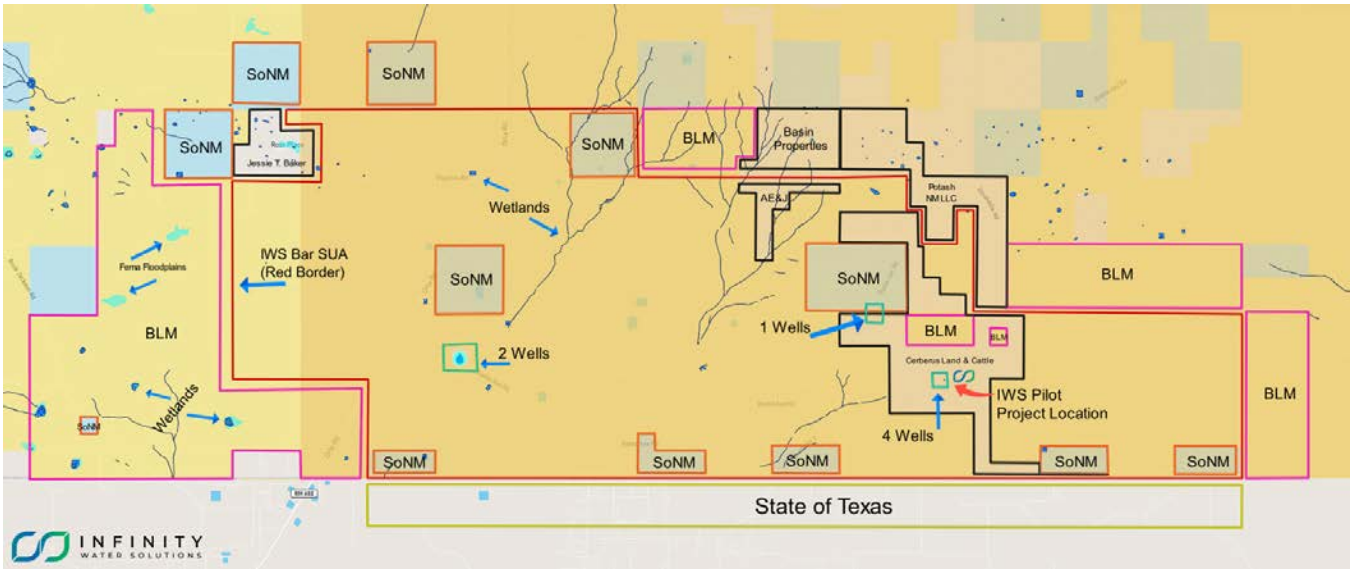


It's worth noting that the main entrance to the Battle Axe Ranch passes right past headquarters and is heavily monitored by ranch staff. With that being said, the traffic that does enter the ranch is associated with oilfield activities (primarily EOG), which are guided to select portions of the property. The sub-section where we intend to house the hemp crops and water storage will have heavy signage to convey the sensitivity of the study area. The hemp crop beds will be contained with an additional perimeter fence, as per NMDA licensing requirements. Additionally, the hemp crops and water storage units will also be monitored by live video camera and security staff.

Fed 128 entrance

Pre-treatment of produced water will occur at Infinity's Mills Ranch 1 recycling facility. The treatment facility is currently handling commercial volumes of recycle and reuse water for customers inside the oil and gas industry.

Attachment B



Attachment C

Regulatory bodies over Infinity's Battle Axe Ranch include the New Mexico Environmental Department, EMNRD's Oil and Conservation Division and the Bureau of Land Management. We have also been awarded a hemp license in coordination with New Mexico's Department of Agriculture: License No. AHPL-7-2023 and USDA License No. 35_0048.

Attachment D

The signage plan for Infinity's pilot project at Battle Axe Ranch will be in accordance with our HSE plan. Signage location and type may include:

- Entry Placard:
  - Company Name
  - Permit Number and/or ID
  - Hazards Present
  - Emergency Contact Number
  - No Admittance without Prior Approval
  - PPE Required
  - Visitors: Sign-In with Office
- Placards for holding tanks delineating treated and groundwater
- No Entry Zones
- Parking Area Designation
- H2S Warnings
- Authorized Personnel Only
- Trip Hazards

Example signage below:

Attachment E

The current landowner is Cerberus Land and Cattle Company LLC. Our current point of contact, William Ditto, is the owner/manager. His contact information is wditto@cerberuslcc.com. We have been working closely with Mr. Ditto and his ranch manager on the development of this pilot application. They have also worked with us to complete the application for a commercial hemp license and registration with New Mexico's Department of Agriculture. The license is granted in their name.

Worth noting, our project, and the utilization of this license, is extremely unique in that we are not interested in producing hemp for commercial sale. Instead, we are using this as a research experiment; investigating the relative effects of watering hemp with highly treated produced water.

Attachment F

The proposed research study includes highly polished/treated produced water (<2 mg/L TOC, <400 mg/L TDS) from the Northern Delaware of the Permian Basin. The produced water will be treated on site at Infinity's Mills Ranch 1 / Fed 128 water recycling facility; the pre-treat will then be transferred via truck to Texas Tech University for desalination. Once desalinated, the freshwater will be transferred to Battle Axe Ranch where it will be stored on site in air tight containers until needed. Any unused water will be delivered back to the Mills Ranch 1 facility where it will be recycled and reused for completions inside the oil and gas industry.

The total volume needed to complete this study is in the ballpark of 100 barrels of water. Each truckload will hold about ~130 bbl, requiring only one truck trip.

Attachment G

Our current disposal and closure plans are below. However, we are open to suggestions from the NMED should you have a preferred methodology, as we wish to execute this study with the utmost environmental stewardship.

- **Equipment:** We do not plan to dispose of our equipment. We plan to reuse it again at future testing sites. Any equipment used during the study will be thoroughly cleaned of any contaminants.
- **Material**: Immediately following the harvest, all excess hemp material will be destroyed in compliance with the USDA guidelines for hemp destruction. The Standard Remediation and Disposal guidelines can be found at the link below: https://www.ams.usda.gov/sites/default/files/media/HempRemediationandDisposalGuidelines.pdf

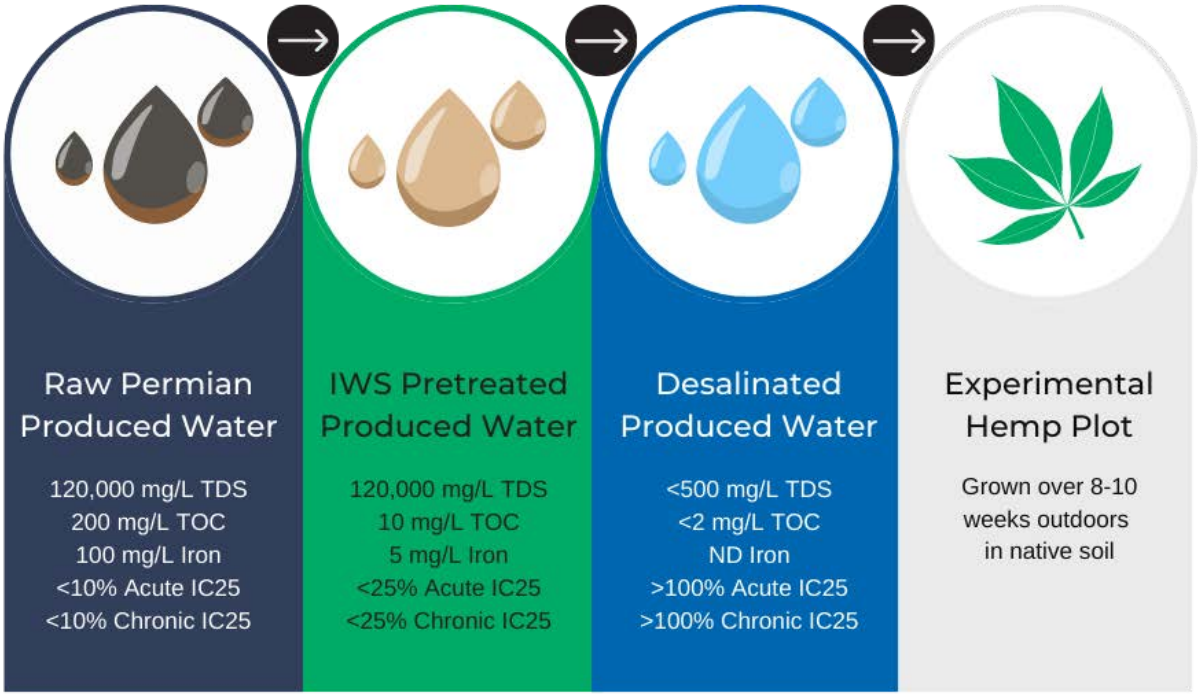
- **Water:** Any unused water from the study will be returned to Infinity Water Solutions' Mills Ranch 1 facility where it can be recycled for direct reuse inside the oil and gas industry.
- **Soil:** Any contaminated soil will be disposed of at approved soil restoration sites or approved landfills.

Attachment H

The prospective water qualities of the raw, pretreated, and desalinated produced waters are illustrated in the table below. These values are based on historical measurements coordinated by Infinity Water Solutions and do not necessarily reflect the qualities of the raw and treated effluents that will be achieved in this proposed research effort.

Formation		**Permian**	**Permian**	**Permian**
State of Water Quality		**Raw produced water**	**Pretreated**	**Desalinated, non-potable fresh water**
Micro OSP ATP Assay	CFU/mL	10,000,000	<1,000	<10
pH	pH	6.79	7.03	8.55
TDS	mg/L	93,297	88,118	447.7
Turbidity	NTU	140.87	10	0.58
>C6-C12	mg/L	90.8	2.03	<0.236
>C12-C28	mg/L	214	8.8	<0.305
>C28-C35	mg/L	13.6	9.73	<0.305
Cumulative TPH	mg/L	318.4	20.56	0
Total Organic Carbon	mg/L	163.84	10.00	1.74
Total Inorganic Carbon	mg/L	138.78	54.56	13.59
Total Nitrogen	mg/L	779.58	369.52	31.47
Boron	mg/L	71.9	52.0	0.2
Bromide	mg/L	746.0	687.0	0.7
Calcium	mg/L	5,410.0	5,030.0	2.4
Chloride	mg/L	60,400.0	57,900.0	37.1
Iron	mg/L	135.0	6.1	ND
Potassium	mg/L	924.0	895.0	112.0
Magnesium	mg/L	925.0	874.0	2.7
Sodium	mg/L	37,200.0	35,200.0	40.4
Sulfur	mg/L	290.0	290.0	0.9
Silica	mg/L	11.4	0.7	13.3
Strontium	mg/L	384.0	353.0	0.2

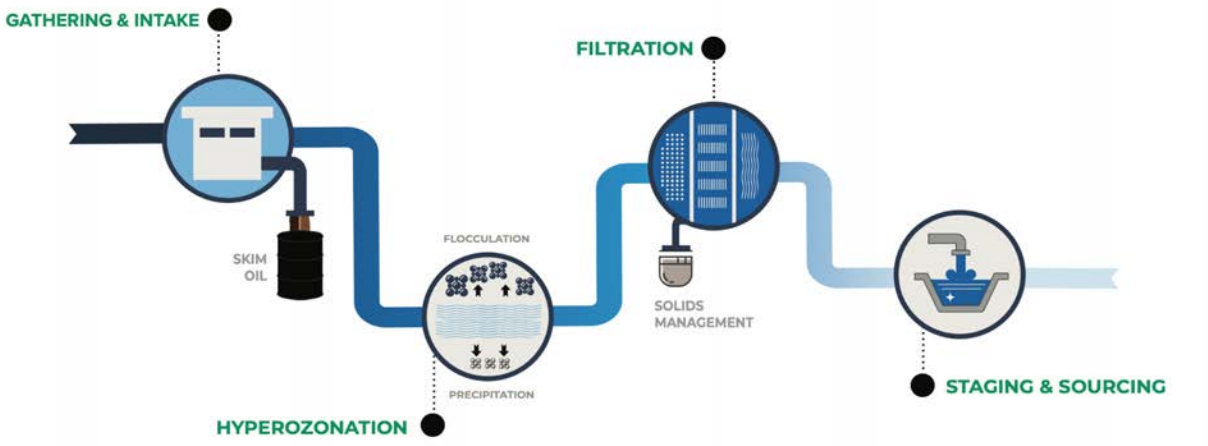
The full treatment train measurements / goals for this study are as follows:



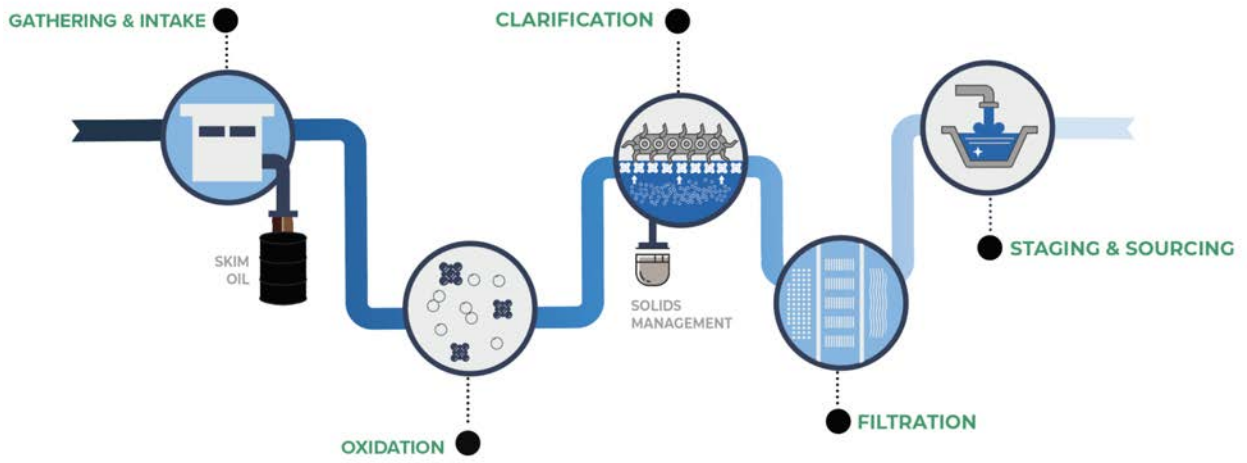
Attachment I

Water coming from Permian operators, specifically XTO / ExxonMobil, will go directly to Infinity's Mills Ranch 1 Water Recycling Facility. From there it will go through a series of processing steps using one of two pre-treatment methodologies: Infinity's patented Hyperozonation system and Infinity's bulk treatment system. Illustrative process flows diagrams of both treatment systems are below. The benefit of this is it allows us (and the New Mexico and Texas Consortiums) to explore the effects of two different pre-treatment options.

Infinity's Hyperozonation Process Flow Diagram:



Infinity's Bulk Treatment Process Flow Diagram:



After pre-treatment, water will be transported to Texas Tech University, in conjunction with the Texas Produced Water Consortium and run through its desalination system. Once complete, the freshwater will then be transported to the pilot location, Battle Axe Ranch, where it will be stored and used on site, as needed, for watering the non-consumptive hemp crop.

The following rendering is an illustration of our updated experimental design based on our last meeting with NMED. As such, we've moved from in-ground lined pits to above-ground, field-scale grow boxes. Everything is closed loop and verifiably leak proof. Again, based on this design our overall water need/consumption has also dropped drastically to just 100 barrels of water.

Attachment J

As a pure-play recycler, Infinity operates within a closed-loop network. We endeavor to recycle 100% of what we gather, avoiding the need to use an SWD for disposal purposes. During this pilot, 100% of the water gathered and treated will be recycled. Any left over water will be recycled back into our system which is currently in commission supplying treated produced water back to oil and gas operators for completions.

Attachment K

In addition to the decommissioning plan outlined in Attachment G, Infinity plans to prepare a white paper for general distribution, as well as a manuscript for publication in a peer-reviewed technical journal. Our goal is to provide essential data for the development of protective permitting regulations for treatment and subsequent use of treated produced water as stated in HB 546. As such, we plan to share our findings with New Mexico regulators, the science and academia community and the public at large.

This study will be run in collaboration with both the New Mexico Produced Water Research Consortium and the Texas Produced Water Research Consortium.