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TPL

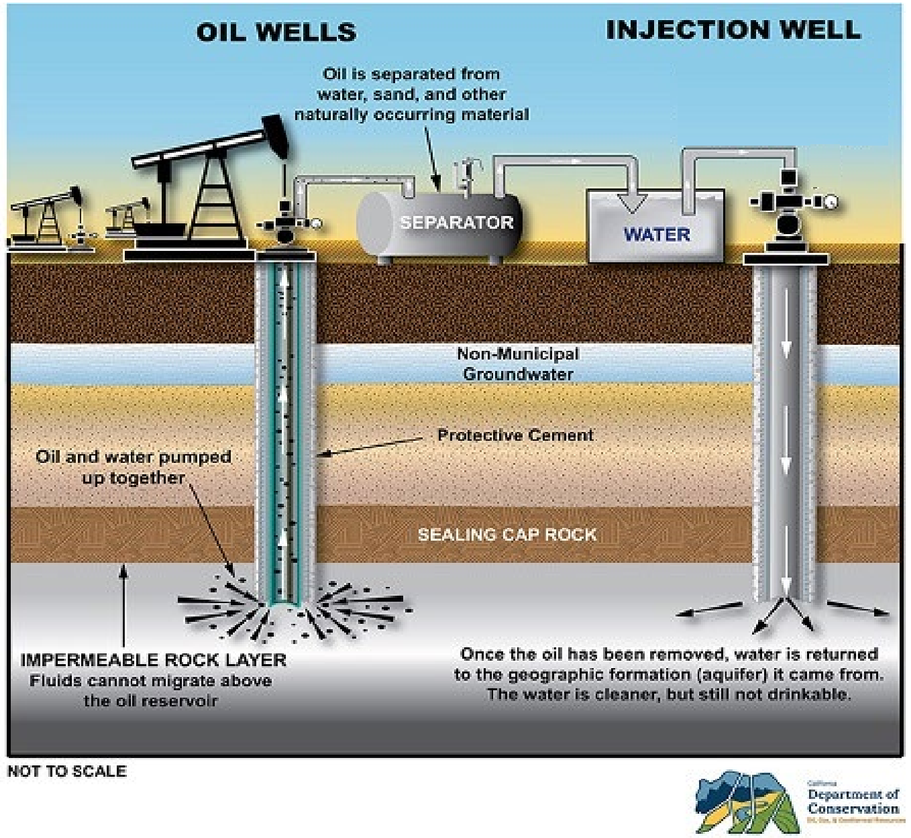
LEEDS

TEXAS PACIFIC LAND CORP.
TEXAS PACIFIC WATER RESOURCES, LLC

Jeff Braune
LEEDS Program Manager
Bechtel
jabraune@bechtel.com

Adrianne Lopez
Technical Research & Development Manager
Texas Pacific Water Resources
alopez@tpwresources.com

What is Produced Water?



Recycling

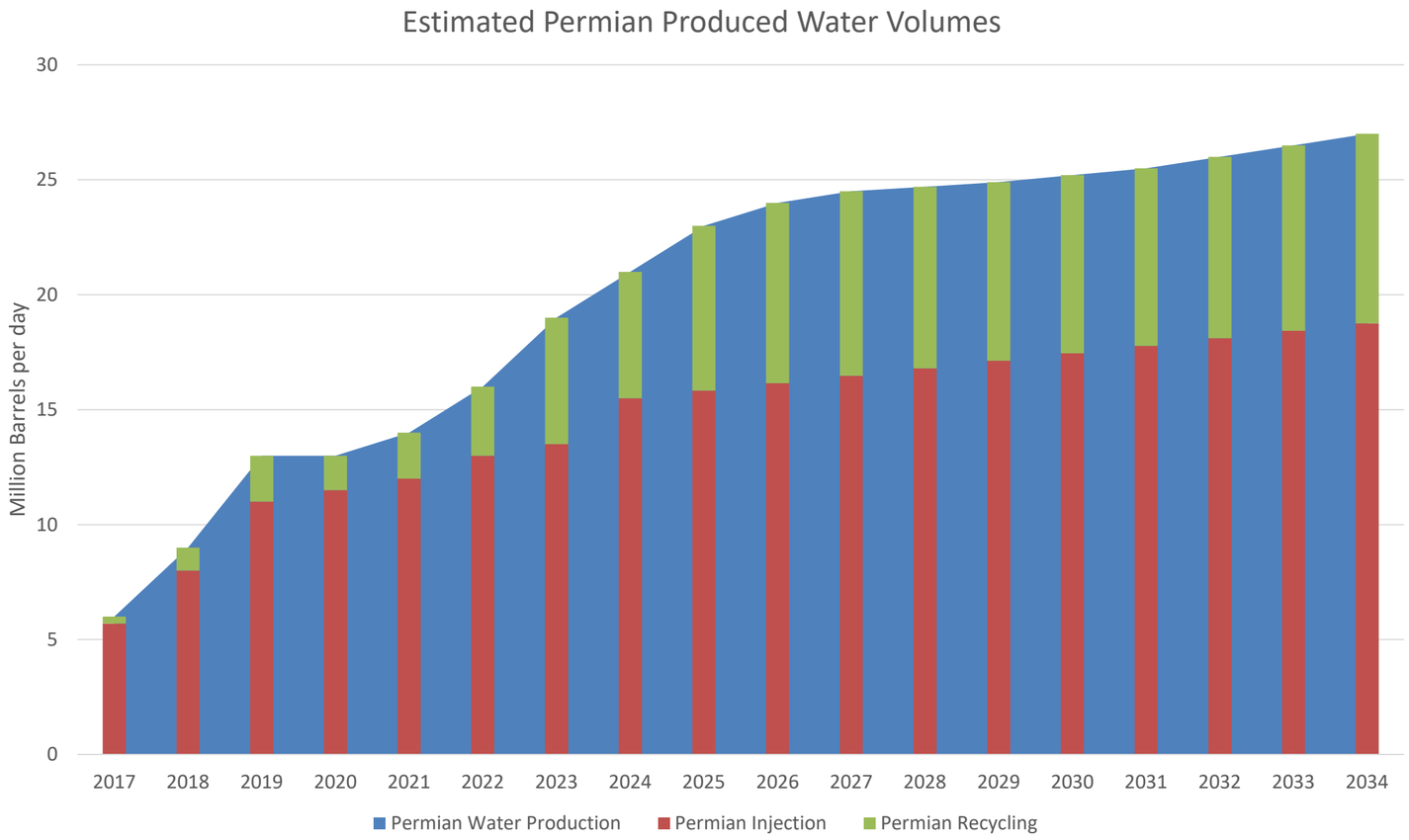
- Utilize the water in upstream activities – fracking and well completions
- Minimal treatment
- Replaces the use of freshwater
- Frack demand < volume of produced water

Disposal

- Salt-Water Disposal Wells (SWDs)
- Inexpensive
- Previously believed to be the best option:
  - Inexpensive
  - Avoids contamination of fresh water

Permian Produced Water Volumes

- **The Permian generates approximately 20 million barrels of produced water per day.**
- **This is due to the avg. 4:1 water to oil ratio seen in Permian wells.**
  - *This equates to roughly 840 million gallons of water per day.*
  - To put this into perspective, the city of Austin uses approximately 273 million gallons of water per day. (120 gal per day, per capita). (3X multiple)
- ~5.5 million barrels of this water are recycled within the industry daily, leaving an excess of ~14.5 million barrels of water requiring a solution alternative to disposal.

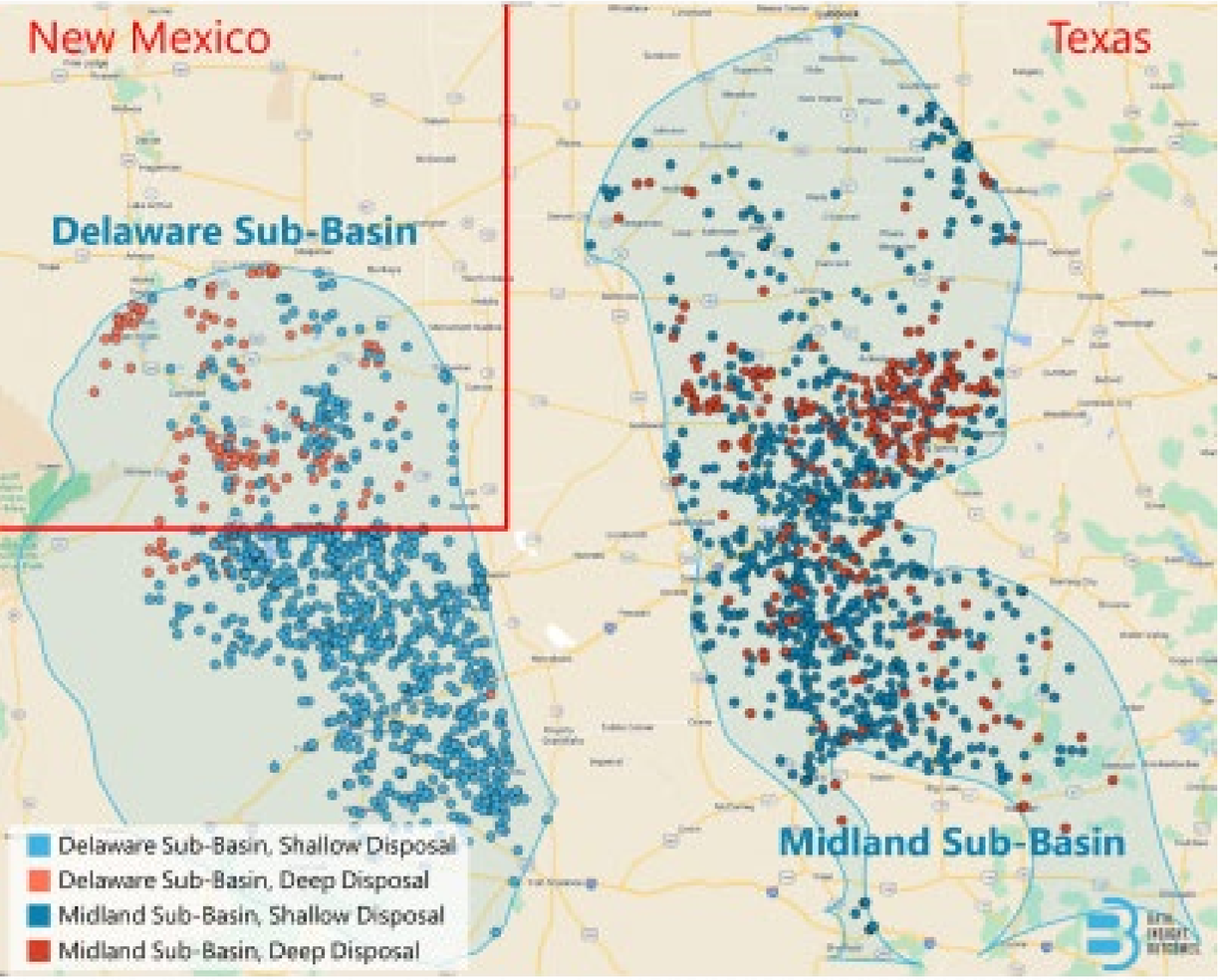


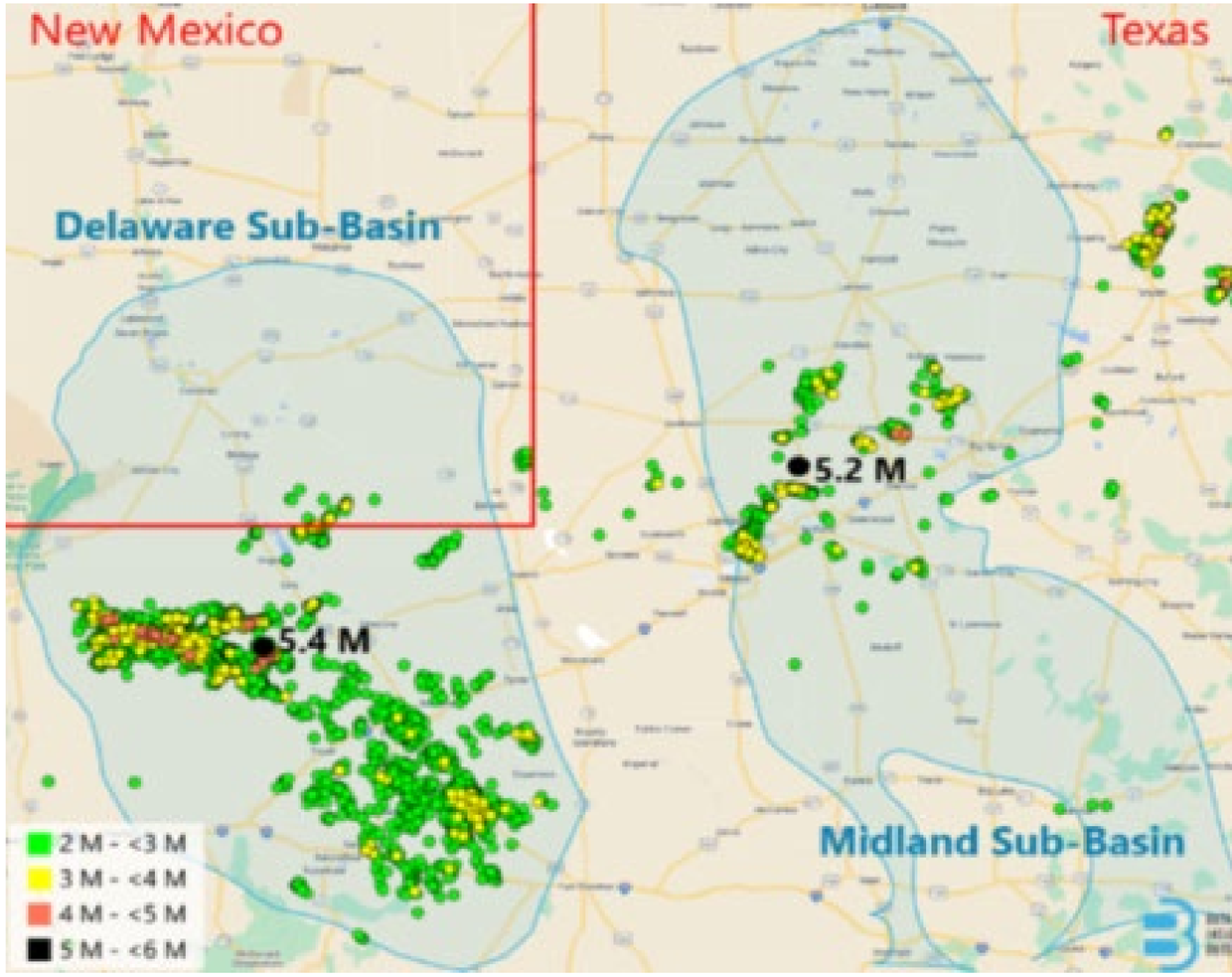
5.3 Billion Barrels Annually

222 Billion Gallons Annually

683,000 Acre/ft Annually

Where is the Produced Water?





What is in Produced Water?

*Common contaminants used as markers throughout the treatment process

EUROFINS MIDLAND	CLIENT: TEXAS PACIFIC WATER RESOURCES SUMMARY OF ANALYTICAL RESULTS FOR JOB#: 880-39374-1 METHOD: METALS BY EPA200.7 REV 4.4 PROJECT NAME:		RAW	HP		PRE-T		FFD		POST-RO	
ANALYTE NAME	UNITS	CAS#	Raw-PW	Oxidized	% dec.	Pre-Treatment	% dec.	Pre-RO-PW	% dec.	Post-RO	% dec.
Aluminum	mg/L	7429-90-5	<10.0	<10.0		<10.0		<10.0		<0.200	
Arsenic	mg/L	7440-38-2	<0.500	<0.500		<0.500		<0.500		<0.0100	
Barium	mg/L	7440-39-3	**3.33**	**2.63**	21%	**2.49**	25%	0	100%	<0.0100	
Cadmium	mg/L	7440-43-9	<0.250	<0.250		<0.250		<0.250		<0.00500	
Calcium	mg/L	7440-70-2	**3840**	**3200**	17%	**3010**	22%	**580**	85%	**8.77**	100%
Chromium	mg/L	7440-47-3	<0.500	<0.500		<0.500		<0.500		<0.0100	
Iron	mg/L	7439-89-6	**31.2**	*2*	94%	0	100%	<10.0		<0.200	
Lead	mg/L	7439-92-1	<0.500	<0.500		<0.500		<0.500		<0.0100	
Lithium	mg/L	7439-93-2	**22.2**	**18.5**	17%	**17.5**	21%	**3.92**	82%	**0.0765**	100%
Magnesium	mg/L	7439-95-4	**660**	**550**	17%	**520**	21%	**101**	85%	**1.48**	100%
Potassium	mg/L	7440-09-7	**630**	**520**	17%	**489**	22%	**106**	83%	**3.71**	99%
Selenium	mg/L	7782-49-2	<1.50	<1.50		<1.50		<1.50		<0.0300	
Silver	mg/L	7440-22-4	<1.00	<1.00		<1.00		<1.00		<0.0200	
Sodium	mg/L	7440-23-5	**56500**	**47000**	17%	**44500**	21%	**8800**	84%	**126**	100%
Strontium	mg/L	7440-24-6	**810**	**650**	20%	**630**	22%	**107**	87%	**1.41**	100%
Chloride	mg/L	16887-00-6	**104000**	**91700**	12%	**96600**	7%	**15000**	86%	**239**	100%
Nitrate as N	mg/L	14797-55-8	<50.0	<50.0		<50.0		<10.0		<0.100	
Fluoride	mg/L	16984-48-8	<250	<250		<250		<250		<0.500	
Nitrite as N	mg/L	14797-65-0	<50.0	<50.0		<50.0		<10.0		<0.100	
Sulfate	mg/L	14808-79-8	**561**	**535**	5%	**537**	4%	**88.6**	84%	**1.42**	100%
Ammonia	mg/L	7664-41-7	**659**	**606**	8%	**614**	7%	**125**	81%	**2.80**	100%
Gross Alpha	pCi/L	12587-46-1	<1790	<1490		**1770G**		<192		<3.55	
Gross Beta	pCi/L	12587-47-2	**1460**	**1080**	26%	*478*	67%	**113**	92%	**1.63**	100%
Radium-226	pCi/L	13982-63-3	**68.2**	**43.4**	36%	**90.7**	-33%	**45.5**	33%	**0.136**	100%
Radium-228	pCi/L	15262-20-1	**328**	**126**	62%	***246***	25%	**44.1**	87%	0	100%
Chemical Oxygen Demand	mg/L	STL00070	**1940**	**2140**	-10%	**2500**	-29%	**248**	87%	0	100%
Alkalinity	mg/L	STL00171	**252**	**204**	19%	**190**	25%	**42.1**	83%	**18.3**	93%
Bicarbonate Alkalinity as CaCO3	mg/L	STL00138	**252**	**204**	19%	**190**	25%	**42.1**	83%	**18.3**	93%
Carbonate Alkalinity as CaCO3	mg/L	STL00154	<4.00	<4.00		<4.00		<4.00		<4.00	
Hydroxide Alkalinity	mg/L	STL00127	<4.00	<4.00		<4.00		<4.00		<4.00	
Phenolphthalein Alkalinity	mg/L	STL00188	<4.00	<4.00		<4.00		<4.00		<4.00	
Specific Conductance	mho/cm @ 2	STL00244	**201000**	**193000**	4%	**196000**	2%	**41900**	79%	**894**	100%
Total Dissolved Solids	mg/L	STL00242	**184000**	**168000**	9%	**179000**	3%	**28100**	85%	**485**	100%
Total Suspended Solids	mg/L	STL00161	**152**	**54.4**	64%	**61.9**	59%	**9.00**	94%	0	100%
pH	SU	STL00204	**6.1HF**	**7.0HF**		**7.0HF**		**7.3HF**		**7.4HF**	
Temperature	Degrees C	STL00038	**14.0HF**	**14.1HF**		**15.1HF**		**14.8HF**		**14.7HF**	
Total Organic Carbon	mg/L	7440-44-0	<1.00	<1.00		<1.00		<1.00		<1.00	
C6-C12 Range Hydrocarbons	mg/L	STL00061	<5.00	<4.97		<5.08		<4.93		<4.87	
>C12-C28 Range Hydrocarbons	mg/L	STL00035	<5.00	<4.97		<5.08		<4.93		<4.87	
>C28-C35 Range Hydrocarbons	mg/L	STL00147	<5.00	<4.97		<5.08		<4.93		<4.87	
Total Petroleum Hydrocarbons (C6-	mg/L	STL00006	<5.00	<4.97		<5.08		<4.93		<4.87	

Most produced water that is produced in the Permian is 3-5x as salty as the ocean.
This water contains high amounts of oil and other VOCs, toxic bacteria (H2S), and high amounts of dissolved metals and scaling ions.
While many desalination methods exist for seawater, they require significant alterations to be applicable to PW.

PW Treated Quality

- **Anions** – 8 tested , 1 detected from latest sample (Chloride (44.2 mg/L)
- **Dioxins** – 11 tested, none detected
- **PFOS** – 37 tested, none detected >0.4 ng/L
- **Furan** – 14 tested, none detected
- **Pesticides & herbicides** – 91 tested, none detected
- **Metals** – 45 tested, Ba, B, Ca, Mg, K, Sr
- **PCBs** – 9 tested, none detected
- **Radionuclides** – 27 tested, 7 non -detect, Gross alpha reduced by 99.99992%, Gross beta reduced by 99.998%, Radium 226 & 228 reduced by 99.999%
- **SVOC** – 164 tested, none detected post GAC
- **VOC** – 69 tested, none detected post GAC
- **Hydrocarbons (TPH/TOG)** – 5 tested, none detected post GAC
- **WET** testing on next page

In addition to analytes regulated by TCEQ and those required by RRC Land application permit, the NPDES+ list that was created by the NMPWRC. This list includes over 500 analytes and has been performed by many beneficial reuse operators & shared with consortium.

WET Testing

Test performed Aug ‘24

Summary of the 7-day Fathead Minnow Survival and Growth		
Concentration	Percent Survival	Mean Growth (mg)
Control	100	0.611
6.25 %	97.5	0.610
12.5 %	100	0.633
25 %	100	0.648
50 %	100	0.660
100 %	100	0.718

Summary of the 6-day *Ceriodaphnia dubia* Survival and Reproduction Data		
Concentration	Percent Survival	Mean Reproduction
Control	100	43.7
6.25 %	100	41.0
12.5 %	100	39.1
25 %	100	38.1
50 %	90.0	32.3
100 %	100	38.8

Method 1000.0 Chronic *Pimephales promelas* (Fathead minnow) Survival and Growth Test: The following were concluded from the test:

Survival: **NOEC** 100 **LOEC** >100 **Growth:** **NOEC** 100 **LOEC** >100 **IC25** >100

Method 1002.0 Chronic *Ceriodaphnia dubia* Survival and Reproduction Test: The following were concluded from the test:

Survival: **NOEC** 100 **LOEC** >100 **Reproduction:** **NOEC** 100 **LOEC** >100 **IC25** >100

Test performed Nov ‘24

Summary of the 7-day Fathead Minnow Survival and Growth		
Concentration	Percent Survival	Mean Growth (mg)
Control	97.5	0.951
6.25 %	100	0.864
12.5 %	95.0	0.927
25 %	92.5	0.916
50 %	97.5	0.935
100 %	97.5	0.927

Summary of the 6-day *Ceriodaphnia dubia* Survival and Reproduction Data		
Concentration	Percent Survival	Mean Reproduction
Control	100	32.6
6.25 %	100	29.9
12.5 %	100	34.7
25 %	100	33.1
50 %	100	33.8
100 %	90.0	25.5

Method 1000.0 Chronic *Pimephales promelas* (Fathead minnow) Survival and Growth Test: The following were concluded from the test:

Survival: **NOEC** 100 **LOEC** >100 **Growth:** **NOEC** 100 **LOEC** >100 **IC25** >100

Method 1002.0 Chronic *Ceriodaphnia dubia* Survival and Reproduction Test: The following were concluded from the test:

Survival: **NOEC** 100 **LOEC** >100 **Reproduction:** **NOEC** 100 **LOEC** >100 **IC25** >100

WET testing was performed on RO permeate that was remineralized .

This is mandated for surface water discharge permits and used as a marker of toxicity removal by beneficial reuse treatment systems.

This method does not tell you the exact contaminant contributing to overall toxicity, but is a great indicator of overall performance and safety of the fluid.

Consortia are also performing human cell line testing and plant tissue testing to check for bioaccumulation.

*Photos taken from: (minnow) www.pearsonecological.com (ceriodaphnia dubia) www.cfb.unh.edu

Produced Water Quality

The 4 treatment steps described below represent a typical treatment process within O&G.

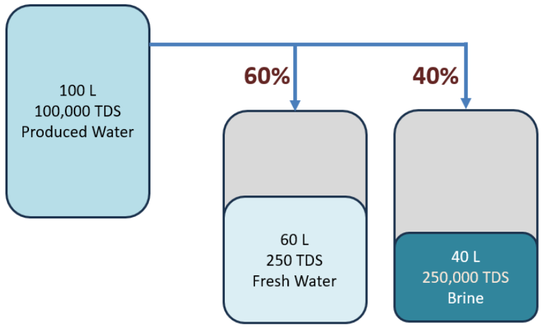
01 **Oxidation / Oil Separation**
Oxidation is used to disinfect H2S, aid in oil separation, and precipitate, Hydrogen peroxide.

02 **Coagulation**
Performed via chemical addition and mixing to create a floc of suspended particles to be removed, aluminum based coag.

03 **Flocculation / DAF**
Coagulated particles are sometimes flocculated via polymers that can be easily separated from the fluid. Sometimes assisted by dissolved air flotation.

04 **Optional pH / Polishing**
Some operators require a pH adjustment, others require a final polishing step via media or filter socks, pH adjust via Sodium Hydroxide

- Polishing of this sort is required before most desalination technologies.
- Desalination technologies reduce the TDS remaining in the water, not just salt.
- Desalination produces a low TDS effluent and a high salinity brine.
- Recovery volume of fresh water is dependent on starting salinity.
- Water can hold from 240,000-300,000ppm of solids before reaching saturation.
- Once low TDS is reached, water can be polished & disinfected as needed. (minerals, pH, DO, etc.)



Beneficial Reuse Pilot Testing

Texas Produced Water Consortium

TEXAS TECH UNIVERSITY

- Texas Produced Water Consortium
- Establish in 2021 with purpose of bringing together information and resources to study the economics and technologies related to beneficial uses of produced water, including environmental and public health considerations.
- Collaboration with 5 pilot tests to date and more planned for 2025
- Research Reports in 2022 and 2024 provided to Texas Legislature

NM STATE NEW MEXICO PRODUCED WATER RESEARCH CONSORTIUM

- New Mexico Produced Water Research Consortium
- Formed in 2019 to advance scientific research and technology development required to guide future statewide produced water reuse policy
- 14 pilot tests to date (5 pretreatment and 9 treatment)
- 15 pilot tests planned for 2025
- Numerous research publications
- On-going support of policy development for fit-for-purpose use of treatment produced water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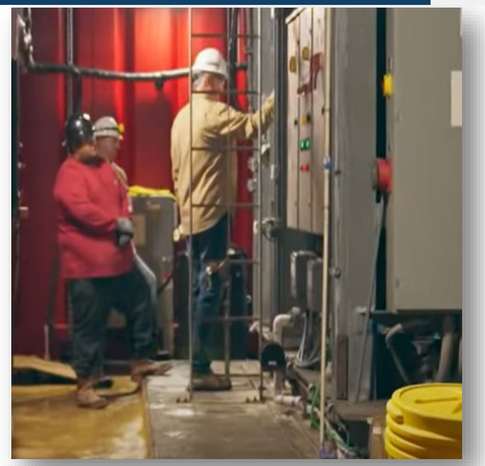
LEEDS – Field Testing Program



Stabilization Period (Jan-Feb)

- Control system automation
- Adjustments for ambient conditions
- Evaluation of influent chemistry
- Operation procedures/cadence

Performance Validation (Feb-May)

- Empirical data collection
  - Availability/Throughput
  - Recovery rate
  - Distillate quality
  - Energy consumption

Boundary Identification (May-August)

- Consistent results with variable inputs
- Operational min/max
- Full scale design validation

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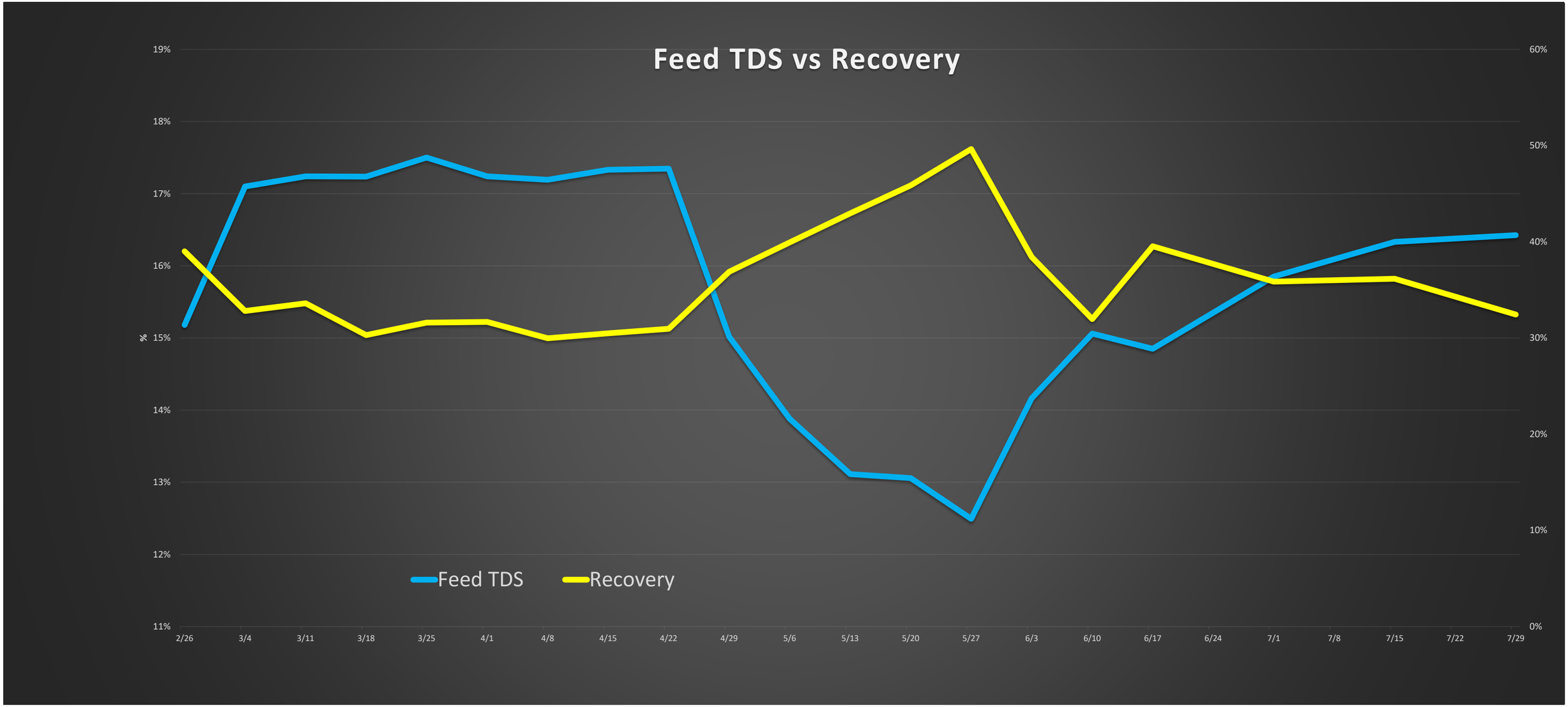
Pilot Operational Performance — Water Recovery



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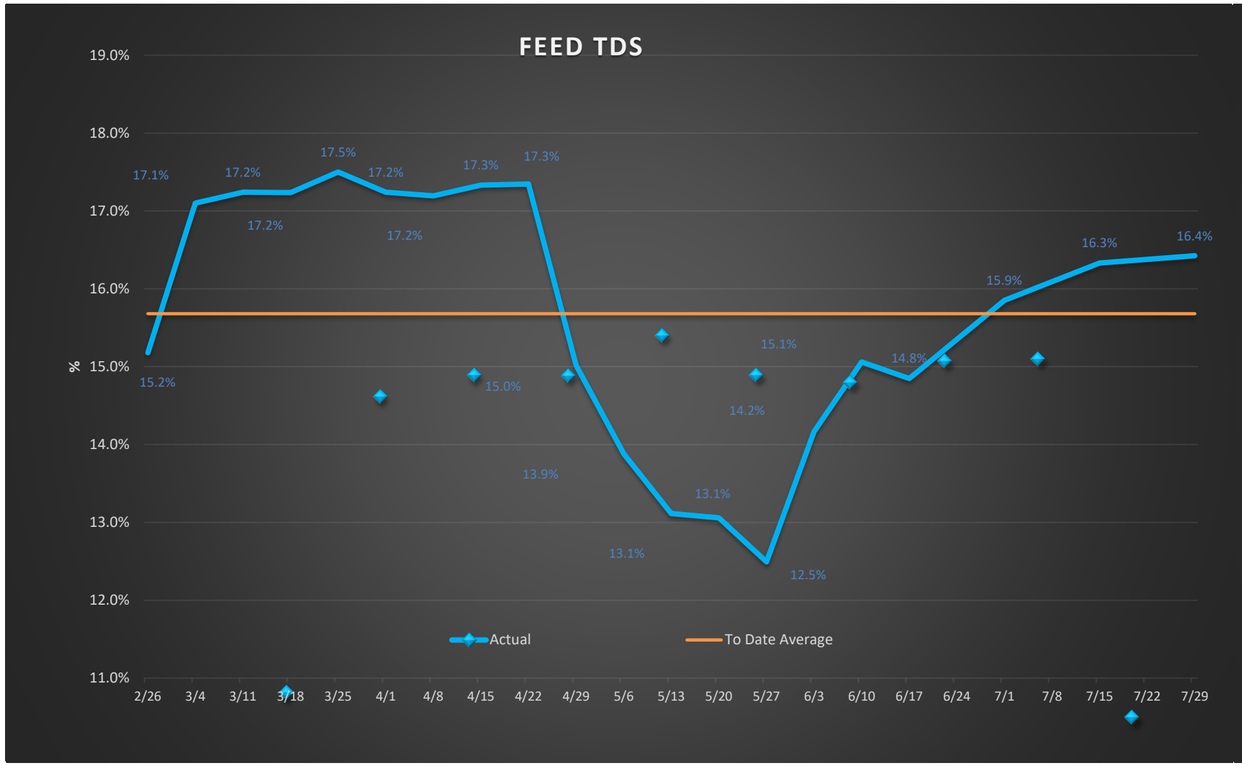
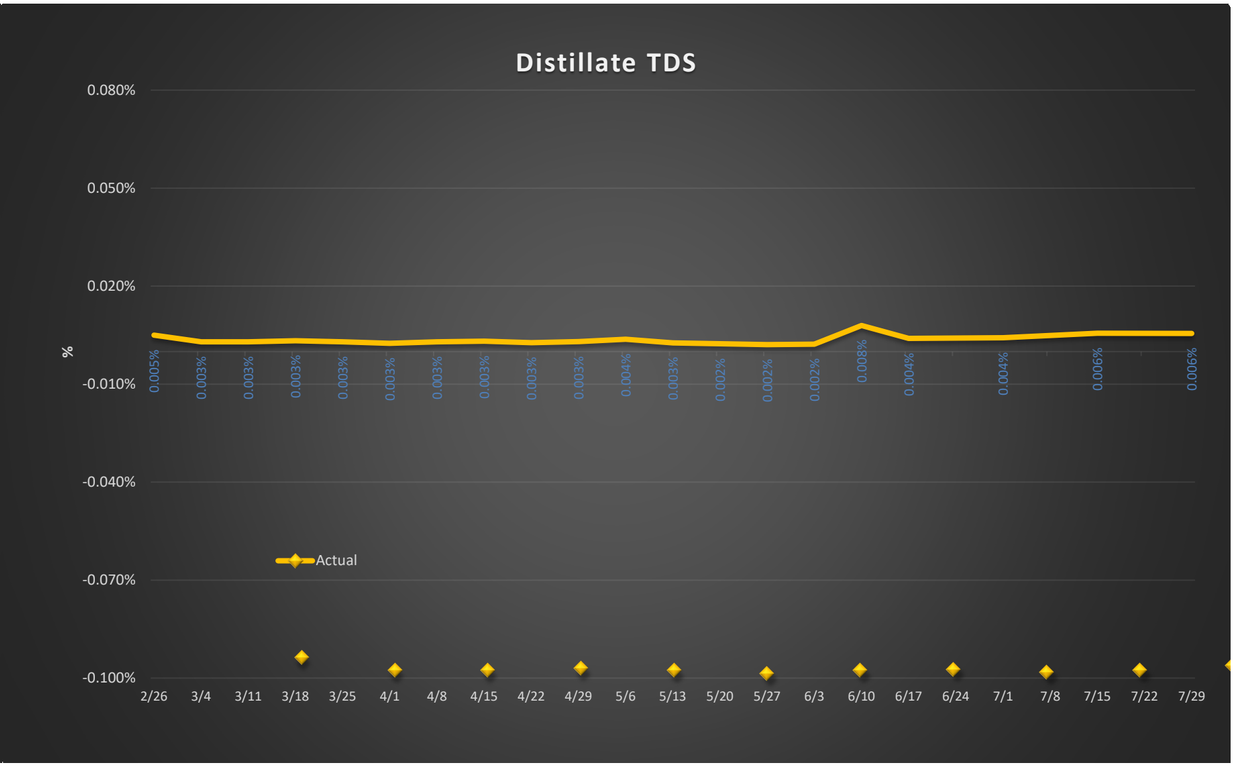
Pilot Water Quality

- Variable influent TDS ranging from ~125,000 to 190,000 mg/L
- Consistent high-quality distillate with an average TDS of **36** mg/L





LEEDS Clean Water Quality

Analyte	UoM	Application Limit	Avg.	Passes Data
pH	std. units	6.5-8.4	9.7	
Temperature	°C	20-30	17.3	
Alkalinity	mg/L	100	76.3	
Alkalinity,Bicarbonate	mg/L	100	49.2	
Hardness (total or dissolved)	mg/L	150	4.13	
Electrical Conductivity	µmho/cm	1500	161	
Turbidity	NTU	30	3.4	
Total Oil and Grease	mg/L	35	3	
Total Dissolved Solids	mg/L	1000	36	
Total Organic Carbon	mg/L		1.65	NL
Nitrogen, ammonia	mg/L	30	26.7	
Gross α/β	pCi/L	15	2.2	
^{226}Ra	pCi/L	30	0.86	
^{228}Ra	pCi/L	30	2.48	
Aluminum	mg/L	5	0.06	
Arsenic	mg/L	0.1	0.0067	
Beryllium	mg/L	0.1	0.0007	
Cadmium	mg/L	0.01	0.001	
Chromium	mg/L	0.1	0.01	
Cobalt	mg/L	0.05	0.007	
Copper	mg/L	0.2	0.04	
Fluoride	mg/L	1	0.5	

Analyte	UoM	Application Limit	Avg.	Passes Data
Iron	mg/L	5	0.12	
Lead	mg/L	5	0.03	
Lithium	mg/L	2.5	0.02	
Manganese	mg/L	0.2	0.02	
Molybdenum	mg/L	0.01	0.003	
Nickel	mg/L	0.2	0.01	
Nitrogen, nitrate	mg/L	45	1.2	
Nitrogen, nitrite	mg/L	10	0.39	
Vanadium	mg/L	0.1	0.01	
Zinc	mg/L	2	0.08	
Phosphorus	mg/L	5	0.05	
Selenium	mg/L	0.02	0.007	
Sodium	mg/L	300	19	
Sulfate	mg/L	500	5.9	
Total Petroleum Hydrocarbons	mg/L	10	0.2	
Boron	mg/L	0.75	0.62	
Chloride	mg/L	100	78.3	
Calcium	mg/L		3.2	NL
Magnesium	mg/L		0.79	NL
Phosphate	mg/L		0.05	NL
Potassium	mg/L		0.53	NL
Total Suspended Solids	mg/L		2.55	NL

Preliminary Subset Summary of Analytical Data Results from Laboratories for period of 02/19 - 7/29 of 2024.

Piloting of Tech

Pilot 1 (Aug ‘23 - Apr ‘24)

Summary: Technology constructed at pilot scale at R&D facility with on -site lab & greenhouse for crops & native plants. Data shared with consortia & regulatory bodies.

Key objectives:
- Technology validation
- Water quality investigation
- Development of treatment train
- Test native plants & soils
- Test effect on crops
- Data for RRC Land Apply & TCEQ TPDES

Details:
- 10-15 BBL per day
- 16 plant/soil combinations
- >400 analytes reviewed

Pilot 2 (Apr ‘24 – Nov ‘24)

Summary: RRC Land Apply Pilot permit to grow alfalfa from Apr -Nov ’24.
Plant, soil, and water sampled regularly.
Done in collaboration with consortia.
Non -provisional patent filed for process.

Key objectives:
- Obtain RRC Land Apply Pilot Permit
- Water Quality, WET, Non -target
- Regulatory investigation
- Non -target Univ. collaboration
- Scaling & Cost considerations
- Comparison to GW

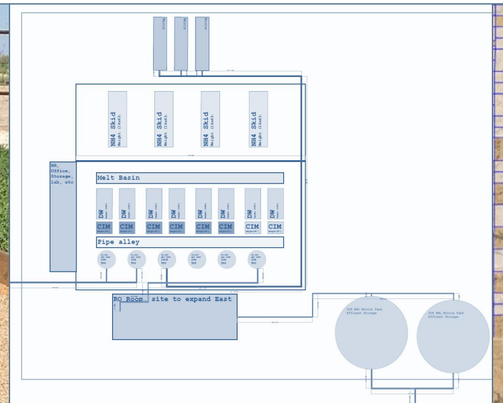
Details:
- 20 BBL per day
- Alfalfa grown in Lubbock soil
- >600 analytes reviewed

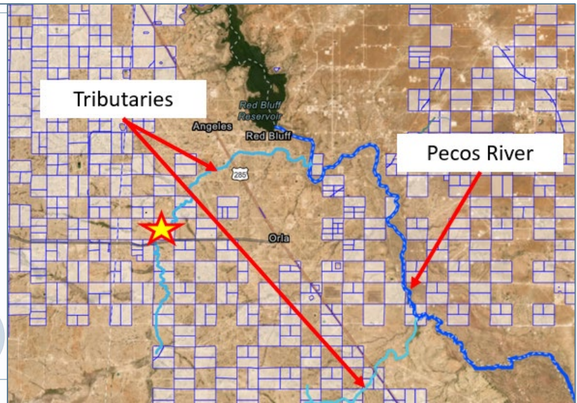
Pilot 3 (Jan ‘25 – Jul ‘25)

Summary: TWS plans to operate a 10k BPD desalination and discharge plant in Orla TX with option to discharge to surface water or Land.

Key objectives:
- Obtain discharge permit from TCEQ/RRC
- Publish data with University
- Continue to develop commercial framework
- Power study
- Brine solution & utilization

Details:
- 10k BPD Influent (~60% recovery)
- Operational Q2 -Q3 ‘25
- Surface & land discharge options
- Potential to study restoration in the heart of the basin





Greenhouse Results

- The greenhouse setup included 16 different soil/water/plant combinations (2.5x7x3) planter boxes
- Each row was irrigated with a different TDS effluent (500 -1500)
- Soil from Reeves and Loving was used to grow native plants and alfalfa without pesticides & herbicides (except bacillus thuri ngi ensis & Neem oil for army worms & Aphids that were present)
- Soil analysis was performed every 30 -40 days
- Alfalfa was sent to an Ag. Lab for nutrient analysis
- Native plant and root samples were sent to NMSU to perform more in -depth analysis (to be published)

- Water used in this study was a combination of the the RO permeate blended with the concentrate to increase TDS & mineral content.
- The addition of brine containing minerals such as Fe, B, Ca, Mg, produced the highest quality alfalfa in the 1000 TDS box, ho wev er, the RO concentrate was deemed unsafe to use for remineralization due to the presence of trace toxic contaminants.
  - *Groundwater used S. of Midland to grow alfalfa ranges from 3,000 -5,000 TDS*

Plants

	Loving RFV	Reeves RFV
1500	164.02	176.19
1000	189.91	175.39
500	142.79	146.33
Ctrl	142.84	160.53

Fair	Good	Premium	Supreme
130-150	150-170	170-185	>185

TDS	Chloride (mg/kg)	SAR
1500	+288.28	+1.43
1000	+102.48	+1.05
500	+65.48	+0.24
Ctrl	-30.30	-0.16

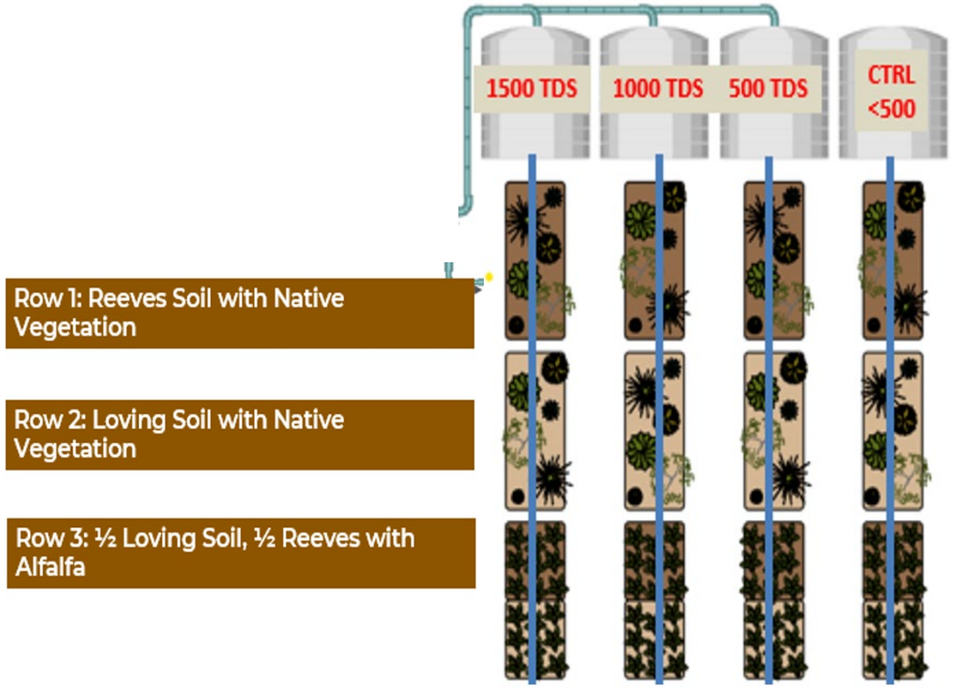
Alfalfa Results

Maintaining Plant & Soil Health

- Native plants: 15 -20 gal per week
- Alfalfa: 50+ gal per week (per 2.5x

- Irrigation rate did not seem to have as large of an effect on salinity in the alfalfa boxes that were irrigated with more than double the amount of treated water
  - For example, both (1500 TDS) Reeves natives and alfalfa increased by 295ppm of chlorides, and 1.5 SAR.
  - Irrigation must be tailored to the predicted uptake to maintain soil health
  - Minerals in the control soil decreased overtime due to the lack of nutrients in the control. Plant quality & size decreased over time as well
  - Increase in SAR in the 1500 was 1.5 over one simulated grow season without any simulated precipitation.
  - Since we can not use the RO Concentrate as is, addition of minerals via fertilizer will also be required to maintain healthy SAR & microbiome.

- The healthiest alfalfa was grown with 1500, and 1000TDS water due to the absence of fertilizer in our study
  - Excess minerals from blending resulted in a much healthier crop in comparison to the 500TDS and the control



Alfalfa Results, cont.

			1500 TDS		1000 TDS		500 TDS		Control <200 TDS	
Analyte	Unit	90% Range*	Sample Name							
			ALF CB1	ALF WK 1	ALF CB2	ALF WK2	ALF CB3	ALF WK3	ALF CB4	ALF WK4
Protien & Digestability										
Crude Protein	%DM	15.4-24.0	17.66	18.88	19.09	21.67	18.42	18.55	19.1	17.85
AD-ICP	%CP	5.24-11.5	5.04	5.2	5.14	4.3	6.36	6.2	6.65	7.06
ND-ICP w/SS	%CP		12.34	14.51	14.82	15	16.23	16.23	14.92	17.76
Protien Sol.	%CP	27.5-47.1	48.98	42.53	43.06	41.58	39.2	40.86	42.88	41.85
ADF	%DM	25.5-41.8	31.57	29.8	30.18	27.48	34.14	34.77	31.56	35.28
aNDF	%DM	31.9-51.8	36.43	34.66	34.72	33.06	39.61	40.21	37.26	39.95
aNDFom	%DM	29.3-48.5	32.26	29.42	31.52	31.14	35.26	31.84	32.78	31.63
Lignin	%NDFom		15.62	15.53	15.74	16.09	17.07	16.46	18.27	17.17
Lignin (Sulfuric Acid)	%DM	5.84-9.64	5.04	4.57	4.96	5.01	6.02	5.24	5.99	5.43
Sugar, Starches, Fats										
Sugar (ESC)	%DM	2.71-9.16	6.82	5.91	8.44	5.93	5.98	5.05	6.55	5.59
Sugar WSC	%DM	3.32-10.2	9.1	7.87	9.39	7.89	7.96	6.71	8.74	7.44
Starch	%DM	.28-3.74	3.75	4.37	4.98	5.1	4.03	2.91	2.83	2.38
Fat (EE)	%DM	1.77-3.35	3.06	3.05	3.16	2.99	2.77	3.08	2.94	3.14
TFA (fat)	%DM	0.81-2.33	1.27	1.12	1.3	1.24	0.99	1.04	1.14	1.07
Minerals										
Ash	%DM	9.15-13.8	16.78	17.18	14.25	12.35	14.66	18.73	15.71	18.59
Calcium	%DM	1.19-1.84	1.44	1.56	1.48	1.53	1.52	1.33	1.58	1.49
Phosphorus	%DM	0.23-0.39	0.35	0.35	0.37	0.37	0.34	0.41	0.32	0.38
Magnesium	%DM	0.25-0.41	0.31	0.35	0.32	0.39	0.32	0.35	0.33	0.33
Potassium	%DM	1.83-3.36	3.12	3.01	3.18	3.03	2.76	3.39	2.7	2.94
Sulfur	%DM	0.17-0.33	0.27	0.28	0.29	0.33	0.26	0.23	0.26	0.21
Chloride	%DM	0.16-1.13	1.47	1.24	1.13	1.01	0.85	0.85	0.73	0.61
Carbohydrates, RFV, RFQ										
NFC	%DM		33.21	35.14	35.67	35.85	32.66	31.85	33.12	33.03
NSC	%DM		12.85	12.24	14.37	12.99	11.99	9.62	11.57	9.82
RFV			**164.02**	**176.19**	**175.39**	**189.91**	**146.33**	**142.79**	**160.53**	**142.84**
RFQ			**138.44**	**160.27**	**174.87**	**204.11**	**132.37**	**133.41**	**145.66**	**140.14**
NDF kd rate MIR_P1	%hr		7.6	8.1	7.93	8.06	7.49	8.48	8.09	8.41
Total Digestable Nutrients										
TDN - ADF			64.31	65.69	65.39	67.49	62.3	61.81	64.31	61.42
TDN - OARDC			58.01	59.09	61.02	63.12	57.49	55.72	57.39	55.65
TDN - MLK 2013			56.61	59.51	62.29	65.83	57.75	57.56	58.71	58.61
Net Energy Lactation										
Nel x3 - ADF	Mcal/cwt		66.24	67.78	67.44	69.78	64	63.46	66.24	63.02
Nel x3 - OARDC	Mcal/cwt		59.15	60.35	62.5	64.84	58.57	56.6	58.46	56.52
Nel x3 - MLK 2013	Mcal/cwt		58.54	60.85	63.89	67.32	59.53	57.49	60.26	58.32
Net Energy Gain										
Neg - ADF	Mcal/cwt		36.62	37.83	37.87	39.48	35.43	35.21	36.7	35.1
Neg - OARDC	Mcal/cwt		34.03	35.89	38.46	42.19	33.35	31.26	33.65	30.81
Neg - MLK 2013	Mcal/cwt		32.11	36.36	39.99	45.35	33.89	33.69	35.42	34.78
Net Energy Maintenance										
Nem - ADF	Mcal/cwt		62.96	64.3	64.35	66.13	61.65	61.41	63.05	61.28
Nem - OARDC	Mcal/cwt		60.11	62.16	65	69.16	59.55	57.07	59.69	56.58
Nem - MLK 2013	Mcal/cwt		58	62.7	66.7	72.7	59.95	59.74	61.64	60.93
Milk per Ton										
Milk per Ton - MLK 2013	lbs/ton		2498	2700	2920	3184	2583	2507	2646	2580

Alfalfa from the 1000 TDS Row grown in Loving County (sandy loam) soil had the highest protein content & lowest non-digestible fiber.

Alfalfa from the 1000 TDS Row grown in Reeves County (clay rich) soil was highest in sugar, starches and fats.

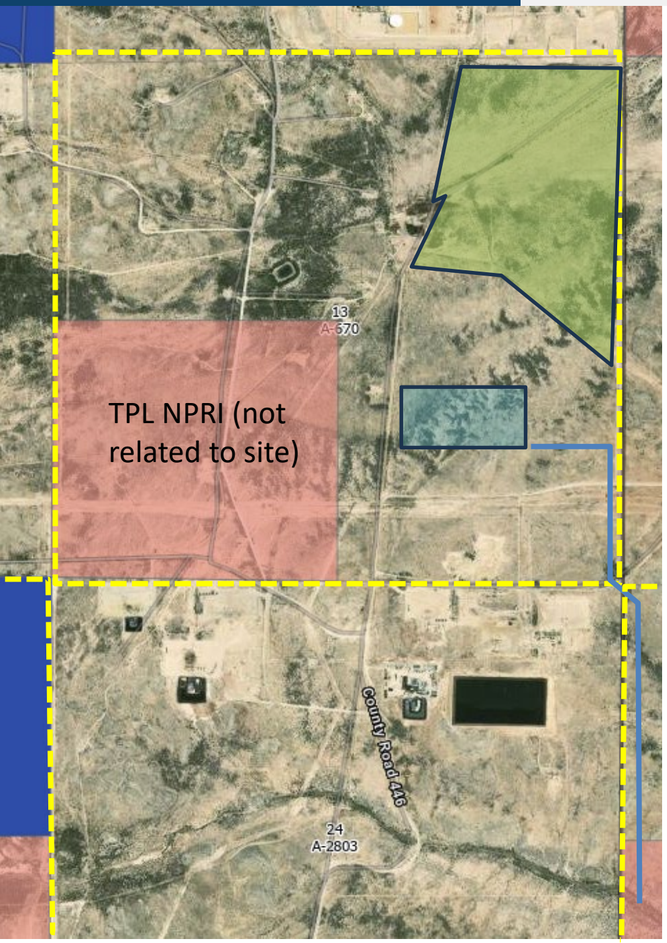
Mineral content in the plants was higher in the alfalfa that received higher TDS water, not surprisingly.

RFV (Relative Feed Value) was highest in the 1000 TDS sample from Loving county and the 1500 TDS sample from Loving County. This value is calculated using 2 values for forage quality and digestibility.
RFQ was the highest in both 1000 TDS samples.
RFQ (Relative Forage Quality) is a new calculation that takes more factors into consideration, like specific nutrients. .

As shown with color trends, these are calculated values based on factors listed above.
In this round greenhouse analysis, the 1000TDS box with loving soil outranked all of the other samples.

Plants from this trial were also tested for toxins, fungus, and mold. All came back negative

Future Projects



Land application area

TPL Section

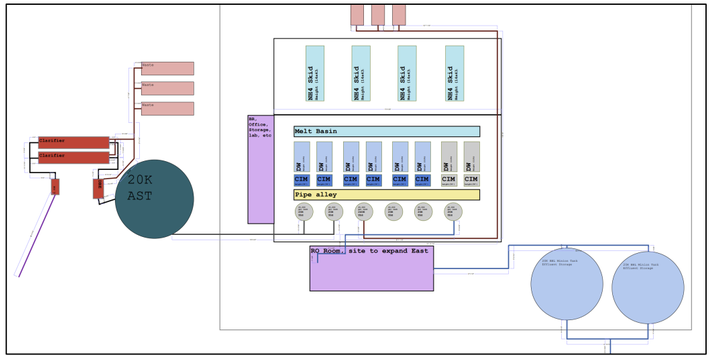
Desalination Facility

Discharge to Salt Creek

01

OPTION 1 – TPDES

- TWS has applied for a discharge permit to the Salt Creek, a tributary of the Pecos River.
- The discharge area is 1 mi to the south of the treatment location and 10 mi upstream of the Pecos River.
- The site plans to intake approx. 10K BPD or 420,000GPD and recover 65% for discharge.
- The site will grow in phases:
  - 16k BPD by mid -year '26
  - eventually grow to discharge up to 67K BPD.
- Remineralization will be required as the Avg salinity in the Pecos River is 15,000.
- See below 2022 TX SW Quality Standards



02

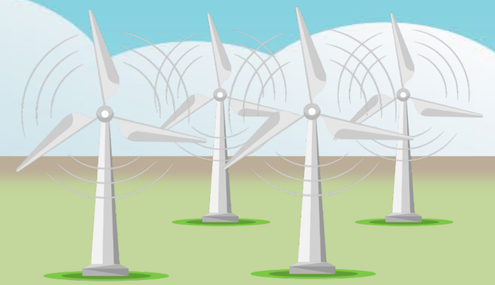
Option 2 – RRC Land Apply

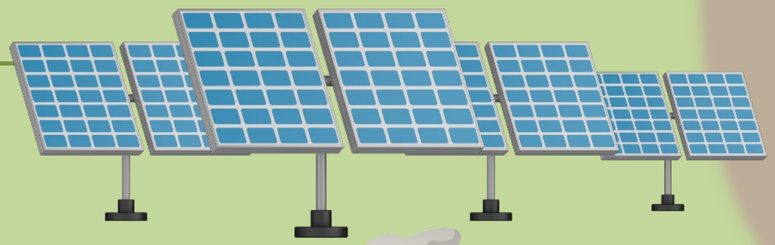
- In the NE corner of the map, the green area encompasses 110 ac. of land used for grazing that TWS is reserving for a potential Land Application – Restoration style project.
- This project would irrigate native brush grasses at approximately 0.7 in per week.
- Land application in this area could greatly improve the habitat in this area, and allow TWS, TTU, and the consortiums to keep researching the application of the treated fluid to native plants.
- Because land application rate will vary by seasons, discharge to Salt Creek would be preferable in winter months.

Segment No.	Rio Grande Basin Segment Names	Recreation Use	Aquatic Life Use	Domestic Water Supply Use	Other Uses	Cl^{-1} (mg/L)	SO_4^{-2} (mg/L)	TDS (mg/L)	Dissolved Oxygen (mg/L)	pH Range (SU)	Indicator Bacteria[1] #/100 mL	Temperature (degrees F)
2311	Upper Pecos River	PCR1	[4]			7,000	3,500	15,000	5.0[5]	6.5-9.0	33	92

Future of Beneficial Reuse

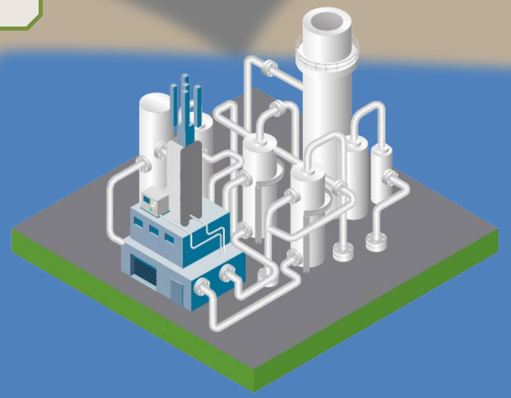
Power Generation





O&G Production

Produced Water Treatment



Agriculture