

# UICI-8-2

## EPA FALL-OFF TEST REPORT (WDW-2)

# 2023



## Technical Report

# MECHANICAL INTEGRITY AND RESERVOIR TESTING

CLASS I NON-HAZARDOUS DEEPWELL CHUKKA  
WELL NO. 2  
(OCD UIC Permit: UICI-008-2)  
(API Number: 30-015-20894)

HollyFrontier Navajo Refining Company  
Artesia, New Mexico

Section 12, Township 18S, Range 27E  
1980 FNL, 660 FWL

August 2023

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2023 MECHANICAL INTEGRITY AND RESERVOIR TESTING  
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**2023 MECHANICAL INTEGRITY AND RESERVOIR TESTING  
CLASS I NON-HAZARDOUS DEEPWELL  
OCD UIC Permit: UICI-008-2  
API Number: 30-015-20894**

**HollyFrontier Navajo Refining Company  
Artesia, New Mexico**

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Mechanical Integrity and Reservoir Testing  
HollyFrontier Navajo Refining-Artesia, New Mexico - August 2023

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## EXECUTIVE SUMMARY

This report summarizes the successful mechanical integrity testing (MIT) and falloff testing activities performed on the Chukka WDW-2 at the HollyFrontier Navajo Refining Company (HFNR) facility at Artesia, New Mexico. The work was performed as a condition of the applicable UIC permit issued by the New Mexico Oil Conservation Division (OCD). Under contract, Petrotek Corporation (Petrotek) developed the MIT procedures, provided field supervision, completed pressure transient test analysis, and prepared the final report documenting the fieldwork on the Class I non-hazardous injection well.

The test procedures were submitted to the OCD headquarters and OCD District II on April 26, 2023, before field activities commenced. Attachment 1 presents the test notification and procedures submitted to OCD. Approvals were received from regulatory agency staff prior to commencement of activities. No OCD personnel were present to witness testing. MIT and reservoir testing activities were supervised by Adam Simonsen (Petrotek).

The field activities consisted of an annulus pressure test (APT) and an injection falloff test on WDW-2. The well satisfactorily demonstrated mechanical integrity pursuant to the applicable UIC permit, guidelines and regulations. All MIT requirements were satisfied as a result of the work performed. Wellbore and reservoir properties were confirmed as similar to those determined from analysis of the previous testing conducted in the well.

**1. FACILITY INFORMATION**

- a. **Name** - HollyFrontier Navajo Refining Company
- b. **Location** - Highway 82 East, Artesia, New Mexico, 88211
- c. **Operator's OIL AND Gas Remittance Identifier (GRD) Number** - 15694

**2. WELL INFORMATION**

- a. **OCD UIC Permit number** - OCD UIC Permit: UICI-008-2
- b. **Well classification** - Class I Non-hazardous
- c. **Well name and number** - Chukka WDW-2
- d. **API Number** - 30-015-20894
- e. **Legal Location** - Section 12, Township 18S, Range 27E, 1980 FNL, 660 FWL

**3. CURRENT WELLBORE SCHEMATIC**

A wellbore schematic displaying the well configuration during testing is provided as Figure 1. A wellhead schematic is provided as Figure 2.

**4. COPY OF AN ELECTRIC LOG ENCOMPASSING THE COMPLETED INTERVAL**

A copy of the dual induction log run in 1973 during the initial completion of the well was submitted with the original permit and can be found online on the OCD website as part of the OCD well files for this well.

<https://wwwapps.emnrd.nm.gov/oed/oedpermitting/Data/WellDetails.aspx?api=30-015-20894&GISReferenceSource=ArcGISOnline>

**5. COPY OF RELEVANT PORTIONS OF ANY POROSITY LOG USED TO ESTIMATE FORMATION POROSITY**

A copy of the neutron density log, encompassing the completed interval between 7,570 and 8,399, can be found online on the OCD website as part of the well files for this well. From these logs, it was determined that the injection reservoir thickness is approximately 175 feet with an average porosity of 10 percent. Consistent with the most recent test analysis previously submitted, these values were used for the analysis performed in this report.

**6. PVT DATA OF THE FORMATION AND INJECTION FLUID**

Fluid samples of connate brine from the injection interval were collected from WDW-1 (33,000 mg/L) and WDW-2 (20,000 mg/L) during recompletion as Class I UIC wells. WDW-1, 2 and 3 are completed in the same injection formation. The average density and total dissolved solids (TDS) of the fluids recovered from the two wells were 1.03 g/cc and 26,500 mg/l, respectively. The results of formation fluid analysis were provided in documents previously submitted to and approved by OCD. Available analyte values for WDWs 1, 2 and 3 are provided in Table 1. Note that formation fluid samples were collected from WDW-4, but the well was completed in a separate injection zone. As such, WDW-4 geology and formation fluid samples will be discussed separately in the testing report for that well.

**TABLE 1**  
**HFNR FORMATION FLUID SAMPLE ANALYSIS RESULTS**

Chemical	Mewbourne Well (WDW-1)	Chukka Well (WDW-2)	Gaines Well (WDW-3)	Average
Date	7/31/1998	6/14/1999	9/8/2006	
Fluoride (mg/L)	2.6	9.7	ND	6.15
Chloride (mg/L)	19,000	15,000	10,447	14,816
NO <sub>3</sub> -N (mg/L)	<10	<10	--	<10
SO <sub>4</sub> (mg/L)	2,200	2,000	1,908	2,036
CaCO <sub>3</sub> (mg/L)	1,000	1,210	--	1,105
Specific Gravity (unitless)	1.0340	1.0249	--	1.0295
TDS (mg/L)	33,000	20,000	--	26,500
Specific Conductance (uMHOs/cm)	52,000	43,000	--	47,500
Potassium (mg/L)	213.0	235.0	85.5	177.8
Magnesium (mg/L)	143	128	155	142
Calcium (mg/L)	390	609	393	464
Sodium (mg/L)	12,770	8,074	6,080	8,975
pH	8.10	7.20	--	7.65

Note: ND: Non-detect; -- indicates no analysis.

The formation viscosity, fluid compressibility, and total compressibility were estimated using the average brine salinity along with the recorded bottom hole pressure and temperature in conjunction with industry standard correlations. The correlations used are from the SPE textbook on Pressure Transient Testing which was published as part of the SPE Textbook Series as Volume 9. For the sake of brevity, only page, equation, and figure numbers from this volume are listed subsequently in this report as a reference for all correlations presented for the PVT data.

The percent solids for the fluid was approximated as 2.65%, based on the average 26,500 mg/l TDS brine concentration for the formation samples presented in Table 1. A bottom hole temperature of 127 °F has been used as representative of the formation for these correlations. This value was derived from the original temperature log, run in 1999 when the well was recompleted. This log is can be found online on the OCD site as part of the well files for this well.

Fluid viscosity was estimated using multiple equations developed by McCain that first are used to estimate fluid viscosity at atmospheric conditions (equations B-72, 73, and 74), which is then converted to viscosity at bottom hole conditions (equation B-75) by using a correction factor. These equations can be found on page 527. As a primary input for the correlation, pressure is required,. The original formation pressure has been estimated at a depth of 7,570 feet using the average formation fluid specific gravity based on the TDS values provided in Table 1. Using this method, a value of 3,364.7 psi has been estimated as the original pressure at the depth the gauges were set at for testing (7,570 feet BGL). At this pressure and a temperature of 127 °F, the following equations have been used to derive viscosity:

$$\mu_{w1} = AT^B \quad (B-72)$$

$$A = 109.574 - 8.40564 * S + 0.313314 * S^2 + 8.72213 * 10^{-3} * S^3 \quad (B-73)$$

$$B = -1.12166 + 2.63951 * 10^{-2} * S - 6.79461 * 10^{-4} * S^2 - 5.47119 * 10^{-5} * S^3 + 1.55586 * 10^{-6} * S^4 \quad (B-74)$$

$$\frac{\mu_w}{\mu_{w1}} = 0.9994 + 4.0295 * 10^{-5} * P + 3.1062 * 10^{-9} * P^2 \quad (B-75)$$

Where,

$\mu_{w1}$  is the viscosity of the formation fluid at atmospheric conditions

$T_F$  is the bottom hole temperature in °F

S is the percent of solids

P is the bottom hole pressure in psi

$\mu_w$  is the viscosity of the brine at bottom hole conditions

Using these equations, a value of 0.56 centipoise is calculated for the formation fluid viscosity.

Formation Compressibility was estimated using equation L-89 provided on page 337. This equation was developed for limestone formations, consistent with the primary composition of the effective injection interval (see discussion in Section 11).

$$cf = \frac{a}{(1+bc\phi)^{\frac{1}{b}}} \quad (L-89)$$

Where,

$$\begin{aligned}a &= 0.8535 \\b &= 1.075 \\c &= 2.303 \text{ E}06 \\\Phi &= 0.10\end{aligned}$$

Based on this equation, a value of  $8.20\text{E-}6 \text{ psi}^{-1}$  is derived for formation compressibility.

Fluid compressibility was estimated using figures L-30 and L-31 on page 338. Based on a bottom hole temperature of  $127^\circ\text{F}$ , a bottom hole pressure of 3,374 psi, and a solids weight of 2.65%. Using Figure L-31 to first estimate freshwater compressibility, a value of  $2.86\text{E-}06 \text{ psi}^{-1}$  is derived. Using Figure L-30, the coefficient of isothermal compressibility (ratio of brine compressibility over freshwater compressibility) was determined to be approximately 0.95. This results in a value of  $2.70\text{E-}06 \text{ psi}^{-1}$  for the formation fluid compressibility ( $c_w$ ).

By combining the formation and formation fluid compressibility, the total system compressibility is determined. The total system compressibility ( $c_t$ ) is approximately  $10.9 \text{ E-}06 \text{ psi}^{-1}$ .

The specific gravity of the test fluid, based on the static gradient survey performed at the end of the test, was 1.001 (gradient of  $0.4335 \text{ psi/ft}$ ) with a measured temperature during injection of  $102.2^\circ\text{F}$ . Using Equations L-84 through L-87, the viscosity of the injected fluid at bottom hole conditions at the wellbore during injection is 0.71 cp. The compressibility of the injected fluid is (based on Figures L-30 and 31) is  $2.88 \text{ E-}06 \text{ psi}^{-1}$ .

The values presented in this section have been utilized for analysis unless stated otherwise.

## 7. DAILY RATE HISTORY FOR A MINIMUM OF ONE MONTH PRECEDING THE FALLOFF TEST

The following table summarizes recent operational data acquired with HFNR well monitoring equipment.

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HollyFrontier Navajo Refining-Artesia, New Mexico - August 2023

**TABLE 2**  
**JUNE AND JULY INJECTION DATA**

Date	Injection Pressure (psi)	Injection Rate (gpm)	Annulus Pressure (psi)
6/1/23	1,235.9	44.24	1,246.1
6/2/23	1,225.6	43.24	1,318.7
6/3/23	1,257.7	47.21	1,230.4
6/4/23	1,275.2	49.32	1,214.4
6/5/23	1,275.2	49.47	1,238.2
6/6/23	1,219.7	40.82	1,239.9
6/7/23	1,156.2	31.20	1,176.4
6/8/23	930.1	0.00	905.6
6/9/23	914.5	0.00	716.6
6/10/23	914.0	0.00	661.6
6/11/23	914.3	0.00	638.0
6/12/23	1,056.4	18.55	796.5
6/13/23	1,204.7	39.93	1,104.4
6/14/23	1,098.6	24.12	1,050.4
6/15/23	1,014.4	11.35	812.8
6/16/23	1,100.0	18.56	1,053.9
6/17/23	1,100.1	17.33	1,060.6
6/18/23	1,108.1	17.26	1,014.8
6/19/23	1,151.5	27.59	997.6
6/20/23	1,326.8	56.03	1,104.8
6/21/23	1,270.8	49.13	1,126.3
6/22/23	1,235.0	44.68	947.0
6/23/23	1,109.0	39.41	803.8
6/24/23	1,100.9	27.11	572.2
6/25/23	1,255.7	50.97	853.0
6/26/23	1,186.1	40.02	932.0
6/27/23	1,127.6	28.05	910.0
6/28/23	1,179.6	38.04	1,007.6
6/29/23	1,221.7	45.98	1,046.8
6/30/23	1,302.3	57.95	1,020.7
7/1/23	1,304.1	58.35	1,103.6
7/2/23	1,300.1	57.55	1,090.3
7/3/23	1,277.7	53.52	1,012.1
7/4/23	1,267.4	52.73	943.9
7/5/23	1,328.3	60.92	933.0
7/6/23	1,350.1	63.38	923.4
7/7/23	1,356.2	63.75	971.2
7/8/23	1,232.0	44.90	892.7
7/9/23	1,225.1	44.79	967.7



Mechanical Integrity and Reservoir Testing  
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Date	Injection Pressure (psi)	Injection Rate (gpm)	Annulus Pressure (psi)
7/10/23	1,189.9	36.76	917.7
7/11/23	1,100.1	12.81	828.0
7/12/23	1,138.8	25.69	832.3
7/13/23	1,107.8	21.20	807.1
7/14/23	1,099.1	20.25	767.7
7/15/23	1,265.0	48.37	941.8
7/16/23	1,275.3	50.35	912.3
7/17/23	1,275.2	50.76	926.7

## 8. CUMULATIVE INJECTION INTO THE FORMATION FROM TEST WELL

At the time of shut-in for testing the cumulative volume of waste injected into this well since operations began, based on HFNR records, is 31,945,485 barrels (1,341,710,366 gallons).

## 9. PRESSURE GAUGES

- a. **Describe the type of downhole surface pressure readout gauge used included manufacturer and type** - Two downhole pressure and temperature memory gauges were utilized for the falloff testing. The gauges were 1.25-inch Quartz pressure and temperature memory gauges manufactured by DataCan (Part No. 101696).
- b. **List the full range, accuracy and resolution of the gauge(s)** - The memory gauges are designed to measure pressure to an accuracy of 0.03% of full scale and a resolution of 0.01% of full scale, and operate within a range of 14.7 to 15,000 psi.
- c. **Provide the manufacturer's recommended frequency of calibration and a calibration certificate showing the date the gauge was last calibrated** - These gauges are recommended to be calibrated once per year. These gauges were last calibrated on 5/28/2021. The most recent calibration certificates are provided in Attachment 3. The bottom gauge (Serial Number - 224831) was utilized for analysis and hung at a test depth 7,557 feet BGL. The gauge data show reasonable measurements of surface pressure before testing, and resulted in data that is consistent with historical testing that do not reflect any concerns regarding gauge calibration.

## 10. ONE-MILE ARE OF REVIEW (AOR)

A standard one-mile Area of Review (AOR) was evaluated for WDW-2 as part of the annual testing and reporting requirements. This evaluation was performed by Federal Abstract Company. The wells located within this one-mile AOR are listed



in Attachment 6. This table includes a listing of operator, well name, API number, well type, well status, location, and date of abandonment or completion. A figure displaying the wells located in the AOR and the wells in the surrounding sections has been provided as Figure 13.

Based on OCD records no wells were drilled or plugged and abandoned within the one-mile AOR since the previous update. The Choate Davis 13 State #3 (30-015-48888) was spud on Feb 24, 2022 and has injected approximately 2.5 million barrels to date based on OCD records. The well has a total vertical depth of 8,784 feet and is completed in the Cisco and Canyon formations.

- a. **Wells Located Within the One-mile AOR** - The wells located within the one-mile AOR are provided as Attachment 6. This table shows the operator, well name, API number, well type, well status, location, and date of abandonment or completion. The only changes to this AOR list are presented in Table 3 above.
- b. **Status of Wells Within AOR** - In Attachment 6, SWD indicates Salt Water Disposal, P&A indicates Plugged and Abandoned, TA indicates Temporarily Abandoned, and AL indicates Abandoned Location.
- c. **Provide details on any offset producers and injectors completed in the same injection interval** - HFNR operates three other Class I Injection wells, two of which are completed in the same interval, WDW-1 and WDW-3. Only WDW-3 is located within the 1-mile AOR of WDW-2. Based on public data, there are three additional wells, not operated by HFNR that are located within the AOR and inject into the same interval. These wells are the AAO Federal SWD No. 1, operated by Apache Corporation, the Federal T SWD #1, operated by Limerock Resources, and the Choate Davis 13 State #3, operated by Riley Permian Operating Company, LLC. No offset producers exist in the injection interval within the AOR based on public data. Additional information is presented in Section 12 of this report.

## 11. GEOLOGY

- a. **Describe the geologic environment of the injection interval**
- b. **Discuss the presence of geologic features, i.e., pinchouts, channels and faults, if applicable**
- c. **Provide a portion of a relevant structure map, if necessary**

The following discussion provides detailed responses to the requirements listed above. This discussion is primarily based on information presented in previous permit applications for this well.

The WDW-1, 2 and 3 wells are located in the northern part of the Delaware Basin. The injection interval for the three wells is composed of carbonates from the Permian-age Lower Wolfcamp Formation, Pennsylvanian-age Cisco Formation,

and Pennsylvanian-age Canyon Formation. The Wolfcamp unconformably overlies the Cisco and Canyon Formations. Table 4, sourced from the 2019 MIT report, presents a summary of the logged formation depths for these formations in each of the wells. The geologic interpretations have been confirmed but not revised as part of this report.

**TABLE 4**  
**HFNR INJECTION FORMATION TOPS – WDW-1, 2 and 3**

Formation	WDW-1 (KB = 3,693 ft AMSL)		WDW-2 (KB = 3,623 ft AMSL)		WDW-3 (KB = 3,625 ft AMSL)	
	MD, KB (ft)	AMSL, KB (ft)	MD, KB (ft)	AMSL, KB (ft)	MD, KB (ft)	AMSL, KB (ft)
Lower Wolfcamp	7,450	-3,757	7,270	-3,647	7,303	-3,678
Cisco	7,816	-4,123	7,645	-4,022	7,650	-4,025
Canyon	8,475	-4,782	8,390	-4,767	8,390	-4,765
Base of Injection Zone (Base of Canyon)	9,016	-5,323	8,894	-5,271	8,894	-5,269

The lower portion of the Wolfcamp Formation, referred to as the Lower Wolfcamp, is the uppermost unit in the injection interval. The top of the zone ranges from 7,303 – 7,450 feet KB in the referenced wells. A structure map of the top of the Lower Wolfcamp is provided in Figure 3. The Wolfcamp ranges from fine to medium-grained, limestones with interbedded shales (Meyer, 1966). The picks for the top of the Wolfcamp were made from log correlations. The Wolfcamp is overlain by the dense, dolomitic Abo Formation. The gross thickness of the Lower Wolfcamp is approximately 363 feet thick. According to porosity log data from the area, the Wolfcamp porosity is generally greater than 5%.

The Cisco Formation is described as consisting of limestone/dolomite with some interbedded shales and fine-grained sandstones (Lindsay et al., 2006). The top of the Cisco occurs at approximately 7,645 – 7,816 feet KB. A structure map of the top of the Cisco can be found in Figure 4. Coarse-grained dolomites have been noted to have interstitial to cavernous porosity (Lindsay et al., 2006). At the three HFNR wells, the Cisco Formation is a porous dolomite that ranges from gross thickness of 659 feet to 745 feet. The net thickness using a porosity cutoff of greater than 10% is approximately 100 feet in WDW-1, 32 feet in WDW-2, and 65 feet in WDW-3.

The Canyon Formation typically consists mostly of brown limestone with interbedded grey shales (Lindsay et al., 2006). The top of the Canyon occurs at approximately 8,400 KB. Some white sandstone and conglomerates have been noted at the base of the Canyon (Lindsay et al., 2006). Some dolomites have been noted to be present in the Canyon as well. Gross thickness of the Canyon Formation is approximately 504-541 feet in the three wells. The net thickness using

a porosity cutoff greater than 5% is approximately 34 feet in WDW-1, 30 feet in WDW-2, and 10 feet in WDW-3. No intervals appear to have a porosity more than 10%, based on logs. A structure map is provided in Figure 5 which displays the top of the Strawn Formation, indicating the bottom of the Canyon.

## 12. OFFSET WELLS

HFNR operates three other Class I Injection wells locally, two of which are completed in the same interval, WDW-1 and WDW-3. Only WDW-3 is listed in Attachment 6 since WDW-1 is not within the 1-mile AOR surrounding WDW-2.

WDW-1 is approximately 10,900 feet to the northeast of WDW-2, while WDW-3 is approximately 3,100 feet to the northeast of WDW-2. These wells were injected into at a constant rate during the duration of testing, are at a significant distance from the test well, are completed in a relatively high permeability system, and are not considered to have had an unacceptable impact on the testing performed on WDW-2.

There are three additional wells, not operated by HFNR that are located within the AOR and inject into the same interval. These wells are the AAO Federal SWD No. 1, operated by Apache Corporation, the Federal T SWD #1, operated by Limerock Resources, and the Choate Davis 13 State #3, operated by Riley Permian Operating Company, LLC. No offset producers exist in the injection interval within the AOR based on public data.

- a. **Identify the distance between the test well and any offset wells completed in the same injection interval** - WDW-3 is approximately 3,100 feet to the north-northeast of WDW-2, the AAO Federal SWD No. 1 is approximately 5,100 feet to the north-northeast, the Federal T SWD #1 is approximately 3,800 feet to the east-northeast, and the Choate Davis 13 State #3 is approximately 3,950 feet to the north.
- b. **Report the status of the offset wells during both the injection and shut-in portions of the test** - The offset HFNR wells were operated at a constant rate during testing. During May 2023, data from the state website indicated average injection rates of approximately 30 gpm for the AAO Federal SWD #1, 145 gpm for the Federal T SWD #1 and 225 gpm for the Choate Davis 13 State #3.
- c. **Describe the impact, if any, of the offset wells during both the injection and shut-in portions of the test** – Development of a useful test was not prevented by these offset injection wells, although the late-time test data is impacted by non-radial flow effects. Average reservoir pressure and extrapolated 1-hour pressures are also impacted by these offset wells. Further discussion of possible late-time effects is included in Section 15 of this report.

## 13. CHRONOLOGICAL LISTING OF THE DAILY TESTING ACTIVITIES

- a. **Date of the test** - Testing was performed from July 18 - 20, 2023.

- b. **Time of the injection period** - Constant-rate injection occurred for approximately 48 hours before the falloff test began. This injection period exceeded the duration of the falloff.
- c. **Type of injection fluid** - Filtered waste was utilized as the test injection fluid.
- d. **Final injection pressure and temperature prior to shutting in the well** - Prior to shutting in the well, the bottom hole injection pressure was 4,424.9 psia (at 7,557 feet BGL) and the injection rate was 48.3 gpm (1,655.9 bpd) with a measured bottom hole temperature of 105.1 °F.
- e. **Total shut-in time** - The well was shut-in for approximately 48 hours for testing.
- f. **Final static pressure and temperature at the end of the falloff portion of the test** - At the conclusion of the test, the final bottom hole pressure was 4,201.7 psia and the final bottom hole temperature was 106.4 °F.

**14. DESCRIBE THE LOCATION OF THE SHUT-IN VALVE USED TO CEASE FLOW TO THE WELL FOR THE SHUT-IN PORTION OF THE TEST**

The well was shut-in using a wing valve located on the inlet side of the wellhead.

**15. PRESSURE FALLOFF ANALYSIS**

This section addresses requirements 15-20 of Section IX, Report Components, of the OCD falloff test guidelines.

The equations, parameters and calculations utilized to derive these values are detailed further below. Table 5 contains input values used to perform the specified calculations.

The raw digital data collected during the test is provided in Attachment 7. The contracted service company that supplied the gauges used for testing generated an injection falloff test summary report based on the data that was collected. This report is provided in Attachment 4.

- a. **Radius of test investigation** - The radius of investigation for this test was determined to be 2,463 feet based on the average permeability derived from test analysis.
- b. **Time to beginning of the infinite acting portion of the test** - The time at which the test shows evidence of the likely transition to radial flow was approximately 6 hours after shut-in. This value was derived from both the diagnostic and semi-log plots.
- c. **Slope(s) determined from the semi-log plot** - The slope for the likely radial period, as determined by the semi-log plot, 8.80 psi/cycle.
- d. **Transmissibility (kh/μ)** - The transmissibility was determined to be 30,588 md-ft/cp.

- e. **Permeability (k)** - The permeability was determined to be 98 md.
- f. **Skin Factor (s)** - The skin factor was determined to be 20.2 units.
- g. **Pressure drop due to skin ( $\Delta P_{\text{skin}}$ )** - The pressure drop due to skin was determined to be 154.7 psi
- h. **Flow efficiency** - The flow efficiency was determined to be 0.31.
- i. **Flow capacity (kh)** - The flow capacity (permeability-thickness) was determined to be 17,129 md-ft.
- j. **P<sub>1hr</sub>** - The extrapolated 1-hr pressure was determined to be 4,217.9 psi.

**TABLE 5**  
**FALLOFF TEST ANALYSIS INPUT VALUES**

Parameter	Value	Unit
Formation Thickness, h	175	feet
Porosity, $\Phi$	10	percent
Viscosity, $\mu$	0.56	centipoise
Formation Compressibility, $c_f$	8.20E-06	1/psi
Total Compressibility, $c_t$	10.90E-06	1/psi
Formation Volume Factor, B	1.00	bbl/stb
Wellbore Radius, $r_w$	0.3281	feet
Final Well Flowing Pressure, $p_{wf}$	4,424.9	psia
Final Injection Rate, $q_{\text{final}}$	1,655.9 48.3	bwpd (gpm)
Horner Straight Line Slope, m	8.80	psi/cycle

The average historical injection period used to account for total volume in the analysis was calculated by dividing the cumulative historical injection through 6/1/2020 (28,632,970 barrels) by the final injection rate (50.8 gpm). This resulted in a value of 394,919 hours. This value of 394,919 hours of injection at 50.8 gpm was used in conjunction with the injection data collected from 6/1/2020 through 7/18/2022. The total waste volume injected up to the time of shut-in utilized for calculations was 1,341,710,366 gallons (31,945,485 bbls).

To determine the mobility-thickness (transmissibility), the following equation was utilized. The resulting transmissibility was 30,588 md-ft/cp.

$$\frac{kh}{\mu} = 162.6 \frac{q_{\text{final}} B}{m}$$

Where,

k is the permeability, in md

h is the formation thickness, in feet

$\mu$  is the viscosity of the formation fluid, in cp

q is the final flow rate, in bpd

B is the formation volume factor in RB/STB

m is the slope of the line assigned to the radial flow period on the semi-log plot, in psi/cycle

and 162.6 is a unit conversion constant

$$\frac{kh}{\mu} = \text{Transmissibility} = 162.6 \frac{1,655.9 * 1.0}{8.80274} = 30,588 \frac{md - ft}{cp}$$

The transmissibility was then used to determine the permeability thickness. The resulting permeability-thickness was 17,129 md-ft.

$$kh = \left(\frac{kh}{\mu}\right) \mu = 30,588 \left(\frac{md - ft}{cp}\right) 0.56 cp = 17,129 md - ft$$

The permeability thickness was then used to determine the permeability of the reservoir. The resulting permeability was 98 md.

$$k = \frac{kh}{h} = \frac{17,129 md - ft}{175 ft} = 98 md$$

In order to determine if the proper viscosity was utilized in the previous calculations, it must be determined if the pressure transient was traveling through reservoir fluids. This is done by determining the time it is expected to take the pressure transient to travel through the injected fluid. The first step of this is to determine the radius of waste emplaced by injection. The piston-like displacement radius was estimated to be 1,806 feet.

$$r_{waste} = \sqrt{\frac{0.13368 * V}{\pi h \Phi}}$$

Where,

r<sub>waste</sub> is the distance to the waste front, in feet

V is the total volume of fluid injected into the well, in gallons

h is the formation thickness, in feet

Φ is the porosity, as a fraction

0.13368 is a conversion constant



$$r_{waste} = \sqrt{\frac{0.13368 * (1,341,710,366)}{\pi * 175 * 0.10}} = 1,806 \text{ feet}$$

Based on this radius, the time for a pressure transient to travel through this fluid can be calculated. The resulting time was 19.3 hours.

$$t_{waste} = 948 \frac{\Phi \mu_{waste} c_t r_{waste}^2}{k}$$

Where,

$t_{waste}$  is the time for a pressure transient to reach the waste front, in hours  
 $\Phi$  is the porosity, as a fraction  
 $\mu_{waste}$  is the viscosity of the waste, in cp  
 $r_{waste}$  is the radius of the waste front, in feet  
 $c_t$  is the total compressibility, in  $\text{psi}^{-1}$   
 $k$  is the permeability, in md  
 948 is a conversion constant

$$t_{waste} = 948 \frac{0.10 * 0.56 * 10.90E-06 * (1,806)^2}{97.9} = 19.3 \text{ hours}$$

Based on this result, and the time it took for the transition to radial flow to start (~6 to 10 hours), it is known that the pressure transient was traveling through reservoir fluid during the middle-time flow period. Late time data of the test, after the end of the data used for analysis, is likely impacted by changing fluid properties and the effects of offset injection so are not suitable for radial flow analysis. This indicates that the appropriate viscosity was used for the evaluation.

The near wellbore damage, referred to as skin, can be calculated based on the results of the straight line, semi-log analysis as well. This is done by utilizing the following equation. The result of this calculation was 20.2 units.

$$s = 1.151 \left( \frac{P_{wf} - P_{1hr}}{m} - \log \left( \frac{k}{\Phi \mu c_t r_w^2} \right) + 3.23 \right)$$

Where,

$s$  is skin damage, in units  
 $P_{wf}$  is the shut-in well pressure, in psi  
 $P_{1hr}$  is the extrapolated pressure at a time of 1 hour, using the slope of the straight line from the semi-log analysis, in psi  
 $m$  is the slope of the radial line, in psi/cycle  
 $k$  is the permeability, in md  
 $\Phi$  is the porosity, as a fraction

$\mu$  is the viscosity, in cp  
 $r_w$  is radius of the wellbore in feet  
 1.151 and 3.23 are constants

$$s = 1.151 \left( \frac{4,424.9 - 4,217.9}{8.80274} - \log \left( \frac{97.9}{0.10 * 0.56 * 10.90E - 06 * 0.3281^2} \right) + 3.23 \right) = 20.2$$

The change in pressure, due to skin, in the wellbore can be calculated using the following equation. The result of this calculation was 154.7 psi of pressure due to skin.

$$\Delta P_{skin} = 0.869 * m * s$$

Where,

$\Delta P_{skin}$  is the change in pressure due to skin damage, in psi  
 $m$  is slope of the radial line, in psi/cycle  
 $s$  is skin, in units  
 0.869 is a conversion constant

$$\Delta P_{skin} = 0.869 * 8.80274 * 20.2 = 154.7 \text{ psi}$$

The flow efficient (FE) can be determined using the following equation, provided within the OCD Guidelines (Section IX, 15, h). The result of this calculation was 0.31.

$$FE = \frac{P_{wf} - \Delta P_{skin} - P_{end \text{ of test}}}{P_{wf} - P_{end \text{ of test}}}$$

Where,

$P_{wf}$  is the shut-in well pressure, in psi  
 $\Delta P_{skin}$  is the change in pressure due to skin damage, in psi  
 $P_{end \text{ of test}}$  is the pressure at the end of the falloff test, in psi

$$FE = \frac{4,424.9 - 154.7 - 4,201.7}{4,424.9 - 4,201.7} = 0.31$$

The test radius of investigation ( $r_{inv}$ ) can be determined using the following equation. The result of this calculation was 2,463 feet.

$$r_{inv} = 0.029 \sqrt{\frac{kt}{\Phi \mu c_t}}$$



Where,

k is permeability, in md  
 t is time, in hours  
 $\Phi$  is porosity, as a fraction  
 $\mu$  is viscosity, in cp  
 $c_t$  is total compressibility, in  $\text{psi}^{-1}$   
 0.029 is a constant

$$r_{inv} = 0.029 \sqrt{\frac{97.9 * 48}{0.1 * 0.56 * 10.90E - 06}} = 2,463 \text{ feet}$$

Based on examination of the log-log diagnostic plot provided as Figure 9, early time data is dominated by changing wellbore storage. Based on the model fit shown in Figure 9, the test data appears to be transitioning into a radial flow period approximately 6-8 hours after shut-in. The middle-time data of the test has also been analyzed using the analytical Horner semi-log method based on the reasonable assumption that a period of radial flow exists in the data. The derivative shows that offset heterogeneity, interference, and/or dual porosity effects may influence the data for the remainder of the test after approximately 10-12 hours of shut-in. Figure 10 shows the semi-log plot of the falloff with a straight line representing a possible radial flow period consistent with the deviation from storage shown on the log-log plot. The late-time tail at the end of the test is used in this analysis. The simulation analysis presented in Figure 9 generally supports the more simplistic graphical analysis that relies upon the semi-log slope. The character of the fall-off data and the derivative are similar to the patterns evident in previous testing of this well.

The following figures are provided:

- Figure 6 - Cartesian Plot of Pressure, Temperature and Rate vs. Time
- Figure 7 - Full Rate History Plot
- Figure 8 - Cartesian Plot of Pressure Falloff with Model Match
- Figure 9 - Log-log Derivative Plot with Model Match
- Figure 10 - Semi-log Horner Plot with Model Match
- Figure 11 - Daily Injection Rate History for Month Prior to Test Plot
- Figure 12 - Hall Plot

As specified by OCD requirements, a Hall Plot (Figure 12) generated from the data presented in Table 2 over the month leading up to the falloff test this year is presented. It is noted that this plot of a limited elapsed time of the Hall function is

a simplistic presentation based on correcting average daily wellhead pressures to bottomhole conditions based on hydrostatic head and tubing friction loss. The plot has been made with this raw BHP rather than a pressure change (or  $\Delta p$ ) that would be generated by subtracting original reservoir pressure from the injection pressure value. Because this BHP value is used, the Hall plot slope is not proportional to other indicators, but qualitatively can yield insight to well conditions based on changing slopes. Further, consistent with the Hall method, it is assumed that the reservoir is homogenous and isotropic, that none of the average daily pressures are impacted by transient flow (relatively continuous, constant-rate injection took place), and that no offset wells are impacting pressure at this well during the time that the Hall function has been plotted (June and July of 2023). The slope of the data is fairly linear for the first half of this period and then flattens substantially through the end of the data plotted. This behavior is likely associated with reductions in rates at the test well and offset wells in the vicinity and is not likely associated with changes in well condition taking place during this time period.

Table 6 shows all historical well test analysis results, including the results from the test this year. Attachment 5 presents a summary of the falloff test analysis.

**TABLE 6**  
**HISTORICAL AMBIENT RESERVOIR TESTING**

Year	Fill Depth (feet)	Permeability (md)	Mobility-thickness (md-ft/cp)	Skin (units)	P* (psia)
2023	8,331	98	30,588	20.2	4,162.9
2022	8,306	509	158,999	64.4	4,006.1
2021	8,304	493	154,200	336.9	3,951.0
2020	8,355	825	229,281	149.4	4,039.6
2019	8,375	466	143,138	77.7	4,138.6
2018	8,356	785	240,931	117.0	4,239.8
2017	8,356	829	254,457	83.9	4,216.1
2016	8,362	510	156,606	25.8	4,259.4
2014	8,773	1,080	320,328	38.6	4,285.2
2012	8,775	1,848	548,069	26.0	3,898.6
2011	8,335	1,451	430,405	29.4	3,697.3
2010	8,775	820	243,821	86.5	3,576.6
2009	8,775	856	253,821	39.7	3,445.9
2008	NA	1,091	265,300	155.0	3,393.5
2006	NA	2,184	707,629	81.6	3,393.6
2005	NA	2,496	808,946	23.5	3,348.0
2001	NA	2,211	716,551	54.1	3,236.4
1999	NA	4,712	1,527,060	59.7	2,844.5
Permit	NA	250	40,094	NA	NA

All raw data generated by the test will be kept on file by HFNR for a period not less

than five years. The raw data has been provided as a part of this report, with additional files available upon OCD request.

## 16. INTERNAL MECHANICAL INTEGRITY

On July 20, 2023, the annulus was pressured to 526 psi to begin the Part I static annulus pressure mechanical integrity test. The well had been shut in for approximately 49 hours prior to the test, ensuring sufficient thermal equilibrium. A calibrated digital pressure gauge (Crystal XP2i, 5,000 psi, SN - 212165) supplied by Petrotek was installed on the annulus at the wellhead. The well and test gauge were then isolated from the rest of the system and annulus pressure was then monitored for a period of thirty minutes at 5-minute intervals. During the test the pressure decreased by 3.3 psi. Since a change of 10% (52.6 psi) of the test pressure is allowable, this test is within acceptable specifications.

Attachment 2 presents a copy of the gauge certification. Pressures were observed as follows during testing.

**TABLE 7**  
**ANNULUS PRESSURE TEST MEASUREMENTS**

Time, Minutes	0	5	10	15	20	25	30
Pressure, Psi	526.0	524.9	524.1	523.2	522.7	522.8	522.7

# FIGURES

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***Petrotek***

OCD UIC Permit: UICI-008-2  
 Well API Number: 30-015-20894  
 Eddy County, New Mexico  
 Sec. 31, T17S-R27E  
 Lat. 32.763772° / Long. -104.238508° (NAD 83)

All depths referenced to Kelly Bushing (KB)  
 elevation 13' above ground level.  
 Ground Level Elevation: +3,610' MSL

Base of USDW - 473'

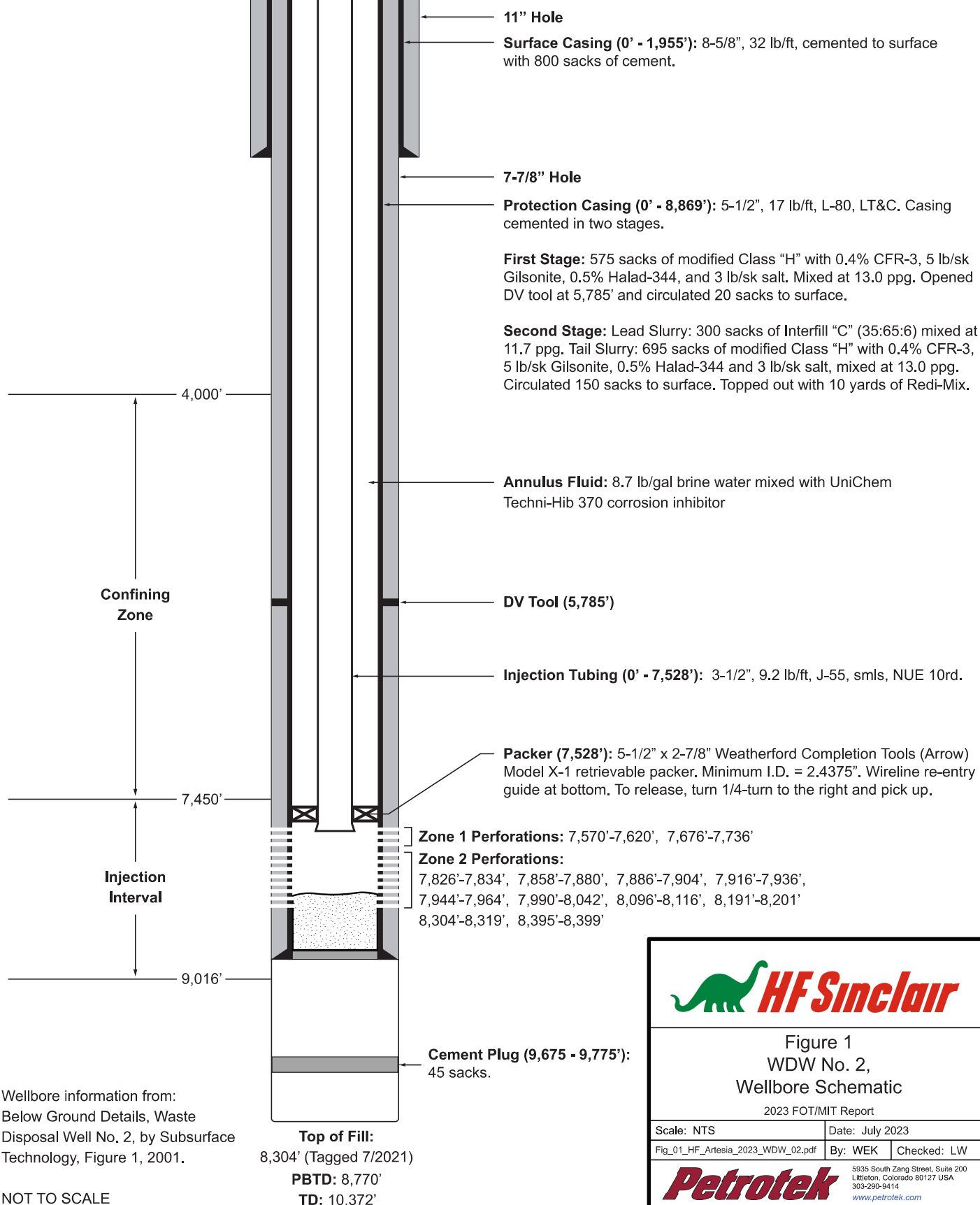


Figure 1  
 WDW No. 2,  
 Wellbore Schematic

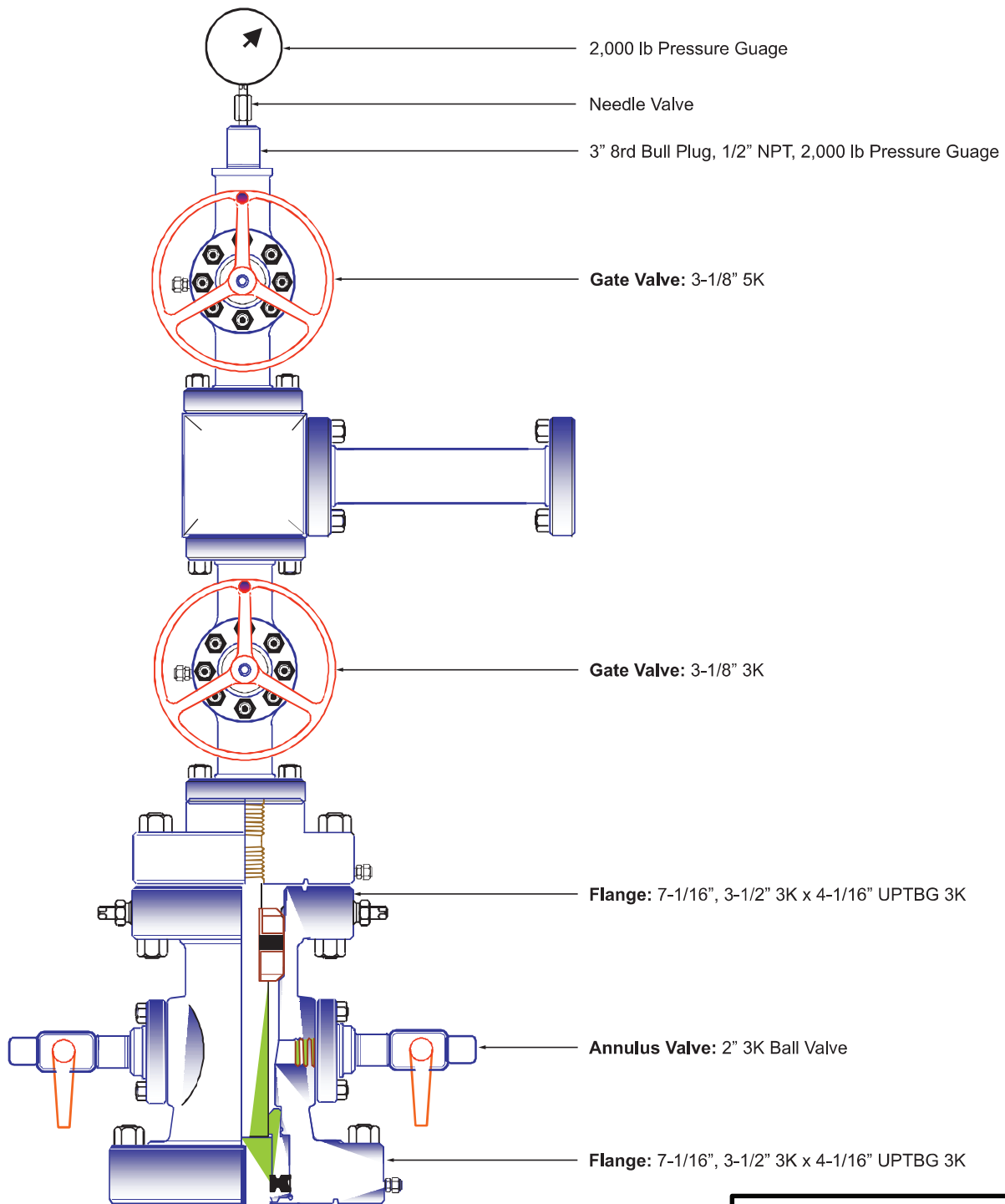
2023 FOT/MIT Report

Scale: NTS	Date: July 2023
Fig_01_HF_Artesia_2023_WDW_02.pdf	By: WEK Checked: LW

**Petrotek**

5935 South Zang Street, Suite 200  
 Littleton, Colorado 80127 USA  
 303-290-9414  
[www.petrotek.com](http://www.petrotek.com)

OCD UIC Permit: UICI-008-2  
 Well API Number: 30-015-20894  
 Eddy County, New Mexico  
 Sec. 31, T17S-R27E  
 Lat. 32.763772° / Long. -104.238508° (NAD 83)



Well Head information partially  
 from: Well: Navajo Refining  
 WDW #2, by Subsurface Technology

NOT TO SCALE



Figure 2  
 WDW No. 2,  
 Wellhead Schematic

2023 FOT/MIT Report

Scale: NTS	Date: July 2023
Fig_02_HF_Artesia_2023_WDW_02.pdf	By: WEK Checked: LW

**Petrotek**

5935 South Zang Street, Suite 200  
 Littleton, Colorado 80127 USA  
 303-290-9414  
[www.petrotek.com](http://www.petrotek.com)

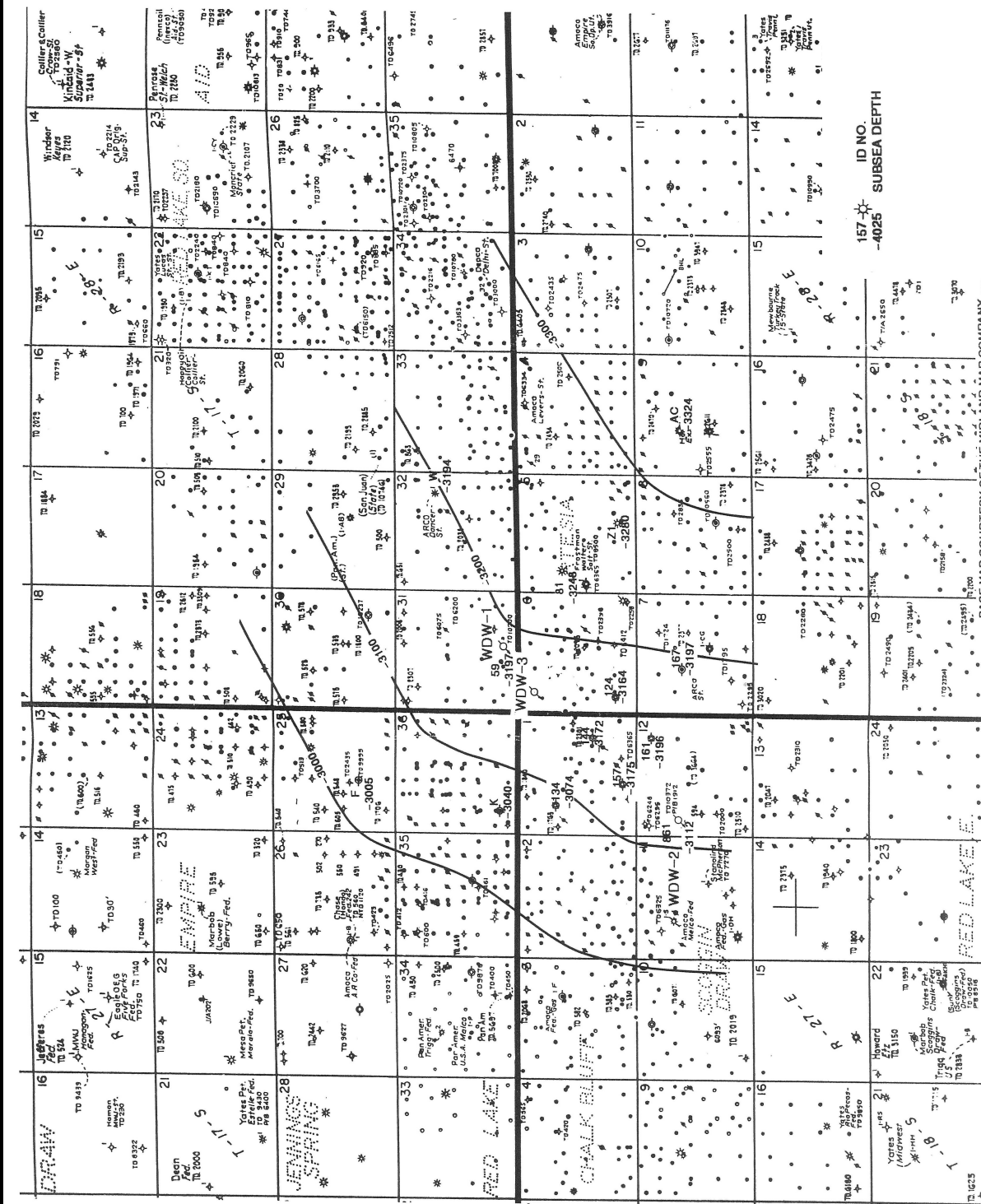


Figure 3  
Wolfcamp Formation Structure Map

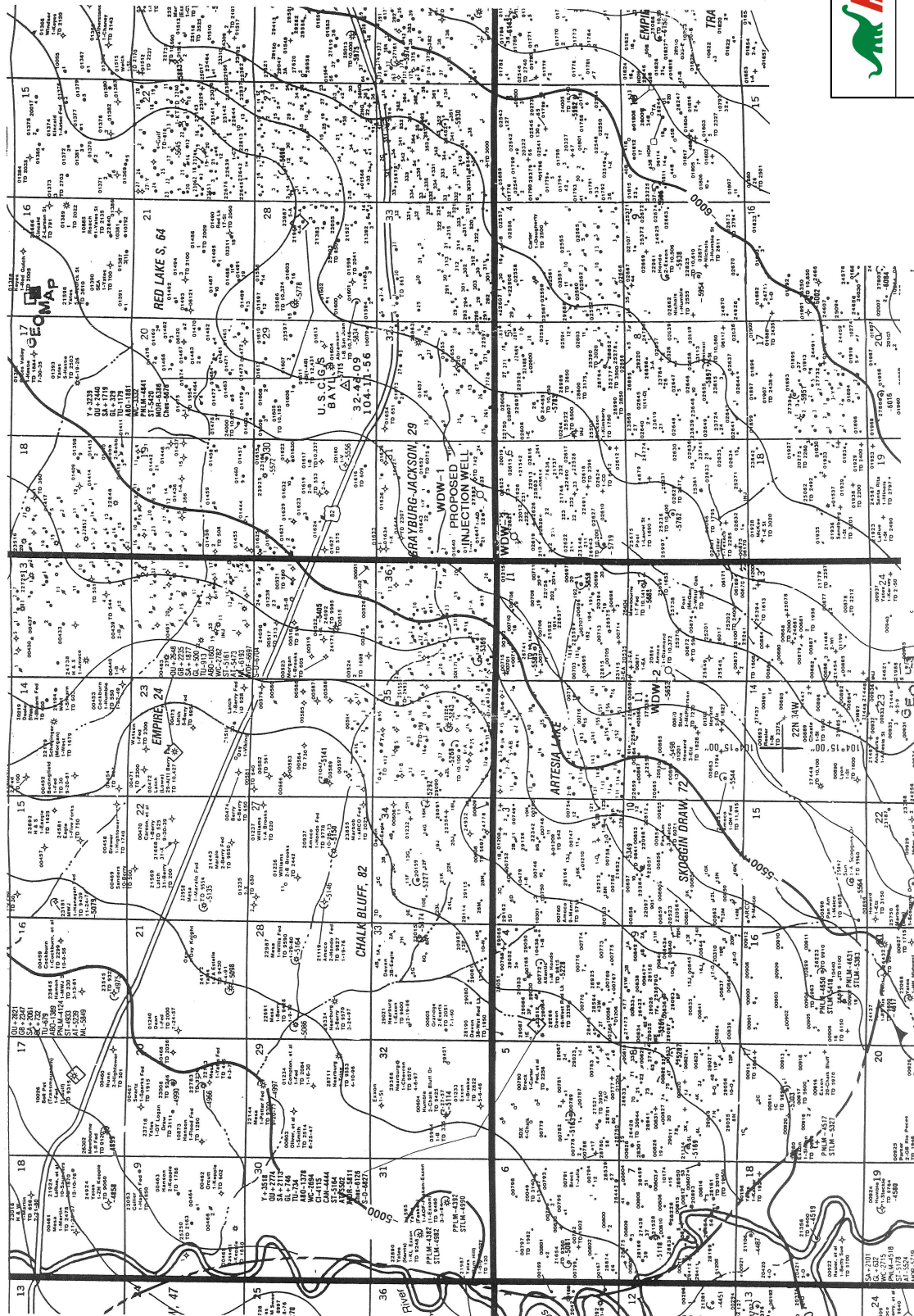
2023 FOT/MT Report  
Contour Interval = 100' Date: June 2023 By: WEK Checked: LW  
Fig. 03-WF\_Areas\_2023\_FOT.pdf  
SINCLAIR ENERGY SERVICES  
Lubbock, Colorado 80137 USA  
www.petrotek.com

Adapted from Navajo Refining Co., Attachment VIII-12.  
Structure - Top of Wolfcamp Formation, Envirocorp, 1998.









**HF Sinclair**

**Petrotek**

Figure 5  
Canyon/Strawn Formation  
Structure Map  
2023 FOTMT Report

Contour Interval = 100' Date: June 2023 By: WEK Checked: LW  
 Figure 5F-June\_2023\_FOTMT Report  
 505 South Zeno Street, Suite 200  
 Lubbock, Colorado 80127 USA  
 www.petrotek.com

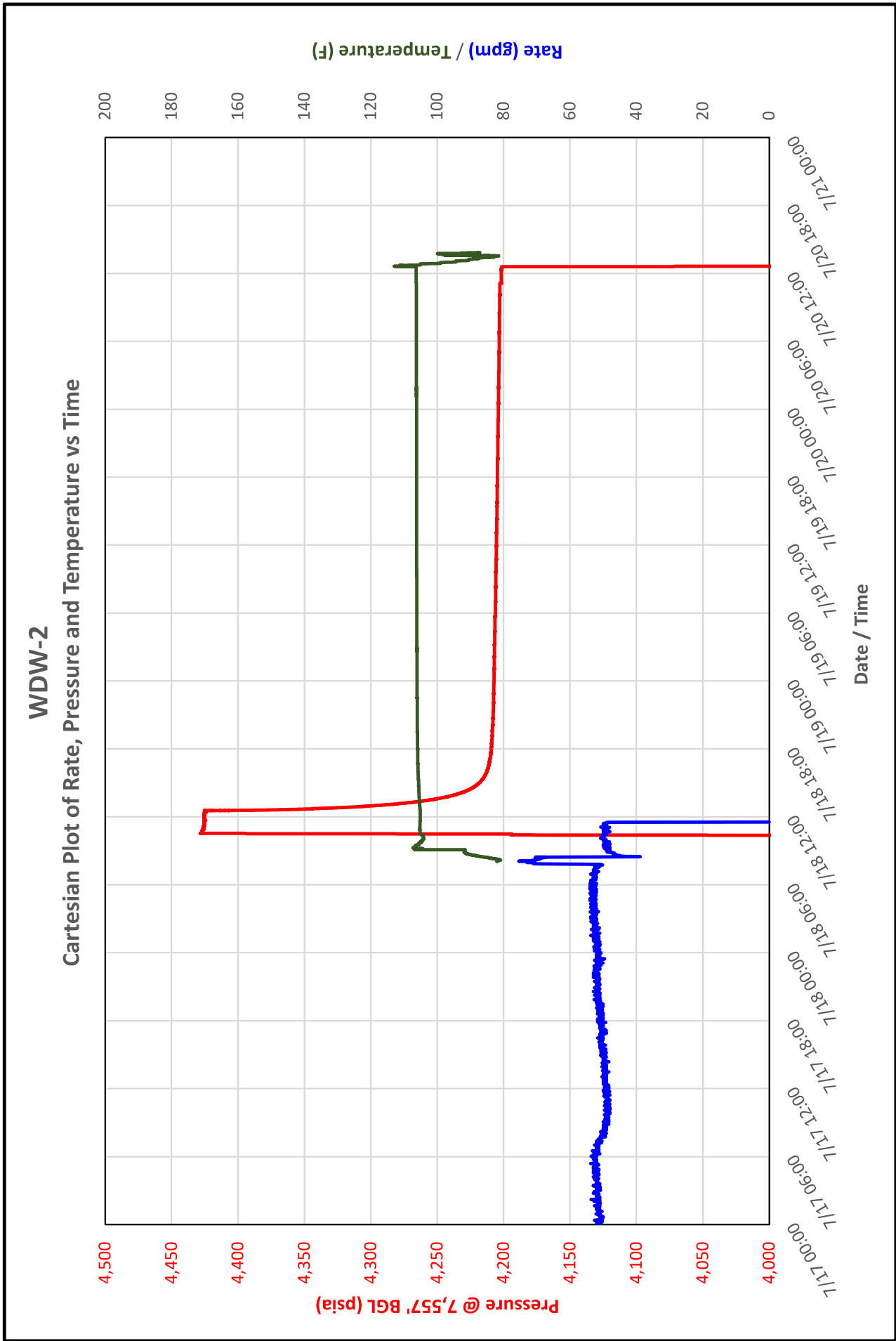
STRUCTURE MAP COURTESY OF THE GEOMAP COMPANY  
 Poster July 1997

Adapted from Navajo Refining Co. Attachment VIII-11,  
 Structure Map of the Strawn Formation, Envirocorp, 1989.

**Petrotek**

**Figure 6**  
Cartesian Plot of Rate, Pressure and Temperature vs Time  
2023 Well Testing

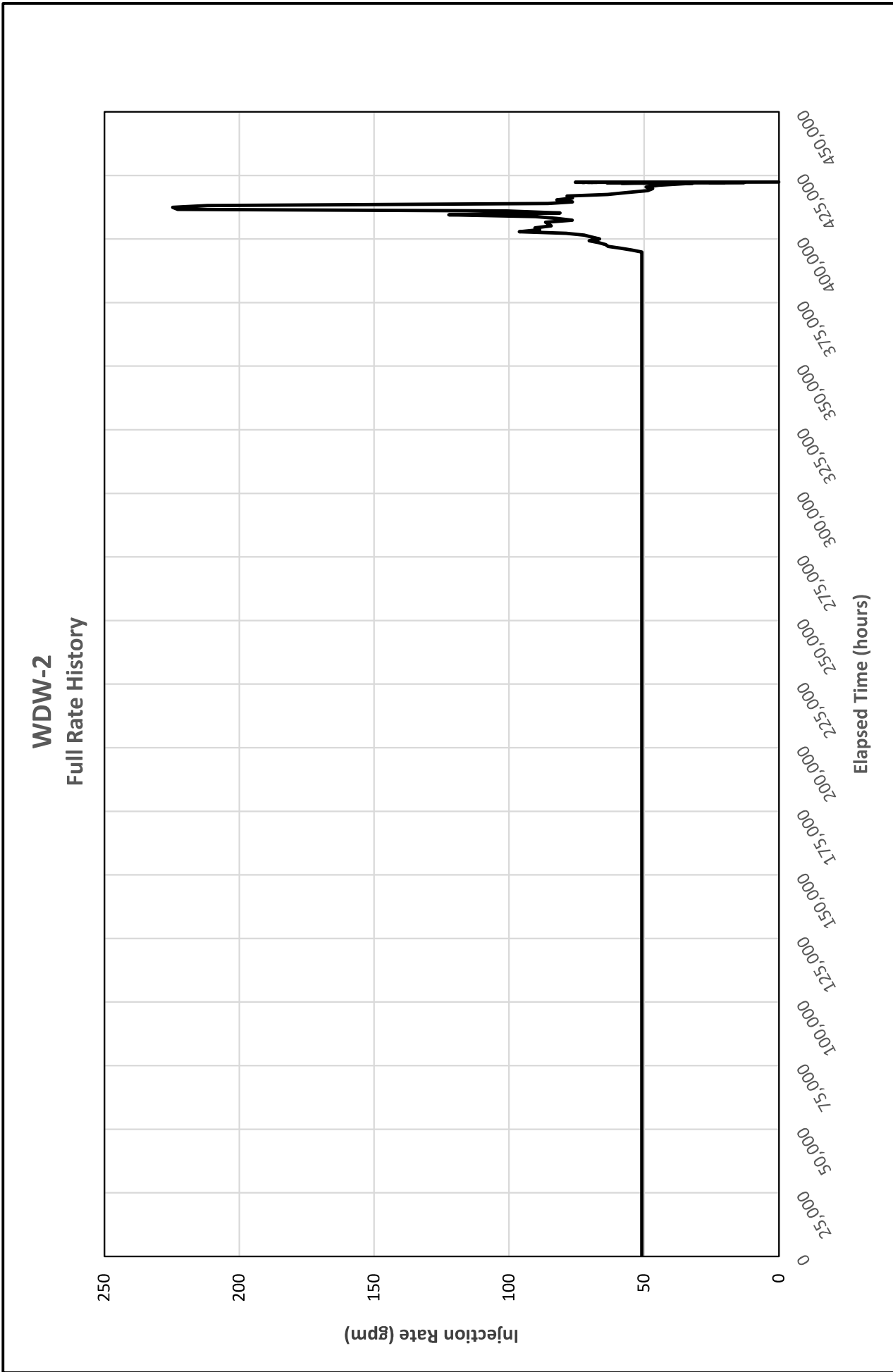
**HF Sinclair**



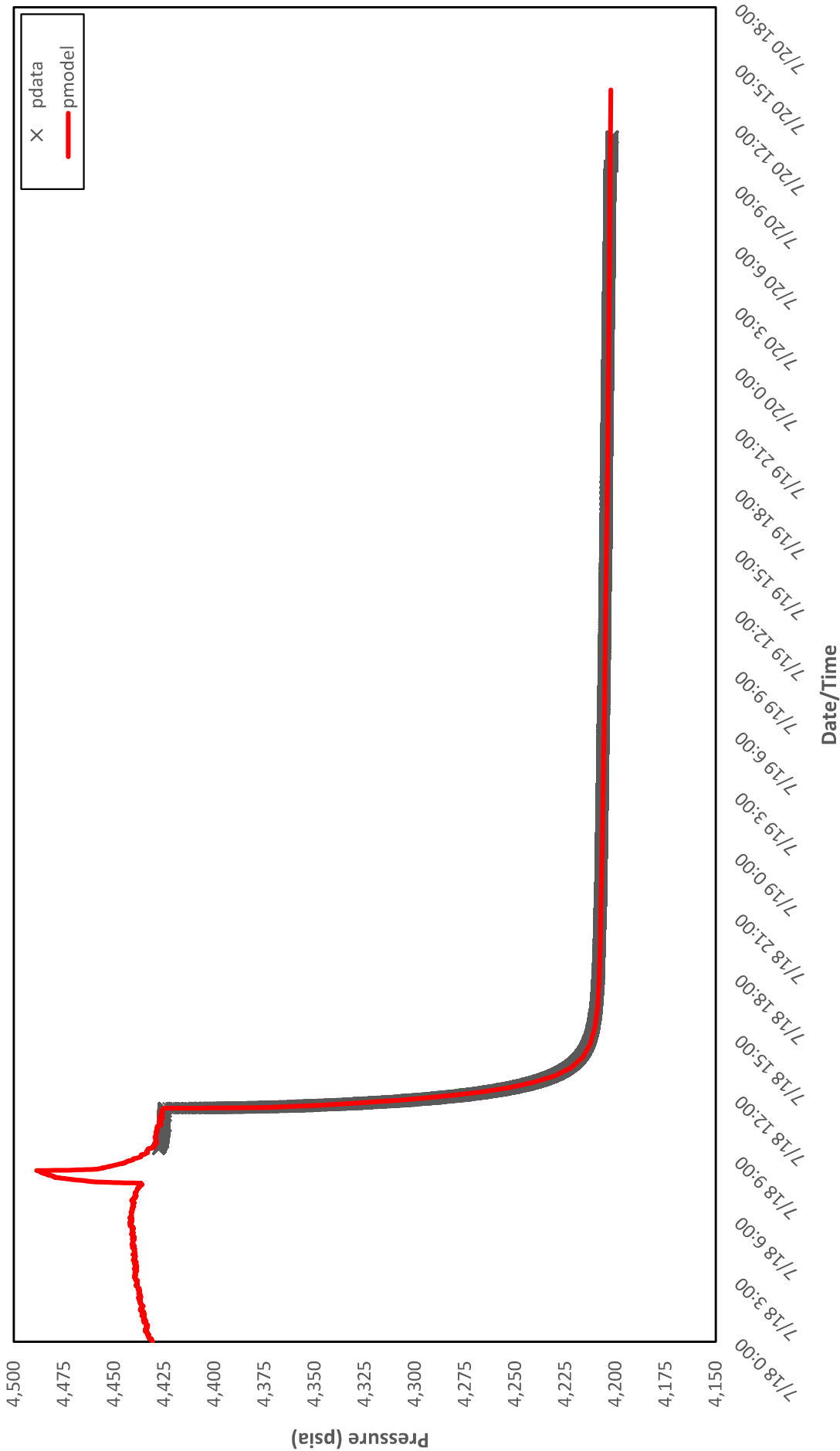
**Petrotek**

**Figure 7**  
Full Rate History  
2023 Well Testing

**HF Sinclair**



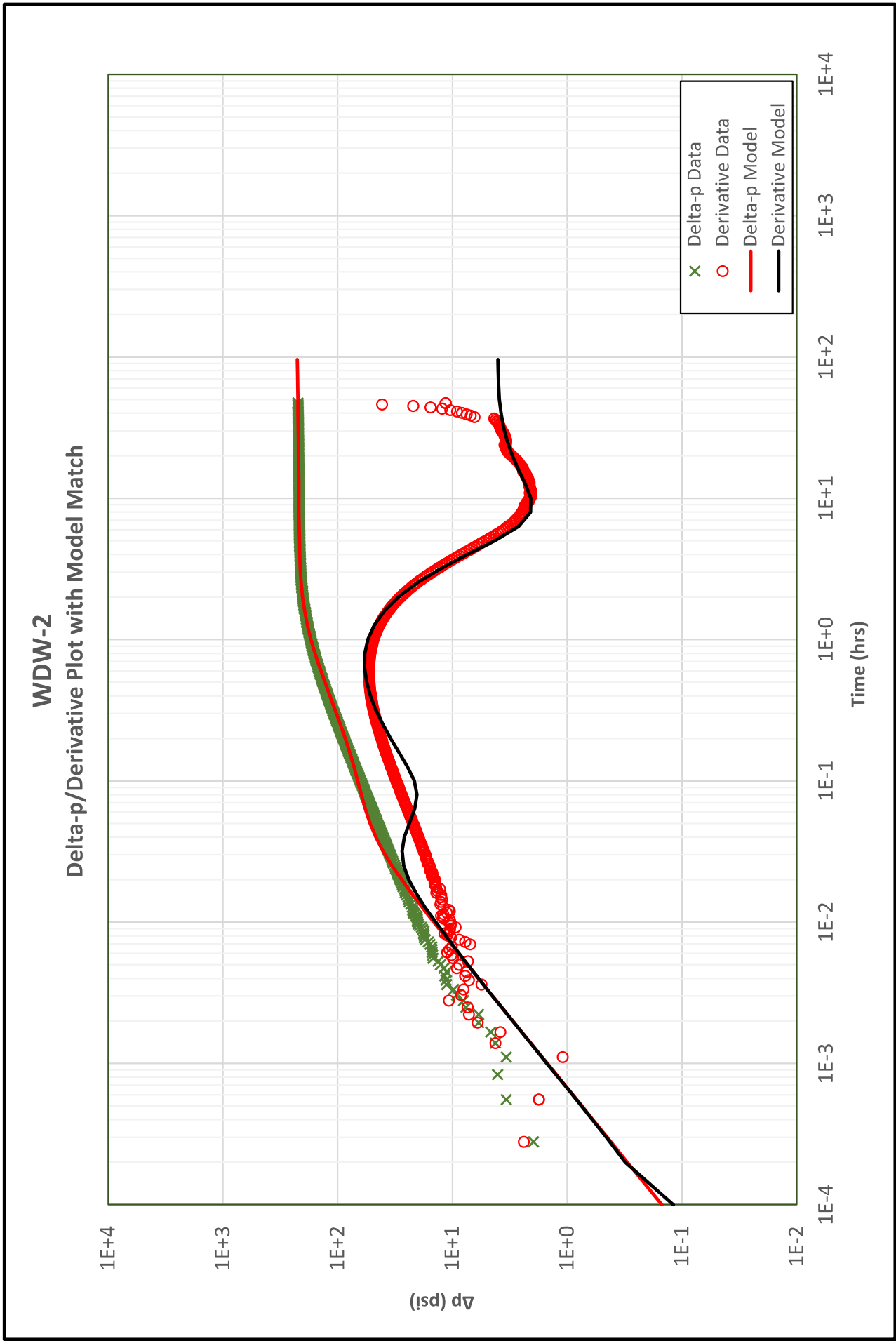
# WDW-2 Cartesian Plot of Pressure Falloff with Model Match



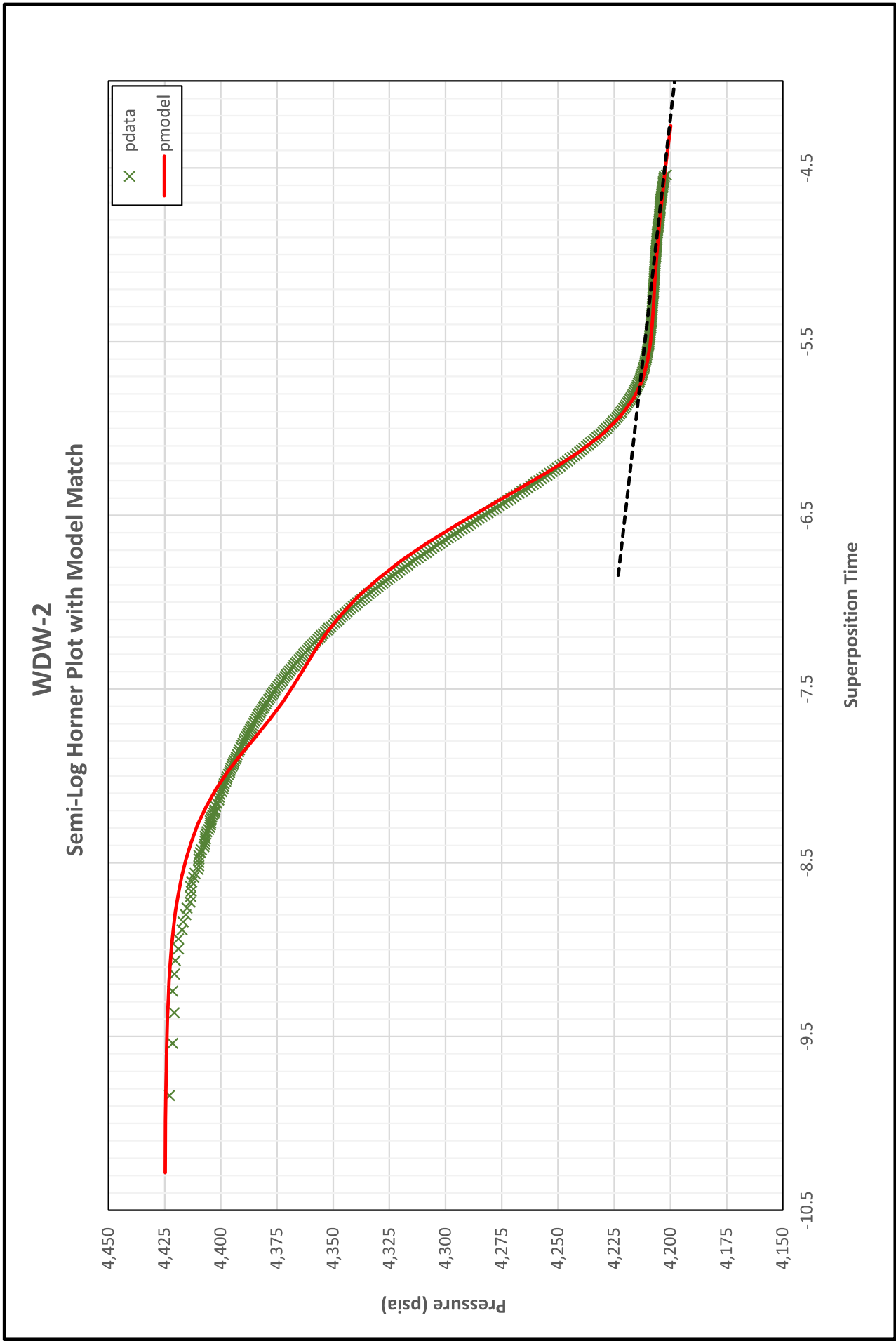
**Figure 8**  
Cartesian Plot of Pressure Falloff with Model Match  
2023 Well Testing

**Petrotek**

**HF Sinclair**



**Figure 9**  
Delta-p/Derivative Plot with Model Match  
2023 Well Testing

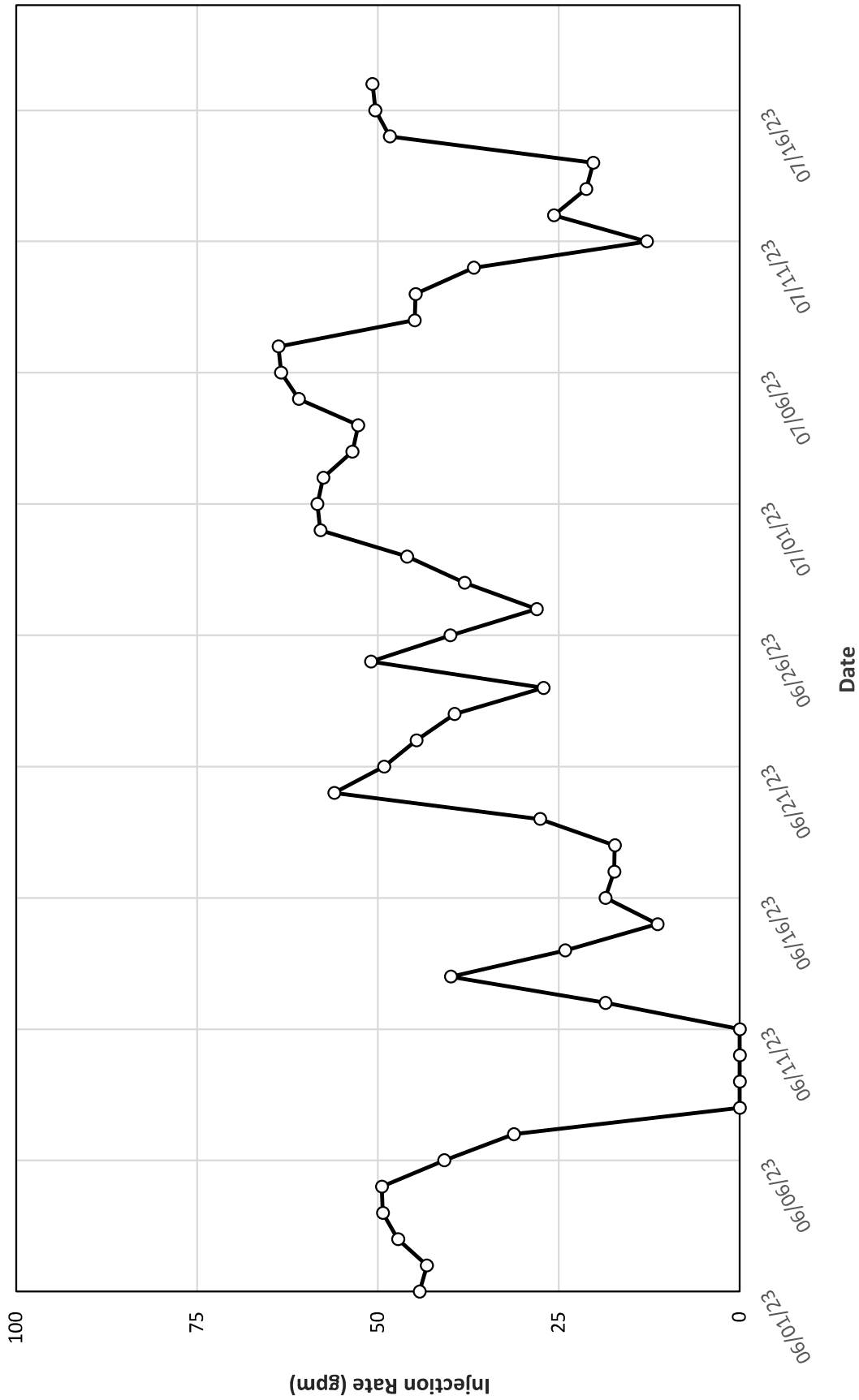


**Petrotek**

**Figure 10**  
Semi-Log Horner Plot with Model Match  
2023 Well Testing

**HF Sinclair**

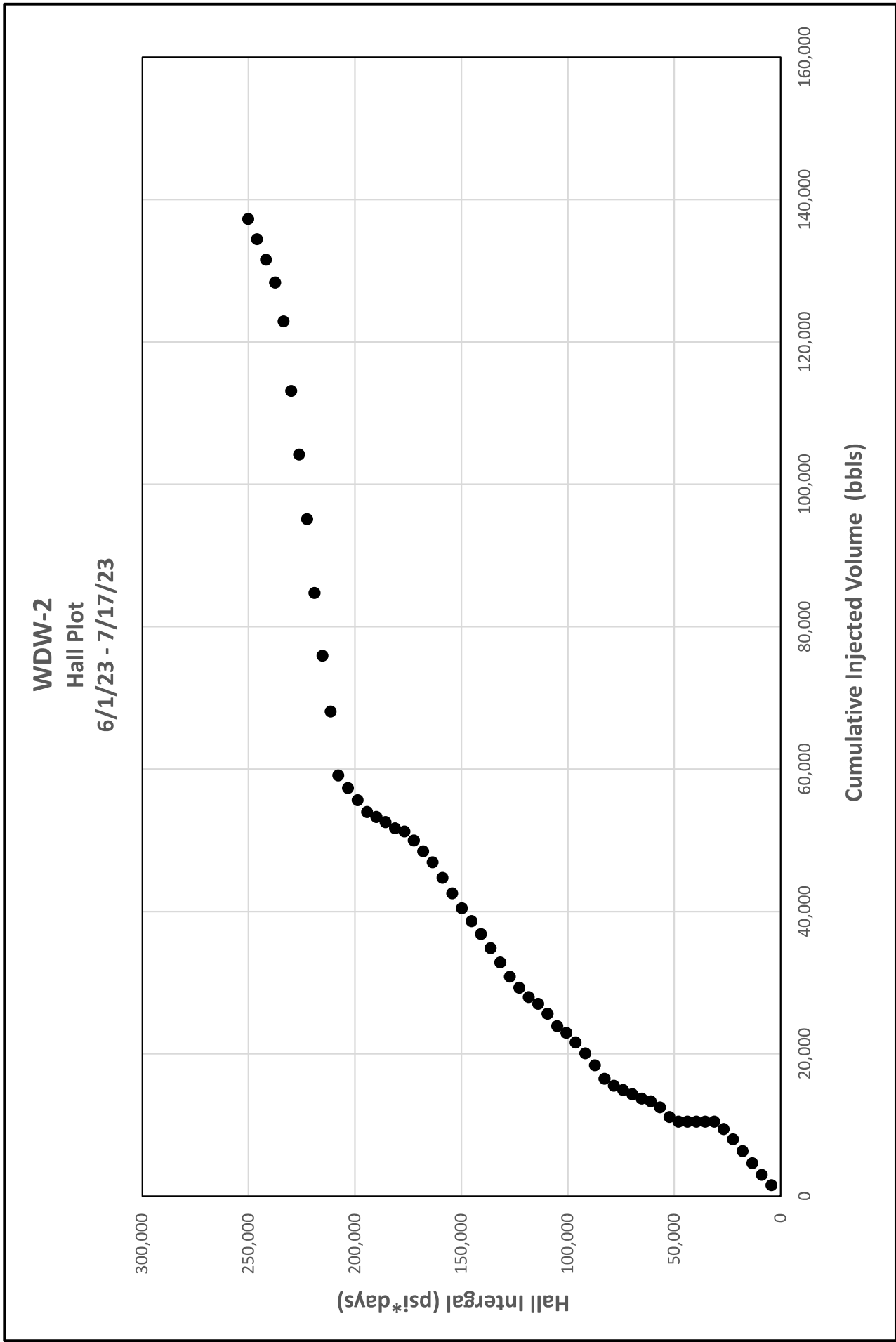
**WDW-2**  
**Daily Average Injection Rates**  
**6/1/23 - 7/17/23**



**Figure 11**  
Daily Average Injection Rates  
2023 Well Testing

**Petrotek**



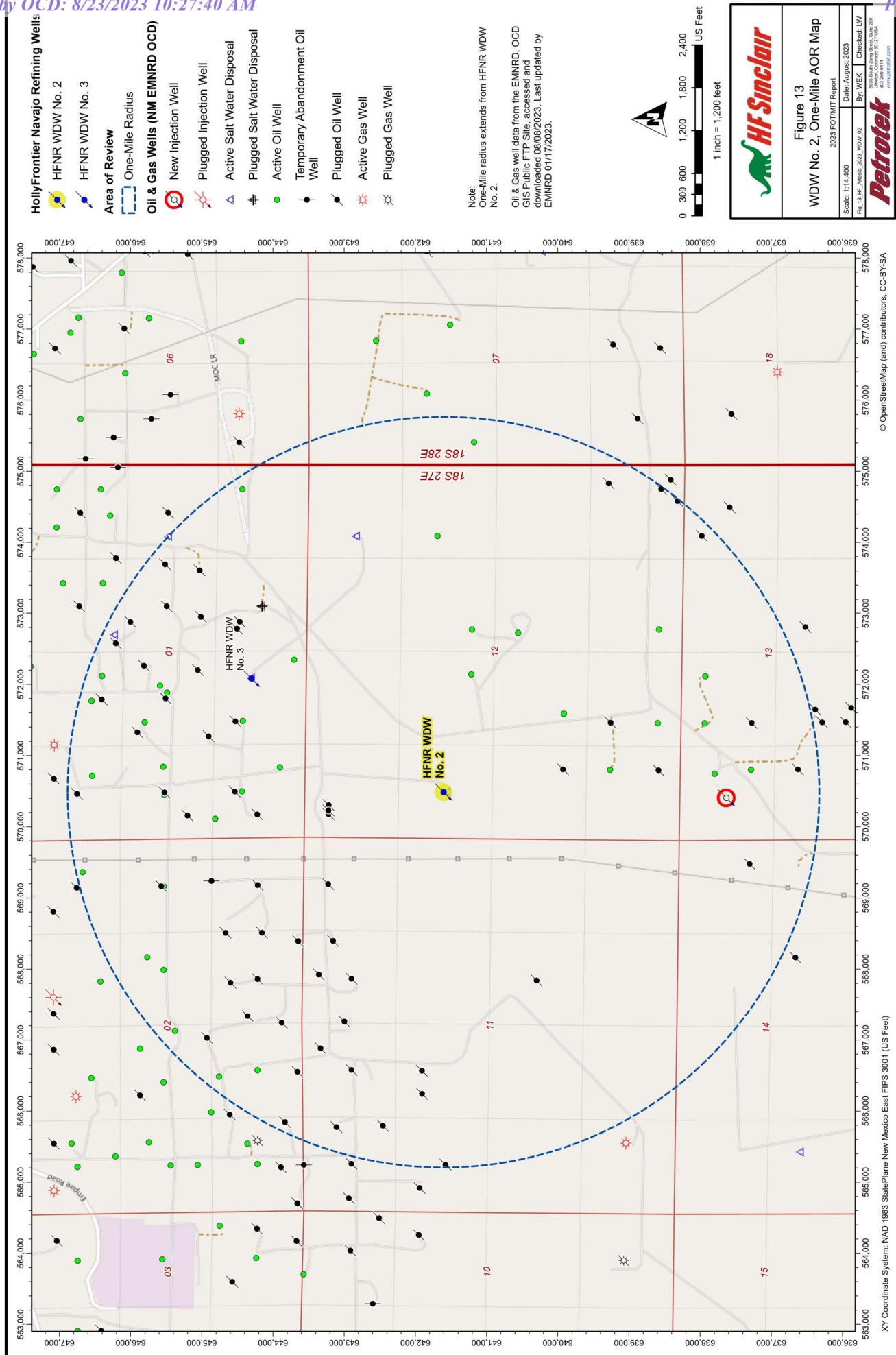


**Figure 12**  
**Hall Plot**  
**2023 Well Testing**

**Petrotek**







# ATTACHMENTS

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***Petrotek***

# Attachment 1 OCD Test Notification

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***Petrotek***

Submit a Copy To Appropriate District

Office

District I – (575) 393-6161

1625 N. French Dr., Hobbs, NM 88240

District II – (575) 748-1283

811 S. First St., Artesia, NM 88210

District III – (505) 334-6178

1000 Rio Brazos Rd., Aztec, NM 87410

District IV – (505) 476-3460

1220 S. St. Francis Dr., Santa Fe, NM

87505

State of New Mexico  
Energy, Minerals and Natural Resources

OIL CONSERVATION DIVISION  
1220 South St. Francis Dr.  
Santa Fe, NM 87505

Form C-103  
Revised July 18, 2013

<b>SUNDRY NOTICES AND REPORTS ON WELLS</b> (DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT" (FORM C-101) FOR SUCH PROPOSALS.)		WELL API NO. 30-015-20894
1. Type of Well: Oil Well <input type="checkbox"/> Gas Well <input type="checkbox"/> Other – UIC Injection Well <input type="checkbox"/>		5. Indicate Type of Lease STATE <input checked="" type="checkbox"/> FEE <input type="checkbox"/>
2. Name of Operator HF SINCLAIR NAVAJO REFINERY LLC		6. State Oil & Gas Lease No. B-2071-28
3. Address of Operator P.O. Box 159, Artesia, NM 88210		7. Lease Name or Unit Agreement Name Chukka WDW-2
4. Well Location Unit Letter <u>E</u> <u>1,980</u> feet from the <u>    </u> NORTH <u>    </u> line and <u>660</u> feet from the <u>    </u> WEST <u>    </u> line Section <u>12</u> Township <u>18S</u> Range <u>27E</u> NMPM County: <u>EDDY</u>		8. Well Number: WDW-2
11. Elevation (Show whether DR, RKB, RT, GR, etc.) 3,678' GL		9. OGRID Number: 15694
		10. Pool name or Wildcat PENN 9681

12. Check Appropriate Box to Indicate Nature of Notice, Report or Other Data

NOTICE OF INTENTION TO:	SUBSEQUENT REPORT OF:
PERFORM REMEDIAL WORK <input type="checkbox"/>	REMEDIAL WORK <input type="checkbox"/>
PLUG AND ABANDON <input type="checkbox"/>	ALTERING CASING <input type="checkbox"/>
TEMPORARILY ABANDON <input type="checkbox"/>	COMMENCE DRILLING OPNS. <input type="checkbox"/>
CHANGE PLANS <input type="checkbox"/>	P AND A <input type="checkbox"/>
PULL OR ALTER CASING <input type="checkbox"/>	CASING/CEMENT JOB <input type="checkbox"/>
MULTIPLE COMPL <input type="checkbox"/>	
DOWNHOLE COMMINGLE <input type="checkbox"/>	
CLOSED-LOOP SYSTEM <input type="checkbox"/>	
OTHER: PRESSURE FALLOFF TEST / MIT <input checked="" type="checkbox"/>	OTHER: <input type="checkbox"/>

13. Describe proposed or completed operations. (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work). SEE RULE 19.15.7.14 NMAC. For Multiple Completions: Attach wellbore diagram of proposed completion or recompletion.

**June 11, 2023; Day 1:** Begin constant-rate injection (+/- 10%) into CHUKKA WDW-2 as well as the three (3) offset wells for at least 30 hours prior to shut-in of WDW-2 for falloff testing. Target rate for WDW-2 is approximately 160 gpm. Wellhead pressure will not exceed 1,400 psig. Plant personnel will record rate, volume and pressure during the constant-rate injection period to ensure steady flow for analysis. Samples of the injectate will be collected approximately every 10 hours and analyzed for pH and specific gravity.

**June 12, 2023; Day 2:** Continue constant-rate injection into all four (4) wells.

**June 13, 2023; Day 3:** While injection continues, run dual downhole memory gauges to test depth making flowing gradient stopes every 1,000 feet. Collect pressure data at test depth for at least 1 hour while injecting at constant rate. Shut in WDW-2 and collect falloff data for a minimum of 30 hours. WDW-1, WDW-3 and WDW-4 will continue injection at constant rate until downhole memory gauges are pulled from WDW-2.

**June 14, 2023; Day 4:** WDW-2 will remain shut-in while collecting falloff pressure data using downhole memory gauges.

**June 15, 2023; Day 5:** After a minimum of 30 hours of falloff data collection, remove gauges from the well making 5-minute gradient stops every 1,000 feet. Note the top of fill will be tagged either with gauges prior to pulling from the well, or on a second run with sinker bars after gauges are removed (TBD). Conduct MIT for a minimum of 30 minutes recording data electronically. Rig down wireline and return well to service.

Spud Date:

Rig Release Date:

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

SIGNATURE \_\_\_\_\_ TITLE \_\_\_\_\_ DATE \_\_\_\_\_

Type or print name \_\_\_\_\_ E-mail address: \_\_\_\_\_ PHONE: \_\_\_\_\_

**For State Use Only**

APPROVED BY: \_\_\_\_\_ TITLE \_\_\_\_\_ DATE \_\_\_\_\_

Conditions of Approval (if any):

## Attachment 2

# Annulus Pressure Gauge Certification

***Petrotek***



7200 E. Dry Creek Rd, STE C-102, Centennial, CO 80112

Ph. 303-804-0667 Cal.Lab@Apex-Instruments.com

# Calibration Certificate

**Certificate Number: 232833****Customer:**Petrotek  
Littleton, CO

**Manufacturer:** Crystal Engineering  
**Model Number:** XP2i 5000 psi  
**Serial Number:** 212165  
**Description:** Digital Test Gauge  
**Procedure:** CI-001  
**Calibrated To:** Manufacturer's Specifications  
**Technician:** Ben Campbell

**Calibration Date:** 6/13/2023  
**Due Date:** 6/13/2024  
**As Found:** In Tolerance  
**As Left:** As Found  
**Temperature:** 71.5 F  
**Humidity:** 45.8 %  
**Issue Date:** 6/13/2023

**Tolerance Specs:**0 - 20%: +/- (0.02% of FS)  
20% - 100%: +/- (0.1% of Rdg)**Technician Notes:**

As Left Userspan: 1.00000

Approved Signatory: 

Apex Instruments certifies that the instrument listed above meets the specifications of the manufacturer at the completion of its calibration. The calibrations within the certificate are traceable through NIST or another National Metrology Institute to the International System of Units (SI).

Methods used are in accordance with the procedure listed above. This calibration is a direct comparison of the unit under test to the listed reference standards and did not involve any sampling plans to complete. No allowance has been made for the instability of the test device due to use, time, etc. Such allowances would be made by the customer as needed.

Unless otherwise contractually specified, a binary decision rule, utilizing simple acceptance, and simple rejection criteria will be used for the determination of compliance. When compliance statements are present, they are reported without factoring in the effects of uncertainty and the limits are defined by the manufacturer's stated accuracy.

This certificate does not guarantee the continued performance of the instrument listed above. Any modifications or services performed hereafter may void this certificate.

This certificate applies only to the item listed above and is not to be reproduced other than in full, except with prior written approval from Apex Instruments Inc.



Certificate Number: 232833

8/13/2023

## Standards Used

Description	Model Number	Serial Number	Calibration Date	Due Date	ID
Electronic Deadweight Tester	RPM4-E-DWT A100M/A10M	1709	8/31/2022	8/31/2023	APX00024
Temp / RH Datalogger	UX100-011	21284718	9/26/2022	9/26/2023	APX09582

Compass Import					
Gauge Pressure					
As Found - As Left					
Test Description	Nominal	Test Results	Tolerance (+/-)	UUT Error	Status
0	-0.02 psi	0.00 psi	1.00 psi	0.02 psi	Pass
1000	999.91 psi	999.90 psi	1.00 psi	-0.01 psi	Pass
2000	2000.10 psi	2000.11 psi	2.00 psi	0.01 psi	Pass
3000	3000.02 psi	3000.04 psi	3.00 psi	0.02 psi	Pass
4000	3999.89 psi	3999.96 psi	4.00 psi	0.07 psi	Pass
5000	5000.03 psi	5000.43 psi	5.00 psi	0.40 psi	Pass
4000	4000.04 psi	4000.38 psi	4.00 psi	0.34 psi	Pass
3000	3000.11 psi	3000.44 psi	3.00 psi	0.33 psi	Pass
2000	2000.04 psi	2000.31 psi	2.00 psi	0.27 psi	Pass
1000	1000.39 psi	1000.60 psi	1.00 psi	0.21 psi	Pass
0	0.09 psi	0.30 psi	1.00 psi	0.21 psi	Pass

— End of measurement results—





## Attachment 3 Downhole Pressure Gauge Certification

***Petrotek***



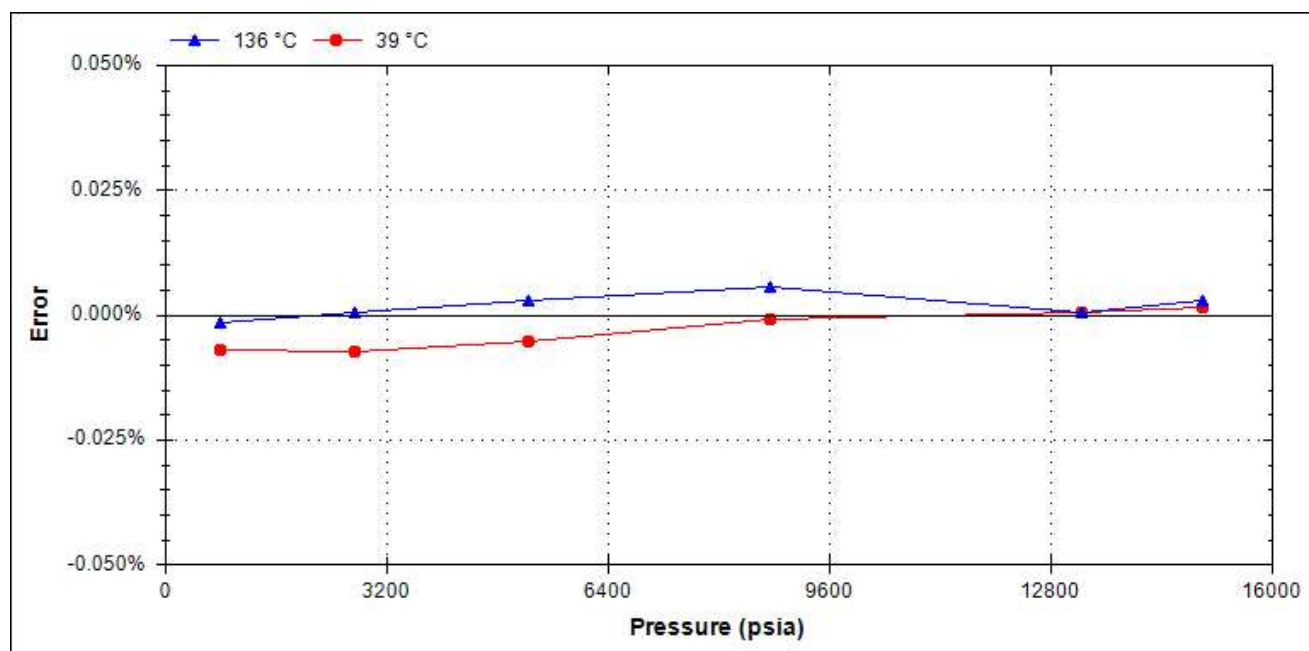
"The Next Generation of Down Hole Tools"

Calibration Date: 28-May-21  
 Max Pressure Error: 0.010% F.S.  
 Max Temperature Error: 0.110 °C  
 Part Number: 101696  
 Serial Number: 224831

Calibration System: CALIBRATION03  
 Batch Number: 20210104.143132

1.25 OD Quartz DXB 2 Assembly			
Max Pressure		Max Temperature	
psi	kPa	°F	°C
16,000	110,316	351	177

**Accuracy:** As shown in the graph below, this DataCan Pressure gauge conforms to within  $\pm 0.030\%$  F.S. of the pressure standard used in calibration, which is accurate to within  $\pm 0.01\%$  of reading.



### Working Standards

Sun Electronic Systems Environmental Chamber, Model: EC127, Serial: EC0020

DHI Instruments Pressure Controller, Model: PPCH-200M (30,000psi Reference), Serial: 1529

### Traceability Statement

All working standards are traceable to nationally or internationally recognized standards.

Approved By:  
 DataCan Services Corp.

Calibrated By:  
 Angelo Pulido



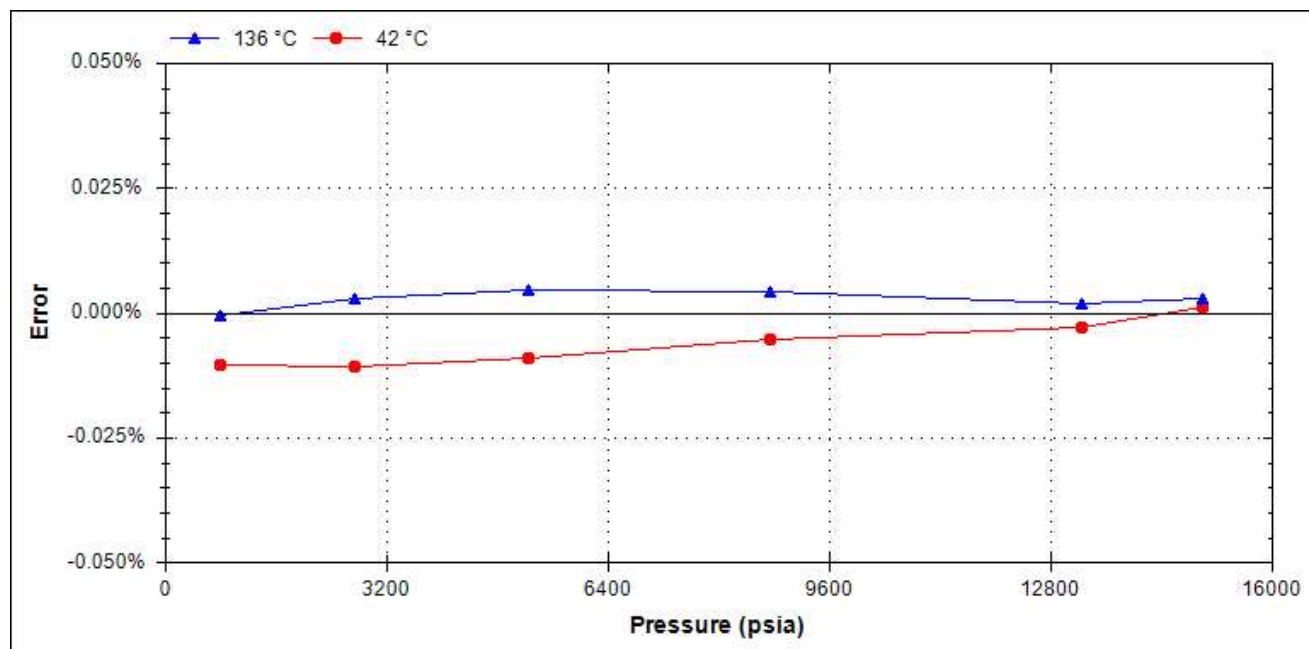
"The Next Generation of Down Hole Tools"

**Calibration Date:** 10-Mar-22  
**Max Pressure Error:** 0.011% F.S.  
**Max Temperature Error:** 0.210 °C  
**Part Number:** 101696  
**Serial Number:** 242665

#### 1.25 OD Quartz DXB 2 Assembly

Max Pressure		Max Temperature	
psi	kPa	°F	°C
16,000	110,316	351	177

**Accuracy:** As shown in the graph below, this DataCan Pressure gauge conforms to within +/- 0.030% F.S. of the pressure standard used in calibration, which is accurate to within +/- 0.01% of reading.



#### Working Standards

Sun Electronic Systems Environmental Chamber, Model: EC127  
 DHI Instruments Pressure Controller, Model: PPCH-200M (30,000psi Reference)

#### Traceability Statement

All working standards are traceable to nationally or internationally recognized standards.



Approved By:  
 DataCan Services Corp.

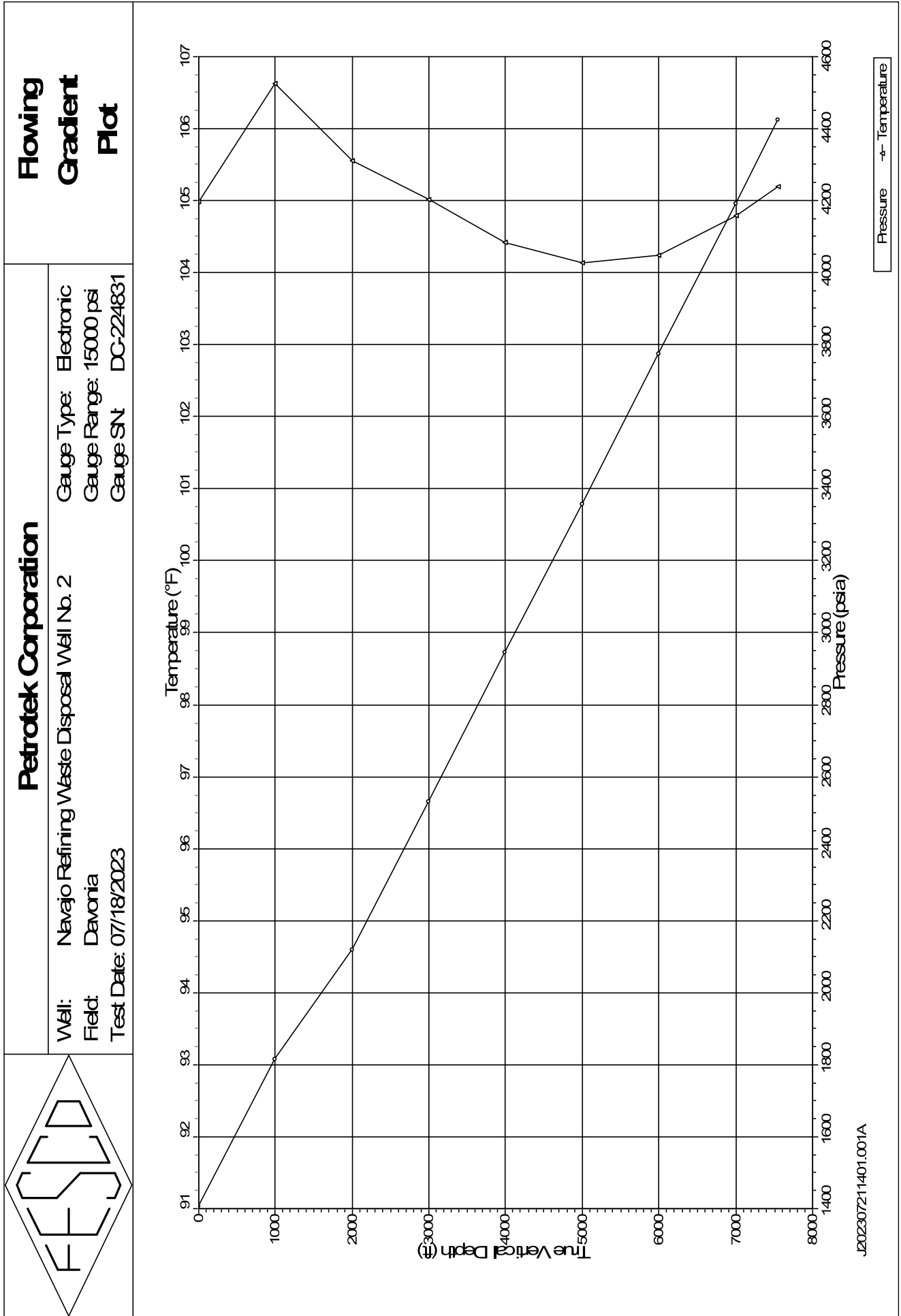
Calibrated By:  
 Angelo Pulido



# Attachment 4 FESCO Injection Falloff Test Report

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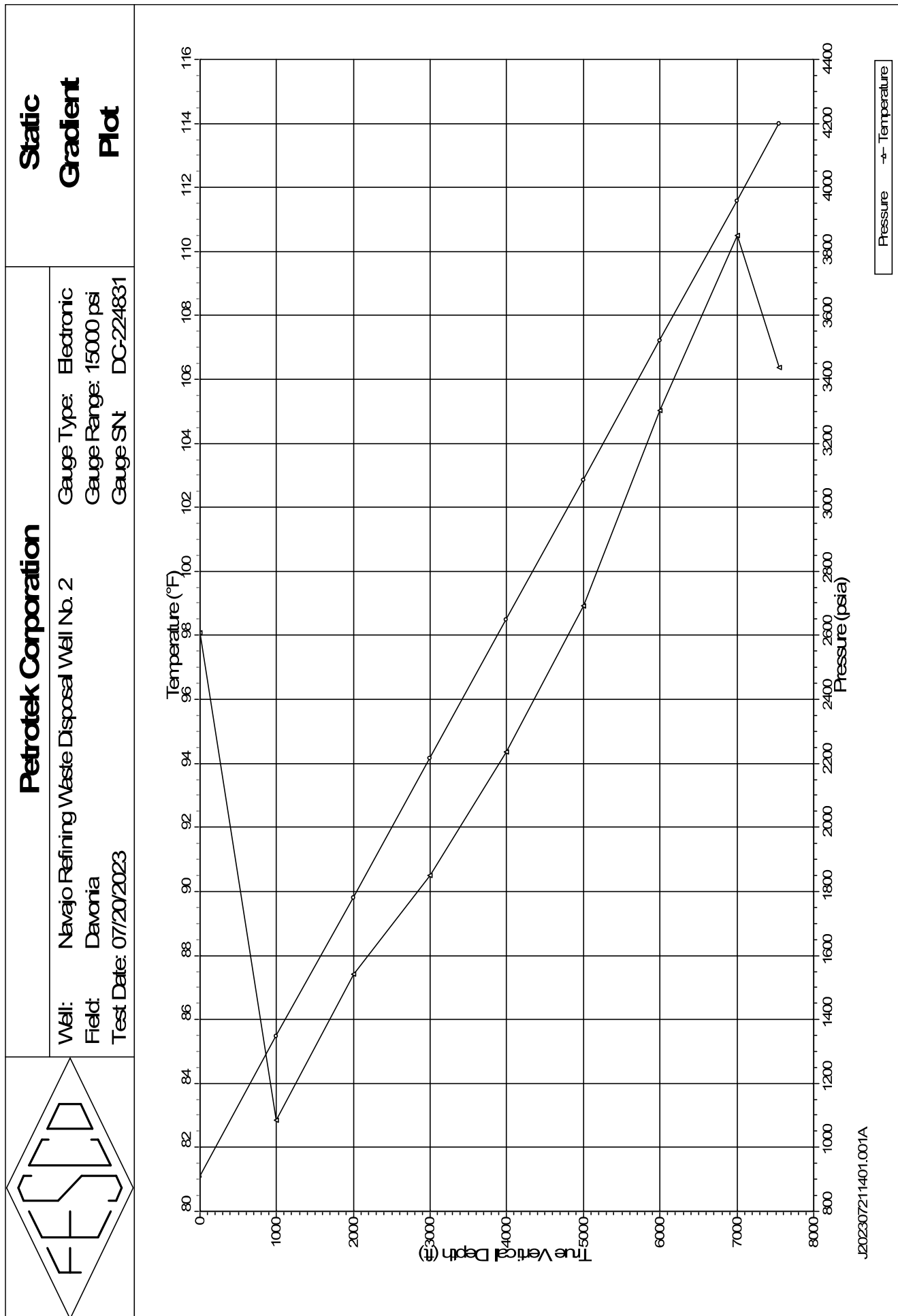
***Petrotek***

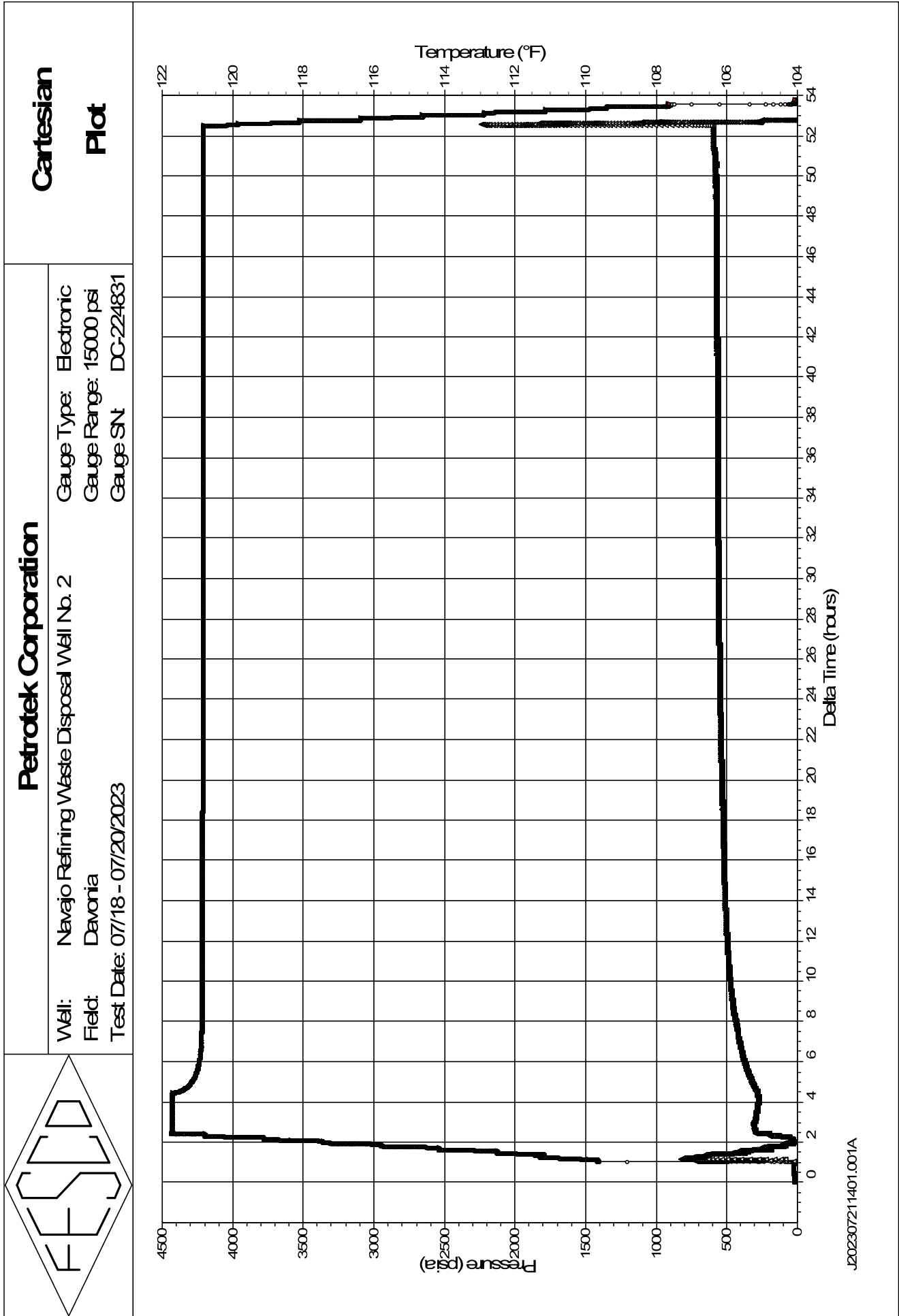
	<b>FESCO, Ltd.</b> 1000 Fesco Ave. - Alice, Texas 78332							
FLOWING GRADIENT SURVEY								
Company: Petrotek Corporation Well: Navajo Refining Waste Disposal Well No. 2 Field: Davonia Formation: Unavailable		Test Date: 07/18/2023 Location: Eddy County, NM Status: Flowing						
Well Data: Wellhead Connection: 3.5" EUE Elevation: 13 ft above GL Tubing: 4.5" Set at 7528 ft (EOT) Casing: 5.5" Set at 8869 ft Perfs: 7570 - 7736; 7826 - 8399 ft (MD) Datum: 7985 ft (MD)		Gauge Type: Electronic Gauge SN: DC-224831 Gauge Range: 15000 psi Gauge OD: 1.2500"						
Depth	Pressure							Comments
MD ft	TVD ft	Delta Depth ft	WHP psia	BHT °F	Gauge Pressure psia	Delta Pressure psi	Pressure Gradient psi / ft	
0	0	0	1410	104.99	1409.54	0.00	0.0000	
1000	1000	1000		106.62	1819.01	409.47	0.4095	
2000	2000	1000		105.56	2122.19	303.18	0.3032	
3000	3000	1000		105.02	2534.25	412.06	0.4121	
4000	4000	1000		104.42	2946.67	412.42	0.4124	
5000	5000	1000		104.14	3358.07	411.40	0.4114	
6000	6000	1000		104.24	3775.89	417.82	0.4178	
7000	7000	1000		104.80	4193.73	417.84	0.4178	
7557	7557	557	1410	105.19	4427.46	233.73	0.4196	
BHT at Test Depth: 106.00 °F Extrapolated BHP at Datum: 4607.05 psia BHP Gradient at Datum : 0.4196 psi/ft				Oil Level: Injecting Water Level: Injecting Csg Press: 780 psig			Previous BHP: U/A BHP Change: U/A	
Remarks: MIRU slickline. RIH with electronic gauge making injecting gradient stops to 7557 ft. Continued injecting waste water into well for 2 hrs. SI well for 48-hr BHP Falloff Test. POOH making static gradient stops to surface. RDMO.								
Certified: FESCO, Ltd. - Midland, TX  By: <u>Michael Carnes</u> District Manager - (432) 332-3211								
Job No.: J202307211401.001A								

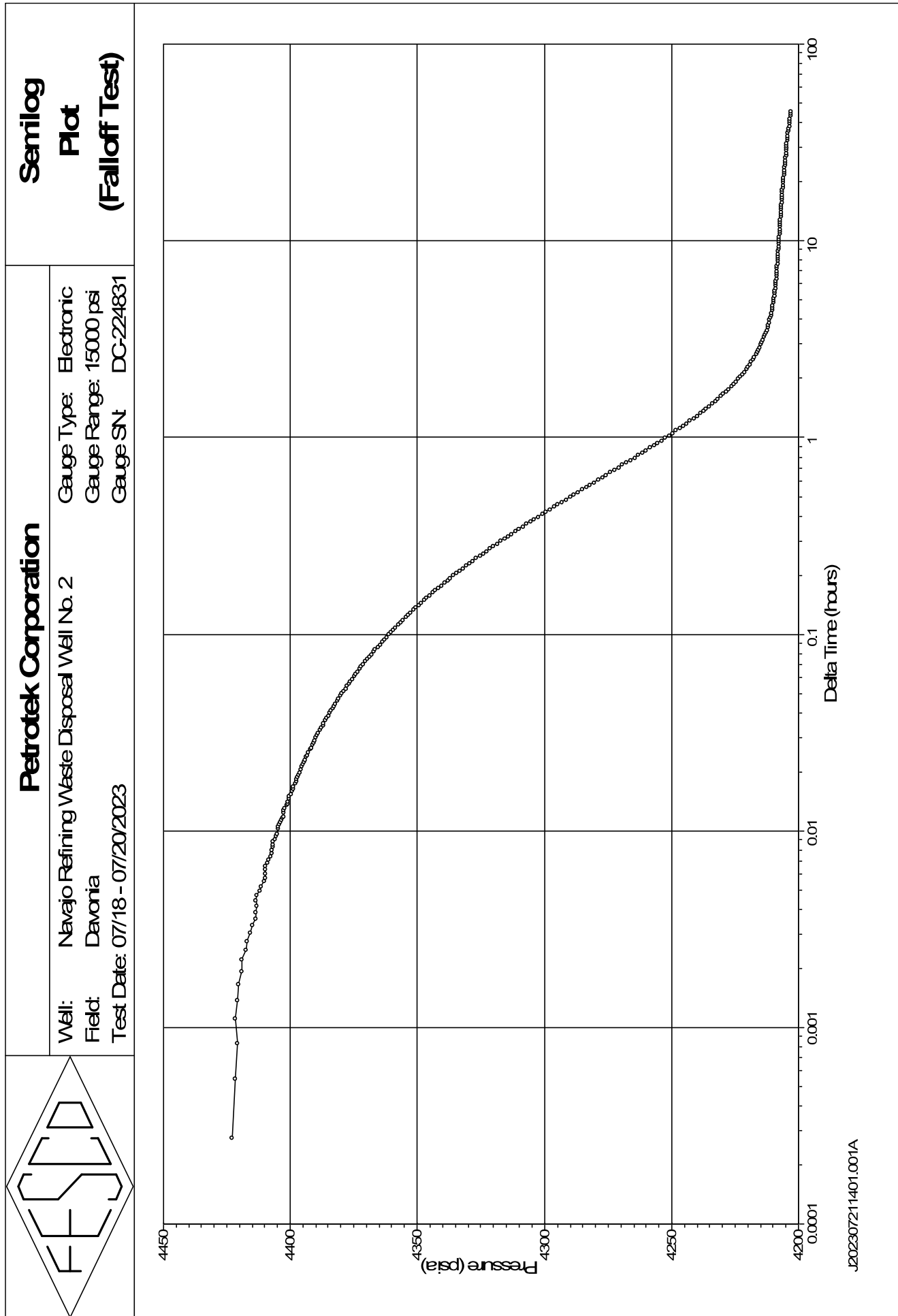


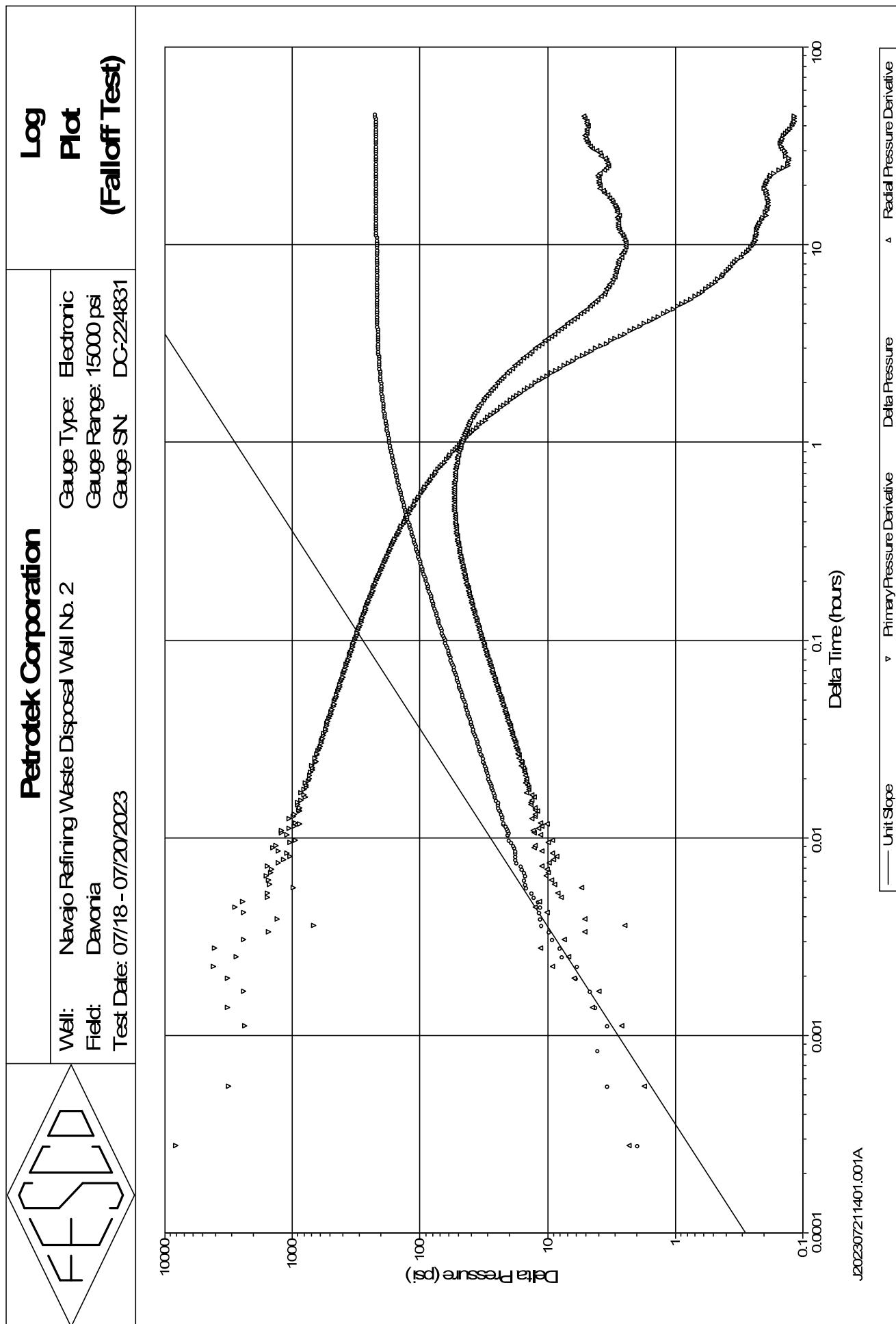
	<b>FESCO, Ltd.</b> 1000 Fesco Ave. - Alice, Texas 78332							
STATIC GRADIENT SURVEY								
Company: Petrotek Corporation Well: Navajo Refining Waste Disposal Well No. 2 Field: Davonia Formation: Unavailable		Test Date: 07/20/2023 Location: Eddy County, NM Status: SI for 48 hrs						
Well Data: Wellhead Connection: 3.5" EUE Elevation: 13 ft above GL Tubing: 4.5" Set at 7528 ft (EOT) Casing: 5.5" Set at 8869 ft Perfs: 7570 - 7736; 7826 - 8399 ft (MD) Datum: 7985 ft (MD)		Gauge Type: Electronic Gauge SN: DC-224831 Gauge Range: 15000 psi Gauge OD: 1.2500"						
Depth	Pressure							Comments
MD ft	TVD ft	Delta Depth ft	WHP psia	BHT °F	Gauge Pressure psia	Delta Pressure psi	Pressure Gradient psi / ft	
0	0	0	910	98.08	910.64	0.00	0.0000	Water level at surface
1000	1000	1000		82.84	1349.51	438.87	0.4389	
2000	2000	1000		87.43	1783.02	433.51	0.4335	
3000	3000	1000		90.50	2217.92	434.90	0.4349	
4000	4000	1000		94.37	2653.66	435.74	0.4357	
5000	5000	1000		98.93	3088.57	434.91	0.4349	
6000	6000	1000		105.02	3524.04	435.47	0.4355	
7000	7000	1000		110.50	3959.69	435.65	0.4357	
7557	7557	557	910	106.38	4201.66	241.97	0.4344	
BHT at Test Depth: 106.38 °F Extrapolated BHP at Datum: 4387.58 psia BHP Gradient at Datum : 0.4344 psi/ft				Oil Level: None Water Level: Surface Csg Press: 290 psig			Previous BHP: U/A BHP Change: U/A	
Remarks: MIRU slickline. RIetrieve gauge off stop. POOH after 48-hr BHP Falloff Test making static gradient stops to surface. RDMO.								
<div style="text-align: right;">           Certified: FESCO, Ltd. - Midland, TX             By: <u>Michael Carnes</u>            District Manager - (432) 332-3211         </div>								
Job No.: J202307211401.001A								





















 PETROLEUM ENGINEERS		FESCO, Ltd. 1000 Fesco Ave. - Alice, Texas 78332					 PETROLEUM ENGINEERS
		RESERVOIR PRESSURE FALLOFF TEST					
Company: Petrotek Corporation Well: Navajo Refining Waste Disposal Well No. 2 Field: Davonia Location: Eddy County, NM Perfs: 7570 - 7736; 7826 - 8399 ft (MD) Formation: Unavailable						Test Date: 07/18 - 07/20/2023 Gauge Depth: 7557 ft Gauge Type: Electronic Gauge SN: DC-224831 Gauge Range: 15000 psi Gauge OD: 1.2500"	
Test Date mm/dd/yy	Real Time hh:mm:ss	Delta Time hours	WHP psia	BHP psia	Delta BHP psi	Temp. °F	Comments
07/18/23	08:05:09	-4.46806		18.19		82.09	Powered up gauge.
07/18/23	08:15:00	-4.30389		17.77		81.51	
07/18/23	08:30:00	-4.05389		18.86		87.06	
07/18/23	08:45:00	-3.80389		19.96		91.17	
07/18/23	09:00:00	-3.55389		19.10		91.76	
07/18/23	09:05:00	-3.47056		18.34		91.57	
07/18/23	09:06:00	-3.45389		2.39		92.85	
07/18/23	09:06:28	-3.44611		1406.23		104.99	Pressured up lubricator.
07/18/23	09:06:57	-3.43806		1411.20		106.86	BHT decreased
07/18/23	09:07:00	-3.43722		1410.46		106.86	
07/18/23	09:08:00	-3.42056		1409.58		106.65	
07/18/23	09:09:00	-3.40389		1410.41		106.09	
07/18/23	09:10:00	-3.38722		1409.22		105.80	
07/18/23	09:11:00	-3.37056		1409.83		105.28	
07/18/23	09:12:00	-3.35389		1409.70		105.03	
07/18/23	09:12:06	-3.35222		1409.63		104.99	Casing Pressure = 780 psig.
07/18/23	09:12:07	-3.35194	1410	1409.54		104.99	RIH making injecting gradient stops.
07/18/23	09:13:00	-3.33722		1424.61		107.02	
07/18/23	09:14:00	-3.32056		1466.88		107.28	
07/18/23	09:14:12	-3.31722		1474.44		107.29	BHT decreased while RIH
07/18/23	09:15:00	-3.30389		1505.64		107.26	
07/18/23	09:16:00	-3.28722		1551.37		107.22	
07/18/23	09:17:00	-3.27056		1601.28		107.14	
07/18/23	09:18:00	-3.25389		1645.38		107.03	
07/18/23	09:19:00	-3.23722		1700.60		106.92	
07/18/23	09:20:00	-3.22056		1752.48		106.80	
07/18/23	09:21:00	-3.20389		1799.33		106.70	
07/18/23	09:21:25	-3.19694		1820.52		106.66	Arrived at 1000 ft stop.
07/18/23	09:22:00	-3.18722		1818.37		106.63	
07/18/23	09:23:00	-3.17056		1818.84		106.63	
07/18/23	09:24:00	-3.15389		1818.79		106.62	
07/18/23	09:24:28	-3.14611		1819.01		106.62	1000 ft stop.
07/18/23	09:25:00	-3.13722		1805.71		106.61	
07/18/23	09:26:00	-3.12056		1810.26		106.61	
07/18/23	09:27:00	-3.10389		1824.95		106.61	
07/18/23	09:27:22	-3.09778		1838.41		106.61	BHT decreased RIH
07/18/23	09:28:00	-3.08722		1837.41		106.55	
07/18/23	09:29:00	-3.07056		1797.94		106.35	



		<b>FESCO, Ltd.</b> 1000 Fesco Ave. - Alice, Texas 78332						
		<b>RESERVOIR PRESSURE FALLOFF TEST</b>						
Company: Petrotek Corporation Well: Navajo Refining Waste Disposal Well No. 2 Field: Davonia Location: Eddy County, NM Perfs: 7570 - 7736; 7826 - 8399 ft (MD) Formation: Unavailable						Test Date: 07/18 - 07/20/2023 Gauge Depth: 7557 ft Gauge Type: Electronic Gauge SN: DC-224831 Gauge Range: 15000 psi Gauge OD: 1.2500"		
Test Date mm/dd/yy	Real Time hh:mm:ss	Delta Time hours	WHP psia	BHP psia	Delta BHP psi	Temp. °F	Comments	
07/18/23	09:30:00	-3.05389		1870.33		106.14		
07/18/23	09:31:00	-3.03722		1940.89		105.96		
07/18/23	09:32:00	-3.02056		2016.91		105.77		
07/18/23	09:33:00	-3.00389		2085.52		105.61		
07/18/23	09:33:30	-2.99556		2125.86		105.53	Arrived at 2000 ft stop.	
07/18/23	09:34:00	-2.98722		2124.55		105.50		
07/18/23	09:35:00	-2.97056		2121.66		105.53		
07/18/23	09:36:00	-2.95389		2122.73		105.51		
07/18/23	09:37:00	-2.93722		2122.81		105.44		
07/18/23	09:38:00	-2.92056		2123.19		105.40		
07/18/23	09:38:56	-2.90500		2122.19		105.56	Left 2000 ft stop.	
07/18/23	09:39:00	-2.90389		2125.25		105.58		
07/18/23	09:40:00	-2.88722		2181.15		105.61		
07/18/23	09:41:00	-2.87056		2271.49		105.35		
07/18/23	09:42:00	-2.85389		2349.78		105.14		
07/18/23	09:43:00	-2.83722		2425.43		105.00		
07/18/23	09:44:00	-2.82056		2516.45		104.81		
07/18/23	09:44:16	-2.81611		2538.87		104.75	Arrived at 3000 ft stop.	
07/18/23	09:45:00	-2.80389		2537.58		104.79		
07/18/23	09:46:00	-2.78722		2535.20		104.86		
07/18/23	09:47:00	-2.77056		2532.26		104.91		
07/18/23	09:48:00	-2.75389		2536.50		104.95		
07/18/23	09:49:00	-2.73722		2535.70		105.00		
07/18/23	09:49:33	-2.72806		2534.25		105.02	Left 3000 ft stop.	
07/18/23	09:50:00	-2.72056		2555.11		105.00		
07/18/23	09:51:00	-2.70389		2648.54		104.84		
07/18/23	09:52:00	-2.68722		2741.85		104.66		
07/18/23	09:53:00	-2.67056		2829.92		104.51		
07/18/23	09:54:00	-2.65389		2931.01		104.38		
07/18/23	09:54:15	-2.64972		2948.53		104.35	Arrived at 4000 ft stop.	
07/18/23	09:55:00	-2.63722		2948.62		104.35		
07/18/23	09:56:00	-2.62056		2947.71		104.37		
07/18/23	09:57:00	-2.60389		2946.94		104.39		
07/18/23	09:58:00	-2.58722		2945.96		104.40		
07/18/23	09:59:00	-2.57056		2945.73		104.42		
07/18/23	09:59:25	-2.56361		2946.67		104.42	Left 4000 ft stop.	
07/18/23	10:00:00	-2.55389		2986.22		104.40		
07/18/23	10:01:00	-2.53722		3074.76		104.30		



		<b>FESCO, Ltd.</b> 1000 Fesco Ave. - Alice, Texas 78332						
		<b>RESERVOIR PRESSURE FALLOFF TEST</b>						
Company: Petrotek Corporation Well: Navajo Refining Waste Disposal Well No. 2 Field: Davonia Location: Eddy County, NM Perfs: 7570 - 7736; 7826 - 8399 ft (MD) Formation: Unavailable							Test Date: 07/18 - 07/20/2023 Gauge Depth: 7557 ft Gauge Type: Electronic Gauge SN: DC-224831 Gauge Range: 15000 psi Gauge OD: 1.2500"	
Test Date mm/dd/yy	Real Time hh:mm:ss	Delta Time hours	WHP psia	BHP psia	Delta BHP psi	Temp. °F	Comments	
07/18/23	10:02:00	-2.52056		3164.18		104.21		
07/18/23	10:03:00	-2.50389		3254.45		104.14		
07/18/23	10:04:00	-2.48722		3342.35		104.10		
07/18/23	10:04:17	-2.48250		3360.50		104.09	Arrived at 5000 ft stop.	
07/18/23	10:05:00	-2.47056		3358.45		104.10		
07/18/23	10:06:00	-2.45389		3358.52		104.11		
07/18/23	10:07:00	-2.43722		3358.65		104.11		
07/18/23	10:08:00	-2.42056		3358.35		104.12		
07/18/23	10:09:00	-2.40389		3357.72		104.13		
07/18/23	10:09:32	-2.39500		3358.07		104.14	Left 5000 ft stop.	
07/18/23	10:10:00	-2.38722		3393.00		104.13		
07/18/23	10:11:00	-2.37056		3467.95		104.11		
07/18/23	10:12:00	-2.35389		3558.92		104.11		
07/18/23	10:12:18	-2.34889		3587.67		104.12	BHT increased while RIH	
07/18/23	10:13:00	-2.33722		3651.81		104.14		
07/18/23	10:14:00	-2.32056		3745.96		104.18		
07/18/23	10:14:19	-2.31528		3777.23		104.20	Arrived at 6000 ft stop.	
07/18/23	10:15:00	-2.30389		3775.85		104.21		
07/18/23	10:16:00	-2.28722		3776.38		104.22		
07/18/23	10:17:00	-2.27056		3777.36		104.23		
07/18/23	10:18:00	-2.25389		3775.81		104.23		
07/18/23	10:19:00	-2.23722		3775.92		104.24		
07/18/23	10:19:29	-2.22917		3775.89		104.24	Left 6000 ft stop.	
07/18/23	10:20:00	-2.22056		3812.81		104.25		
07/18/23	10:21:00	-2.20389		3900.00		104.34		
07/18/23	10:22:00	-2.18722		3985.96		104.44		
07/18/23	10:23:00	-2.17056		4080.72		104.55		
07/18/23	10:24:00	-2.15389		4179.70		104.72		
07/18/23	10:24:09	-2.15139		4194.22		104.75	Arrived at 7000 ft stop.	
07/18/23	10:25:00	-2.13722		4194.15		104.78		
07/18/23	10:26:00	-2.12056		4193.88		104.78		
07/18/23	10:27:00	-2.10389		4194.41		104.79		
07/18/23	10:28:00	-2.08722		4194.09		104.79		
07/18/23	10:29:00	-2.07056		4193.65		104.80		
07/18/23	10:29:21	-2.06472		4193.73		104.80	Left 7000 ft stop.	
07/18/23	10:30:00	-2.05389		4236.17		104.85		
07/18/23	10:31:00	-2.03722		4323.97		105.00		
07/18/23	10:32:00	-2.02056		4407.37		105.15		







 PETROLEUM ENGINEERS		FESCO, Ltd. 1000 Fesco Ave. - Alice, Texas 78332					 PETROLEUM ENGINEERS	
		RESERVOIR PRESSURE FALLOFF TEST						
Company: Petrotek Corporation Well: Navajo Refining Waste Disposal Well No. 2 Field: Davonia Location: Eddy County, NM Perfs: 7570 - 7736; 7826 - 8399 ft (MD) Formation: Unavailable							Test Date: 07/18 - 07/20/2023 Gauge Depth: 7557 ft Gauge Type: Electronic Gauge SN: DC-224831 Gauge Range: 15000 psi Gauge OD: 1.2500"	
Test Date mm/dd/yy	Real Time hh:mm:ss	Delta Time hours	WHP psia	BHP psia	Delta BHP psi	Temp. °F	Comments	
07/18/23	10:32:19	-2.01528	1410	4428.44		105.18	Softset gauge at 7557 ft.	
07/18/23	10:32:20	-2.01500		4428.11		105.18	POOH with slickline. RDMO	
07/18/23	10:33:00	-2.00389		4427.90		105.18		
07/18/23	10:34:00	-1.98722		4427.71		105.18		
07/18/23	10:35:00	-1.97056		4427.62		105.19		
07/18/23	10:36:00	-1.95389		4427.50		105.19		
07/18/23	10:36:36	-1.94389	1410	4427.46		105.19	7557 ft stop.	
07/18/23	10:37:00	-1.93722		4427.36		105.19		
07/18/23	10:38:00	-1.92056		4427.33		105.20		
07/18/23	10:39:00	-1.90389		4427.23		105.20		
07/18/23	10:40:00	-1.88722		4427.14		105.20		
07/18/23	10:45:00	-1.80389		4426.81		105.21		
07/18/23	10:50:00	-1.72056		4426.48		105.22		
07/18/23	10:55:00	-1.63722		4426.36		105.23		
07/18/23	11:00:00	-1.55389		4426.14		105.24		
07/18/23	11:05:00	-1.47056		4425.69		105.23		
07/18/23	11:10:00	-1.38722		4425.81		105.20		
07/18/23	11:15:00	-1.30389		4425.62		105.19		
07/18/23	11:20:00	-1.22056		4425.45		105.17		
07/18/23	11:25:00	-1.13722		4425.14		105.16		
07/18/23	11:30:00	-1.05389		4425.25		105.16		
07/18/23	11:35:00	-0.97056		4425.21		105.15		
07/18/23	11:40:00	-0.88722		4424.81		105.14		
07/18/23	11:45:00	-0.80389		4425.14		105.14		
07/18/23	11:50:00	-0.72056		4425.26		105.13		
07/18/23	11:55:00	-0.63722		4425.26		105.12		
07/18/23	12:00:00	-0.55389		4425.27		105.12		
07/18/23	12:05:00	-0.47056		4425.23		105.11		
07/18/23	12:10:00	-0.38722		4425.24		105.11		
07/18/23	12:15:00	-0.30389		4425.20		105.10		
07/18/23	12:20:00	-0.22056		4425.08		105.11		
07/18/23	12:25:00	-0.13722		4424.97		105.13		
07/18/23	12:30:00	-0.05389		4424.99		105.14		
07/18/23	12:33:12	-0.00056		4424.97		105.14	Water Injection Rate = Unavailable.	
07/18/23	12:33:13	-0.00028		4424.94		105.14	Casing Pressure = 780 psig.	
07/18/23	12:33:14	0.00000	1410	4424.88	0.00	105.14	Shut in well for 48-hr falloff test.	
07/18/23	12:33:15	0.00028		4422.91	-1.97	105.14		
07/18/23	12:33:16	0.00056		4421.47	-3.41	105.14		

	<b>FESCO, Ltd.</b> 1000 Fesco Ave. - Alice, Texas 78332						
RESERVOIR PRESSURE FALLOFF TEST							
Company: Petrotek Corporation Well: Navajo Refining Waste Disposal Well No. 2 Field: Davonia Location: Eddy County, NM Perfs: 7570 - 7736; 7826 - 8399 ft (MD) Formation: Unavailable		Test Date: 07/18 - 07/20/2023 Gauge Depth: 7557 ft Gauge Type: Electronic Gauge SN: DC-224831 Gauge Range: 15000 psi Gauge OD: 1.2500"					
Test Date mm/dd/yy	Real Time hh:mm:ss	Delta Time hours	WHP psia	BHP psia	Delta BHP psi	Temp. °F	Comments
07/18/23	12:33:17	0.00083		4420.83	-4.05	105.14	
07/18/23	12:33:18	0.00111		4421.47	-3.41	105.14	
07/18/23	12:33:19	0.00139		4420.65	-4.23	105.14	
07/18/23	12:33:20	0.00167		4420.22	-4.66	105.14	
07/18/23	12:33:21	0.00194		4418.94	-5.94	105.14	
07/18/23	12:33:22	0.00222		4418.96	-5.92	105.14	
07/18/23	12:33:23	0.00250		4417.23	-7.65	105.14	
07/18/23	12:33:24	0.00278		4416.86	-8.02	105.14	
07/18/23	12:33:25	0.00306		4415.65	-9.23	105.14	
07/18/23	12:33:26	0.00333		4415.10	-9.78	105.14	
07/18/23	12:33:27	0.00361		4413.62	-11.26	105.14	
07/18/23	12:33:28	0.00389		4413.45	-11.43	105.14	
07/18/23	12:33:29	0.00417		4413.19	-11.69	105.14	
07/18/23	12:33:30	0.00444		4413.57	-11.31	105.14	
07/18/23	12:33:31	0.00472		4412.99	-11.89	105.14	
07/18/23	12:33:32	0.00500		4412.13	-12.75	105.14	
07/18/23	12:33:33	0.00528		4411.55	-13.33	105.14	
07/18/23	12:33:34	0.00556		4410.11	-14.77	105.14	
07/18/23	12:33:35	0.00583		4409.90	-14.98	105.14	
07/18/23	12:33:36	0.00611		4409.79	-15.09	105.14	
07/18/23	12:33:37	0.00639		4409.81	-15.07	105.14	
07/18/23	12:33:38	0.00667		4409.73	-15.15	105.14	
07/18/23	12:33:39	0.00694		4409.15	-15.73	105.14	
07/18/23	12:33:40	0.00722		4408.65	-16.23	105.14	
07/18/23	12:33:41	0.00750		4407.59	-17.29	105.14	
07/18/23	12:33:42	0.00778		4407.22	-17.66	105.14	
07/18/23	12:33:43	0.00806		4407.07	-17.81	105.14	
07/18/23	12:33:44	0.00833		4406.95	-17.93	105.14	
07/18/23	12:33:45	0.00861		4407.06	-17.82	105.14	
07/18/23	12:33:46	0.00889		4406.65	-18.23	105.14	
07/18/23	12:33:47	0.00917		4406.21	-18.67	105.14	
07/18/23	12:33:48	0.00944		4405.48	-19.40	105.14	
07/18/23	12:33:49	0.00972		4404.98	-19.90	105.14	
07/18/23	12:33:51	0.01028		4404.60	-20.28	105.14	
07/18/23	12:33:52	0.01056		4404.70	-20.18	105.14	
07/18/23	12:33:53	0.01083		4404.44	-20.44	105.14	
07/18/23	12:33:54	0.01111		4404.08	-20.80	105.14	
07/18/23	12:33:55	0.01139		4403.56	-21.32	105.14	



	<b>FESCO, Ltd.</b> 1000 Fesco Ave. - Alice, Texas 78332						
RESERVOIR PRESSURE FALLOFF TEST							
Company: Petrotek Corporation Well: Navajo Refining Waste Disposal Well No. 2 Field: Davonia Location: Eddy County, NM Perfs: 7570 - 7736; 7826 - 8399 ft (MD) Formation: Unavailable		Test Date: 07/18 - 07/20/2023 Gauge Depth: 7557 ft Gauge Type: Electronic Gauge SN: DC-224831 Gauge Range: 15000 psi Gauge OD: 1.2500"					
Test Date mm/dd/yy	Real Time hh:mm:ss	Delta Time hours	WHP psia	BHP psia	Delta BHP psi	Temp. °F	Comments
07/18/23	12:33:56	0.01167		4403.03	-21.85	105.14	
07/18/23	12:33:57	0.01194		4402.77	-22.11	105.14	
07/18/23	12:33:59	0.01250		4402.60	-22.28	105.14	
07/18/23	12:34:00	0.01278		4402.45	-22.43	105.14	
07/18/23	12:34:01	0.01306		4402.15	-22.73	105.14	
07/18/23	12:34:03	0.01361		4401.28	-23.60	105.14	
07/18/23	12:34:04	0.01389		4400.98	-23.90	105.14	
07/18/23	12:34:05	0.01417		4400.77	-24.11	105.14	
07/18/23	12:34:07	0.01472		4400.62	-24.26	105.14	
07/18/23	12:34:08	0.01500		4400.39	-24.49	105.14	
07/18/23	12:34:10	0.01556		4399.67	-25.21	105.14	
07/18/23	12:34:12	0.01611		4399.12	-25.76	105.14	
07/18/23	12:34:13	0.01639		4399.00	-25.88	105.14	
07/18/23	12:34:15	0.01694		4398.75	-26.13	105.14	
07/18/23	12:34:17	0.01750		4398.16	-26.72	105.14	
07/18/23	12:34:19	0.01806		4397.60	-27.28	105.14	
07/18/23	12:34:20	0.01833		4397.44	-27.44	105.14	
07/18/23	12:34:22	0.01889		4397.20	-27.68	105.14	
07/18/23	12:34:24	0.01944		4396.72	-28.16	105.14	
07/18/23	12:34:26	0.02000		4396.18	-28.70	105.14	
07/18/23	12:34:28	0.02056		4395.87	-29.01	105.14	
07/18/23	12:34:31	0.02139		4395.34	-29.54	105.14	
07/18/23	12:34:33	0.02194		4394.82	-30.06	105.14	
07/18/23	12:34:35	0.02250		4394.49	-30.39	105.14	
07/18/23	12:34:37	0.02306		4394.23	-30.65	105.14	
07/18/23	12:34:40	0.02389		4393.53	-31.35	105.14	
07/18/23	12:34:42	0.02444		4393.18	-31.70	105.14	
07/18/23	12:34:45	0.02528		4392.74	-32.14	105.14	
07/18/23	12:34:48	0.02611		4392.14	-32.74	105.14	
07/18/23	12:34:50	0.02667		4391.81	-33.07	105.14	
07/18/23	12:34:53	0.02750		4391.35	-33.53	105.14	
07/18/23	12:34:56	0.02833		4390.77	-34.11	105.14	
07/18/23	12:34:59	0.02917		4390.33	-34.55	105.14	
07/18/23	12:35:02	0.03000		4389.80	-35.08	105.14	
07/18/23	12:35:05	0.03083		4389.35	-35.53	105.14	
07/18/23	12:35:08	0.03167		4388.88	-36.00	105.14	
07/18/23	12:35:12	0.03278		4388.23	-36.65	105.15	
07/18/23	12:35:15	0.03361		4387.80	-37.08	105.15	

	<b>FESCO, Ltd.</b> 1000 Fesco Ave. - Alice, Texas 78332						
RESERVOIR PRESSURE FALLOFF TEST							
Company: Petrotek Corporation Well: Navajo Refining Waste Disposal Well No. 2 Field: Davonia Location: Eddy County, NM Perfs: 7570 - 7736; 7826 - 8399 ft (MD) Formation: Unavailable		Test Date: 07/18 - 07/20/2023 Gauge Depth: 7557 ft Gauge Type: Electronic Gauge SN: DC-224831 Gauge Range: 15000 psi Gauge OD: 1.2500"					
Test Date mm/dd/yy	Real Time hh:mm:ss	Delta Time hours	WHP psia	BHP psia	Delta BHP psi	Temp. °F	Comments
07/18/23	12:35:19	0.03472		4387.16	-37.72	105.15	
07/18/23	12:35:22	0.03556		4386.76	-38.12	105.15	
07/18/23	12:35:26	0.03667		4386.14	-38.74	105.15	
07/18/23	12:35:30	0.03778		4385.58	-39.30	105.15	
07/18/23	12:35:34	0.03889		4384.99	-39.89	105.15	
07/18/23	12:35:38	0.04000		4384.44	-40.44	105.15	
07/18/23	12:35:42	0.04111		4383.89	-40.99	105.15	
07/18/23	12:35:46	0.04222		4383.34	-41.54	105.15	
07/18/23	12:35:51	0.04361		4382.68	-42.20	105.15	
07/18/23	12:35:55	0.04472		4382.15	-42.73	105.15	
07/18/23	12:36:00	0.04611		4381.50	-43.38	105.15	
07/18/23	12:36:05	0.04750		4380.85	-44.03	105.15	
07/18/23	12:36:10	0.04889		4380.21	-44.67	105.15	
07/18/23	12:36:15	0.05028		4379.58	-45.30	105.15	
07/18/23	12:36:20	0.05167		4378.98	-45.90	105.15	
07/18/23	12:36:26	0.05333		4378.27	-46.61	105.15	
07/18/23	12:36:31	0.05472		4377.66	-47.22	105.16	
07/18/23	12:36:37	0.05639		4376.95	-47.93	105.16	
07/18/23	12:36:43	0.05806		4376.27	-48.61	105.16	
07/18/23	12:36:49	0.05972		4375.58	-49.30	105.16	
07/18/23	12:36:55	0.06139		4374.90	-49.98	105.16	
07/18/23	12:37:02	0.06333		4374.13	-50.75	105.16	
07/18/23	12:37:08	0.06500		4373.47	-51.41	105.16	
07/18/23	12:37:15	0.06694		4372.71	-52.17	105.16	
07/18/23	12:37:22	0.06889		4371.97	-52.91	105.16	
07/18/23	12:37:29	0.07083		4371.23	-53.65	105.16	
07/18/23	12:37:37	0.07306		4370.41	-54.47	105.16	
07/18/23	12:37:44	0.07500		4369.70	-55.18	105.16	
07/18/23	12:37:52	0.07722		4368.89	-55.99	105.17	
07/18/23	12:38:00	0.07944		4368.11	-56.77	105.17	
07/18/23	12:38:09	0.08194		4367.23	-57.65	105.17	
07/18/23	12:38:17	0.08417		4366.46	-58.42	105.17	
07/18/23	12:38:26	0.08667		4365.60	-59.28	105.17	
07/18/23	12:38:35	0.08917		4364.76	-60.12	105.17	
07/18/23	12:38:45	0.09194		4363.85	-61.03	105.17	
07/18/23	12:38:54	0.09444		4363.03	-61.85	105.17	
07/18/23	12:39:04	0.09722		4362.14	-62.74	105.17	
07/18/23	12:39:15	0.10028		4361.17	-63.71	105.17	



	<b>FESCO, Ltd.</b> 1000 Fesco Ave. - Alice, Texas 78332						
RESERVOIR PRESSURE FALLOFF TEST							
Company: Petrotek Corporation Well: Navajo Refining Waste Disposal Well No. 2 Field: Davonia Location: Eddy County, NM Perfs: 7570 - 7736; 7826 - 8399 ft (MD) Formation: Unavailable		Test Date: 07/18 - 07/20/2023 Gauge Depth: 7557 ft Gauge Type: Electronic Gauge SN: DC-224831 Gauge Range: 15000 psi Gauge OD: 1.2500"					
Test Date mm/dd/yy	Real Time hh:mm:ss	Delta Time hours	WHP psia	BHP psia	Delta BHP psi	Temp. °F	Comments
07/18/23	12:39:25	0.10306		4360.31	-64.57	105.17	
07/18/23	12:39:36	0.10611		4359.37	-65.51	105.18	
07/18/23	12:39:47	0.10917		4358.44	-66.44	105.18	
07/18/23	12:39:58	0.11222		4357.53	-67.35	105.18	
07/18/23	12:40:10	0.11556		4356.56	-68.32	105.18	
07/18/23	12:40:22	0.11889		4355.59	-69.29	105.18	
07/18/23	12:40:35	0.12250		4354.56	-70.32	105.18	
07/18/23	12:40:48	0.12611		4353.55	-71.33	105.18	
07/18/23	12:41:01	0.12972		4352.55	-72.33	105.19	
07/18/23	12:41:15	0.13361		4351.50	-73.38	105.19	
07/18/23	12:41:29	0.13750		4350.46	-74.42	105.19	
07/18/23	12:41:43	0.14139		4349.44	-75.44	105.19	
07/18/23	12:41:58	0.14556		4348.36	-76.52	105.19	
07/18/23	12:42:13	0.14972		4347.30	-77.58	105.19	
07/18/23	12:42:29	0.15417		4346.19	-78.69	105.20	
07/18/23	12:42:45	0.15861		4345.09	-79.79	105.20	
07/18/23	12:43:02	0.16333		4343.93	-80.95	105.20	
07/18/23	12:43:19	0.16806		4342.80	-82.08	105.20	
07/18/23	12:43:37	0.17306		4341.62	-83.26	105.20	
07/18/23	12:43:55	0.17806		4340.47	-84.41	105.20	
07/18/23	12:44:13	0.18306		4339.33	-85.55	105.20	
07/18/23	12:44:33	0.18861		4338.09	-86.79	105.20	
07/18/23	12:44:52	0.19389		4336.93	-87.95	105.21	
07/18/23	12:45:13	0.19972		4335.67	-89.21	105.21	
07/18/23	12:45:34	0.20556		4334.44	-90.44	105.21	
07/18/23	12:45:55	0.21139		4333.22	-91.66	105.21	
07/18/23	12:46:18	0.21778		4331.91	-92.97	105.21	
07/18/23	12:46:40	0.22389		4330.68	-94.20	105.21	
07/18/23	12:47:04	0.23056		4329.36	-95.52	105.22	
07/18/23	12:47:28	0.23722		4328.06	-96.82	105.22	
07/18/23	12:47:53	0.24417		4326.74	-98.14	105.22	
07/18/23	12:48:19	0.25139		4325.39	-99.49	105.22	
07/18/23	12:48:45	0.25861		4324.06	-100.82	105.22	
07/18/23	12:49:12	0.26611		4322.71	-102.17	105.23	
07/18/23	12:49:40	0.27389		4321.33	-103.55	105.23	
07/18/23	12:50:09	0.28194		4319.93	-104.95	105.23	
07/18/23	12:50:39	0.29028		4318.51	-106.37	105.23	
07/18/23	12:51:09	0.29861		4317.12	-107.76	105.23	



 PETROLEUM ENGINEERS		FESCO, Ltd. 1000 Fesco Ave. - Alice, Texas 78332					 PETROLEUM ENGINEERS
		RESERVOIR PRESSURE FALLOFF TEST					
Company: Petrotek Corporation Well: Navajo Refining Waste Disposal Well No. 2 Field: Davonia Location: Eddy County, NM Perfs: 7570 - 7736; 7826 - 8399 ft (MD) Formation: Unavailable							Test Date: 07/18 - 07/20/2023 Gauge Depth: 7557 ft Gauge Type: Electronic Gauge SN: DC-224831 Gauge Range: 15000 psi Gauge OD: 1.2500"
Test Date mm/dd/yy	Real Time hh:mm:ss	Delta Time hours	WHP psia	BHP psia	Delta BHP psi	Temp. °F	Comments
07/18/23	12:51:41	0.30750		4315.66	-109.22	105.24	
07/18/23	12:52:13	0.31639		4314.24	-110.64	105.24	
07/18/23	12:52:46	0.32556		4312.80	-112.08	105.24	
07/18/23	12:53:20	0.33500		4311.35	-113.53	105.24	
07/18/23	12:53:56	0.34500		4309.84	-115.04	105.25	
07/18/23	12:54:32	0.35500		4308.36	-116.52	105.25	
07/18/23	12:55:09	0.36528		4306.89	-117.99	105.25	
07/18/23	12:55:48	0.37611		4305.36	-119.52	105.25	
07/18/23	12:56:27	0.38694		4303.86	-121.02	105.26	
07/18/23	12:57:08	0.39833		4302.33	-122.55	105.26	
07/18/23	12:57:50	0.41000		4300.79	-124.09	105.26	
07/18/23	12:58:33	0.42194		4299.26	-125.62	105.27	
07/18/23	12:59:17	0.43417		4297.72	-127.16	105.27	
07/18/23	13:00:03	0.44694		4296.15	-128.73	105.27	
07/18/23	13:00:50	0.46000		4294.60	-130.28	105.28	
07/18/23	13:01:38	0.47333		4293.04	-131.84	105.28	
07/18/23	13:02:28	0.48722		4291.45	-133.43	105.28	
07/18/23	13:03:19	0.50139		4289.89	-134.99	105.29	
07/18/23	13:04:11	0.51583		4288.32	-136.56	105.29	
07/18/23	13:05:06	0.53111		4286.72	-138.16	105.29	
07/18/23	13:06:01	0.54639		4285.15	-139.73	105.30	
07/18/23	13:06:59	0.56250		4283.54	-141.34	105.30	
07/18/23	13:07:58	0.57889		4281.95	-142.93	105.31	
07/18/23	13:08:59	0.59583		4280.35	-144.53	105.31	
07/18/23	13:10:02	0.61333		4278.74	-146.14	105.31	
07/18/23	13:11:06	0.63111		4277.15	-147.73	105.32	
07/18/23	13:12:12	0.64944		4275.56	-149.32	105.32	
07/18/23	13:13:21	0.66861		4273.96	-150.92	105.33	
07/18/23	13:14:31	0.68806		4272.38	-152.50	105.33	
07/18/23	13:15:43	0.70806		4270.79	-154.09	105.33	
07/18/23	13:16:58	0.72889		4269.20	-155.68	105.34	
07/18/23	13:18:14	0.75000		4267.64	-157.24	105.34	
07/18/23	13:19:33	0.77194		4266.06	-158.82	105.35	
07/18/23	13:20:54	0.79444		4264.50	-160.38	105.35	
07/18/23	13:22:18	0.81778		4262.94	-161.94	105.36	
07/18/23	13:23:44	0.84167		4261.39	-163.49	105.36	
07/18/23	13:25:12	0.86611		4259.86	-165.02	105.37	
07/18/23	13:26:43	0.89139		4258.34	-166.54	105.38	







 PETROLEUM ENGINEERS		FESCO, Ltd. 1000 Fesco Ave. - Alice, Texas 78332					 PETROLEUM ENGINEERS
		RESERVOIR PRESSURE FALLOFF TEST					
Company: Petrotek Corporation Well: Navajo Refining Waste Disposal Well No. 2 Field: Davonia Location: Eddy County, NM Perfs: 7570 - 7736; 7826 - 8399 ft (MD) Formation: Unavailable							Test Date: 07/18 - 07/20/2023 Gauge Depth: 7557 ft Gauge Type: Electronic Gauge SN: DC-224831 Gauge Range: 15000 psi Gauge OD: 1.2500"
Test Date mm/dd/yy	Real Time hh:mm:ss	Delta Time hours	WHP psia	BHP psia	Delta BHP psi	Temp. °F	Comments
07/18/23	13:28:17	0.91750		4256.81	-168.07	105.38	
07/18/23	13:29:53	0.94417		4255.32	-169.56	105.39	
07/18/23	13:31:32	0.97167		4253.83	-171.05	105.39	
07/18/23	13:33:15	1.00028		4252.35	-172.53	105.40	
07/18/23	13:35:00	1.02944		4250.90	-173.98	105.41	
07/18/23	13:36:48	1.05944		4249.46	-175.42	105.41	
07/18/23	13:38:39	1.09028		4248.04	-176.84	105.42	
07/18/23	13:40:34	1.12222		4246.63	-178.25	105.42	
07/18/23	13:42:32	1.15500		4245.25	-179.63	105.43	
07/18/23	13:44:33	1.18861		4243.89	-180.99	105.44	
07/18/23	13:46:38	1.22333		4242.55	-182.33	105.44	
07/18/23	13:48:47	1.25917		4241.21	-183.67	105.45	
07/18/23	13:50:59	1.29583		4239.92	-184.96	105.46	
07/18/23	13:53:15	1.33361		4238.64	-186.24	105.47	
07/18/23	13:55:35	1.37250		4237.40	-187.48	105.47	
07/18/23	13:58:00	1.41278		4236.17	-188.71	105.48	
07/18/23	14:00:28	1.45389		4234.97	-189.91	105.49	
07/18/23	14:03:01	1.49639		4233.80	-191.08	105.49	
07/18/23	14:05:38	1.54000		4232.66	-192.22	105.50	
07/18/23	14:08:20	1.58500		4231.54	-193.34	105.51	
07/18/23	14:11:07	1.63139		4230.45	-194.43	105.52	
07/18/23	14:13:58	1.67889		4229.40	-195.48	105.52	
07/18/23	14:16:55	1.72806		4228.37	-196.51	105.53	
07/18/23	14:19:56	1.77833		4227.37	-197.51	105.54	
07/18/23	14:23:03	1.83028		4226.41	-198.47	105.55	
07/18/23	14:26:16	1.88389		4225.47	-199.41	105.56	
07/18/23	14:29:34	1.93889		4224.57	-200.31	105.56	
07/18/23	14:32:57	1.99528		4223.70	-201.18	105.57	
07/18/23	14:36:27	2.05361		4222.85	-202.03	105.58	
07/18/23	14:40:03	2.11361		4222.04	-202.84	105.59	
07/18/23	14:43:45	2.17528		4221.26	-203.62	105.60	
07/18/23	14:47:34	2.23889		4220.51	-204.37	105.60	
07/18/23	14:51:29	2.30417		4219.80	-205.08	105.61	
07/18/23	14:55:31	2.37139		4219.11	-205.77	105.62	
07/18/23	14:59:41	2.44083		4218.45	-206.43	105.63	
07/18/23	15:03:57	2.51194		4217.82	-207.06	105.64	
07/18/23	15:08:21	2.58528		4217.22	-207.66	105.64	
07/18/23	15:12:53	2.66083		4216.65	-208.23	105.65	







	<b>FESCO, Ltd.</b> 1000 Fesco Ave. - Alice, Texas 78332						
RESERVOIR PRESSURE FALLOFF TEST							
Company: Petrotek Corporation Well: Navajo Refining Waste Disposal Well No. 2 Field: Davonia Location: Eddy County, NM Perfs: 7570 - 7736; 7826 - 8399 ft (MD) Formation: Unavailable		Test Date: 07/18 - 07/20/2023 Gauge Depth: 7557 ft Gauge Type: Electronic Gauge SN: DC-224831 Gauge Range: 15000 psi Gauge OD: 1.2500"					
Test Date mm/dd/yy	Real Time hh:mm:ss	Delta Time hours	WHP psia	BHP psia	Delta BHP psi	Temp. °F	Comments
07/18/23	15:17:33	2.73861		4216.10	-208.78	105.66	
07/18/23	15:22:21	2.81861		4215.60	-209.28	105.67	
07/18/23	15:27:17	2.90083		4215.11	-209.77	105.68	
07/18/23	15:32:22	2.98556		4214.65	-210.23	105.69	
07/18/23	15:37:36	3.07278		4214.20	-210.68	105.70	
07/18/23	15:42:59	3.16250		4213.78	-211.10	105.71	
07/18/23	15:48:31	3.25472		4213.40	-211.48	105.72	
07/18/23	15:54:13	3.34972		4213.03	-211.85	105.73	
07/18/23	16:00:05	3.44750		4212.69	-212.19	105.75	
07/18/23	16:06:08	3.54833		4212.35	-212.53	105.75	
07/18/23	16:12:21	3.65194		4212.05	-212.83	105.77	
07/18/23	16:18:45	3.75861		4211.76	-213.12	105.78	
07/18/23	16:25:20	3.86833		4211.49	-213.39	105.79	
07/18/23	16:32:06	3.98111		4211.24	-213.64	105.80	
07/18/23	16:39:05	4.09750		4211.00	-213.88	105.81	
07/18/23	16:46:16	4.21722		4210.77	-214.11	105.82	
07/18/23	16:53:39	4.34028		4210.56	-214.32	105.83	
07/18/23	17:01:15	4.46694		4210.36	-214.52	105.84	
07/18/23	17:09:05	4.59750		4210.18	-214.70	105.85	
07/18/23	17:17:08	4.73167		4210.01	-214.87	105.86	
07/18/23	17:25:25	4.86972		4209.84	-215.04	105.86	
07/18/23	17:33:57	5.01194		4209.69	-215.19	105.87	
07/18/23	17:42:44	5.15833		4209.55	-215.33	105.88	
07/18/23	17:51:46	5.30889		4209.41	-215.47	105.89	
07/18/23	18:01:04	5.46389		4209.28	-215.60	105.90	
07/18/23	18:10:39	5.62361		4209.15	-215.73	105.91	
07/18/23	18:20:30	5.78778		4209.05	-215.83	105.91	
07/18/23	18:30:38	5.95667		4208.94	-215.94	105.92	
07/18/23	18:41:05	6.13083		4208.85	-216.03	105.93	
07/18/23	18:51:49	6.30972		4208.75	-216.13	105.94	
07/18/23	19:02:52	6.49389		4208.66	-216.22	105.95	
07/18/23	19:14:15	6.68361		4208.57	-216.31	105.96	
07/18/23	19:25:57	6.87861		4208.48	-216.40	105.97	
07/18/23	19:38:01	7.07972		4208.41	-216.47	105.97	
07/18/23	19:50:25	7.28639		4208.33	-216.55	105.98	
07/18/23	20:03:11	7.49917		4208.25	-216.63	105.99	
07/18/23	20:16:19	7.71806		4208.17	-216.71	105.99	
07/18/23	20:29:50	7.94333		4208.10	-216.78	106.00	

	<b>FESCO, Ltd.</b> 1000 Fesco Ave. - Alice, Texas 78332						
RESERVOIR PRESSURE FALLOFF TEST							
Company: Petrotek Corporation Well: Navajo Refining Waste Disposal Well No. 2 Field: Davonia Location: Eddy County, NM Perfs: 7570 - 7736; 7826 - 8399 ft (MD) Formation: Unavailable		Test Date: 07/18 - 07/20/2023 Gauge Depth: 7557 ft Gauge Type: Electronic Gauge SN: DC-224831 Gauge Range: 15000 psi Gauge OD: 1.2500"					
Test Date mm/dd/yy	Real Time hh:mm:ss	Delta Time hours	WHP psia	BHP psia	Delta BHP psi	Temp. °F	Comments
07/18/23	20:43:45	8.17528		4208.03	-216.85	106.00	
07/18/23	20:58:05	8.41417		4207.97	-216.91	106.01	
07/18/23	21:12:49	8.65972		4207.89	-216.99	106.02	
07/18/23	21:28:00	8.91278		4207.83	-217.05	106.02	
07/18/23	21:43:36	9.17278		4207.76	-217.12	106.03	
07/18/23	21:59:41	9.44083		4207.69	-217.19	106.03	
07/18/23	22:16:13	9.71639		4207.62	-217.26	106.04	
07/18/23	22:33:15	10.00028		4207.55	-217.33	106.05	
07/18/23	22:50:46	10.29222		4207.49	-217.39	106.05	
07/18/23	23:08:48	10.59278		4207.43	-217.45	106.06	
07/18/23	23:27:21	10.90194		4207.37	-217.51	106.06	
07/18/23	23:46:27	11.22028		4207.32	-217.56	106.07	
07/19/23	00:06:07	11.54806		4207.27	-217.61	106.08	
07/19/23	00:26:21	11.88528		4207.22	-217.66	106.08	
07/19/23	00:47:10	12.23222		4207.16	-217.72	106.09	
07/19/23	01:08:36	12.58944		4207.10	-217.78	106.09	
07/19/23	01:30:39	12.95694		4207.03	-217.85	106.09	
07/19/23	01:53:21	13.33528		4206.97	-217.91	106.10	
07/19/23	02:16:43	13.72472		4206.90	-217.98	106.11	
07/19/23	02:40:46	14.12556		4206.82	-218.06	106.11	
07/19/23	03:05:31	14.53806		4206.76	-218.12	106.12	
07/19/23	03:30:59	14.96250		4206.69	-218.19	106.12	
07/19/23	03:57:12	15.39944		4206.62	-218.26	106.13	
07/19/23	04:24:11	15.84917		4206.55	-218.33	106.14	
07/19/23	04:51:57	16.31194		4206.48	-218.40	106.14	
07/19/23	05:20:31	16.78806		4206.41	-218.47	106.15	
07/19/23	05:49:56	17.27833		4206.35	-218.53	106.16	
07/19/23	06:20:13	17.78306		4206.27	-218.61	106.16	
07/19/23	06:51:22	18.30222		4206.21	-218.67	106.17	
07/19/23	07:23:26	18.83667		4206.12	-218.76	106.18	
07/19/23	07:56:26	19.38667		4206.06	-218.82	106.18	
07/19/23	08:30:24	19.95278		4205.97	-218.91	106.19	
07/19/23	09:05:21	20.53528		4205.88	-219.00	106.19	
07/19/23	09:41:20	21.13500		4205.79	-219.09	106.20	
07/19/23	10:18:22	21.75222		4205.70	-219.18	106.20	
07/19/23	10:56:28	22.38722		4205.60	-219.28	106.21	
07/19/23	11:35:42	23.04111		4205.49	-219.39	106.21	
07/19/23	12:16:04	23.71389		4205.38	-219.50	106.22	

 PETROLEUM ENGINEERS		FESCO, Ltd. 1000 Fesco Ave. - Alice, Texas 78332					 PETROLEUM ENGINEERS
		RESERVOIR PRESSURE FALLOFF TEST					
Company: Petrotek Corporation Well: Navajo Refining Waste Disposal Well No. 2 Field: Davonia Location: Eddy County, NM Perfs: 7570 - 7736; 7826 - 8399 ft (MD) Formation: Unavailable							Test Date: 07/18 - 07/20/2023 Gauge Depth: 7557 ft Gauge Type: Electronic Gauge SN: DC-224831 Gauge Range: 15000 psi Gauge OD: 1.2500"
Test Date mm/dd/yy	Real Time hh:mm:ss	Delta Time hours	WHP psia	BHP psia	Delta BHP psi	Temp. °F	Comments
07/19/23	12:57:37	24.40639		4205.27	-219.61	106.22	
07/19/23	13:40:22	25.11889		4205.15	-219.73	106.22	
07/19/23	14:24:23	25.85250		4205.05	-219.83	106.23	
07/19/23	15:09:41	26.60750		4204.94	-219.94	106.23	
07/19/23	15:56:18	27.38444		4204.85	-220.03	106.24	
07/19/23	16:44:16	28.18389		4204.76	-220.12	106.24	
07/19/23	17:33:39	29.00694		4204.65	-220.23	106.24	
07/19/23	18:24:28	29.85389		4204.58	-220.30	106.25	
07/19/23	19:16:47	30.72583		4204.53	-220.35	106.25	
07/19/23	20:10:37	31.62306		4204.46	-220.42	106.25	
07/19/23	21:06:01	32.54639		4204.38	-220.50	106.25	
07/19/23	22:03:02	33.49667		4204.26	-220.62	106.25	
07/19/23	23:01:43	34.47472		4204.14	-220.74	106.26	
07/20/23	00:02:07	35.48139		4204.02	-220.86	106.26	
07/20/23	01:04:17	36.51750		4203.86	-221.02	106.26	
07/20/23	02:08:16	37.58389		4203.72	-221.16	106.27	
07/20/23	03:14:07	38.68139		4203.59	-221.29	106.27	
07/20/23	04:21:53	39.81083		4203.45	-221.43	106.27	
07/20/23	05:31:38	40.97333		4203.33	-221.55	106.28	
07/20/23	06:43:25	42.16972		4203.20	-221.68	106.28	
07/20/23	07:57:18	43.40111		4203.07	-221.81	106.29	
07/20/23	09:13:21	44.66861		4202.93	-221.95	106.29	
07/20/23	10:31:36	45.97278		4202.78	-222.10	106.30	
07/20/23	11:52:09	47.31528		4201.77		106.38	
07/20/23	12:35:00	48.02944		4201.66		106.38	
07/20/23	12:35:39	48.04028	910	4201.66		106.38	Ended Falloff Test.
07/20/23	12:35:40	48.04056		4201.63		106.38	POOH making static gradient stops.
07/20/23	12:36:00	48.04611		4172.51		107.03	
07/20/23	12:37:00	48.06278		4057.89		112.31	
07/20/23	12:38:00	48.07944		3960.24		110.70	
07/20/23	12:38:06	48.08111		3960.39		110.66	Arrived at 7000 ft stop.
07/20/23	12:39:00	48.09611		3959.68		110.59	
07/20/23	12:40:00	48.11278		3959.69		110.55	
07/20/23	12:41:00	48.12944		3959.70		110.53	
07/20/23	12:41:59	48.14583		3959.69		110.50	Left 7000 ft stop.
07/20/23	12:42:00	48.14611		3959.63		110.50	
07/20/23	12:43:00	48.16278		3816.30		110.06	
07/20/23	12:44:00	48.17944		3653.48		107.88	

 PETROLEUM ENGINEERS		FESCO, Ltd. 1000 Fesco Ave. - Alice, Texas 78332					 PETROLEUM ENGINEERS
		RESERVOIR PRESSURE FALLOFF TEST					
Company: Petrotek Corporation Well: Navajo Refining Waste Disposal Well No. 2 Field: Davonia Location: Eddy County, NM Perfs: 7570 - 7736; 7826 - 8399 ft (MD) Formation: Unavailable							Test Date: 07/18 - 07/20/2023 Gauge Depth: 7557 ft Gauge Type: Electronic Gauge SN: DC-224831 Gauge Range: 15000 psi Gauge OD: 1.2500"
Test Date mm/dd/yy	Real Time hh:mm:ss	Delta Time hours	WHP psia	BHP psia	Delta BHP psi	Temp. °F	Comments
07/20/23	12:45:00	48.19611		3524.97		105.19	
07/20/23	12:45:13	48.19972		3523.94		105.09	Arrived at 6000 ft stop.
07/20/23	12:46:00	48.21278		3524.11		105.06	
07/20/23	12:47:00	48.22944		3524.05		105.04	
07/20/23	12:48:00	48.24611		3524.03		105.03	
07/20/23	12:49:00	48.26278		3524.04		105.02	
07/20/23	12:49:59	48.27917		3524.04		105.02	Left 6000 ft stop.
07/20/23	12:50:00	48.27944		3523.95		105.02	
07/20/23	12:51:00	48.29611		3391.59		103.72	
07/20/23	12:52:00	48.31278		3231.77		101.29	
07/20/23	12:53:00	48.32944		3091.42		99.11	
07/20/23	12:53:04	48.33056		3087.83		99.05	Arrived at 5000 ft stop.
07/20/23	12:54:00	48.34611		3088.57		98.98	
07/20/23	12:55:00	48.36278		3088.53		98.96	
07/20/23	12:56:00	48.37944		3088.56		98.95	
07/20/23	12:57:00	48.39611		3088.57		98.94	
07/20/23	12:58:00	48.41278		3088.57		98.93	
07/20/23	12:58:02	48.41333		3088.57		98.93	Left 5000 ft stop.
07/20/23	12:59:00	48.42944		2958.89		97.87	
07/20/23	13:00:00	48.44611		2795.62		96.25	
07/20/23	13:00:55	48.46139		2653.39		94.58	Arrived at 4000 ft stop.
07/20/23	13:01:00	48.46278		2654.47		94.49	
07/20/23	13:02:00	48.47944		2653.43		94.40	
07/20/23	13:03:00	48.49611		2653.58		94.40	
07/20/23	13:04:00	48.51278		2653.63		94.39	
07/20/23	13:05:00	48.52944		2653.63		94.38	
07/20/23	13:05:58	48.54556		2653.66		94.37	Left 4000 ft stop.
07/20/23	13:06:00	48.54611		2653.04		94.37	
07/20/23	13:07:00	48.56278		2507.68		93.31	
07/20/23	13:08:00	48.57944		2345.67		91.80	
07/20/23	13:08:50	48.59333		2217.06		90.69	Arrived at 3000 ft stop.
07/20/23	13:09:00	48.59611		2218.78		90.56	
07/20/23	13:10:00	48.61278		2217.99		90.53	
07/20/23	13:11:00	48.62944		2217.86		90.53	
07/20/23	13:12:00	48.64611		2217.86		90.52	
07/20/23	13:13:00	48.66278		2217.89		90.51	
07/20/23	13:14:00	48.67944		2217.90		90.51	
07/20/23	13:14:49	48.69306		2217.92		90.50	Left 3000 ft stop.

		<b>FESCO, Ltd.</b> 1000 Fesco Ave. - Alice, Texas 78332						
		<b>RESERVOIR PRESSURE FALLOFF TEST</b>						
Company: Petrotek Corporation Well: Navajo Refining Waste Disposal Well No. 2 Field: Davonia Location: Eddy County, NM Perfs: 7570 - 7736; 7826 - 8399 ft (MD) Formation: Unavailable							Test Date: 07/18 - 07/20/2023 Gauge Depth: 7557 ft Gauge Type: Electronic Gauge SN: DC-224831 Gauge Range: 15000 psi Gauge OD: 1.2500"	
Test Date mm/dd/yy	Real Time hh:mm:ss	Delta Time hours	WHP psia	BHP psia	Delta BHP psi	Temp. °F	Comments	
07/20/23	13:15:00	48.69611		2201.60		90.49		
07/20/23	13:16:00	48.71278		2081.73		89.82		
07/20/23	13:17:00	48.72944		1925.98		88.32		
07/20/23	13:17:56	48.74500		1782.40		87.46	Arrived at 2000 ft stop.	
07/20/23	13:18:00	48.74611		1783.74		87.44		
07/20/23	13:19:00	48.76278		1782.97		87.43		
07/20/23	13:20:00	48.77944		1782.95		87.43		
07/20/23	13:21:00	48.79611		1782.99		87.43		
07/20/23	13:22:00	48.81278		1783.01		87.43		
07/20/23	13:23:00	48.82944		1783.02		87.43		
07/20/23	13:23:01	48.82972		1783.02		87.43	Left 2000 ft stop.	
07/20/23	13:24:00	48.84611		1654.94		86.22		
07/20/23	13:25:00	48.86278		1495.31		84.79		
07/20/23	13:26:00	48.87944		1350.42		83.10		
07/20/23	13:26:14	48.88333		1349.37		82.92	Arrived at 1000 ft stop.	
07/20/23	13:27:00	48.89611		1349.40		82.89		
07/20/23	13:28:00	48.91278		1349.46		82.88		
07/20/23	13:29:00	48.92944		1349.48		82.87		
07/20/23	13:30:00	48.94611		1349.49		82.86		
07/20/23	13:31:00	48.96278		1349.50		82.85		
07/20/23	13:31:31	48.97139		1349.51		82.84	Left 1000 ft stop.	
07/20/23	13:32:00	48.97944		1291.54		83.21		
07/20/23	13:33:00	48.99611		1114.45		81.63		
07/20/23	13:34:00	49.01278		932.70		86.17		
07/20/23	13:35:00	49.02944		894.57		92.40		
07/20/23	13:35:14	49.03333		896.38		95.56	Gauge at surface.	
07/20/23	13:36:00	49.04611		910.24		97.53		
07/20/23	13:37:00	49.06278		910.68		97.54		
07/20/23	13:38:00	49.07944		910.63		97.72		
07/20/23	13:39:00	49.09611		910.66		97.85		
07/20/23	13:40:00	49.11278		910.63		98.03		
07/20/23	13:40:23	49.11917	910	910.64		98.08	Surface stop.	
07/20/23	13:40:24	49.11944		910.61		98.08	Closed crown valve.	
07/20/23	13:40:54	49.12778		909.86		98.38	Pressured down lubricator.	
07/20/23	13:41:00	49.12944		220.71		98.40		
07/20/23	13:42:00	49.14611		14.89		98.40		
07/20/23	13:42:59	49.16250		9.35		98.86	Test completed.	
07/20/23	13:45:00	49.19611		10.55		99.88		

	<b>FESCO, Ltd.</b> 1000 Fesco Ave. - Alice, Texas 78332						
RESERVOIR PRESSURE FALLOFF TEST							
Company: Petrotek Corporation Well: Navajo Refining Waste Disposal Well No. 2 Field: Davonia Location: Eddy County, NM Perfs: 7570 - 7736; 7826 - 8399 ft (MD) Formation: Unavailable		Test Date: 07/18 - 07/20/2023 Gauge Depth: 7557 ft Gauge Type: Electronic Gauge SN: DC-224831 Gauge Range: 15000 psi Gauge OD: 1.2500"					
Test Date mm/dd/yy	Real Time hh:mm:ss	Delta Time hours	WHP psia	BHP psia	Delta BHP psi	Temp. °F	Comments
07/20/23	13:50:00	49.27944		11.93		88.80	
07/20/23	13:51:25	49.30306		11.44		87.14	Powered down gauge.
<b>Remarks:</b> MIRU slickline. RIH with electronic gauge making injecting gradient stops to 7557 ft. Continued injecting waste water into well for 2 hrs. SI well for 48-hr BHP Falloff Test. POOH making static gradient stops to surface. RDMO.							
<div style="display: flex; justify-content: space-between;"> <div>           Job No.: J202307211401.001A         </div> <div>           Certified: FESCO, Ltd. - Midland, TX             By: <u>Michael Carnes</u>            District Manager - (432) 332-3211         </div> </div>							

## Attachment 5 Falloff Test Summary

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***Petrotek***

## WDW-2 2023 Falloff Test Summary

### Reservoir Properties

Net Pay (h)	175 ft
Porosity ( $\Phi$ )	10.0 %
Formation Compressibility ( $c_f$ )	8.20E-06 psi <sup>-1</sup>
Total Compressibility ( $c_t$ )	1.09E-05 psi <sup>-1</sup>
Wellbore Radius ( $r_w$ )	0.328 ft

### Fluid Properties

Viscosity ( $\mu$ )	0.56 cp
Fluid Compressibility ( $c_f$ )	2.70E-06 psi <sup>-1</sup>
Formation Volume Factor (B)	1.00 bbl/stb

### Model Parameters

Wellbore Storage	Changing hegeman
Well Model	Vertical
Reservoir Model	Dual-porosity PSS
Boundary Model	Infinite

### Analysis Results

#### Well & Wellbore

Initial Wellbore Storage	4.67E-02 bbl/psi
Final Wellbore Storage	2.30E-01 bbl/psi
$D_t$ [changing storage]	1.38E-01 hr
Skin	20.2
$\Delta p_{skin}$	154.4

#### Reservoir & Boundary

Permeability (k)	98 md
Transmissibility	158,999 md-ft/cp
Radius of Investigation ( $r_i$ )	5,617 ft
Omega	2.00E-01
Lambda	1.49E-07



## Attachment 6 AOR Well List

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***Petrotek***

Operator	Well Name	API	Well Type	PLSS Location	Latitude	Longitude	Well Status	Spud Date	Plug Date
APACHE CORPORATION	EMPIRE ABO UNIT #143	30-015-22609	Oil	N-02-18S-27E	32.77240	-104.25150	Active	11/26/1978	-
APACHE CORPORATION	EMPIRE ABO UNIT #014	30-015-00730	Oil	N-02-18S-27E	32.77100	-104.25120	Active	9/22/1958	-
APACHE CORPORATION	EMPIRE ABO UNIT #143A	30-015-22896	Oil	K-02-18S-27E	32.77410	-104.24940	Active	4/16/1979	-
APACHE CORPORATION	EMPIRE ABO UNIT #015	30-015-00716	Oil	J-02-18S-27E	32.77460	-104.24660	Active	2/11/1959	-
APACHE CORPORATION	SCBP STATE #001	30-015-32946	Oil	J-02-18S-27E	32.77520	-104.24600	Active	3/14/2005	-
RILEY PERMIAN OPERATING COMPANY, LLC	STATE H #002	30-015-35814	Oil	H-02-18S-27E	32.77770	-104.24210	Active	10/31/2007	-
APACHE CORPORATION	EMPIRE ABO UNIT #016	30-015-00717	Oil	I-02-18S-27E	32.77460	-104.24280	Active	3/30/1959	-
APACHE CORPORATION	AAO FEDERAL #030	30-015-42360	Oil	M-01-18S-27E	32.77260	-104.23970	Active	7/20/2014	-
APACHE CORPORATION	AAO FEDERAL #009	30-015-34387	Oil	L-01-18S-27E	32.77460	-104.23860	Active	11/7/2005	-
HF Sinclair Navajo Refining LLC	WDW #002	30-015-20894	SWD	E-12-18S-27E	32.76370	-104.23850	Active	5/5/1999	-
APACHE CORPORATION	AAO FEDERAL #011	30-015-34555	Oil	M-01-18S-27E	32.77160	-104.23850	Active	2/15/2006	-
APACHE CORPORATION	AAO FEDERAL #020	30-015-42036	Oil	E-01-18S-27E	32.77730	-104.23770	Active	4/10/2014	-
ROVER OPERATING, LLC	ARTESIA STATE UNIT #802	30-015-25370	Oil	D-13-18S-27E	32.75330	-104.23770	Active	8/27/1985	-
APACHE CORPORATION	AAO FEDERAL #025	30-015-42361	Oil	L-01-18S-27E	32.77460	-104.23730	Active	6/23/2014	-
APACHE CORPORATION	AAO FEDERAL #029	30-015-42339	Oil	M-01-18S-27E	32.77010	-104.23740	Active	6/16/2014	-
ROVER OPERATING, LLC	ARTESIA STATE UNIT #801	30-015-00883	Oil	D-13-18S-27E	32.75190	-104.23750	Active	12/11/1944	-
HARLOW ENTERPRISES LLC	COMSTOCK FEDERAL #003	30-015-25545	Oil	M-12-18S-27E	32.75730	-104.23750	Active	5/19/1986	-
HARLOW ENTERPRISES LLC	COMSTOCK FEDERAL #001	30-015-25100	Oil	N-12-18S-27E	32.75550	-104.23540	Active	12/10/1984	-
LIJ VENTURES, LLC DBA MARKER OIL & GAS	ARTESIA STATE #001	30-015-25241	Oil	C-13-18S-27E	32.75370	-104.23540	Active	4/13/1985	-
APACHE CORPORATION	AAO FEDERAL #026	30-015-42338	Oil	K-01-18S-27E	32.77530	-104.23530	Active	6/10/2014	-
HARLOW ENTERPRISES LLC	COMSTOCK FEDERAL #002	30-015-25201	Oil	K-12-18S-27E	32.75910	-104.23490	Active	3/16/1985	-
APACHE CORPORATION	AAO FEDERAL #012	30-015-34998	Oil	N-01-18S-27E	32.77150	-104.23520	Active	8/13/2006	-
APACHE CORPORATION	AAO FEDERAL #006	30-015-34071	Oil	F-01-18S-27E	32.77740	-104.23430	Active	7/6/2005	-
APACHE CORPORATION	AAO FEDERAL #027	30-015-42359	Oil	K-01-18S-27E	32.77440	-104.23390	Active	7/3/2014	-
APACHE CORPORATION	AAO FEDERAL #010	30-015-34576	Oil	K-01-18S-27E	32.77470	-104.23360	Active	6/2/2006	-
HF Sinclair Navajo Refining LLC	WDW #003	30-015-26575	SWD	N-01-18S-27E	32.77120	-104.23330	Active	12/22/1990	-
APACHE CORPORATION	AAO FEDERAL #019	30-015-42051	Oil	F-01-18S-27E	32.77700	-104.23320	Active	4/2/2014	-
BILL L MILLER	CHUKKA FEDERAL #001	30-015-25270	Oil	F-12-18S-27E	32.76270	-104.23310	Active	4/23/1985	-
APACHE CORPORATION	AAO FEDERAL #028	30-015-42358	Oil	N-01-18S-27E	32.76950	-104.23250	Active	7/12/2014	-
LIJ VENTURES, LLC DBA MARKER OIL & GAS	ARTESIA STATE #002	30-015-25394	Oil	C-13-18S-27E	32.75370	-104.23230	Active	9/28/1985	-
HARLOW ENTERPRISES LLC	COMSTOCK FEDERAL #007	30-015-00874	Oil	J-12-18S-27E	32.76090	-104.23120	Active	7/28/1948	-
HARLOW ENTERPRISES LLC	COMSTOCK FEDERAL #005	30-015-25202	Oil	O-12-18S-27E	32.75540	-104.23110	Active	4/19/1985	-
APACHE CORPORATION	AAO FEDERAL SWD #001	30-015-42549	SWD	G-01-18S-27E	32.77650	-104.23130	Active	10/24/2014	-
HARLOW ENTERPRISES LLC	COMSTOCK FEDERAL #009	30-015-25738	Oil	G-12-18S-27E	32.76270	-104.23110	Active	4/25/1987	-
RILEY PERMIAN OPERATING COMPANY, LLC	FEDERAL T SWD #001	30-015-26404	SWD	A-12-18S-27E	32.76720	-104.22680	Active	6/28/1990	-
HARLOW ENTERPRISES LLC	COMSTOCK FEDERAL #006	30-015-25099	Oil	H-12-18S-27E	32.76400	-104.22680	Active	8/18/1985	-
APACHE CORPORATION	EMPIRE ABO UNIT #020B	30-015-00699	Oil	P-01-18S-27E	32.77150	-104.22460	Active	11/16/1961	-
LIJ VENTURES, LLC DBA MARKER OIL & GAS	LAUREL STATE #003	30-015-31319	Oil	E-07-18S-28E	32.76260	-104.22250	Active	10/2/2000	-
RILEY PERMIAN OPERATING COMPANY, LLC	CHOATE DAVIS 13 STATE SWD #003	30-015-48888	SWD	D-13-18S-27E	32.75290	-104.23880	New	2/24/2022	-
APACHE CORPORATION	EMPIRE ABO UNIT #183	30-015-22096	Oil	K-01-18S-27E	32.77560	-104.23580	Plugged (not released)	6/23/1977	4/27/2021
APACHE CORPORATION	EMPIRE ABO UNIT #193	30-015-22657	Oil	J-01-18S-27E	32.77590	-104.23070	Plugged (not released)	9/29/1978	4/29/2021
APACHE CORPORATION	EMPIRE ABO UNIT #194	30-015-22658	Oil	J-01-18S-27E	32.77310	-104.23050	Plugged (not released)	10/18/1978	4/19/2021
APACHE CORPORATION	EMPIRE ABO UNIT #192	30-015-22560	Oil	J-01-18S-27E	32.77450	-104.22810	Plugged (not released)	5/30/1978	4/22/2021
PRE-ONGARD WELL OPERATOR	PRE-ONGARD WELL #131	30-015-00866	Oil	E-11-18S-27E	32.76370	-104.25560	Plugged (site released)	N/A	1/1/1900
APACHE CORPORATION	EMPIRE ABO UNIT #133B	30-015-22833	Oil	D-11-18S-27E	32.76790	-104.25380	Plugged (site released)	5/23/1979	6/22/2017
BP AMERICA PRODUCTION COMPANY	EMPIRE ABO UNIT #132	30-015-21807	Oil	M-02-18S-27E	32.76990	-104.25360	Plugged (site released)	N/A	6/22/2009
PRE-ONGARD WELL OPERATOR	PRE-ONGARD WELL #131	30-015-22556	Oil	D-11-18S-27E	32.76610	-104.25380	Plugged (site released)	N/A	N/A
PRE-ONGARD WELL OPERATOR	PRE-ONGARD WELL #001	30-015-20510	Oil	F-11-18S-27E	32.76460	-104.25230	Plugged (site released)	N/A	N/A
PRE-ONGARD WELL OPERATOR	PRE-ONGARD WELL #014	30-015-00865	Oil	F-11-18S-27E	32.76460	-104.25130	Plugged (site released)	N/A	N/A
BP AMERICA PRODUCTION COMPANY	EMPIRE ABO UNIT #142	30-015-22608	Oil	N-02-18S-27E	32.76940	-104.25130	Plugged (site released)	N/A	9/9/2009
PRE-ONGARD WELL OPERATOR	PRE-ONGARD WELL #014	30-015-00864	Oil	C-11-18S-27E	32.76730	-104.25120	Plugged (site released)	1/1/1900	N/A
APACHE CORPORATION	EMPIRE ABO UNIT #141B	30-015-22834	Oil	C-11-18S-27E	32.76850	-104.25020	Plugged (site released)	5/21/1979	6/22/2017
APACHE CORPORATION	EMPIRE ABO UNIT #152	30-015-21825	Oil	O-02-18S-27E	32.77000	-104.24910	Plugged (site released)	N/A	12/27/2011
BP AMERICA PRODUCTION COMPANY	EMPIRE ABO UNIT #152B	30-015-22569	Oil	B-11-18S-27E	32.76760	-104.24900	Plugged (site released)	N/A	10/2/2008
APACHE CORPORATION	EMPIRE ABO UNIT #141A	30-015-22051	Oil	K-02-18S-27E	32.77290	-104.24970	Plugged (site released)	N/A	12/21/2011
BP AMERICA PRODUCTION COMPANY	EMPIRE ABO UNIT #154	30-015-22669	Oil	O-02-18S-27E	32.77130	-104.24870	Plugged (site released)	N/A	6/30/2009
BP AMERICA PRODUCTION COMPANY	EMPIRE ABO UNIT #153B	30-015-22838	Oil	B-11-18S-27E	32.76860	-104.24680	Plugged (site released)	N/A	12/22/2008
APACHE CORPORATION	EMPIRE ABO UNIT #155	30-015-22885	Oil	O-02-18S-27E	32.77200	-104.24720	Plugged (site released)	3/30/1979	1/3/2012
PRE-ONGARD WELL OPERATOR	PRE-ONGARD WELL #001	30-015-00870	Oil	J-11-18S-27E	32.76020	-104.24710	Plugged (site released)	N/A	N/A
BP AMERICA PRODUCTION COMPANY	EMPIRE ABO UNIT #015C	30-015-00868	Oil	B-11-18S-27E	32.76730	-104.24700	Plugged (site released)	N/A	7/16/2004
BP AMERICA PRODUCTION COMPANY	EMPIRE ABO UNIT #015A	30-015-00731	Oil	O-02-18S-27E	32.77100	-104.24700	Plugged (site released)	N/A	2/12/2009
BP AMERICA PRODUCTION COMPANY	EMPIRE ABO UNIT #153	30-015-22013	Oil	O-02-18S-27E	32.76940	-104.24530	Plugged (site released)	N/A	10/30/2008
BP AMERICA PRODUCTION COMPANY	EMPIRE ABO UNIT #151B	30-015-22568	Oil	B-11-18S-27E	32.76800	-104.24530	Plugged (site released)	N/A	8/16/2006
BP AMERICA PRODUCTION COMPANY	EMPIRE ABO UNIT #156	30-015-22808	Oil	O-02-18S-27E	32.77080	-104.24490	Plugged (site released)	N/A	10/7/2009
APACHE CORPORATION	EMPIRE ABO UNIT #151	30-015-21544	Oil	O-02-18S-27E	32.77220	-104.24490	Plugged (site released)	N/A	1/6/2012
PRE-ONGARD WELL OPERATOR	PRE-ONGARD WELL #001	30-015-00726	Oil	L-02-18S-27E	32.77470	-104.24280	Plugged (site released)	N/A	N/A
BP AMERICA PRODUCTION COMPANY	EMPIRE ABO UNIT #016A	30-015-00722	Oil	P-02-18S-27E	32.77100	-104.24280	Plugged (site released)	N/A	2/23/2009
BP AMERICA PRODUCTION COMPANY	EMPIRE ABO UNIT #016C	30-015-00869	Oil	A-11-18S-27E	32.76820	-104.24270	Plugged (site released)	N/A	1/24/2007
PRE-ONGARD WELL OPERATOR	PRE-ONGARD WELL #003	30-015-00894	Oil	P-14-18S-27E	32.75200	-104.24180	Plugged (site released)	N/A	N/A
PRE-ONGARD WELL OPERATOR	PRE-ONGARD WELL #001	30-015-00891	Oil	A-14-18S-27E	32.75200	-104.24180	Plugged (site released)	N/A	N/A
APACHE CORPORATION	EMPIRE ABO UNIT #171	30-015-22815	Oil	M-01-18S-27E	32.77100	-104.23950	Plugged (site released)	5/22/1979	10/24/2019
RHONDA OPERATING CO	FEDERAL EA #001	30-015-00871	Oil	D-12-18S-27E	32.76820	-104.23950	Plugged (site released)	N/A	4/12/1994
PRE-ONGARD WELL OPERATOR	PRE-ONGARD WELL #002	30-015-20535	Oil	D-12-18S-27E	32.76820	-104.23910	Plugged (site released)	N/A	N/A
PRE-ONGARD WELL OPERATOR	PRE-ONGARD WELL #003	30-015-23115	Oil	D-12-18S-27E	32.76820	-104.23930	Plugged (site released)	N/A	N/A
PRE-ONGARD WELL OPERATOR	PRE-ONGARD WELL #001	30-015-00695	Oil	L-01-18S-27E	32.77370	-104.23960	Plugged (site released)	N/A	N/A
PRE-ONGARD WELL OPERATOR	PRE-ONGARD WELL #017	30-015-00704	Oil	E-01-18S-27E	32.77790	-104.23860	Plugged (site released)	N/A	N/A
BP AMERICA PRODUCTION COMPANY	EMPIRE ABO UNIT #017A	30-015-00703	Oil	L-01-18S-27E	32.77450	-104.23850	Plugged (site released)	N/A	3/19/2009
BP AMERICA PRODUCTION COMPANY	EMPIRE ABO UNIT #017B	30-015-00705	Oil	M-01-18S-27E	32.77180	-104.23850	Plugged (site released)	N/A	7/21/2004
PRE-ONGARD WELL OPERATOR	PRE-ONGARD WELL #008	30-015-25649	Oil	L-12-18S-27E	32.75920	-104.23750	Plugged (site released)	N/A	N/A
PRE-ONGARD WELL OPERATOR	PRE-ONGARD WELL #001	30-015-00880	Oil	E-13-18S-27E	32.75010	-104.23750	Plugged (site released)	N/A	N/A
PRE-ONGARD WELL OPERATOR	PRE-ONGARD WELL #001	30-015-00872	Oil	L-12-18S-27E	32.75550	-104.23750	Plugged (site released)	N/A	N/A
BP AMERICA PRODUCTION COMPANY	EMPIRE ABO UNIT #181	30-015-21554	Oil	K-01-18S-27E	32.77280	-104.23590	Plugged (site released)	N/A	4/17/2003
PRE-ONGARD WELL OPERATOR	PRE-ONGARD WELL #003	30-015-00884	Oil	C-13-18S-27E	32.75190	-104.23540	Plugged (site released)	N/A	N/A
EASTLAND OIL CO	COMSTOCK FEDERAL #010	30-015-26017	Oil	N-12-18S-27E	32.75730	-104.23530	Plugged (site released)	N/A	1/23/2003
BP AMERICA PRODUCTION COMPANY	EMPIRE ABO UNIT #018D	30-015-00713	Oil	N-01-18S-27E	32.77180	-104.23530	Plugged (site released)	N/A	9/27/2003
APACHE CORPORATION	EMPIRE ABO UNIT #018A	30-015-00706	Oil	F-01-18S-27E	32.77700	-104.23430	Plugged (site released)	4/24/1959	9/20/2019
APACHE CORPORATION	EMPIRE ABO UNIT #018B	30-015-00707	Oil	K-01-18S-27E	32.77450	-104.23420	Plugged (site released)	4/23/1959	6/7/2017
APACHE CORPORATION	EMPIRE ABO UNIT #182	30-015-21792	Oil	K-01-18S-27E	32.77330	-104.23290	Plugged (site released)	5/6/1976	4/14/2021
APACHE CORPORATION	EMPIRE ABO UNIT #184	30-015-22559	Oil	K-01-18S-27E	32.77530	-104.23270	Plugged (site released)	N/A	7/18/2013
APACHE CORPORATION	EMPIRE ABO UNIT #191	30-015-21552	Oil	G-01-18S-27E	32.77640	-104.23170	Plugged (site released)	N/A	7/23/2013
PRE-ONGARD WELL OPERATOR	PRE-ONGARD WELL #005	30-015-20388	Oil	N-01-18S-27E	32.77170	-104.23100	Plugged (site released)	N/A	N/A
PRE-ONGARD WELL OPERATOR	PRE-ONGARD WELL #019	30-015-20394	Oil	O-01-18S-27E	32.77160	-104.23070	Plugged (site released)	N/A	N/A
ARCO PERMIAN	EMPIRE ABO UNIT #191	30-015-00698	SWD	O-01-18S-27E	32.77080	-104.23000	Plugged (site released)	10/7/1959	12/8/1989
APACHE CORPORATION	EMPIRE ABO UNIT #191A	30-015-21873	Oil	J-01-18S-27E	32.77320	-104.22830	Plugged (site released)	8/27/1976	5/19/2017
APACHE CORPORATION	EMPIRE ABO UNIT #019Q	30-015-00696	Oil	J-01-18S-27E	32.77440	-104.23000	Plugged (site released)	N/A	7/12/2013
PRE-ONGARD WELL OPERATOR	PRE-ONGARD WELL #002	30-015-06137	Oil	A-13-18S-27E	32.75380	-104.22680	Plugged (site released)	N/A	N/A
PRE-ONGARD WELL OPERATOR	PRE-ONGARD WELL #005	30-015-00876	Oil	P-12-18S-27E	32.75470	-104.22520	Plugged (site released)	N/A	N/A
PRE-ONGARD WELL OPERATOR	PRE-ONGARD WELL #003	30-015-06171	Oil	I-12-18S-27E	32.75740	-104.22440	Plugged (site released)	N/A	N/A
PRE-ONGARD WELL OPERATOR	PRE-ONGARD WELL #004	30-015-00875	Oil	P-12-18S-27E	32.75540	-104.22460	Plugged (site released)	N/A	N/A
ROVER OPER									

## Attachment 7

### Digital Data

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***Petrotek***

**District I**

1625 N. French Dr., Hobbs, NM 88240  
Phone:(575) 393-6161 Fax:(575) 393-0720

**District II**

811 S. First St., Artesia, NM 88210  
Phone:(575) 748-1283 Fax:(575) 748-9720

**District III**

1000 Rio Brazos Rd., Aztec, NM 87410  
Phone:(505) 334-6178 Fax:(505) 334-6170

**District IV**

1220 S. St Francis Dr., Santa Fe, NM 87505  
Phone:(505) 476-3470 Fax:(505) 476-3462

**State of New Mexico**  
**Energy, Minerals and Natural Resources**  
**Oil Conservation Division**  
**1220 S. St Francis Dr.**  
**Santa Fe, NM 87505**

COMMENTS

Action 255870

**COMMENTS**

Operator: HF Sinclair Navajo Refining LLC ATTN: GENERAL COUNSEL Dallas, TX 75201	OGRID: 15694
	Action Number: 255870
	Action Type: [C-103] Sub. General Sundry (C-103Z)

**COMMENTS**

Created By	Comment	Comment Date
cchavez	Fall-Off Test (FOT) 2023 Submittal Comments are: 1. Fig. 13 AOR shows 1 new SWD Well API# 30-015-48888 but there are 2 others:42549 (AAO Fed SWD #1) and 26404 (Fed T SWD Well #1); 2. O&G Wells within 1-Mile AOR that are horiz. spaced 1000 ft from WDW-2 should be reported to the OCD and protested by the Permittee; 3. Differential pressure start of FOT Monitor to end was ~230 psi; 4. Pg. 12 Table 5: Fm. Thick only 175, but interval is 739 ft. (should be changed to reflect larger interval next FOT; 5. Log-Log Plot indicates radial flow condition achieved late; 6. Hall Plot Fig. 12 shows increased slope toward end of test suggesting wellbore plugging; 7: Tbl. 6 Skin positive, i.e., 20, suggest wellbore plugging; and 8. Anomalous injection rate noticed before FOT monitoring questioning pseudo-steady state flowrate condition was achieved before FOT monitoring.	9/18/2023

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**Energy, Minerals and Natural Resources**  
**Oil Conservation Division**  
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CONDITIONS

Action 255870

**CONDITIONS**

Operator: HF Sinclair Navajo Refining LLC ATTN: GENERAL COUNSEL Dallas, TX 75201	OGRID: 15694
	Action Number: 255870
	Action Type: [C-103] Sub. General Sundry (C-103Z)

**CONDITIONS**

Created By	Condition	Condition Date
cchavez	Conditions of approval are: 1. Better tracking of wells with API#s drilled or completed in AOR within 1000 ft. of WDW-2 is needed to safeguard injection for the foreseeable future; 2. Formation thickness needs to be increased in next FOT; 3. Wellbore needs to be cleaned before running next FOT as wellbore plugging is evident from Hall Plot and elevated wellbore skin values; 4. Radial flow may be achieved sooner if No. 3 is addressed; and 5. Pseudo Steady-State Flow Rate condition must be achieved during next FOT for accurate FOT results.	9/18/2023