Petrotek

Technical Report

MECHANICAL INTEGRITY AND RESERVOIR TESTING

CLASS I NON-HAZARDOUS DEEPWELL
WELL NO. 4
(OCD UIC Permit: UICI-008-4)
(API Number: 30-015-44677)

HollyFrontier Navajo Refining Company
Artesia, New Mexico

Section 23, Township 17S, Range 27E
1217 FSL, 2443 FWL

December 2021

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2021 MECHANICAL INTEGRITY AND RESERVOIR TESTING
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EXECUTIVE SUMMARY

This report summarizes the successful mechanical integrity testing (MIT) and falloff testing activities performed on WDW-4 at the HollyFrontier Navajo Refining Company (HFNR) facility in 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 September 8, 2020, 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 activities were supervised by Wes Janes (Petrotek).

The field activities consisted of an annulus pressure test (APT) and an injection falloff test on WDW-4. 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 authorizing injection** - OCD UIC Permit: UICI-008-4

b. **Well classification** - Class I Non-hazardous

c. **Well name and number** - WDW-4

d. **API Number** - 30-015-44677

e. **Legal Location** - Section 23, Township 17S, Range 27E, 1217 FSL, 2443 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 2018 during the 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.

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 10,307 and 10,680 feet BGL, 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 330 feet with an average porosity of 25 percent. Consistent with the most recent test analysis submitted, these values were used for the analysis performed for and presented in this report.

6. PVT DATA OF THE FORMATION AND INJECTION FLUID

Formation fluid samples of connate brine from the injection interval were not collected from the WDW-4 during drilling and completion. Therefore, the average total dissolved solids (TDS) of the formation fluid is estimated to be 25,000 mg/l per the previously submitted and approved UIC permit application, data acquired from offset wells, and consistent with the falloff test analysis from 2018.

The formation viscosity, fluid compressibility, and total compressibility were estimated using this average brine salinity along with the bottom hole temperature and pressure recorded in the well at the depth of the injection zone in conjunction with industry standard correlations. These correlations are presented in 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 2.5%, based on the average 25,000 mg/l TDS brine concentration discussed above. A bottom hole temperature of 159 °F has been used as representative of the formation for these correlations. This value was derived from the original temperature log, run in 2018 when the well was completed. This log is can be found online on the OCD site as part of the WDW-4 well files.

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 formation pressure has been estimated at a depth of 10,307 feet BGL using the average formation fluid specific gravity based on the TDS value discussed above. Using this method, a value of 4,574.5 psi has been estimated as the pressure at the depth the gauges were set at for testing (10,307 feet BGL). At this pressure and a temperature of 159 °F, the following equations have been used to derive viscosity:

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

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

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

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

Where,

μ_{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
μ_w is the viscosity of the brine at bottom hole conditions

Using these equations, a value of 0.47 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, which is consistent with the primary composition of the effective injection interval (see discussion in Section 11).

$$cf = \frac{a}{(1+bc\Phi)^{\frac{1}{b}}} \qquad \text{(L-89)}$$

Where,

a = 0.8535
b = 1.075
c = 2.303 E06
Φ = 0.25

Based on this equation, a value of 3.50E-6 psi^{-1} is derived for formation compressibility.

Fluid compressibility was estimated using figures L-30 and L-31 on page 338 with a bottom hole temperature of 159 °F, a bottom hole pressure of 4,574.5 psi, and a dissolved solids weight of 2.5%. Using Figure L-31 to first estimate freshwater compressibility, a value of 2.86E-06 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 2.70E-06 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 6.20E-06 psi^{-1}.

The specific gravity of the test fluid, based on the static gradient survey performed at the end of the test, was 1.003 (gradient of 0.434 psi/ft) with a measured

temperature during injection of 103.2 °F. Using Equations L-84 through L-87, the viscosity of the injected fluid at bottom hole conditions at the wellbore during injection is 0.76 cp. The compressibility of the injected fluid (based on Figures L-30 and 31) is 2.78E-06 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 data acquired with HFNR well monitoring equipment for the month prior to and the month that testing was conducted.

TABLE 1
MAY AND JUNE INJECTION DATA

Date	Injection Pressure (psi)	Injection Rate (gpm)	Annulus Pressure (psi)
5/1/2021	128.84	188.05	174.59
5/2/2021	126.89	179.55	185.17
5/3/2021	137.53	205.96	189.35
5/4/2021	133.27	196.58	187.85
5/5/2021	133.95	195.41	187.98
5/6/2021	134.82	195.59	185.00
5/7/2021	136.62	198.30	204.88
5/8/2021	136.72	196.84	228.46
5/9/2021	137.38	197.42	241.10
5/10/2021	138.10	197.26	245.01
5/11/2021	136.79	194.26	238.34
5/12/2021	138.06	196.60	230.91
5/13/2021	139.73	202.03	221.82
5/14/2021	138.68	199.67	222.79
5/15/2021	135.81	196.55	220.89
5/16/2021	136.95	195.72	206.53
5/17/2021	139.37	199.34	215.03
5/18/2021	140.52	198.61	232.54
5/19/2021	141.85	196.42	252.14
5/20/2021	143.61	196.37	265.25
5/21/2021	153.67	217.98	261.38
5/23/2021	162.54	238.28	257.96

Date	Injection Pressure (psi)	Injection Rate (gpm)	Annulus Pressure (psi)
5/24/2021	164.70	240.05	257.11
5/25/2021	163.85	236.67	251.03
5/26/2021	152.93	211.89	246.39
5/27/2021	144.34	191.15	236.68
5/28/2021	145.06	193.98	240.31
5/29/2021	143.58	188.71	221.60
5/30/2021	145.30	191.11	221.25
5/31/2021	159.08	224.62	222.67
6/1/2021	160.33	228.66	205.25
6/2/2021	159.46	225.22	214.42
6/3/2021	156.30	214.76	223.28
6/4/2021	152.19	211.29	227.69
6/5/2021	149.63	205.11	224.78
6/6/2021	147.98	199.54	244.46
6/7/2021	152.06	206.30	261.58
6/8/2021	167.54	232.94	260.04
6/9/2021	173.47	242.40	253.02
6/10/2021	174.17	242.94	255.50
6/11/2021	158.65	210.59	210.87
6/12/2021	181.92	255.58	175.65
6/13/2021	182.88	255.89	222.02
6/14/2021	169.06	231.14	200.03
6/15/2021	156.64	200.75	174.16
6/16/2021	161.47	219.90	150.95
6/17/2021	154.14	213.82	175.01
6/18/2021	143.41	185.51	167.43
6/19/2021	156.11	210.60	193.25
6/20/2021	143.29	185.58	194.95
6/21/2021	135.41	169.57	197.35
6/22/2021	135.65	168.93	173.20

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 OCD records and HFNR data, is 6,620,336 barrels (278,054,128 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. 100229).

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 16,000 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 11/25/2020 (Gauge #220992) and 12/19/2020 (Gauge #224821). The most recent calibration certificates are provided in Attachment 3. The bottom gauge (Serial Number - 224821) was utilized for analysis. The bottom gauge was hung at a test depth of 10,327 feet KB.

10. ONE-MILE AREA OF REVIEW (AOR)

A standard one-mile Area of Review (AOR) was evaluated for WDW-4 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 contains the 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 the data review, there are no wells that have been newly plugged and abandoned within the AOR in the last year. In addition, no new wells have been drilled within the AOR in the last year.

a. **Wells Located Within the One-mile AOR** - The wells located within the one-mile AOR are provided as Attachment 6. This table contains the operator, well name, API number, well type, well status, location, and date of abandonment or completion.

b. **Status of Wells Within AOR** - In Attachment 6, the abbreviation SWD indicates Salt Water Disposal, P&A indicates Plugged and Abandoned, TA indicates Temporarily Abandoned, and AL indicates Abandoned Location. The "new" well status represents permitted wells that have not been drilled or

completed.

c. **Provide details on any offset producers and injectors completed in the same injection interval -** Based on public data, there is one well that has been completed in the same formation as WDW-4 within the one-mile AOR. This well is the Alamo Permian Resources, LLC Berry Federal #029 (ID – 14) and it was plugged and abandoned in 2013. No offset producers or injectors exist in the injection interval within the AOR based on public data.

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 responses to the requirements listed above. This discussion is primarily based on information presented in the previous permit application for this well.

The WDW-4 well is located in Eddy County, New Mexico on the Northwest Shelf of the Permian Basin. The injection interval is undifferentiated Silurian-Devonian age strata composed of shallow water carbonates, dolostone and limestones. The confining zone is comprised of the upper Devonian Woodford Formation and the overlying undifferentiated Mississippian strata.

Based on the WDW-4 drilling report, the top of the Silurian-Devonian injection zone is at a depth of approximately 10,220 feet KB. A structure map of the top of the Silurian-Devonian is provided in Figure 3. The gross thickness of the Silurian-Devonian is approximately 665 feet thick. The top of the injection zone is over 1,000 feet below the base of the injection zone in which the three other Class I wells (WDW-1, WDW-2, and WDW-3) operated by HFNR are completed. These three wells are completed in the lower portion of the Permian age Wolfcamp Formation and the underlying Pennsylvanian age Cisco and Canyon Formations. The geologic interpretations have been confirmed but not revised as part of this report.

12. OFFSET WELLS

There is one well that was completed in the same formation as WDW-4 within the AOR. As noted in 10.c, this well is the Alamo Permian Resources, LLC Berry Federal #029 (ID – 14). This well was plugged and abandoned in 2013.

a. **Identify the distance between the test well and any offset wells completed in the same injection interval –** The Berry Federal #029 well was located approximately 2,000 feet to the north of WDW-4.

b. **Report the status of the offset wells during both the injection and shut-in portions of the test -** The offset Berry Federal #029 well was plugged and abandoned in 2013.

c. **Describe the impact, if any, of the offset wells during both the injection and shut-in portions of the test -** There was no impact on the character of

the falloff test and the development of a useful test from wells identified in the AOR. A 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 June 23 through 25, 2021.

b. **Time of the injection period -** Constant-rate injection occurred for approximately 57 hours before the falloff test began. This injection period exceeded the duration of the falloff. Figure 5 presents the test history.

c. **Type of injection fluid -** Filtered waste was utilized as 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 4,606.7 psia (at 10,307 feet BGL) and the injection rate was 168.0 gpm (5,761.4 bwpd) with a measured bottom hole temperature of 105.1 °F.

e. **Total shut-in time -** The well was shut-in for approximately 30.4 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 4,599.9 psia and the final bottom hole temperature was 117.7 °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 in the following discussion. Table 2 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 whose gauges were utilized for testing generated an injection falloff test summary report based on this collected data. This report is provided in Attachment 4.

a. **Radius of test investigation** - The radius of investigation for this test was determined to be approximately 11,965 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 began to transition into radial flow was approximately 0.06 hours after shut-in. This value was derived from the log-log plot.

c. **Slope(s) determined from the semi-log plot** - The slope for the likely middle-time radial period, as determined from the semi-log plot, was 0.3228 psi/cycle.

d. **Transmissibility (kh/μ)** - The transmissibility was determined to be 2,902,490 md-ft/cp.

e. **Permeability (k)** - The permeability was determined to be 4,134 md.

f. **Skin Factor (s)** - The skin factor was determined to be 6.6 units.

g. **Pressure drop due to skin (ΔP_{skin})** - The pressure drop due to skin was determined to be 1.9 psi

h. **Flow efficiency** - The flow efficiency was determined to be 0.72.

i. **Flow capacity (kh)** - The flow capacity (permeability-thickness) was determined to be 1,364,170 md-ft.

j. **P_{1hr}** - The extrapolated 1-hr pressure was determined to be 4,602.4 psi.

TABLE 2
FALLOFF TEST ANALYSIS INPUT VALUES

Parameter	Value	Unit
Formation Thickness, h	330	feet
Porosity, Φ	25	percent
Viscosity, μ	0.47	centipoise
Formation Compressibility, c_f	3.50E-06	1/psi
Total Compressibility, c_t	6.20E-06	1/psi
Formation Volume Factor, B	1.00	bbl/stb
Wellbore Radius, r_w	0.3532	feet
Final Well Flowing Pressure, p_{wf}	4,606.7	psia
Final Injection Rate, q_{final}	5,761.4 168.0	bwpd (gpm)
Horner Straight Line Slope, m	0.3228	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 8/1/2020 (4,573,230 barrels) by the final injection rate (142.4 gpm). This resulted in a value of 22,475.7 hours. This value of 22,475.7 hours of injection at 142.4 gpm was used in conjunction with the injection data collected from 8/1/2020 through 6/23/21. The total waste volume injected up to the time of shut-in utilized for calculations was 278,054,128 gallons (6,620,336 bbls).

To determine the mobility-thickness (transmissibility), the following equation was utilized. The resulting transmissibility was 2,902,490 md-ft/cp.

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

Where,

k is the permeability, in md
h is the formation thickness, in feet
μ 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

$$\frac{kh}{\mu} = Transmissibility = 162.6\frac{5{,}761.4 * 1.0}{0.3228} = 2{,}902{,}490\frac{md-ft}{cp}$$

The transmissibility derived from the slope of the semi-log straight line was then used to determine the permeability thickness. The resulting permeability-thickness was 1,364,170 md-ft.

$$kh = \left(\frac{kh}{\mu}\right)\mu = 2{,}902{,}490\left(\frac{md-ft}{cp}\right)0.47\ cp = 1{,}364{,}170\ md-ft$$

This permeability-thickness was then used to determine the permeability of the reservoir. The resulting permeability was 4,134 md.

$$k = \frac{kh}{h} = \frac{1{,}364{,}170\ md-ft}{330\ ft} = 4{,}134\ md$$

In order to determine if the appropriate 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 379 feet.

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

Where,

r_{waste} 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

$$r_{waste} = \sqrt{\frac{0.13368 * (278{,}054{,}128)}{\pi * 330 * 0.25}} = 379\ feet$$

Based on this radius, the time for a pressure transient to travel through this fluid can be calculated. The resulting time was approximately 0.02 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
Φ is the porosity, as a fraction
μ_{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 psi^{-1}
k is the permeability, in md
948 is a conversion constant

$$t_{waste} = 948\frac{0.25 * 0.47 * 6.2E-06 * (379)^2}{4{,}134} = 0.02\ hours$$

Based on this result, and the time it took for radial flow to be reached (0.6 hours), it is likely that the pressure transient was dominated by reservoir fluid properties during the middle-time radial flow period, indicating that the appropriate viscosity was used for analysis.

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 a skin of 6.6 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
Φ is the porosity, as a fraction
μ is the viscosity, in cp
r_w is radius of the wellbore in feet
1.151 and 3.23 are constants

$$s = 1.151\left(\frac{4{,}606.7 - 4{,}602.4}{0.3228} - log\left(\frac{4{,}134}{0.25 * 0.47 * 6.2E-06 * 0.3532^2}\right) + 3.23\right) = 6.6$$

The pressure contribution of the skin term to wellbore pressure can be calculated using the following equation. The result of this calculation was 1.9 psi of pressure due to skin.

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

Where,

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

$$\Delta P_{skin} = 0.869 * 0.3228 * 6.6 = 1.9\ psi$$

The flow efficiency (FE) can be determined using the following equation, provided within the OCD Guidelines (Section IX, 15, h). The result of this calculation was 0.72.

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

Where,

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

$$FE = \frac{4{,}606.7 - 1.9 - 4{,}599.9}{4{,}606.7 - 4{,}599.9} = 0.72$$

The test radius of investigation (r_{inv}) can be determined using the following equation. The result of this calculation was 11,965 feet.

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

Where,

k is permeability, in md
t is time, in hours
Φ is porosity, as a fraction
μ is viscosity, in cp
c_t is total compressibility, in psi^{-1}
0.029 is a constant

$$r_{inv} = 0.029\sqrt{\frac{4{,}134 * 30}{0.25 * 0.47 * 6.2E-06}} = 11{,}965\ feet$$

Figure 6 is a cartesian plot of the test showing the modeled pressure falloff relative to actual falloff pressure data. Based on examination of the log-log diagnostic plot provided as Figure 7, is it evident that early-time data is dominated by wellbore storage. It is likely that the test reached the onset of radial flow approximately 0.05 hours after well shut-in. Middle-time data suitable for semi-log analysis lasts from approximately 0.05 to 0.1 hours after shut-in. The test has been analyzed using the analytical Horner semi-log method based on the reasonable assumption that a period of radial flow exists in the data). Figure 8 presents the semi-log plot of the falloff with a line consistent with the likely radial flow period denoted in Figure 7. Subsequent to the end of the radial-flow period, a boundary-influenced late-time period develops. A simulation analysis was conducted to generate a best-fit model of the data. This analysis implies the presence of two intersecting limited-flow heterogeneities, both located at a distance of approximately 700 feet from the injector. The simulation analysis generally supports the more simplistic graphical analysis that relies upon the semi-log slope to derive a permeability-thickness during the period more likely to be dominated by radial flow.

The character of the fall-off data and the derivative are similar to the patterns evident in previous testing of this well and are consistent with a large permeability-thickness and a small skin factor.

The following figures are provided illustrating the test analysis and results:

- Figure 4 - Cartesian Plot of Pressure, Temperature and Rate vs. Time
- Figure 5 - Full Rate History Plot
- Figure 6 - Cartesian Plot of Pressure Falloff with Model Match
- Figure 7 - Log-log Derivative Plot with Model Match
- Figure 8 - Semi-log Horner Plot with Model Match
- Figure 9 - Daily Injection Rate History for Month Prior to Test Plot

- Figure 10 - Hall Plot

As specified by OCD requirements, a Hall Plot (Figure 10) generated from the data presented in Table 1 over the month leading up to the falloff test this year is included. 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 these BHP values rather than a pressure change (or dp) 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. The slope of the data is fairly linear, and this linearity is consistent with no significant changes in well condition taking place during this time period. Based on this observed linear trend, there are no current concerns noted with regard to well or reservoir performance. Attachment 5 presents a summary of the falloff test.

Table 3 summarizes historical well test analysis results, including the results from the test this year.

TABLE 3
HISTORICAL AMBIENT RESERVOIR TESTING

Year	Fill Depth (feet)	Permeability (md)	Mobility-thickness (md-ft/cp)	Skin (units)	P* (psia)
2021	10,310	4,134	2,902,490	6.6	4,600.9
2020	10,448	2,474	1,569,774	-1.9	4,579.0
2018	N/A	6,642	3,845,360	-3.47	4,520.4

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 September 15, the annulus was pressured to 527.6 psi. The annulus pressure test was conducted under dynamic conditions. As such, tubing injection pressure as well as injection rate readings have been reported in addition to the annulus pressure. Flow conditions were stabilized prior to testing to allow for well

equilibrium prior to testing. A calibrated digital pressure gauge (Fluke 700G29, 3,000 psi, SN - 2643157) 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, injection pressure and injection rate were then monitored for a period of thirty minutes at 5-minute intervals. During the Part I internal mechanical integrity test the pressure decreased by 5.2 psi. Since a change of 10% (52.8 psi) of the starting 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.

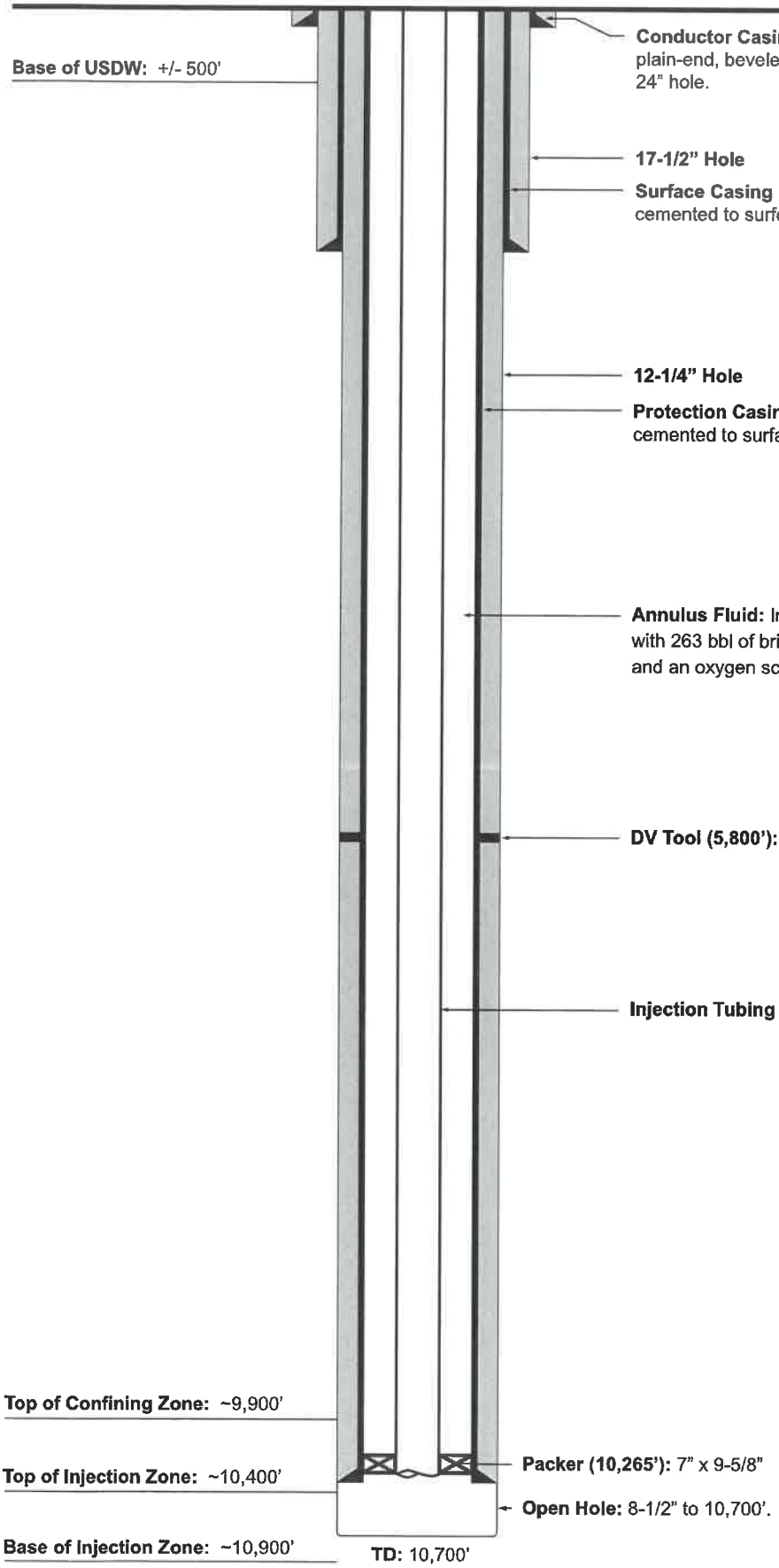
TABLE 4
ANNULUS PRESSURE TEST MEASUREMENTS

Time, Minutes	0	5	10	15	20	25	30
Pressure, Psi	527.6	526.2	525.2	524.2	523.5	522.9	522.4
Tubing Pressure, psi	183	180	180	180	180	178	-
Injection Rate, gpm	259	253	254	256	256	250	-

FIGURES

OCD UIC Permit: UICI-008-4
Well API Number: 30-015-44677
Eddy County, New Mexico
Sec. 23, T17S-R27E
Lat. 32.815970° / Long. -104.250174° (NAD 83)

All depths referenced to Kelly Bushing (KB) elevation 20' above ground level.
Ground Level Elevation: +3,563'



NOT TO SCALE

Wellbore information from: Figure 8.2, HollyFrontier Navajo Refining LLC, Artesia, New Mexico, As Built Below Ground Well Schematic by WSP and information found in the 2017 WDW-4 Permit.

HOLLYFRONTIER

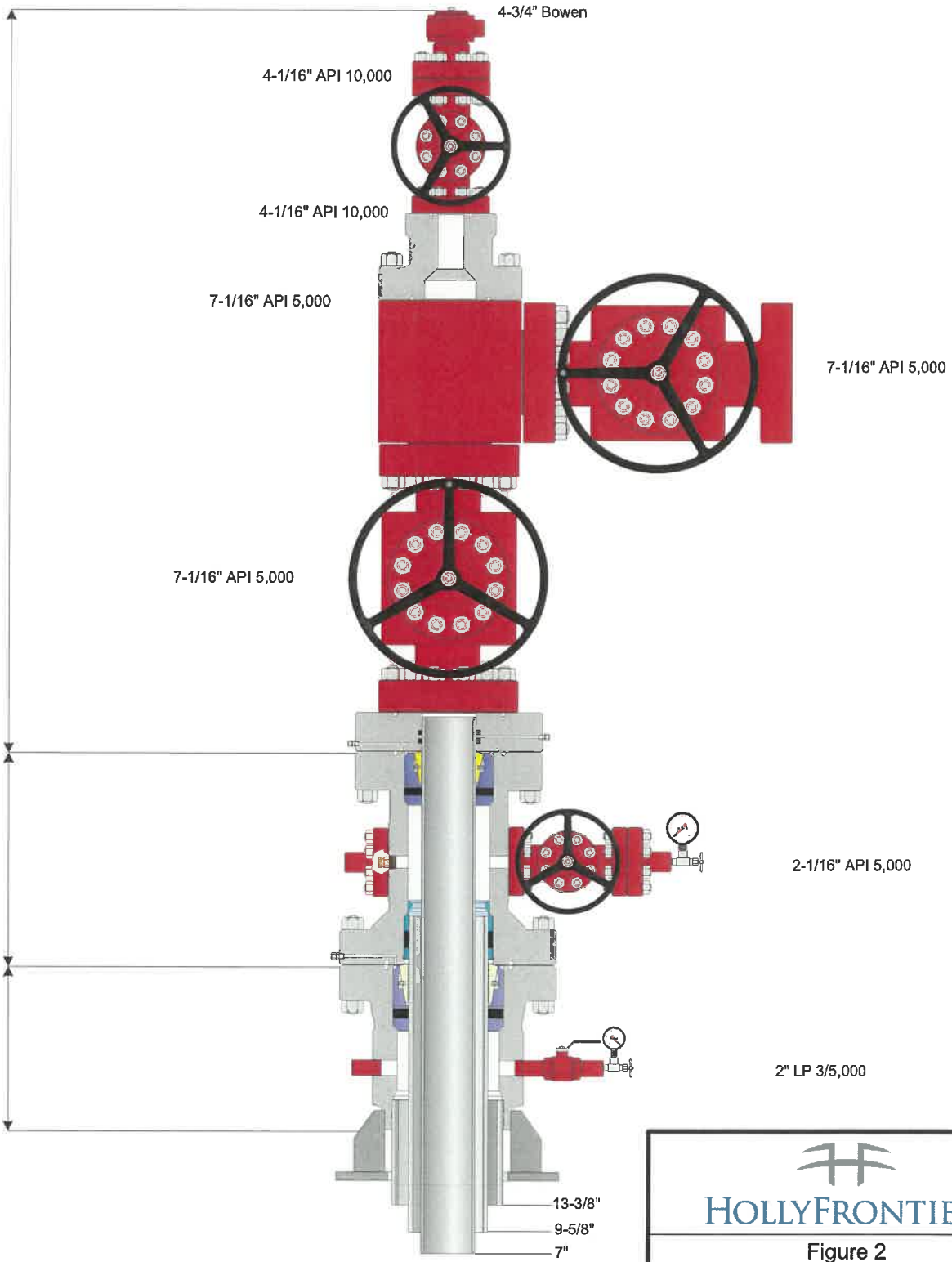
Figure 1
WDW No. 4,
Wellbore Schematic

2021 FOT/MIT Report

Scale: NTS	Date: October 2021	
Fig_01_HF_Artesia_2021_WDW_04.pdf	By: WEK	Checked: LW

Petrotek
5935 South Zang Street, Suite 200
Littleton, Colorado 80127 USA
303-290-9414
www.petrotek.com

OCD UIC Permit: UICI-008-4
Well API Number: 30-015-44677
Eddy County, New Mexico
Sec. 31, T17S-R27E
Lat. 32.81581° / Long. -104.25003° (NAD 83)



Wellhead information from:
Figure 8.3, Navajo Refining - HollyFrontier
by Weatherford.

NOT TO SCALE

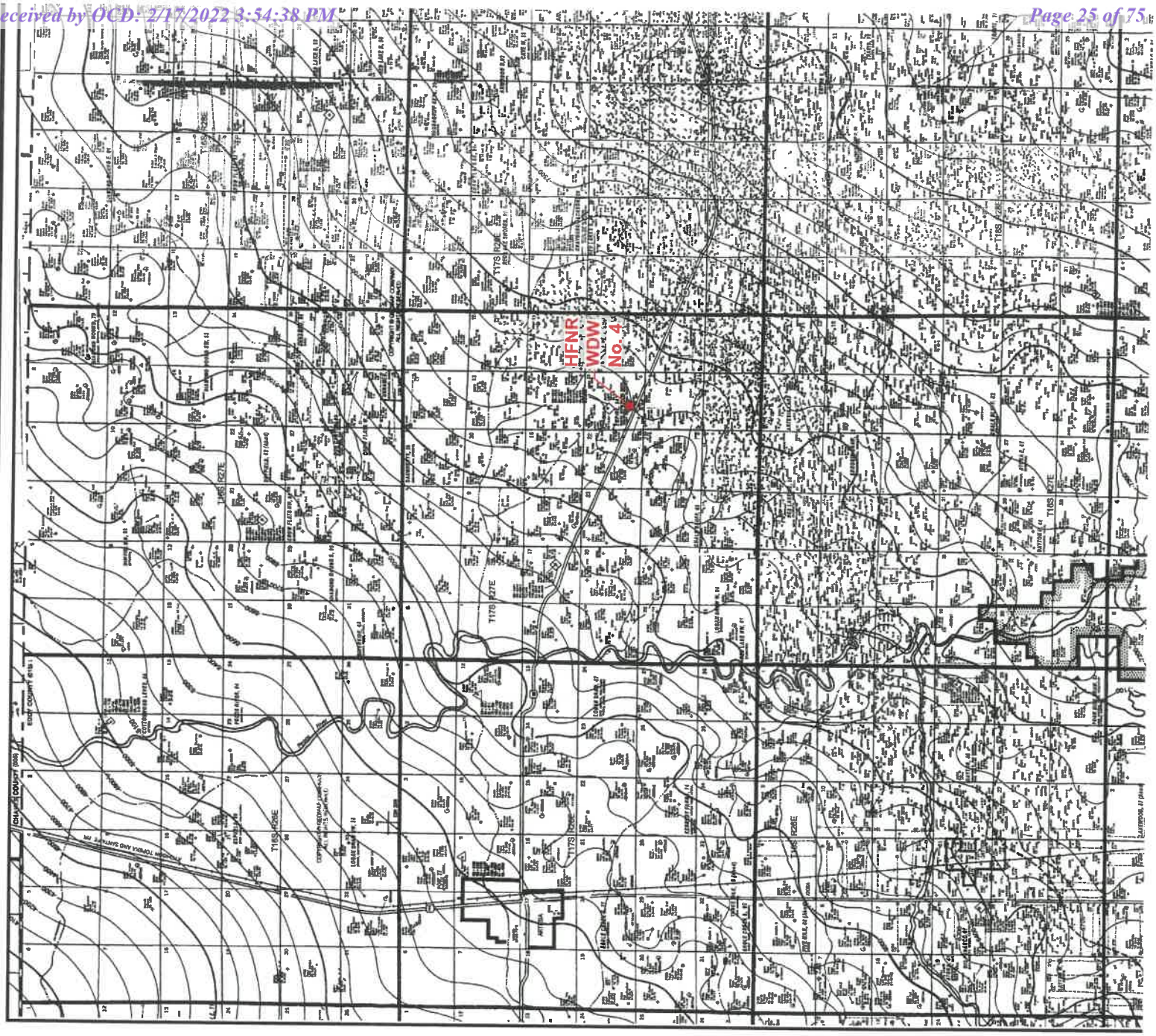
HOLLYFRONTIER

Figure 2
WDW No. 4,
Wellhead Schematic

2021 FOT/MIT Report

Scale: NTS	Date: October 2021	
Fig_02_HF_Artesia_2021_WDW_04.pdf	By: WEK	Checked: LW

Petrotek
5935 South Zang Street, Suite 200
Littleton, Colorado 80127 USA
303-290-9414
www.petrotek.com


HFNR
WDW
No. 4

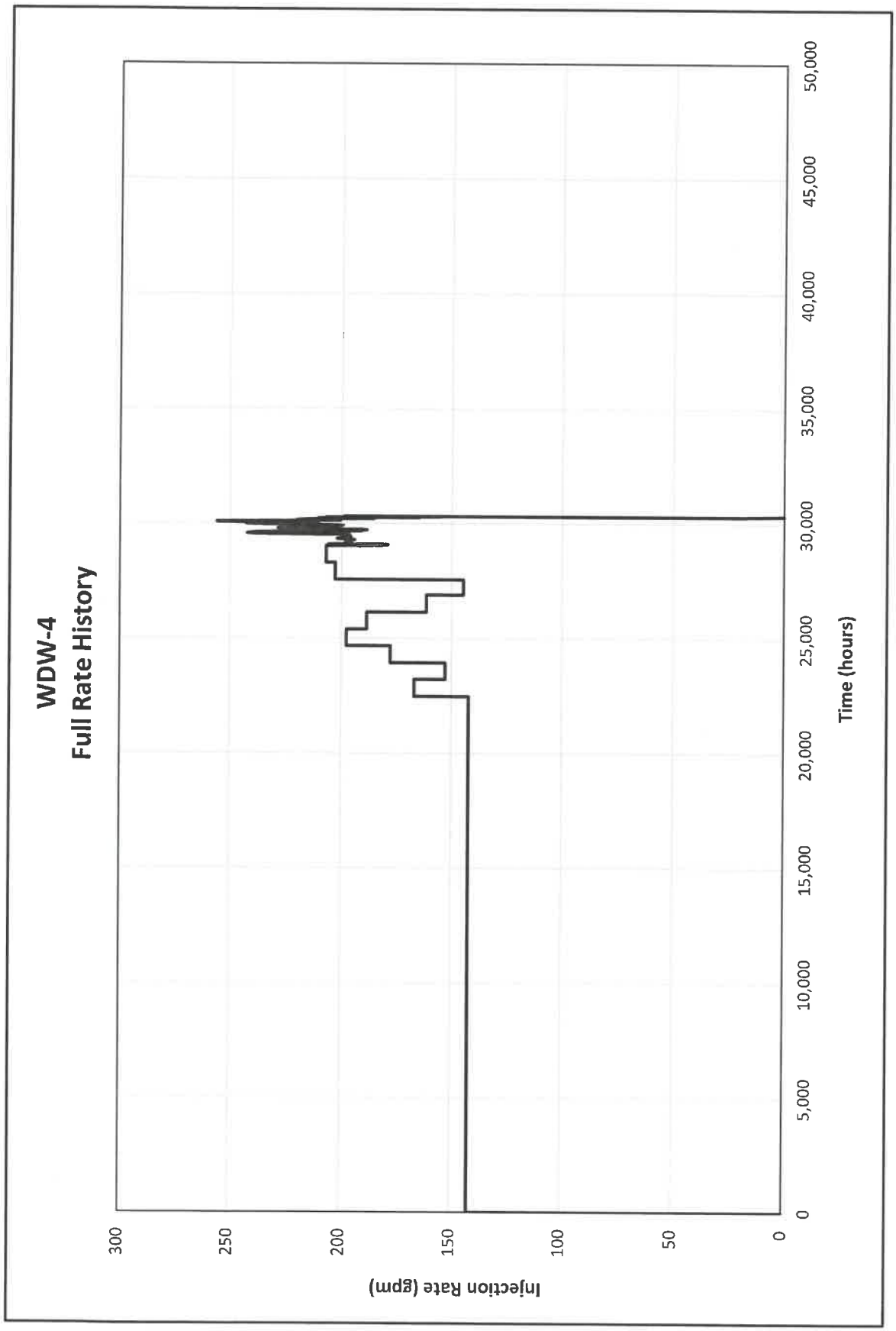


Figure 4
Full Rate History
2021 Well Testing

HOLLYFRONTIER

Petrotek

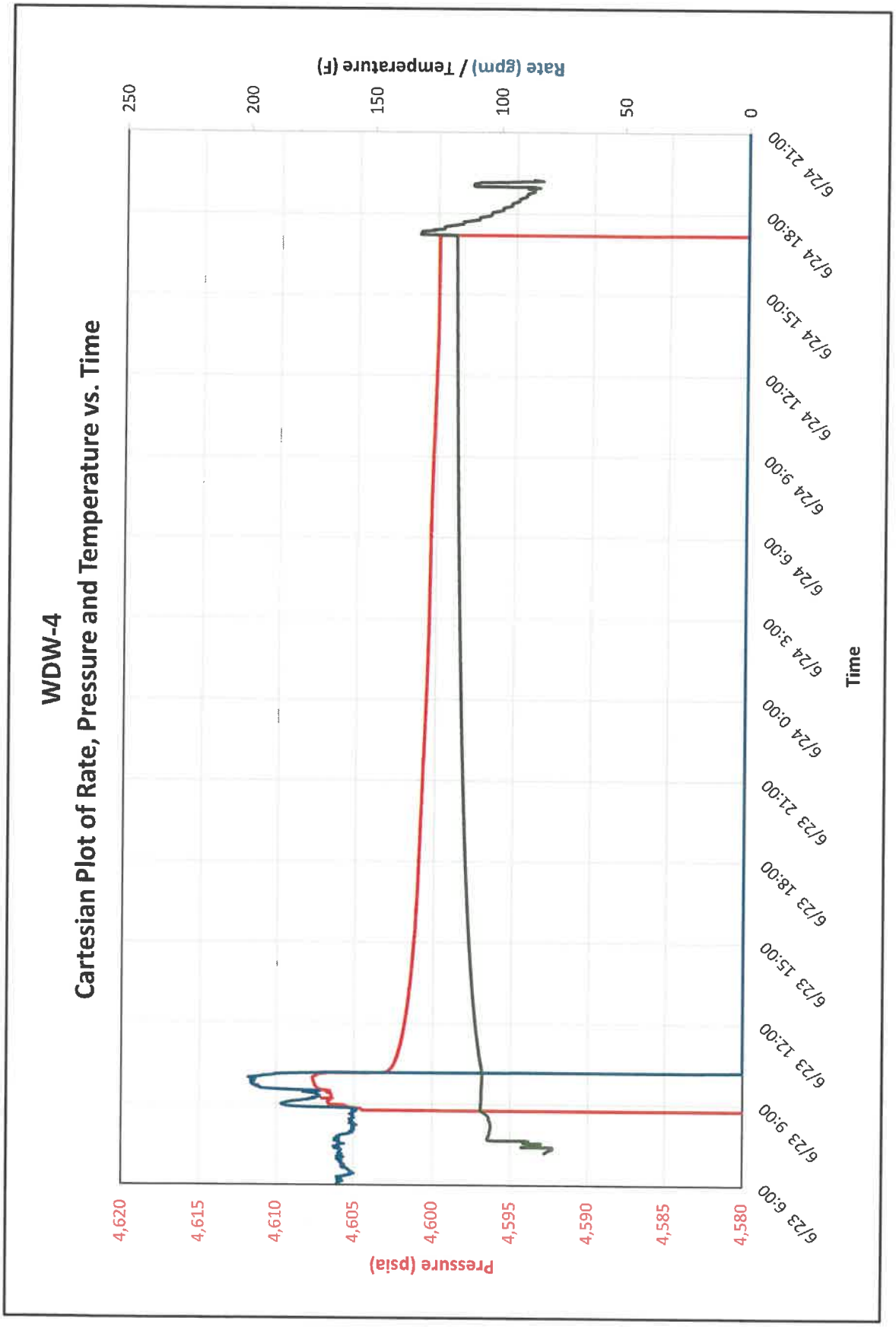


Figure 5
Cartesian Plot of Rate, Pressure and Temperature vs Time
2021 Well Testing

Petrotek

HOLLYFRONTIER

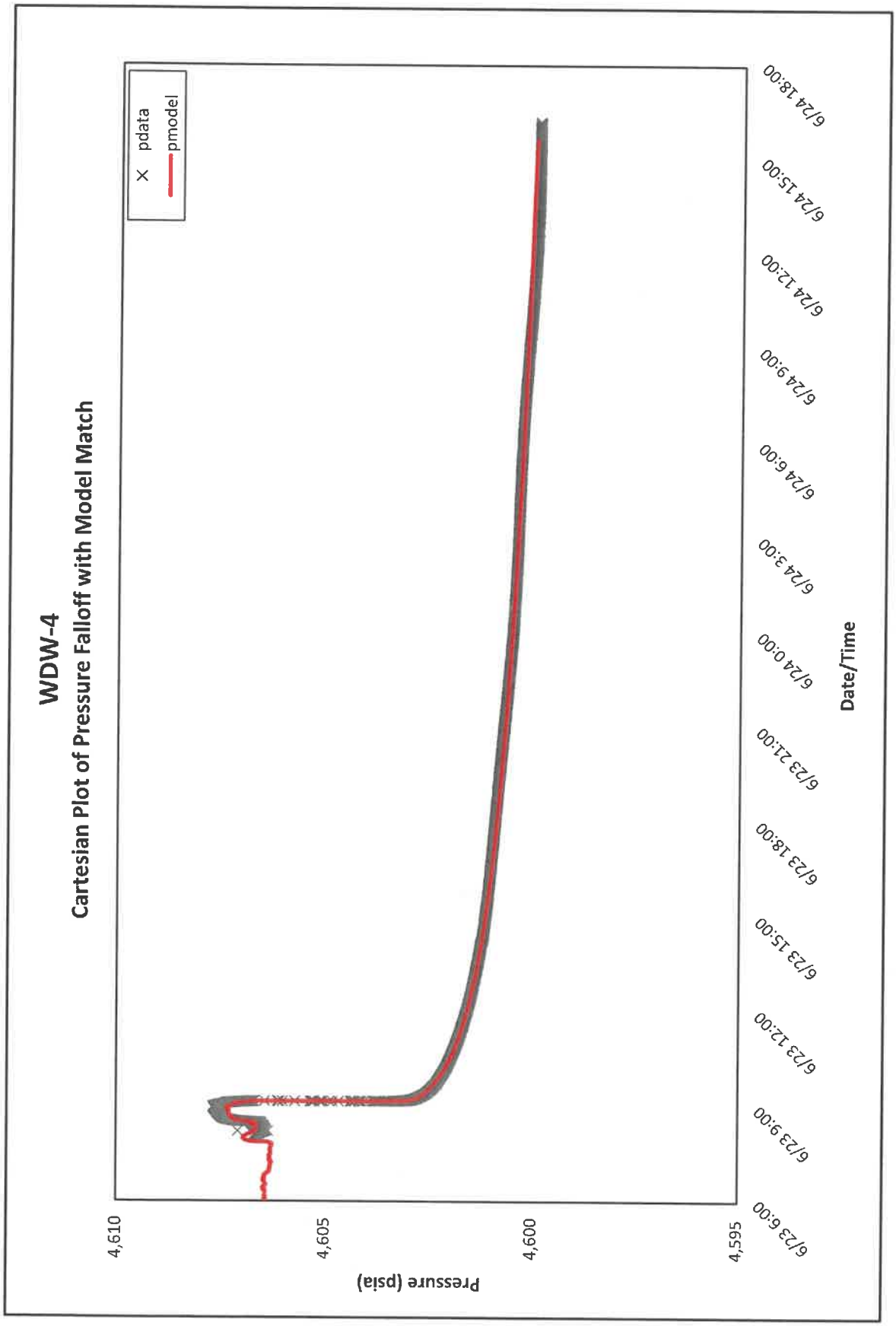


Figure 6
Cartesian Plot of Pressure Falloff with Model Match
2021 Well Testing

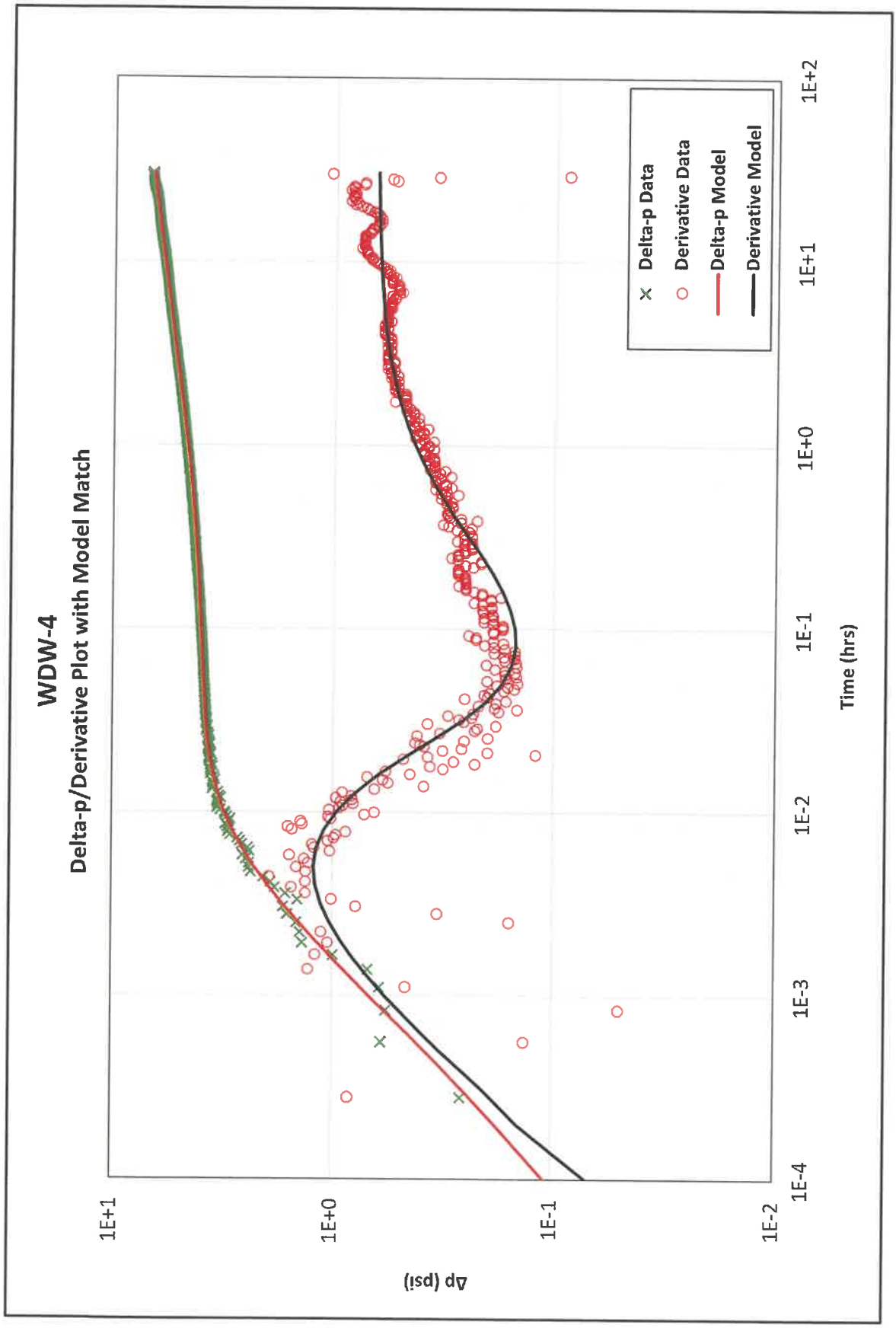


Figure 7
Delta-p/Derivative Plot with Model Match
2021 Well Testing

HOLLYFRONTIER

Petrotek

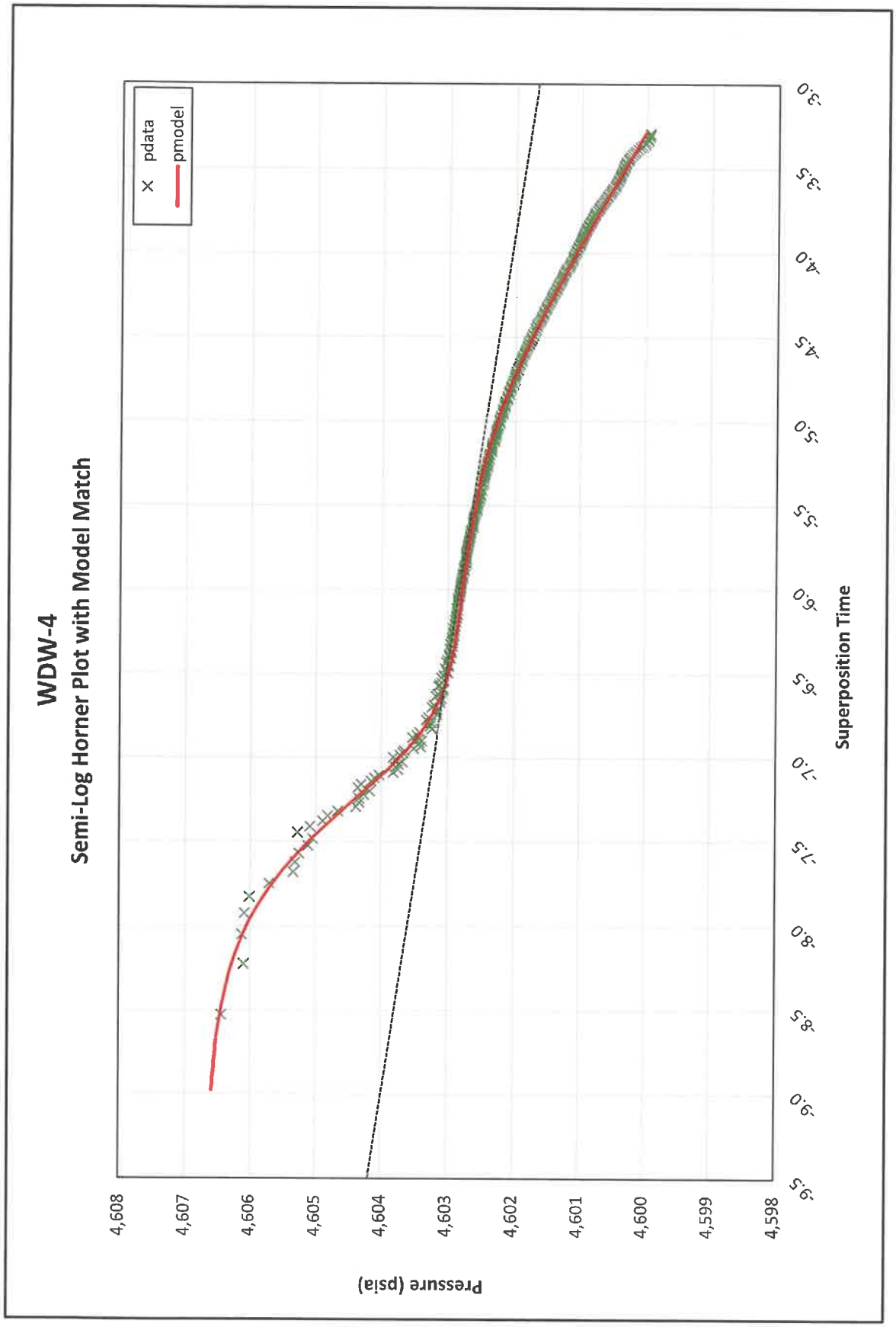
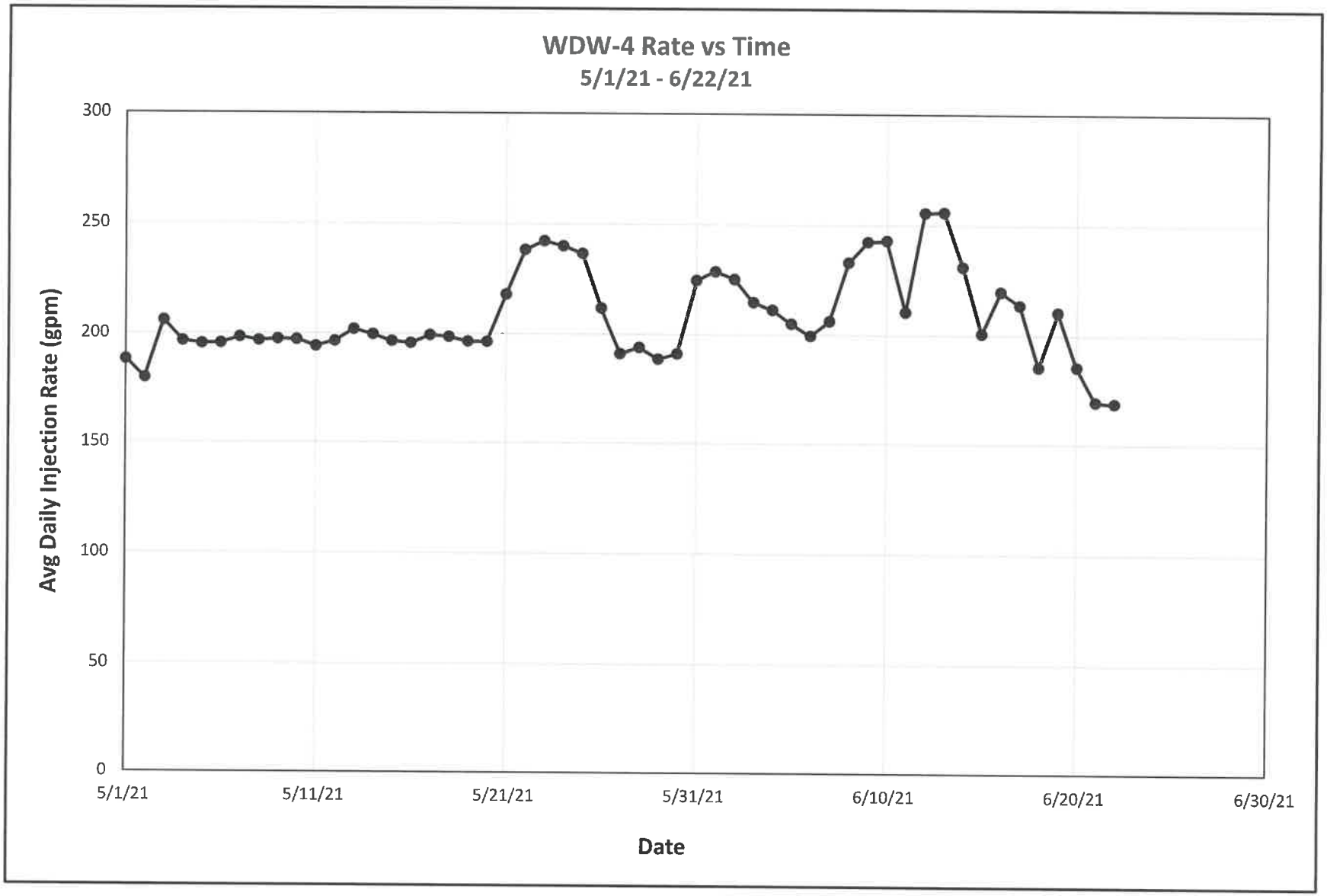


Figure 8
Semi-Log Horner Plot with Model Match
2021 Well Testing

Petrotek

HOLLYFRONTIER



HOLLYFRONTIER

Figure 9
Daily Rate vs Time
2021 Well Testing

Petrotek

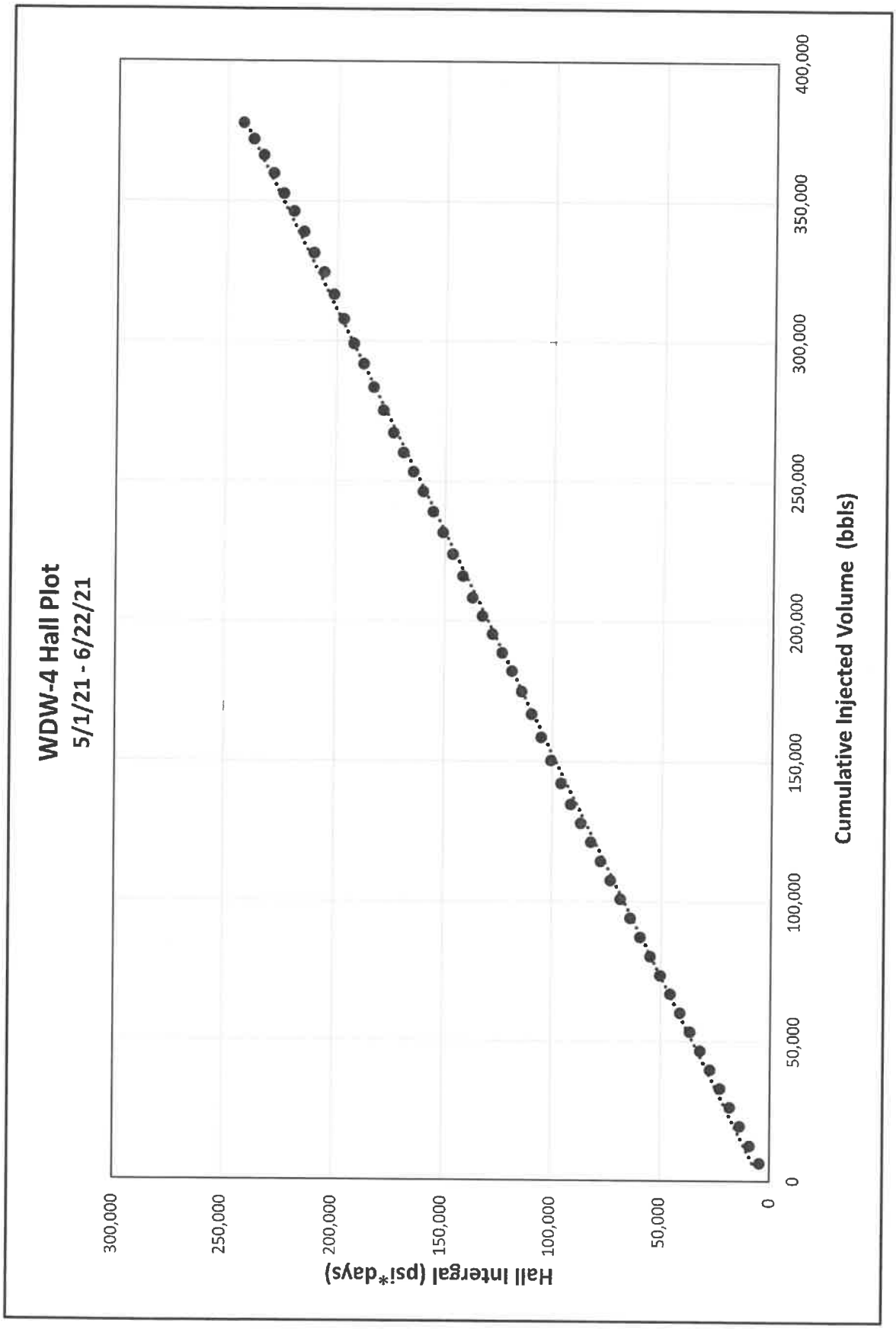
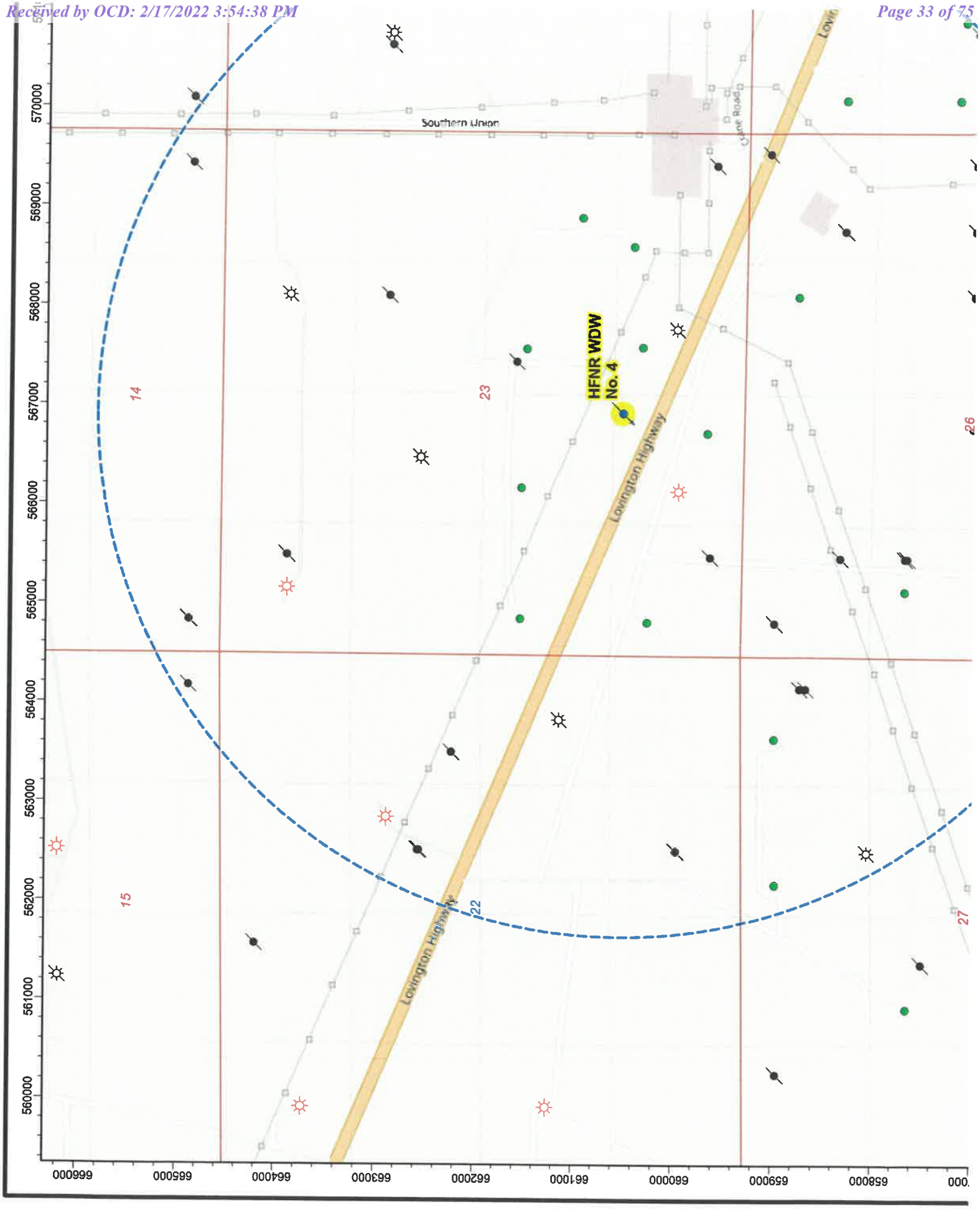


Figure 10
Hall Plot
2021 Well Testing

HOLLYFRONTIER

Petrotek


HFNR WDW
No. 4
Lovington Highway
Lovington Highway
Southern Union
Clive Road
14
23
26
15
22
27
570000
569000
568000
567000
566000
565000
564000
563000
562000
561000
560000
666000
665000
664000
663000
662000
661000
660000
659000
658000

ATTACHMENTS

Attachment 1
OCD Test Notification

Petrotek

State of New Mexico
Energy, Minerals and Natural Resources

Revised July 18, 2013

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

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

WELL API NO.
30-015-44677

5. Indicate Type of Lease ☐ STATE ☐ FEE

6. State Oil & Gas Lease No.
NM0255527A

SUNDRY NOTICES AND REPORTS ON WELLS
(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.)

7. Lease Name or Unit Agreement Name

1. Type of Well: Oil Well ☐ Gas Well ☐ Other: UIC Injection Well

8. Well Number: WDW-4

2. Name of Operator: HOLLYFRONTIER NAVAJO REFINING LLC

9. OGRID Number: 15694

3. Address of Operator: P.O. BOX 159, ARTESIA, NM 88210

10. Pool name or Wildcat:
SILURIAN-DEVONIAN

4. Well Location: 32.816088 -104.249871 NAD83
Unit Letter: K :1319 feet from the SOUTH line and 2493 feet from the WEST line
Section : 23 Township: 17S Range: 27E NMPM County: EDDY

11. Elevation *(Show whether DR, RKB, RT, GR, etc.)*
3565

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

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
PERFORM REMEDIAL WORK	☐	PLUG AND ABANDON	☐	REMEDIAL WORK	☐	ALTERING CASING	☐
TEMPORARILY ABANDON	☐	CHANGE PLANS	☐	COMMENCE DRILLING OPNS.	☐	P AND A	☐
PULL OR ALTER CASING	☐	MULTIPLE COMPL	☐	CASING/CEMENT JOB	☐		
DOWNHOLE COMMINGLE	☐						
OTHER: Pressure Fall Off /Test & MIT	☐			OTHER:			☐

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.

Day 1: **June 20, 2021**; Start constant Injection Rate of 160 gpm into WDW-4, (30-015-44677) as well as the three (3) other injection wells for at least 30 hours prior to shut-in of WDW-4 for Fall Off Testing. .Wellhead pressure on WDW-1, WDW-2 and WDW-3 will not exceed 1400 psig. Plant personnel will record rate, volume and pressure during the constant rate injection period to ensure steady flow for analysis. Injection fluid samples will be collected every 10 hours and analyzed for pH and specific gravity.
Day 2: June 21, 2021: Continue constant injection rate into all 4 wells.
Day 3: June 22, 2021 While injection continues, run dual downhole memory gauges to test depth making flowing gradient stops every 1,000 feet. Collect pressure data at test depth for a minimum of 1 hour while injecting at a constant rate. Shut WDW-4 in and start data collection for a minimum of 30 hours. WDW-1, WDW-2 and WDW-3 will continue normal injection and operation.
Day 4: June 23, 2021. WDW-4 is still shut in while collecting pressure data.
Day 5: June 24, 2021. After a minimum of 30 hours of data collection, gauges will be pulled from the well making stops every 1,000 feet. After tools reach surface, a second run with sinker bars will tag bottom. MIT will be conducted for a minimum of 30 minutes with calibrated pressure gauge.
NOTE: Will notify Artesia District of schedule for Witnessing of bottom hole gauge install and MIT. .

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 Env.Spec. DATE 5/21/2021
Type or print name LewisR.Dade E-mail address: Lewis.Dade@hollyfrontier.com PHONE:575-746-5281

For State Use Only

APPROVED BY: TITLE DATE
Conditions of Approval (if any):

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 29055

COMMENTS

Operator: NAVAJO REFINING COMPANY, L.L.C. P.O. Box 159 Artesia, NM 88211	OGRID: 15694
	Action Number: 29055
	Action Type: [C-103] NOI General Sundry (C-103X)

COMMENTS

Created By	Comment	Comment Date
cchavez	Fall-Off Test 2021	6/8/2021

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

CONDITIONS

Action 29055

CONDITIONS

Operator: NAVAJO REFINING COMPANY, L.L.C. P.O. Box 159 Artesia, NM 88211	OGRID: 15694
	Action Number: 29055
	Action Type: [C-103] NOI General Sundry (C-103X)

CONDITIONS

Created By	Condition	Condition Date
cchavez	Conditions of approval are as follows: 1) Follow OCD approved Test Plan; 2) Sundry should indicate injection into WDW-4 with monitoring of WDWs 1, 2 and 3; and 3) Notify Artesia District Office of date with time for test to witness installation of bottom hole pressure gauge(s) and/or date with time of injection shut-off into WDW-4 for immediate pressure fall-off period.	6/8/2021

Attachment 2
Annulus Pressure Gauge Certification

Petrotek

JMC INSTRUMENTS INC.
9829 E. Easter Ave. • Centennial, CO 80112
303.794.8833 • Fax 303.730.1220
Toll Free 1.800.327.7257
www.jmcinstruments.com

CERTIFIED CALIBRATION

CUSTOMER PETROTEK ORDER NO. _____

ITEM Digital Gauge RANGE 0-3000PSIG ITEM NO. 5095-2

TRUE VALUE	INDICATED VALUE	
PSIG	INCREASING READINGS	DECREASING READINGS
0.00	0	0
300.00	299.6	299.7
600.00	599.4	599.7
900.00	899.2	899.5
1200.00	1199.0	1199.4
1500.00	1498.9	1499.2
1800.00	1798.8	1799.0
2100.00	2098.5	2098.7
2400.00	2398.1	2398.3
2700.00	2698.0	2698.1
3000.00	2997.8	2997.8

Tested On: Deadweight Tester S/N# 1GA4474

Traceable to National Institute of Standards and Technology certificate # 17-043

Tested By: BMZ Date 22 Jan 2021

Remarks:

Fluke	700G29	SN 2643157
Accuracy is +/-	.25	% of Full Scale or Better
Test Conditions	68 °F;	619 mmHg Atm. Pressure

Attachment 3
Downhole Pressure Gauge Certification

Petrotek

DataCan Gauge Program Sheet

Gauge Information

Tool Model	:	Quartz Pressure Recorder 2 Million Samples
Serial Number	:	220992
Max. Calibration Pressure	:	16000 psi
Max. Calibration Temperature	:	175 DegC
Sample Capacity	:	2 000 000
Calibration Date	:	Wednesday, November 25, 2020

Program

Step	Sample Rate	Days	Hours	Minutes	Samples
1	1	0	0	1.08	65
2	5	0	2	0.00	1440
3	1	0	6	0.00	21600
4	5	10	0	0.00	172800

Summary

	Steps	Days	Hours	Minutes	Samples	Power Required
Total	4	10	8	1.08	195905	See Battery Calculator Ah

Overrun (for reference)

Overrun - 637 days 13 hours 51.5 minutes at 30 second sample rate

Date: Friday, July 23, 2021 04:57:58 PM Programmed By: FRANK

DataCan Gauge Program Sheet

Gauge Information

Tool Model	:	Quartz Pressure Recorder 2 Million Samples
Serial Number	:	224821
Max. Calibration Pressure	:	16000 psi
Max. Calibration Temperature	:	175 DegC
Sample Capacity	:	2 000 000
Calibration Date	:	Saturday, December 19, 2020

Program

Step	Sample Rate	Days	Hours	Minutes	Samples
1	1	0	0	1.08	65
2	5	0	2	0.00	1440
3	1	0	6	0.00	21600
4	5	10	0	0.00	172800

Summary

	Steps	Days	Hours	Minutes	Samples	Power Required
Total	4	10	8	1.08	195905	See Battery Calculator Ah

Overrun (for reference)

Overrun - 637 days 13 hours 51.5 minutes at 30 second sample rate

Date: Friday, July 23, 2021 04:55:32 PM Programmed By: FRANK

Attachment 4
FESCO Injection Falloff Test Report

Petrotek

FESCO, Ltd.

1000 Fesco Ave. - Alice, Texas 78332

FLOWING GRADIENT SURVEY

Company:	Petrotek Engineering Corporation	Test Date:	06/23/2021
Well:	Navajo Refining Waste Disposal Well No. 4	Location:	Eddy County, NM
Field:	Devonia	Status:	Flowing
Formation:	Unavailable		

Well Data:	Wellhead Connection: 4-1/16" BX-155 Flange	Gauge Type:	Electronic
	Elevation: 20 ft above GL	Gauge SN:	DC-224821
	Tubing: 3" Set at 10265 ft (Packer)	Gauge Range:	15000 psi
	Casing: 9.625" Set at 10327 ft (EOC)	Gauge OD:	1.2500"
	Perfs:		
	Datum: Unavailable		

Depth			Pressure					
MD ft	TVD ft	Delta Depth ft	WHP psia	BHT °F	Gauge Pressure psia	Delta Pressure psi	Pressure Gradient psi / ft	Comments
20	20	0		86.34	136.99	0.00	0.0000	
2500	2500	2480		102.06	1220.05	1083.06	0.4367	
7500	7500	5000		102.46	3384.14	2164.09	0.4328	
10307	10307	2807		105.64	4604.75	1220.61	0.4348	

BHT at Test Depth:	117.68 °F	Oil Level:	Flowing	Previous BHP:	U/A
Interpolated BHP at Datum:	136.99 psia	Water Level:	Flowing	BHP Change:	U/A
BHP Gradient at Datum :	0.0000 psi/ft	Csg Press:	N/A		

Remarks: MIRU slickline. RIH with 1.25" weight bar. Cleared 10307 ft. POOH. RIH with electronic gauge making injecting gradient stops to 10307 ft.

Certified: FESCO, Ltd. - Odessa, TX

By: Michael Carnes
District Manager - (432) 332-3211

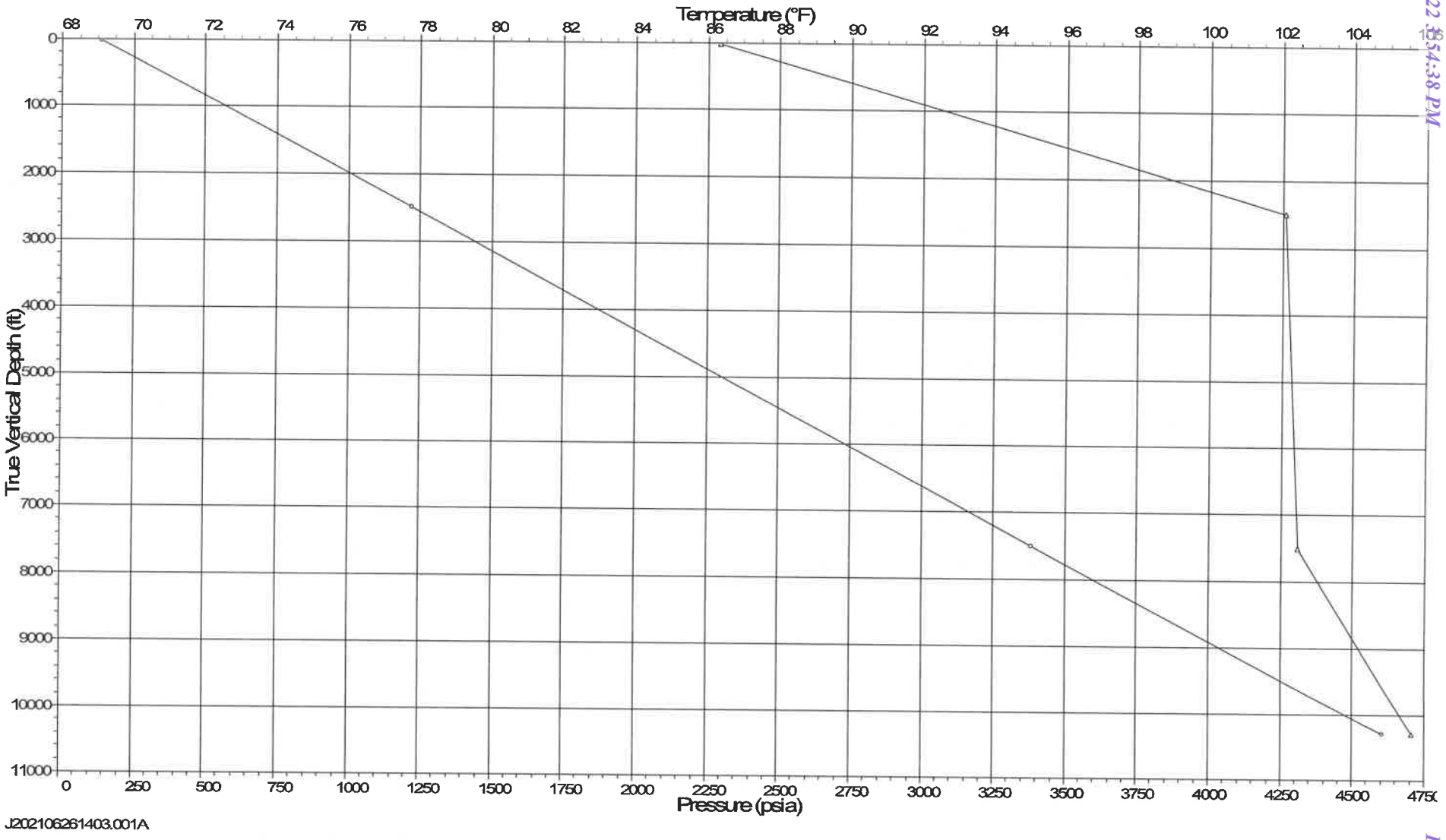
Job No.: J202106261403.001A

Petrotek Engineering Corporation

Well: Navajo Refining Waste Disposal Well No. 4
Field: Devonia
Test Date: 06/23/2021

Gauge Type: Electronic
Gauge Range: 15000 psi
Gauge SN: DC-224821

Flowing Gradient Plot



J202106261403.001A

FESCO, Ltd.

1000 Fesco Ave. - Alice, Texas 78332

STATIC GRADIENT SURVEY

Company:	Petrotek Engineering Corporation	Test Date:	06/23/2021
Well:	Navajo Refining Waste Disposal Well No. 4	Location:	Eddy County, NM
Field:	Devonia	Status:	Shut in.
Formation:	Unavailable		

Well Data:	Wellhead Connection: 4-1/16" BX-155 Flange	Gauge Type:	Electronic
	Elevation: 20 ft above GL	Gauge SN:	DC-224821
	Tubing: 3" Set at 10265 ft (Packer)	Gauge Range:	15000 psi
	Casing: 9.625" Set at 10327 ft (EOC)	Gauge OD:	1.2500"
	Perfs:		
	Datum: Unavailable		

Depth			Pressure					
MD ft	TVD ft	Delta Depth ft	WHP psia	BHT °F	Gauge Pressure psia	Delta Pressure psi	Pressure Gradient psi / ft	Comments
20	20	0		110.81	106.32	0.00	0.0000	
1000	1000	980		86.89	548.52	442.20	0.4512	Water gradient
2000	2000	1000		89.81	983.28	434.76	0.4348	
3000	3000	1000		92.87	1418.09	434.81	0.4348	
4000	4000	1000		95.79	1852.65	434.56	0.4346	
5000	5000	1000		99.42	2287.93	435.28	0.4353	
6000	6000	1000		103.92	2723.31	435.38	0.4354	
7000	7000	1000		108.70	3159.20	435.89	0.4359	
8000	8000	1000		115.22	3594.41	435.21	0.4352	
9000	9000	1000		122.71	4029.54	435.13	0.4351	
10000	10000	1000		131.81	4463.70	434.16	0.4342	
10307	10307	307		117.68	4599.94	136.24	0.4438	

BHT at Test Depth:	117.68 °F	Oil Level:	None	Previous BHP:	U/A
Interpolated BHP at Datum:	106.32 psia	Water Level:	Surface	BHP Change:	U/A
BHP Gradient at Datum :	0.0000 psi/ft	Csg Press:	N/A		

Remarks: POOH after 31-hr BHP Falloff Test making static gradient stops. RDMO.

Certified: FESCO, Ltd. - Odessa, TX

By: Michael Carnes
District Manager - (432) 332-3211

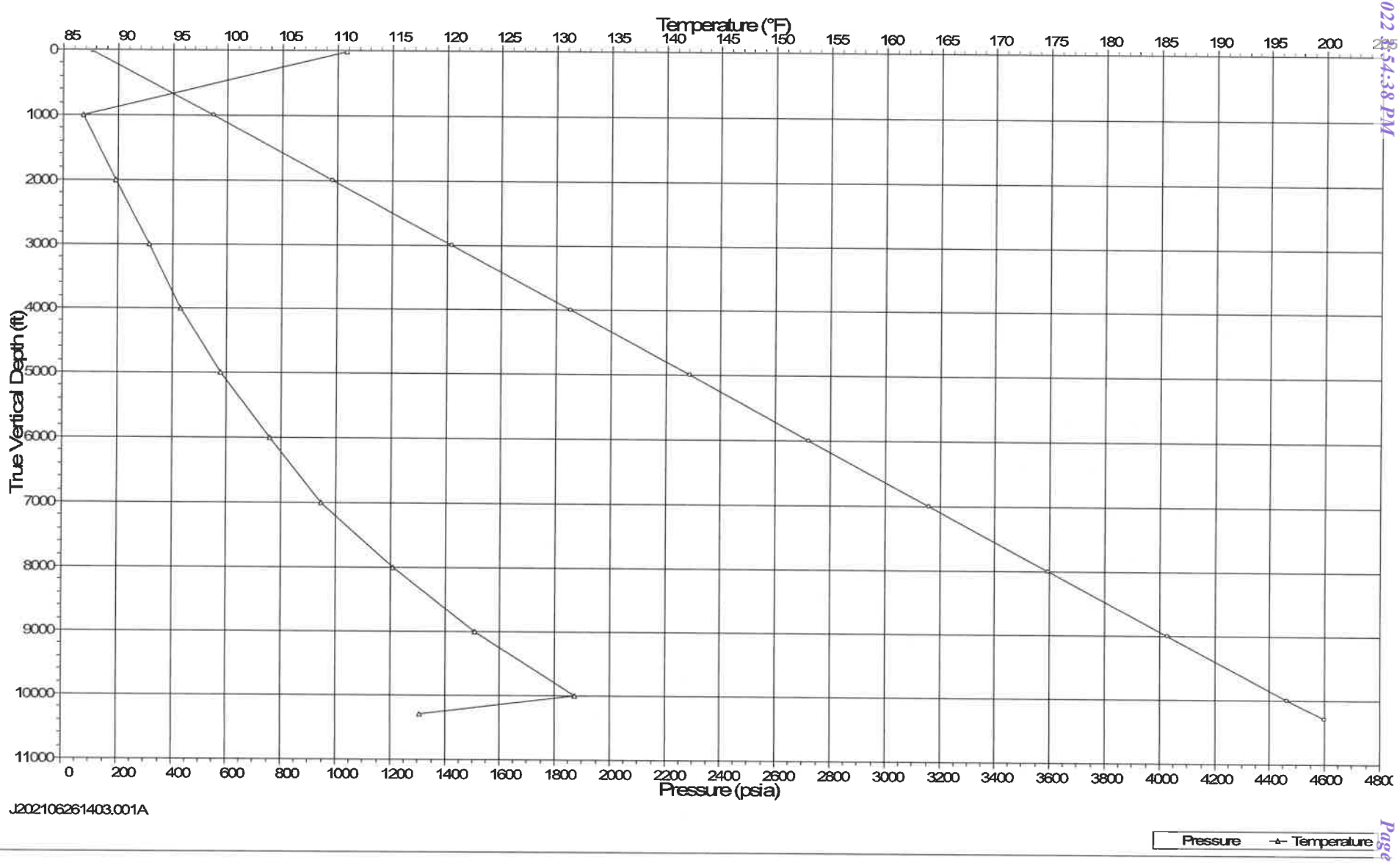
Job No.: J202106261403.001A

Petrotek Engineering Corporation

Well: Navajo Refining Waste Disposal Well No. 4
Field: Devonia
Test Date: 06/23/2021

Gauge Type: Electronic
Gauge Range: 15000 psi
Gauge SN: DC-224821

Static Gradient Plot



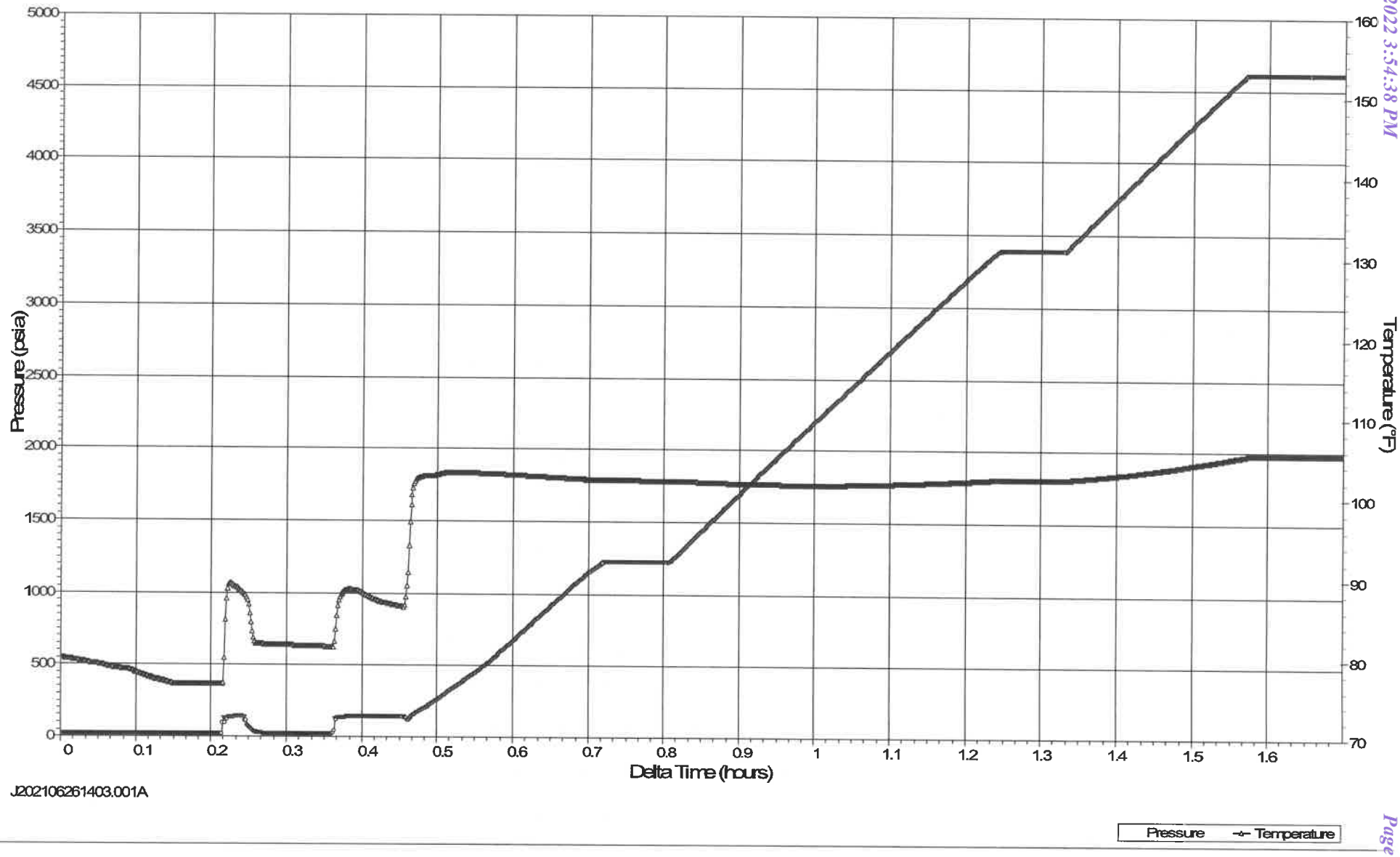
J202106261403.001A

Petrotek Engineering Corporation

Well: Navajo Refining Waste Disposal Well No. 4
Field: Devonia
Test Date: 06/23 - 06/24/2021

Gauge Type: Electronic
Gauge Range: 15000 psi
Gauge SN: DC-224821

Cartesian Plot



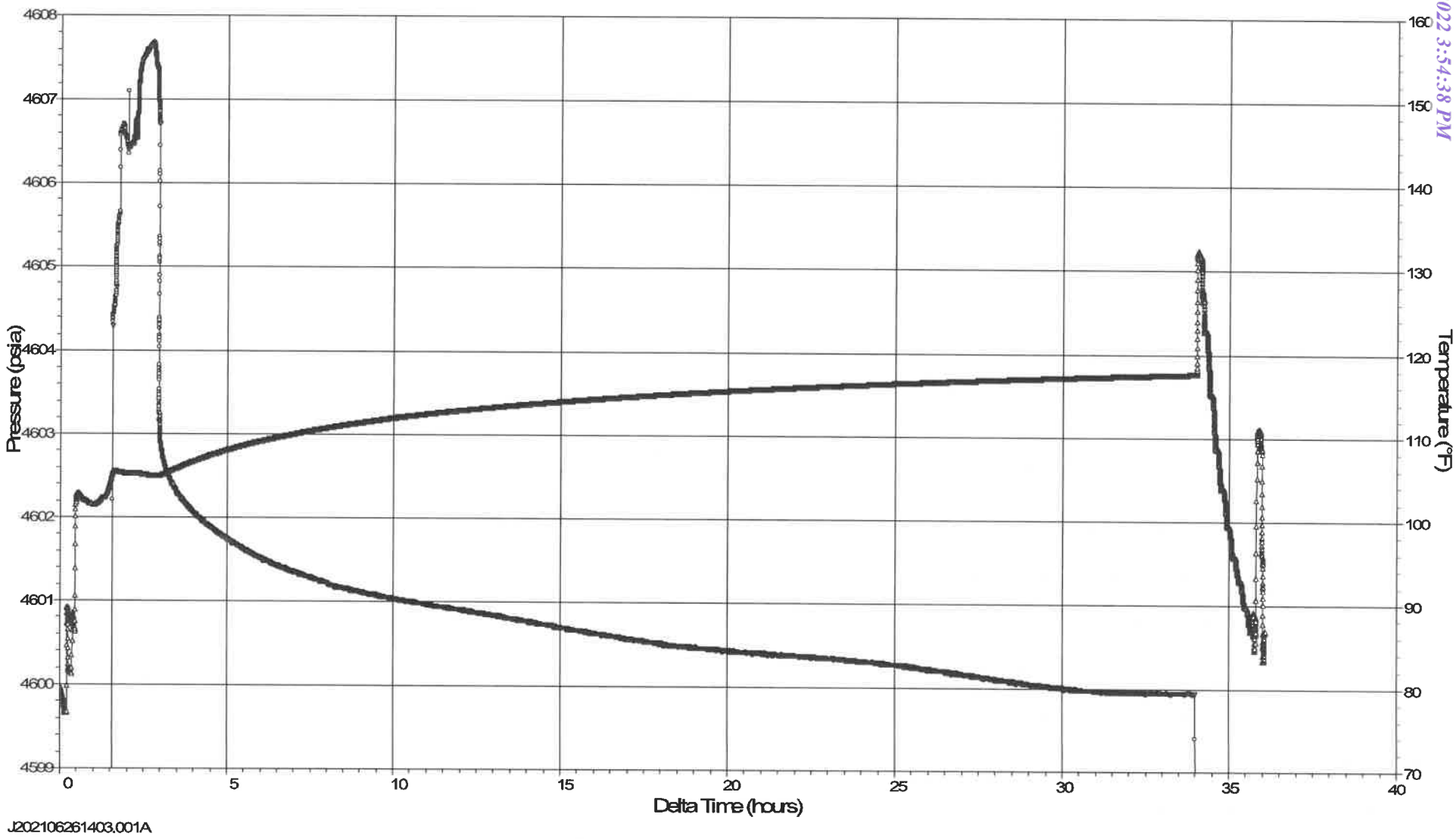
J202106261403.001A

Petrotek Engineering Corporation

Cartesian Plot

Well: Navajo Refining Waste Disposal Well No. 4
Field: Devonia
Test Date: 06/23 - 06/24/2021

Gauge Type: Electronic
Gauge Range: 15000 psi
Gauge SN: DC-224821



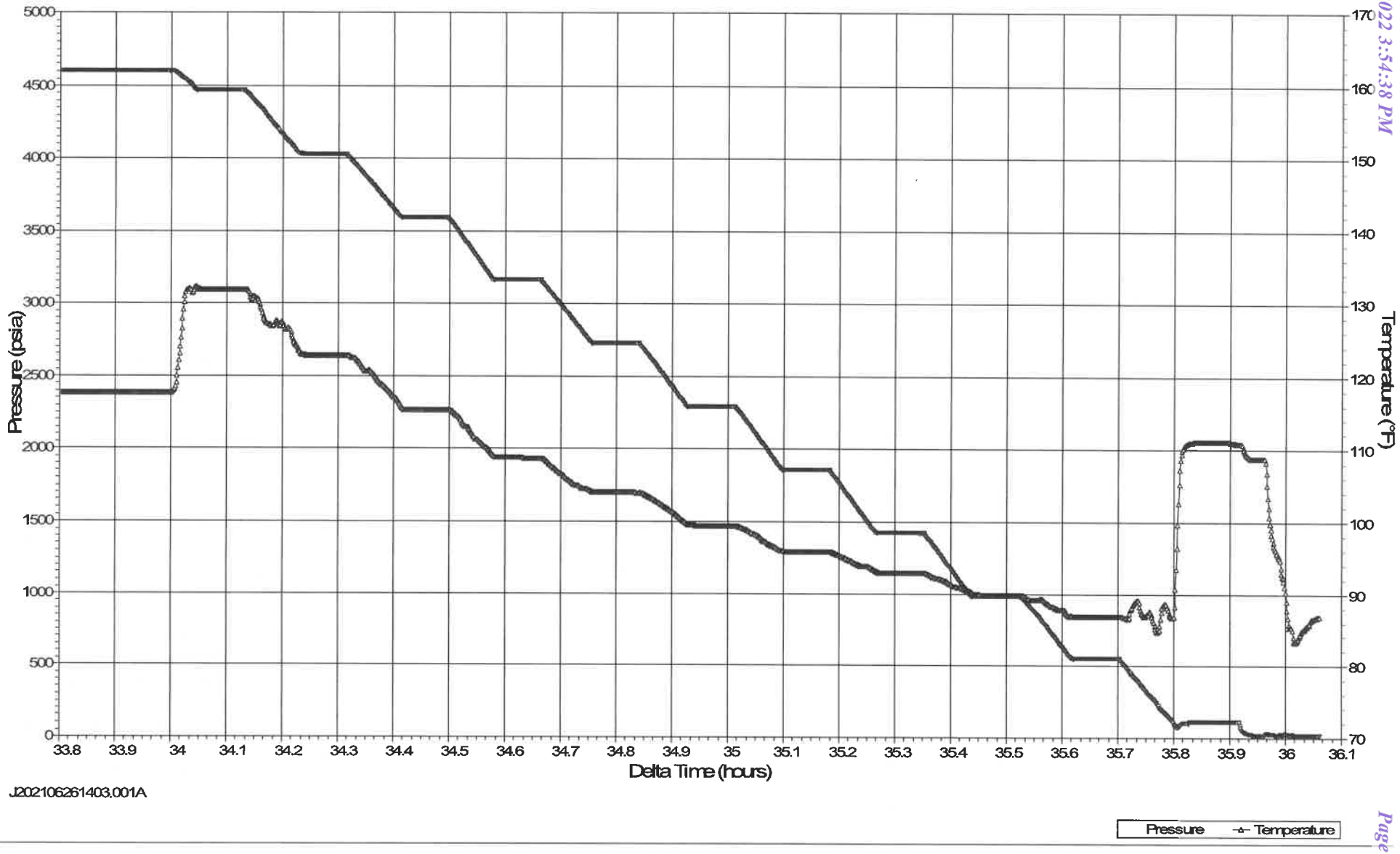
J202106261403.001A

Petrotek Engineering Corporation

Well: Navajo Refining Waste Disposal Well No. 4
Field: Devonia
Test Date: 06/23 - 06/24/2021

Gauge Type: Electronic
Gauge Range: 15000 psi
Gauge SN: DC-224821

Cartesian Plot



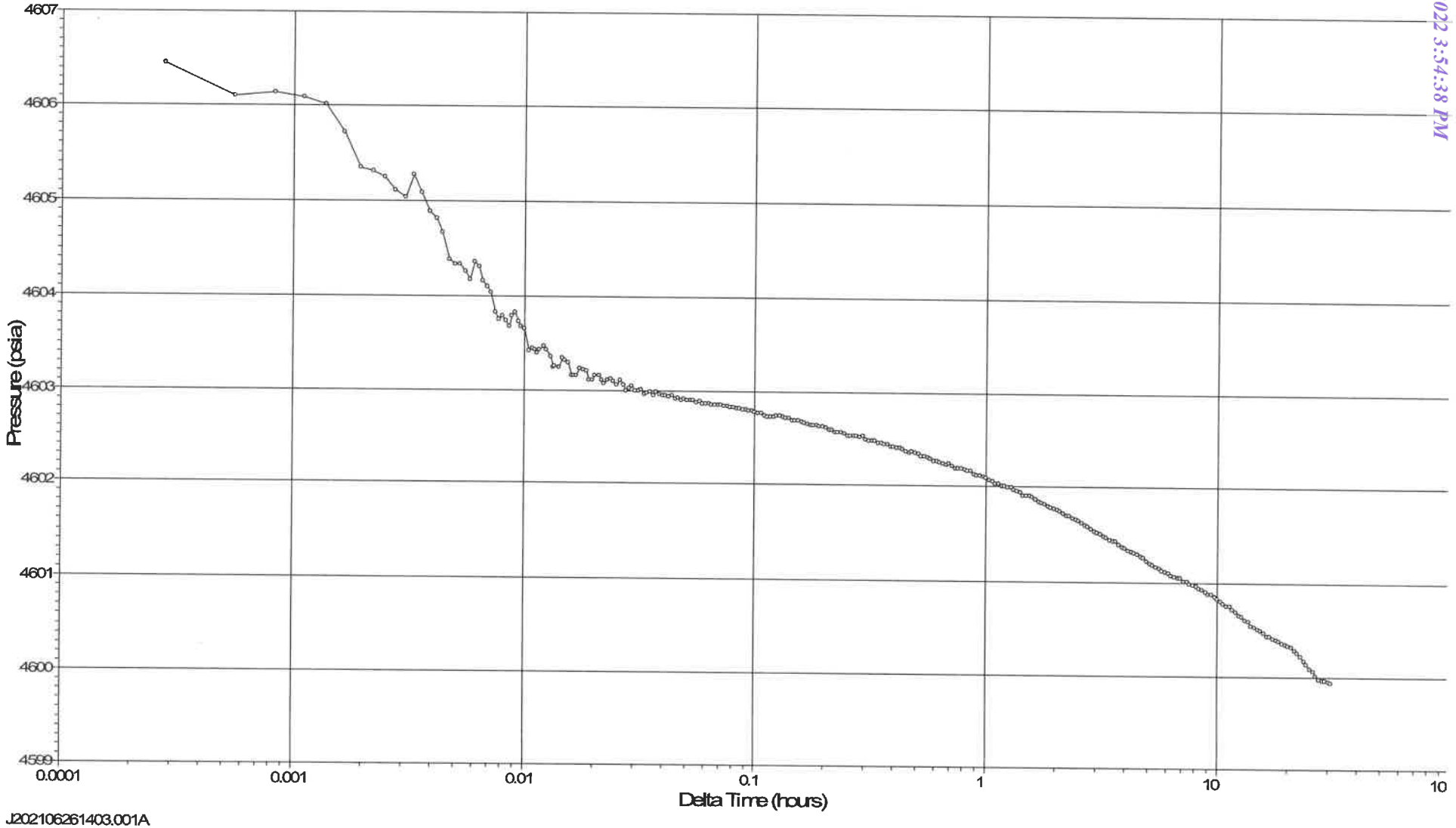
J202106261403.001A

Petrotek Engineering Corporation

Well: Navajo Refining Waste Disposal Well No. 4
Field: Devonia
Test Date: 06/23 - 06/24/2021

Gauge Type: Electronic
Gauge Range: 15000 psi
Gauge SN: DC-224821

Semilog Plot (Falloff Tes



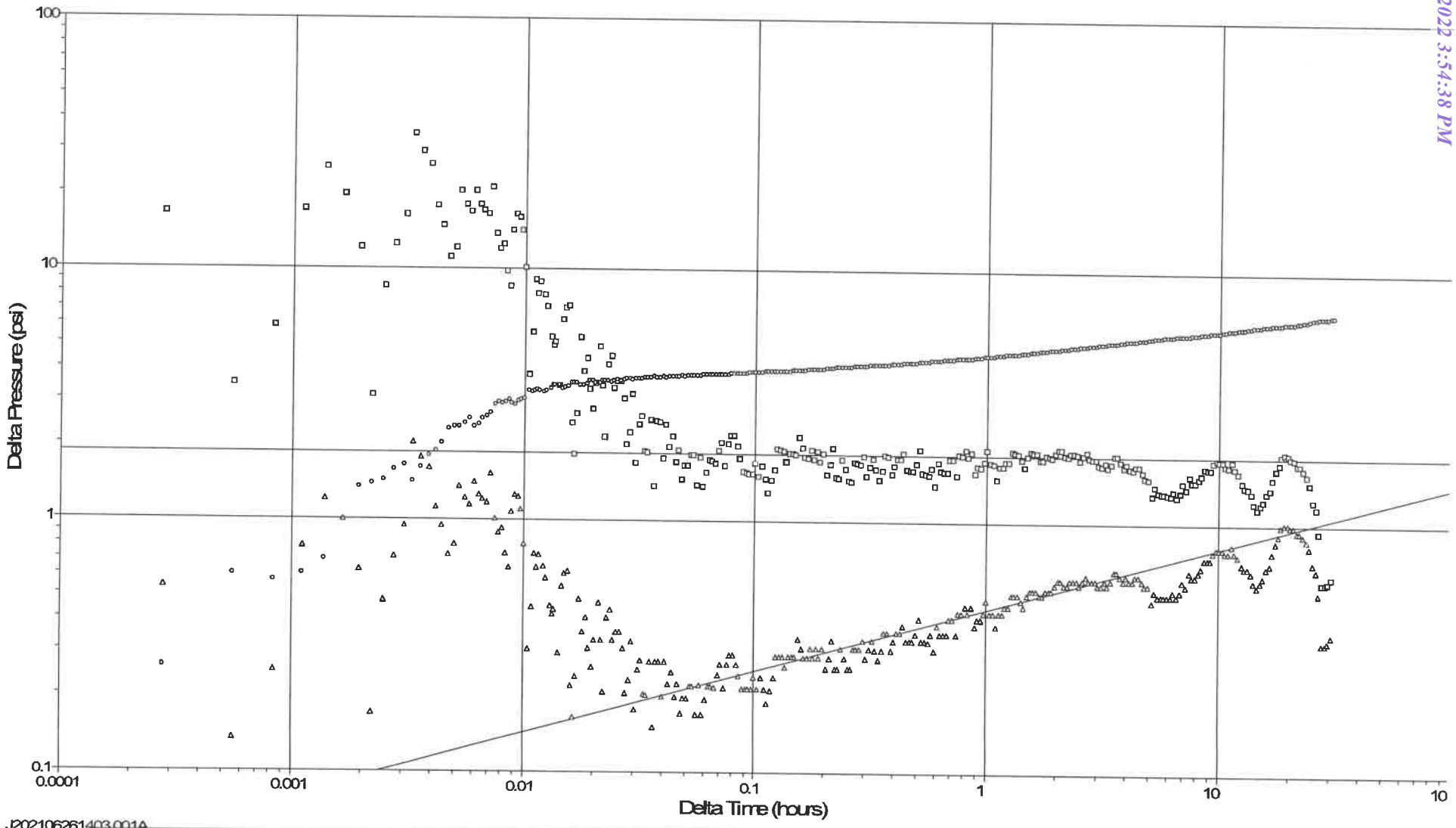
J202106261403.001A

Petrotek Engineering Corporation

Well: Navajo Refining Waste Disposal Well No. 4
Field: Devonia
Test Date: 06/23 - 06/24/2021

Gauge Type: Electronic
Gauge Range: 15000 psi
Gauge SN: DC-224821

Log Plot (Falloff Tes



FESCO, Ltd.

1000 Fesco Ave. - Alice, Texas 78332

RESERVOIR PRESSURE FALLOFF TEST

Company: Petrotek Engineering Corporation
Well: Navajo Refining Waste Disposal Well No. 4
Field: Devonia
Location: Eddy County, NM
Perfs:
Formation: Unavailable

Test Date: 06/23 - 06/24/2021
Gauge Depth: 10307 ft
Gauge Type: Electronic
Gauge SN: DC-224821
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
06/23/21	07:11:36	-2.95694		16.13		79.91	Powered up gauge.
06/23/21	07:15:00	-2.90028		15.98		79.02	
06/23/21	07:20:00	-2.81694		15.93		76.96	
06/23/21	07:24:00	-2.75028		15.47		76.72	
06/23/21	07:24:40	-2.73917		123.92		79.84	Pressured up lubricator.
06/23/21	07:25:00	-2.73361		130.99		89.05	
06/23/21	07:26:00	-2.71694		136.78		88.17	
06/23/21	07:26:15	-2.71278		133.52		87.81	Pressured down lubricator. O-Ring leak.
06/23/21	07:28:00	-2.68361		17.88		81.61	
06/23/21	07:30:00	-2.65028		14.99		81.49	
06/23/21	07:32:00	-2.61694		15.10		81.37	
06/23/21	07:33:00	-2.60028		15.18		81.31	
06/23/21	07:33:30	-2.59194		125.31		83.43	Pressured up lubricator.
06/23/21	07:34:00	-2.58361		133.35		87.97	
06/23/21	07:36:00	-2.55028		136.24		87.72	
06/23/21	07:38:00	-2.51694		136.31		86.62	
06/23/21	07:38:55	-2.50167		136.99		86.34	RIH making flowing gradient stops.
06/23/21	07:39:00	-2.50028		131.60		86.58	
06/23/21	07:40:00	-2.48361		168.26		102.21	
06/23/21	07:42:00	-2.45028		284.63		102.88	
06/23/21	07:44:00	-2.41694		410.43		102.95	
06/23/21	07:46:00	-2.38361		540.66		102.84	
06/23/21	07:48:00	-2.35028		697.33		102.68	
06/23/21	07:50:00	-2.31694		857.32		102.51	
06/23/21	07:52:00	-2.28361		1016.17		102.32	
06/23/21	07:53:00	-2.26694		1095.06		102.23	
06/23/21	07:54:00	-2.25028		1163.52		102.16	
06/23/21	07:54:55	-2.23500		1220.12		102.10	Arrived at 2500 ft stop.
06/23/21	07:55:00	-2.23361		1220.51		102.10	
06/23/21	07:56:00	-2.21694		1220.31		102.07	
06/23/21	07:57:00	-2.20028		1220.15		102.07	
06/23/21	07:58:00	-2.18361		1220.14		102.06	
06/23/21	07:59:00	-2.16694		1220.15		102.06	
06/23/21	07:59:55	-2.15167		1220.05		102.06	Left 2500 ft stop.
06/23/21	08:00:00	-2.15028		1220.12		102.06	
06/23/21	08:01:00	-2.13361		1291.43		102.02	
06/23/21	08:02:00	-2.11694		1376.77		101.94	
06/23/21	08:03:00	-2.10028		1462.06		101.87	

FESCO, Ltd.

1000 Fesco Ave. - Alice, Texas 78332

RESERVOIR PRESSURE FALLOFF TEST

Company: Petrotek Engineering Corporation
Well: Navajo Refining Waste Disposal Well No. 4
Field: Devonia
Location: Eddy County, NM
Perfs:
Formation: Unavailable

Test Date: 06/23 - 06/24/2021
Gauge Depth: 10307 ft
Gauge Type: Electronic
Gauge SN: DC-224821
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
06/23/21	08:04:00	-2.08361		1546.58		101.82	
06/23/21	08:05:00	-2.06694		1630.71		101.77	
06/23/21	08:06:00	-2.05028		1715.35		101.73	
06/23/21	08:07:00	-2.03361		1800.46		101.70	
06/23/21	08:08:00	-2.01694		1885.08		101.67	
06/23/21	08:09:00	-2.00028		1969.26		101.64	
06/23/21	08:10:00	-1.98361		2053.35		101.63	
06/23/21	08:11:00	-1.96694		2136.91		101.62	
06/23/21	08:12:00	-1.95028		2220.50		101.62	
06/23/21	08:13:00	-1.93361		2304.30		101.63	
06/23/21	08:14:00	-1.91694		2387.58		101.64	
06/23/21	08:15:00	-1.90028		2470.40		101.67	
06/23/21	08:16:00	-1.88361		2553.12		101.70	
06/23/21	08:17:00	-1.86694		2636.10		101.75	
06/23/21	08:18:00	-1.85028		2719.27		101.79	
06/23/21	08:19:00	-1.83361		2801.39		101.85	
06/23/21	08:20:00	-1.81694		2883.72		101.91	
06/23/21	08:21:00	-1.80028		2965.79		101.97	
06/23/21	08:22:00	-1.78361		3046.99		102.04	
06/23/21	08:23:00	-1.76694		3128.61		102.12	
06/23/21	08:24:00	-1.75028		3210.08		102.21	
06/23/21	08:25:00	-1.73361		3287.35		102.30	
06/23/21	08:26:00	-1.71694		3362.60		102.41	
06/23/21	08:26:25	-1.71000		3384.27		102.44	Arrived at 7500 ft stop.
06/23/21	08:27:00	-1.70028		3384.07		102.47	
06/23/21	08:28:00	-1.68361		3384.14		102.47	
06/23/21	08:29:00	-1.66694		3384.19		102.47	
06/23/21	08:30:00	-1.65028		3384.11		102.47	
06/23/21	08:31:00	-1.63361		3384.16		102.46	
06/23/21	08:31:30	-1.62528		3384.14		102.46	Left 7500 ft stop.
06/23/21	08:32:00	-1.61694		3422.84		102.49	
06/23/21	08:33:00	-1.60028		3508.70		102.62	
06/23/21	08:34:00	-1.58361		3595.25		102.76	
06/23/21	08:35:00	-1.56694		3681.12		102.92	
06/23/21	08:36:00	-1.55028		3767.24		103.10	
06/23/21	08:37:00	-1.53361		3853.21		103.29	
06/23/21	08:38:00	-1.51694		3939.15		103.49	
06/23/21	08:39:00	-1.50028		4024.45		103.71	

FESCO, Ltd.

1000 Fesco Ave. - Alice, Texas 78332

RESERVOIR PRESSURE FALLOFF TEST

Company: Petrotek Engineering Corporation
Well: Navajo Refining Waste Disposal Well No. 4
Field: Devonia
Location: Eddy County, NM
Perfs:
Formation: Unavailable

Test Date: 06/23 - 06/24/2021
Gauge Depth: 10307 ft
Gauge Type: Electronic
Gauge SN: DC-224821
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
06/23/21	08:40:00	-1.48361		4110.03		103.94	
06/23/21	08:41:00	-1.46694		4195.12		104.20	
06/23/21	08:42:00	-1.45028		4279.62		104.47	
06/23/21	08:43:00	-1.43361		4364.07		104.71	
06/23/21	08:44:00	-1.41694		4448.26		104.99	
06/23/21	08:45:00	-1.40028		4532.11		105.30	
06/23/21	08:46:00	-1.38361		4604.29		105.58	Arrived at 10307 ft.
06/23/21	08:47:00	-1.36694		4604.48		105.63	
06/23/21	08:48:00	-1.35028		4604.50		105.63	
06/23/21	08:49:00	-1.33361		4604.52		105.64	
06/23/21	08:50:00	-1.31694		4604.56		105.63	
06/23/21	08:51:00	-1.30028		4604.75		105.64	10307 ft stop.
06/23/21	08:52:00	-1.28361		4605.07		105.63	
06/23/21	08:53:00	-1.26694		4605.28		105.62	
06/23/21	08:54:00	-1.25028		4605.41		105.60	
06/23/21	08:55:00	-1.23361		4605.51		105.58	
06/23/21	08:56:00	-1.21694		4605.56		105.56	
06/23/21	08:57:00	-1.20028		4605.61		105.54	
06/23/21	08:58:00	-1.18361		4605.63		105.52	
06/23/21	08:59:00	-1.16694		4606.60		105.51	
06/23/21	09:00:00	-1.15028		4606.61		105.49	
06/23/21	09:05:00	-1.06694		4606.69		105.42	
06/23/21	09:10:00	-0.98361		4606.51		105.38	
06/23/21	09:15:00	-0.90028		4606.44		105.37	
06/23/21	09:20:00	-0.81694		4606.48		105.38	
06/23/21	09:25:00	-0.73361		4606.66		105.37	
06/23/21	09:30:00	-0.65028		4606.71		105.36	
06/23/21	09:35:00	-0.56694		4607.35		105.30	
06/23/21	09:40:00	-0.48361		4607.48		105.23	
06/23/21	09:45:00	-0.40028		4607.56		105.17	
06/23/21	09:50:00	-0.31694		4607.60		105.12	
06/23/21	09:55:00	-0.23361		4607.64		105.10	
06/23/21	10:00:00	-0.15028		4607.62		105.07	
06/23/21	10:05:00	-0.06694		4607.37		105.08	
06/23/21	10:09:00	-0.00028		4606.71		105.10	Injection Rate = Unavailable.
06/23/21	10:09:01	0.00000		4606.70	0.00	105.10	Shut in well for falloff test.
06/23/21	10:09:02	0.00028		4606.44	-0.26	105.11	
06/23/21	10:09:03	0.00056		4606.10	-0.60	105.11	

FESCO, Ltd.

1000 Fesco Ave. - Alice, Texas 78332

RESERVOIR PRESSURE FALLOFF TEST

Company: Petrotek Engineering Corporation
Well: Navajo Refining Waste Disposal Well No. 4
Field: Devonia
Location: Eddy County, NM
Perfs:
Formation: Unavailable

Test Date: 06/23 - 06/24/2021
Gauge Depth: 10307 ft
Gauge Type: Electronic
Gauge SN: DC-224821
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
06/23/21	10:09:04	0.00083		4606.13	-0.57	105.11	
06/23/21	10:09:05	0.00111		4606.09	-0.61	105.11	
06/23/21	10:09:06	0.00139		4606.01	-0.69	105.11	
06/23/21	10:09:07	0.00167		4605.71	-0.99	105.11	
06/23/21	10:09:08	0.00194		4605.34	-1.36	105.11	
06/23/21	10:09:09	0.00222		4605.31	-1.39	105.11	
06/23/21	10:09:10	0.00250		4605.25	-1.45	105.11	
06/23/21	10:09:11	0.00278		4605.11	-1.59	105.11	
06/23/21	10:09:12	0.00306		4605.04	-1.66	105.11	
06/23/21	10:09:13	0.00333		4605.27	-1.43	105.11	
06/23/21	10:09:14	0.00361		4605.08	-1.62	105.11	
06/23/21	10:09:15	0.00389		4604.89	-1.81	105.11	
06/23/21	10:09:16	0.00417		4604.81	-1.89	105.11	
06/23/21	10:09:17	0.00444		4604.66	-2.04	105.11	
06/23/21	10:09:18	0.00472		4604.38	-2.32	105.11	
06/23/21	10:09:19	0.00500		4604.33	-2.37	105.11	
06/23/21	10:09:20	0.00528		4604.33	-2.37	105.11	
06/23/21	10:09:21	0.00556		4604.26	-2.44	105.11	
06/23/21	10:09:22	0.00583		4604.17	-2.53	105.11	
06/23/21	10:09:23	0.00611		4604.35	-2.35	105.11	
06/23/21	10:09:24	0.00639		4604.30	-2.40	105.11	
06/23/21	10:09:25	0.00667		4604.15	-2.55	105.11	
06/23/21	10:09:26	0.00694		4604.10	-2.60	105.11	
06/23/21	10:09:27	0.00722		4604.03	-2.67	105.11	
06/23/21	10:09:28	0.00750		4603.82	-2.88	105.11	
06/23/21	10:09:29	0.00778		4603.75	-2.95	105.11	
06/23/21	10:09:30	0.00806		4603.78	-2.92	105.11	
06/23/21	10:09:31	0.00833		4603.74	-2.96	105.11	
06/23/21	10:09:32	0.00861		4603.68	-3.02	105.11	
06/23/21	10:09:33	0.00889		4603.78	-2.92	105.11	
06/23/21	10:09:34	0.00917		4603.82	-2.88	105.11	
06/23/21	10:09:35	0.00944		4603.72	-2.98	105.11	
06/23/21	10:09:36	0.00972		4603.67	-3.03	105.11	
06/23/21	10:09:37	0.01000		4603.65	-3.05	105.11	
06/23/21	10:09:39	0.01056		4603.41	-3.29	105.11	
06/23/21	10:09:40	0.01083		4603.44	-3.26	105.11	
06/23/21	10:09:41	0.01111		4603.43	-3.27	105.11	
06/23/21	10:09:42	0.01139		4603.39	-3.31	105.11	

FESCO, Ltd.

1000 Fesco Ave. - Alice, Texas 78332

RESERVOIR PRESSURE FALLOFF TEST

Company: Petrotek Engineering Corporation
Well: Navajo Refining Waste Disposal Well No. 4
Field: Devonia
Location: Eddy County, NM
Perfs:
Formation: Unavailable

Test Date: 06/23 - 06/24/2021
Gauge Depth: 10307 ft
Gauge Type: Electronic
Gauge SN: DC-224821
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
06/23/21	10:09:43	0.01167		4603.43	-3.27	105.11	
06/23/21	10:09:45	0.01222		4603.46	-3.24	105.11	
06/23/21	10:09:46	0.01250		4603.43	-3.27	105.11	
06/23/21	10:09:48	0.01306		4603.35	-3.35	105.11	
06/23/21	10:09:49	0.01333		4603.24	-3.46	105.11	
06/23/21	10:09:50	0.01361		4603.25	-3.45	105.11	
06/23/21	10:09:52	0.01417		4603.24	-3.46	105.11	
06/23/21	10:09:54	0.01472		4603.34	-3.36	105.11	
06/23/21	10:09:55	0.01500		4603.32	-3.38	105.12	
06/23/21	10:09:57	0.01556		4603.29	-3.41	105.12	
06/23/21	10:09:59	0.01611		4603.16	-3.54	105.12	
06/23/21	10:10:00	0.01639		4603.16	-3.54	105.12	
06/23/21	10:10:02	0.01694		4603.16	-3.54	105.12	
06/23/21	10:10:04	0.01750		4603.23	-3.47	105.12	
06/23/21	10:10:06	0.01806		4603.22	-3.48	105.12	
06/23/21	10:10:08	0.01861		4603.20	-3.50	105.12	
06/23/21	10:10:10	0.01917		4603.10	-3.60	105.12	
06/23/21	10:10:12	0.01972		4603.10	-3.60	105.12	
06/23/21	10:10:14	0.02028		4603.15	-3.55	105.12	
06/23/21	10:10:17	0.02111		4603.15	-3.55	105.12	
06/23/21	10:10:19	0.02167		4603.10	-3.60	105.12	
06/23/21	10:10:21	0.02222		4603.07	-3.63	105.12	
06/23/21	10:10:24	0.02306		4603.10	-3.60	105.12	
06/23/21	10:10:27	0.02389		4603.12	-3.58	105.12	
06/23/21	10:10:29	0.02444		4603.09	-3.61	105.12	
06/23/21	10:10:32	0.02528		4603.06	-3.64	105.12	
06/23/21	10:10:35	0.02611		4603.10	-3.60	105.12	
06/23/21	10:10:38	0.02694		4603.06	-3.64	105.12	
06/23/21	10:10:41	0.02778		4603.00	-3.70	105.12	
06/23/21	10:10:44	0.02861		4603.02	-3.68	105.12	
06/23/21	10:10:47	0.02944		4603.04	-3.66	105.12	
06/23/21	10:10:50	0.03028		4602.99	-3.71	105.12	
06/23/21	10:10:54	0.03139		4602.99	-3.71	105.12	
06/23/21	10:10:57	0.03222		4603.01	-3.69	105.12	
06/23/21	10:11:01	0.03333		4602.96	-3.74	105.12	
06/23/21	10:11:04	0.03417		4602.97	-3.73	105.12	
06/23/21	10:11:08	0.03528		4602.98	-3.72	105.12	
06/23/21	10:11:12	0.03639		4602.94	-3.76	105.12	

FESCO, Ltd.

1000 Fesco Ave. - Alice, Texas 78332

RESERVOIR PRESSURE FALLOFF TEST

Company: Petrotek Engineering Corporation
Well: Navajo Refining Waste Disposal Well No. 4
Field: Devonia
Location: Eddy County, NM
Perfs:
Formation: Unavailable

Test Date: 06/23 - 06/24/2021
Gauge Depth: 10307 ft
Gauge Type: Electronic
Gauge SN: DC-224821
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
06/23/21	10:11:16	0.03750		4602.98	-3.72	105.12	
06/23/21	10:11:20	0.03861		4602.96	-3.74	105.12	
06/23/21	10:11:25	0.04000		4602.94	-3.76	105.12	
06/23/21	10:11:29	0.04111		4602.95	-3.75	105.13	
06/23/21	10:11:34	0.04250		4602.93	-3.77	105.13	
06/23/21	10:11:39	0.04389		4602.94	-3.76	105.13	
06/23/21	10:11:44	0.04528		4602.91	-3.79	105.13	
06/23/21	10:11:49	0.04667		4602.92	-3.78	105.13	
06/23/21	10:11:54	0.04806		4602.90	-3.80	105.13	
06/23/21	10:11:59	0.04944		4602.91	-3.79	105.13	
06/23/21	10:12:05	0.05111		4602.89	-3.81	105.13	
06/23/21	10:12:10	0.05250		4602.90	-3.80	105.14	
06/23/21	10:12:16	0.05417		4602.89	-3.81	105.14	
06/23/21	10:12:22	0.05583		4602.87	-3.83	105.14	
06/23/21	10:12:29	0.05778		4602.88	-3.82	105.14	
06/23/21	10:12:35	0.05944		4602.86	-3.84	105.15	
06/23/21	10:12:42	0.06139		4602.86	-3.84	105.15	
06/23/21	10:12:49	0.06333		4602.86	-3.84	105.15	
06/23/21	10:12:56	0.06528		4602.85	-3.85	105.16	
06/23/21	10:13:03	0.06722		4602.85	-3.85	105.16	
06/23/21	10:13:11	0.06944		4602.85	-3.85	105.16	
06/23/21	10:13:18	0.07139		4602.85	-3.85	105.17	
06/23/21	10:13:26	0.07361		4602.83	-3.87	105.17	
06/23/21	10:13:35	0.07611		4602.83	-3.87	105.17	
06/23/21	10:13:43	0.07833		4602.82	-3.88	105.17	
06/23/21	10:13:52	0.08083		4602.82	-3.88	105.17	
06/23/21	10:14:01	0.08333		4602.81	-3.89	105.18	
06/23/21	10:14:10	0.08583		4602.81	-3.89	105.18	
06/23/21	10:14:20	0.08861		4602.80	-3.90	105.18	
06/23/21	10:14:30	0.09139		4602.79	-3.91	105.19	
06/23/21	10:14:40	0.09417		4602.78	-3.92	105.20	
06/23/21	10:14:51	0.09722		4602.78	-3.92	105.20	
06/23/21	10:15:01	0.10000		4602.77	-3.93	105.21	
06/23/21	10:15:13	0.10333		4602.76	-3.94	105.22	
06/23/21	10:15:24	0.10639		4602.76	-3.94	105.22	
06/23/21	10:15:36	0.10972		4602.74	-3.96	105.23	
06/23/21	10:15:49	0.11333		4602.72	-3.98	105.24	
06/23/21	10:16:01	0.11667		4602.72	-3.98	105.25	

FESCO, Ltd.

1000 Fesco Ave. - Alice, Texas 78332

RESERVOIR PRESSURE FALLOFF TEST

Company: Petrotek Engineering Corporation
Well: Navajo Refining Waste Disposal Well No. 4
Field: Devonia
Location: Eddy County, NM
Perfs:
Formation: Unavailable

Test Date: 06/23 - 06/24/2021
Gauge Depth: 10307 ft
Gauge Type: Electronic
Gauge SN: DC-224821
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
06/23/21	10:16:14	0.12028		4602.72	-3.98	105.26	
06/23/21	10:16:28	0.12417		4602.73	-3.97	105.27	
06/23/21	10:16:42	0.12806		4602.73	-3.97	105.27	
06/23/21	10:16:56	0.13194		4602.72	-3.98	105.28	
06/23/21	10:17:11	0.13611		4602.71	-3.99	105.28	
06/23/21	10:17:26	0.14028		4602.71	-3.99	105.29	
06/23/21	10:17:42	0.14472		4602.69	-4.01	105.29	
06/23/21	10:17:58	0.14917		4602.69	-4.01	105.30	
06/23/21	10:18:15	0.15389		4602.68	-4.02	105.31	
06/23/21	10:18:32	0.15861		4602.67	-4.03	105.32	
06/23/21	10:18:50	0.16361		4602.66	-4.04	105.33	
06/23/21	10:19:08	0.16861		4602.65	-4.05	105.34	
06/23/21	10:19:27	0.17389		4602.64	-4.06	105.35	
06/23/21	10:19:47	0.17944		4602.63	-4.07	105.36	
06/23/21	10:20:07	0.18500		4602.63	-4.07	105.37	
06/23/21	10:20:27	0.19056		4602.62	-4.08	105.38	
06/23/21	10:20:49	0.19667		4602.62	-4.08	105.39	
06/23/21	10:21:11	0.20278		4602.61	-4.09	105.40	
06/23/21	10:21:34	0.20917		4602.59	-4.11	105.41	
06/23/21	10:21:57	0.21556		4602.59	-4.11	105.42	
06/23/21	10:22:21	0.22222		4602.56	-4.14	105.44	
06/23/21	10:22:46	0.22917		4602.56	-4.14	105.45	
06/23/21	10:23:12	0.23639		4602.56	-4.14	105.46	
06/23/21	10:23:38	0.24361		4602.55	-4.15	105.47	
06/23/21	10:24:06	0.25139		4602.53	-4.17	105.48	
06/23/21	10:24:34	0.25917		4602.53	-4.17	105.50	
06/23/21	10:25:03	0.26722		4602.52	-4.18	105.52	
06/23/21	10:25:33	0.27556		4602.52	-4.18	105.54	
06/23/21	10:26:04	0.28417		4602.51	-4.19	105.56	
06/23/21	10:26:36	0.29306		4602.52	-4.18	105.57	
06/23/21	10:27:09	0.30222		4602.49	-4.21	105.58	
06/23/21	10:27:43	0.31167		4602.47	-4.23	105.60	
06/23/21	10:28:18	0.32139		4602.47	-4.23	105.62	
06/23/21	10:28:54	0.33139		4602.47	-4.23	105.64	
06/23/21	10:29:31	0.34167		4602.45	-4.25	105.66	
06/23/21	10:30:09	0.35222		4602.45	-4.25	105.68	
06/23/21	10:30:49	0.36333		4602.44	-4.26	105.70	
06/23/21	10:31:29	0.37444		4602.44	-4.26	105.73	

FESCO, Ltd.

1000 Fesco Ave. - Alice, Texas 78332

RESERVOIR PRESSURE FALLOFF TEST

Company: Petrotek Engineering Corporation
Well: Navajo Refining Waste Disposal Well No. 4
Field: Devonia
Location: Eddy County, NM
Perfs:
Formation: Unavailable

Test Date: 06/23 - 06/24/2021
Gauge Depth: 10307 ft
Gauge Type: Electronic
Gauge SN: DC-224821
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
06/23/21	10:32:11	0.38611		4602.41	-4.29	105.75	
06/23/21	10:32:55	0.39833		4602.41	-4.29	105.77	
06/23/21	10:33:39	0.41056		4602.40	-4.30	105.79	
06/23/21	10:34:25	0.42333		4602.40	-4.30	105.81	
06/23/21	10:35:13	0.43667		4602.39	-4.31	105.83	
06/23/21	10:36:02	0.45028		4602.36	-4.34	105.86	
06/23/21	10:36:52	0.46417		4602.35	-4.35	105.88	
06/23/21	10:37:45	0.47889		4602.36	-4.34	105.91	
06/23/21	10:38:38	0.49361		4602.35	-4.35	105.94	
06/23/21	10:39:34	0.50917		4602.34	-4.36	105.96	
06/23/21	10:40:31	0.52500		4602.31	-4.39	105.99	
06/23/21	10:41:30	0.54139		4602.31	-4.39	106.02	
06/23/21	10:42:30	0.55806		4602.30	-4.40	106.05	
06/23/21	10:43:33	0.57556		4602.29	-4.41	106.09	
06/23/21	10:44:38	0.59361		4602.27	-4.43	106.12	
06/23/21	10:45:44	0.61194		4602.27	-4.43	106.15	
06/23/21	10:46:53	0.63111		4602.25	-4.45	106.18	
06/23/21	10:48:04	0.65083		4602.24	-4.46	106.22	
06/23/21	10:49:17	0.67111		4602.23	-4.47	106.26	
06/23/21	10:50:32	0.69194		4602.24	-4.46	106.30	
06/23/21	10:51:50	0.71361		4602.22	-4.48	106.33	
06/23/21	10:53:10	0.73583		4602.19	-4.51	106.37	
06/23/21	10:54:32	0.75861		4602.19	-4.51	106.40	
06/23/21	10:55:57	0.78222		4602.19	-4.51	106.44	
06/23/21	10:57:25	0.80667		4602.18	-4.52	106.47	
06/23/21	10:58:56	0.83194		4602.16	-4.54	106.52	
06/23/21	11:00:29	0.85778		4602.16	-4.54	106.56	
06/23/21	11:02:05	0.88444		4602.13	-4.57	106.60	
06/23/21	11:03:45	0.91222		4602.12	-4.58	106.64	
06/23/21	11:05:27	0.94056		4602.11	-4.59	106.69	
06/23/21	11:07:13	0.97000		4602.10	-4.60	106.74	
06/23/21	11:09:01	1.00000		4602.09	-4.61	106.79	
06/23/21	11:10:54	1.03139		4602.07	-4.63	106.84	
06/23/21	11:12:49	1.06333		4602.06	-4.64	106.89	
06/23/21	11:14:49	1.09667		4602.03	-4.67	106.94	
06/23/21	11:16:52	1.13083		4602.03	-4.67	107.00	
06/23/21	11:18:59	1.16611		4602.01	-4.69	107.04	
06/23/21	11:21:10	1.20250		4602.00	-4.70	107.10	

FESCO, Ltd.

1000 Fesco Ave. - Alice, Texas 78332

RESERVOIR PRESSURE FALLOFF TEST

Company: Petrotek Engineering Corporation
Well: Navajo Refining Waste Disposal Well No. 4
Field: Devonia
Location: Eddy County, NM
Perfs:
Formation: Unavailable

Test Date: 06/23 - 06/24/2021
Gauge Depth: 10307 ft
Gauge Type: Electronic
Gauge SN: DC-224821
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
06/23/21	11:23:24	1.23972		4601.99	-4.71	107.16	
06/23/21	11:25:44	1.27861		4601.99	-4.71	107.21	
06/23/21	11:28:07	1.31833		4601.97	-4.73	107.27	
06/23/21	11:30:35	1.35944		4601.96	-4.74	107.32	
06/23/21	11:33:08	1.40194		4601.94	-4.76	107.38	
06/23/21	11:35:45	1.44556		4601.91	-4.79	107.44	
06/23/21	11:38:27	1.49056		4601.91	-4.79	107.50	
06/23/21	11:41:14	1.53694		4601.90	-4.80	107.58	
06/23/21	11:44:07	1.58500		4601.89	-4.81	107.63	
06/23/21	11:47:05	1.63444		4601.87	-4.83	107.70	
06/23/21	11:50:08	1.68528		4601.85	-4.85	107.76	
06/23/21	11:53:17	1.73778		4601.83	-4.87	107.83	
06/23/21	11:56:32	1.79194		4601.82	-4.88	107.90	
06/23/21	11:59:54	1.84806		4601.80	-4.90	107.97	
06/23/21	12:03:21	1.90556		4601.78	-4.92	108.04	
06/23/21	12:06:55	1.96500		4601.77	-4.93	108.11	
06/23/21	12:10:35	2.02611		4601.76	-4.94	108.18	
06/23/21	12:14:23	2.08944		4601.74	-4.96	108.26	
06/23/21	12:18:17	2.15444		4601.72	-4.98	108.33	
06/23/21	12:22:19	2.22167		4601.70	-5.00	108.41	
06/23/21	12:26:28	2.29083		4601.69	-5.01	108.49	
06/23/21	12:30:46	2.36250		4601.67	-5.03	108.56	
06/23/21	12:35:11	2.43611		4601.66	-5.04	108.64	
06/23/21	12:39:44	2.51194		4601.64	-5.06	108.72	
06/23/21	12:44:26	2.59028		4601.62	-5.08	108.81	
06/23/21	12:49:17	2.67111		4601.60	-5.10	108.89	
06/23/21	12:54:16	2.75417		4601.58	-5.12	108.97	
06/23/21	12:59:26	2.84028		4601.56	-5.14	109.06	
06/23/21	13:04:44	2.92861		4601.54	-5.16	109.14	
06/23/21	13:10:13	3.02000		4601.52	-5.18	109.23	
06/23/21	13:15:52	3.11417		4601.51	-5.19	109.32	
06/23/21	13:21:42	3.21139		4601.49	-5.21	109.41	
06/23/21	13:27:42	3.31139		4601.47	-5.23	109.50	
06/23/21	13:33:54	3.41472		4601.45	-5.25	109.59	
06/23/21	13:40:17	3.52111		4601.44	-5.26	109.69	
06/23/21	13:46:52	3.63083		4601.43	-5.27	109.78	
06/23/21	13:53:39	3.74389		4601.40	-5.30	109.88	
06/23/21	14:00:40	3.86083		4601.37	-5.33	109.97	

FESCO, Ltd.

1000 Fesco Ave. - Alice, Texas 78332

RESERVOIR PRESSURE FALLOFF TEST

Company: Petrotek Engineering Corporation
Well: Navajo Refining Waste Disposal Well No. 4
Field: Devonia
Location: Eddy County, NM
Perfs:
Formation: Unavailable

Test Date: 06/23 - 06/24/2021
Gauge Depth: 10307 ft
Gauge Type: Electronic
Gauge SN: DC-224821
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
06/23/21	14:07:53	3.98111		4601.36	-5.34	110.07	
06/23/21	14:15:20	4.10528		4601.34	-5.36	110.17	
06/23/21	14:23:01	4.23333		4601.32	-5.38	110.27	
06/23/21	14:30:56	4.36528		4601.31	-5.39	110.37	
06/23/21	14:39:06	4.50139		4601.30	-5.40	110.47	
06/23/21	14:47:31	4.64167		4601.27	-5.43	110.57	
06/23/21	14:56:12	4.78639		4601.26	-5.44	110.67	
06/23/21	15:05:09	4.93556		4601.23	-5.47	110.78	
06/23/21	15:14:25	5.09000		4601.20	-5.50	110.88	
06/23/21	15:23:55	5.24833		4601.19	-5.51	110.99	
06/23/21	15:33:45	5.41222		4601.17	-5.53	111.09	
06/23/21	15:43:50	5.58028		4601.15	-5.55	111.20	
06/23/21	15:54:20	5.75528		4601.13	-5.57	111.31	
06/23/21	16:05:05	5.93444		4601.12	-5.58	111.42	
06/23/21	16:16:10	6.11917		4601.10	-5.60	111.53	
06/23/21	16:27:35	6.30944		4601.08	-5.62	111.64	
06/23/21	16:39:25	6.50667		4601.07	-5.63	111.75	
06/23/21	16:51:35	6.70944		4601.05	-5.65	111.86	
06/23/21	17:04:10	6.91917		4601.05	-5.65	111.97	
06/23/21	17:17:05	7.13444		4601.02	-5.68	112.09	
06/23/21	17:30:25	7.35667		4601.02	-5.68	112.20	
06/23/21	17:44:10	7.58583		4600.99	-5.71	112.31	
06/23/21	17:58:25	7.82333		4600.98	-5.72	112.42	
06/23/21	18:13:00	8.06639		4600.96	-5.74	112.54	
06/23/21	18:28:05	8.31778		4600.94	-5.76	112.65	
06/23/21	18:43:40	8.57750		4600.93	-5.77	112.77	
06/23/21	18:59:40	8.84417		4600.91	-5.79	112.88	
06/23/21	19:16:15	9.12056		4600.88	-5.82	113.00	
06/23/21	19:33:20	9.40528		4600.88	-5.82	113.11	
06/23/21	19:50:55	9.69833		4600.85	-5.85	113.23	
06/23/21	20:09:00	9.99972		4600.83	-5.87	113.35	
06/23/21	20:27:45	10.31222		4600.81	-5.89	113.46	
06/23/21	20:47:00	10.63306		4600.78	-5.92	113.58	
06/23/21	21:06:55	10.96500		4600.76	-5.94	113.70	
06/23/21	21:27:25	11.30667		4600.75	-5.95	113.82	
06/23/21	21:48:35	11.65944		4600.72	-5.98	113.93	
06/23/21	22:10:25	12.02333		4600.69	-6.01	114.05	
06/23/21	22:32:55	12.39833		4600.66	-6.04	114.17	

FESCO, Ltd.

1000 Fesco Ave. - Alice, Texas 78332

RESERVOIR PRESSURE FALLOFF TEST

Company: Petrotek Engineering Corporation
Well: Navajo Refining Waste Disposal Well No. 4
Field: Devonia
Location: Eddy County, NM
Perfs:
Formation: Unavailable

Test Date: 06/23 - 06/24/2021
Gauge Depth: 10307 ft
Gauge Type: Electronic
Gauge SN: DC-224821
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
06/23/21	22:56:05	12.78444		4600.64	-6.06	114.29	
06/23/21	23:20:00	13.18306		4600.61	-6.09	114.41	
06/23/21	23:44:40	13.59417		4600.59	-6.11	114.53	
06/24/21	00:10:05	14.01778		4600.55	-6.15	114.65	
06/24/21	00:36:20	14.45528		4600.53	-6.17	114.77	
06/24/21	01:03:20	14.90528		4600.51	-6.19	114.89	
06/24/21	01:31:15	15.37056		4600.49	-6.21	115.01	
06/24/21	02:00:00	15.84972		4600.47	-6.23	115.13	
06/24/21	02:29:35	16.34278		4600.44	-6.26	115.25	
06/24/21	03:00:10	16.85250		4600.43	-6.27	115.37	
06/24/21	03:31:40	17.37750		4600.41	-6.29	115.49	
06/24/21	04:04:15	17.92056		4600.40	-6.30	115.61	
06/24/21	04:37:45	18.47889		4600.39	-6.31	115.73	
06/24/21	05:12:20	19.05528		4600.36	-6.34	115.85	
06/24/21	05:47:55	19.64833		4600.35	-6.35	115.97	
06/24/21	06:24:40	20.26083		4600.33	-6.37	116.08	
06/24/21	07:02:35	20.89278		4600.32	-6.38	116.20	
06/24/21	07:41:40	21.54417		4600.29	-6.41	116.32	
06/24/21	08:22:00	22.21639		4600.26	-6.44	116.44	
06/24/21	09:03:30	22.90806		4600.22	-6.48	116.56	
06/24/21	09:46:25	23.62333		4600.18	-6.52	116.67	
06/24/21	10:30:35	24.35944		4600.14	-6.56	116.79	
06/24/21	11:16:10	25.11917		4600.09	-6.61	116.90	
06/24/21	12:03:10	25.90250		4600.06	-6.64	117.02	
06/24/21	12:51:35	26.70944		4600.02	-6.68	117.13	
06/24/21	13:41:35	27.54278		4599.98	-6.72	117.25	
06/24/21	14:33:05	28.40111		4599.97	-6.73	117.36	
06/24/21	15:26:10	29.28583		4599.96	-6.74	117.47	
06/24/21	16:21:00	30.19972		4599.95	-6.75	117.58	
06/24/21	17:11:30	31.04139		4599.94	-6.76	117.68	POOH from 10307 ft making static gradient stops.
06/24/21	17:11:35	31.04278		4599.41		117.68	
06/24/21	17:11:40	31.04417		4598.40		117.70	
06/24/21	17:11:45	31.04556		4597.21		117.79	
06/24/21	17:11:50	31.04694		4596.23		117.93	
06/24/21	17:11:55	31.04833		4596.50		118.11	
06/24/21	17:12:00	31.04972		4595.95		118.25	
06/24/21	17:13:00	31.06639		4546.34		130.11	
06/24/21	17:14:00	31.08306		4487.85		131.53	

FESCO, Ltd.

1000 Fesco Ave. - Alice, Texas 78332

RESERVOIR PRESSURE FALLOFF TEST

Company: Petrotek Engineering Corporation
Well: Navajo Refining Waste Disposal Well No. 4
Field: Devonia
Location: Eddy County, NM
Perfs:
Formation: Unavailable

Test Date: 06/23 - 06/24/2021
Gauge Depth: 10307 ft
Gauge Type: Electronic
Gauge SN: DC-224821
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
06/24/21	17:14:25	31.09000		4464.18		132.16	Arrived at 10000 ft stop.
06/24/21	17:15:00	31.09972		4463.63		131.88	
06/24/21	17:16:00	31.11639		4463.66		131.84	
06/24/21	17:17:00	31.13306		4463.70		131.81	
06/24/21	17:18:00	31.14972		4463.71		131.80	
06/24/21	17:19:00	31.16639		4463.72		131.81	
06/24/21	17:19:25	31.17333		4463.70		131.81	Left 10000 ft stop.
06/24/21	17:20:00	31.18306		4441.26		131.51	
06/24/21	17:21:00	31.19972		4369.03		130.42	
06/24/21	17:22:00	31.21639		4290.32		127.08	
06/24/21	17:23:00	31.23306		4214.13		127.55	
06/24/21	17:24:00	31.24972		4137.87		126.19	
06/24/21	17:25:00	31.26639		4064.10		124.18	
06/24/21	17:25:30	31.27472		4031.83		123.07	Arrived at 9000 ft stop.
06/24/21	17:26:00	31.28306		4030.01		122.79	
06/24/21	17:27:00	31.29972		4029.77		122.75	
06/24/21	17:28:00	31.31639		4029.73		122.73	
06/24/21	17:29:00	31.33306		4029.70		122.72	
06/24/21	17:30:00	31.34972		4029.67		122.71	
06/24/21	17:30:30	31.35806		4029.54		122.71	Left 9000 ft stop.
06/24/21	17:31:00	31.36639		3995.30		122.50	
06/24/21	17:32:00	31.38306		3924.55		121.41	
06/24/21	17:33:00	31.39972		3851.23		120.58	
06/24/21	17:34:00	31.41639		3776.01		119.07	
06/24/21	17:35:00	31.43306		3699.66		117.91	
06/24/21	17:36:00	31.44972		3624.22		116.59	
06/24/21	17:36:25	31.45667		3596.63		115.62	Arrived at 8000 ft stop.
06/24/21	17:37:00	31.46639		3594.77		115.29	
06/24/21	17:38:00	31.48306		3594.55		115.25	
06/24/21	17:39:00	31.49972		3594.53		115.24	
06/24/21	17:40:00	31.51639		3594.51		115.23	
06/24/21	17:41:00	31.53306		3594.50		115.22	
06/24/21	17:41:25	31.54000		3594.41		115.22	Left 8000 ft stop.
06/24/21	17:42:00	31.54972		3552.59		115.02	
06/24/21	17:43:00	31.56639		3465.88		113.43	
06/24/21	17:44:00	31.58306		3375.20		112.07	
06/24/21	17:45:00	31.59972		3284.43		110.74	
06/24/21	17:46:00	31.61639		3194.30		109.54	

FESCO, Ltd.

1000 Fesco Ave. - Alice, Texas 78332

RESERVOIR PRESSURE FALLOFF TEST

Company: Petrotek Engineering Corporation
Well: Navajo Refining Waste Disposal Well No. 4
Field: Devonia
Location: Eddy County, NM
Perfs:
Formation: Unavailable

Test Date: 06/23 - 06/24/2021
Gauge Depth: 10307 ft
Gauge Type: Electronic
Gauge SN: DC-224821
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
06/24/21	17:46:25	31.62333		3160.54		108.95	Arrived at 7000 ft stop.
06/24/21	17:47:00	31.63306		3159.45		108.75	
06/24/21	17:48:00	31.64972		3159.34		108.73	
06/24/21	17:49:00	31.66639		3159.35		108.72	
06/24/21	17:50:00	31.68306		3159.34		108.71	
06/24/21	17:51:00	31.69972		3159.33		108.71	
06/24/21	17:51:25	31.70667		3159.20		108.70	Left 7000 ft stop.
06/24/21	17:52:00	31.71639		3117.00		108.33	
06/24/21	17:53:00	31.73306		3039.50		107.19	
06/24/21	17:54:00	31.74972		2961.02		106.17	
06/24/21	17:55:00	31.76639		2880.23		105.08	
06/24/21	17:56:00	31.78306		2799.19		104.50	
06/24/21	17:57:00	31.79972		2724.03		104.08	Arrived at 6000 ft stop.
06/24/21	17:58:00	31.81639		2723.36		103.95	
06/24/21	17:59:00	31.83306		2723.34		103.94	
06/24/21	18:00:00	31.84972		2723.33		103.93	
06/24/21	18:01:00	31.86639		2723.32		103.93	
06/24/21	18:02:00	31.88306		2723.31		103.92	Left 6000 ft stop.
06/24/21	18:03:00	31.89972		2647.19		103.43	
06/24/21	18:04:00	31.91639		2565.30		102.68	
06/24/21	18:05:00	31.93306		2480.59		101.84	
06/24/21	18:06:00	31.94972		2395.20		100.94	
06/24/21	18:07:00	31.96639		2310.95		99.84	
06/24/21	18:07:20	31.97194		2288.59		99.57	Arrived at 5000 ft stop.
06/24/21	18:08:00	31.98306		2288.02		99.45	
06/24/21	18:09:00	31.99972		2287.97		99.44	
06/24/21	18:10:00	32.01639		2287.96		99.43	
06/24/21	18:11:00	32.03306		2287.94		99.43	
06/24/21	18:12:00	32.04972		2287.93		99.42	
06/24/21	18:12:20	32.05528		2287.93		99.42	Left 5000 ft stop.
06/24/21	18:13:00	32.06639		2245.74		99.18	
06/24/21	18:14:00	32.08306		2160.63		98.54	
06/24/21	18:15:00	32.09972		2073.13		97.88	
06/24/21	18:16:00	32.11639		1984.84		96.85	
06/24/21	18:17:00	32.13306		1896.69		96.19	
06/24/21	18:17:30	32.14139		1853.90		95.93	Arrived at 4000 ft stop.
06/24/21	18:18:00	32.14972		1852.81		95.82	
06/24/21	18:19:00	32.16639		1852.69		95.81	

FESCO, Ltd.

1000 Fesco Ave. - Alice, Texas 78332

RESERVOIR PRESSURE FALLOFF TEST

Company: Petrotek Engineering Corporation
Well: Navajo Refining Waste Disposal Well No. 4
Field: Devonia
Location: Eddy County, NM
Perfs:
Formation: Unavailable

Test Date: 06/23 - 06/24/2021
Gauge Depth: 10307 ft
Gauge Type: Electronic
Gauge SN: DC-224821
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
06/24/21	18:20:00	32.18306		1852.67		95.80	
06/24/21	18:21:00	32.19972		1852.66		95.80	
06/24/21	18:22:00	32.21639		1852.65		95.80	
06/24/21	18:22:30	32.22472		1852.65		95.79	Left 4000 ft stop.
06/24/21	18:23:00	32.23306		1818.82		95.66	
06/24/21	18:24:00	32.24972		1732.15		95.07	
06/24/21	18:25:00	32.26639		1644.05		94.44	
06/24/21	18:26:00	32.28306		1557.21		93.82	
06/24/21	18:27:00	32.29972		1470.73		93.58	
06/24/21	18:27:40	32.31083		1418.79		93.04	Arrived at 3000 ft stop.
06/24/21	18:28:00	32.31639		1418.31		92.92	
06/24/21	18:29:00	32.33306		1418.13		92.89	
06/24/21	18:30:00	32.34972		1418.12		92.88	
06/24/21	18:31:00	32.36639		1418.10		92.88	
06/24/21	18:32:00	32.38306		1418.09		92.87	
06/24/21	18:32:40	32.39417		1418.09		92.87	Left 3000 ft stop.
06/24/21	18:33:00	32.39972		1398.73		92.83	
06/24/21	18:34:00	32.41639		1318.01		92.16	
06/24/21	18:35:00	32.43306		1230.57		91.80	
06/24/21	18:36:00	32.44972		1142.31		91.01	
06/24/21	18:37:00	32.46639		1054.36		90.67	
06/24/21	18:37:50	32.48028		985.07		90.19	Arrived at 2000 ft stop.
06/24/21	18:38:00	32.48306		984.05		90.01	
06/24/21	18:39:00	32.49972		983.35		89.86	
06/24/21	18:40:00	32.51639		983.31		89.84	
06/24/21	18:41:00	32.53306		983.30		89.83	
06/24/21	18:42:00	32.54972		983.29		89.81	
06/24/21	18:43:00	32.56639		983.28		89.81	
06/24/21	18:43:05	32.56778		983.28		89.81	Left 2000 ft stop.
06/24/21	18:44:00	32.58306		923.78		89.26	
06/24/21	18:45:00	32.59972		852.28		89.20	
06/24/21	18:46:00	32.61639		771.21		88.63	
06/24/21	18:47:00	32.63306		686.63		87.90	
06/24/21	18:48:00	32.64972		604.17		87.38	
06/24/21	18:48:45	32.66222		548.69		86.84	Arrived at 1000 ft stop.
06/24/21	18:49:00	32.66639		548.57		86.85	
06/24/21	18:50:00	32.68306		548.54		86.88	
06/24/21	18:51:00	32.69972		548.54		86.88	

FESCO, Ltd.

1000 Fesco Ave. - Alice, Texas 78332

RESERVOIR PRESSURE FALLOFF TEST

Company: Petrotek Engineering Corporation
Well: Navajo Refining Waste Disposal Well No. 4
Field: Devonia
Location: Eddy County, NM
Perfs:
Formation: Unavailable

Test Date: 06/23 - 06/24/2021
Gauge Depth: 10307 ft
Gauge Type: Electronic
Gauge SN: DC-224821
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
06/24/21	18:52:00	32.71639		548.53		86.89	
06/24/21	18:53:00	32.73306		548.52		86.89	
06/24/21	18:53:40	32.74417		548.52		86.89	Left 1000 ft stop.
06/24/21	18:54:00	32.74972		530.12		86.83	
06/24/21	18:55:00	32.76639		452.54		87.90	
06/24/21	18:56:00	32.78306		380.74		87.74	
06/24/21	18:57:00	32.79972		301.03		87.59	
06/24/21	18:58:00	32.81639		220.79		85.06	
06/24/21	18:59:00	32.83306		151.58		87.72	
06/24/21	19:00:00	32.84972		72.83		99.62	
06/24/21	19:01:00	32.86639		103.00		110.84	
06/24/21	19:01:10	32.86917		103.93		110.92	Gauge at surface.
06/24/21	19:02:00	32.88306		105.55		111.05	
06/24/21	19:03:00	32.89972		105.69		111.16	
06/24/21	19:04:00	32.91639		105.82		111.16	
06/24/21	19:05:00	32.93306		106.34		111.11	
06/24/21	19:06:00	32.94972		106.53		110.94	
06/24/21	19:06:35	32.95944		106.32		110.81	Pressured down lubricator.
06/24/21	19:07:00	32.96639		48.68		110.33	
06/24/21	19:08:00	32.98306		19.58		108.83	
06/24/21	19:08:40	32.99417		15.67		108.82	Test completed.
06/24/21	19:10:00	33.01639		24.53		98.98	
06/24/21	19:15:00	33.09972		13.60		86.80	
06/24/21	19:15:10	33.10250		13.45		86.91	Powered down gauge.

Remarks: MIRU slickline. RIH with 1.25" weight bar. Cleared 10307 ft. POOH. RIH with electronic gauge making injecting gradient stops to 10307 ft. Flow well for 1.5 hrs. SI well for 31-hr BHP Falloff Test. POOH making static gradient stops. RDMO.

Certified: FESCO, Ltd. - Odessa, TX

By: Michael Carnes
District Manager - (432) 332-3211

Job No.: J202106261403.001A

Attachment 5
Falloff Test Summary

Petrotek

Falloff Test Summary

Reservoir Properties

Net Pay (h)	330 ft
Porosity (Φ)	25.0 %
Formation Compressibility (c_f)	3.50E-06 psi^{-1}
Total Compressibility (c_t)	6.20E-06 psi^{-1}
Wellbore Radius (r_w)	0.3246 ft

Fluid Properties

Water Viscosity (μ_w)	0.47 cp
Water Compressibility (c_w)	2.70E-06 psi^{-1}
Water Formation Volume Factor (B_w)	1.00 bbl/stb

Model Parameters

Wellbore Model	Changing hegeman
Reservoir Model	Homogenous
Boundary Model	Intersecting faults

Analysis Results

Well & Wellbore

Initial Wellbore Storage	0.332 bbl/psi
Final Wellbore Storage	0.570 bbl/psi
D_t [changing storage]	3.130E-04 hr

Reservoir & Boundary

Average Pressure (P*)	4,600.9 psia
Permeability (k)	4,134 md
Transmissibility	1.36E+06 md-ft
1st Boundary Distance	701 ft
2nd Boundary Distance	701 ft
Angle	70.0 °
Radius of Investigation (r_i)	11,965 ft

Attachment 6
AOR Well List

Petrotek

Operator	Well Name	API	Type	Well Status	Latitude	Longitude	Spud Date	P&A Date
SDX RESOURCES INC	BERRY A #031Y	30-015-21668	Oil	Plugged (site released)	32.82143	-104.26438	31-Dec-99	20-Jun-00
Redwood Operating LLC	EAGLE 27 B FEDERAL #003	30-015-29937	Oil	Active	32.81153	-104.26551	22-Jan-98	N/A
PRE-ONGARD WELL OPERATOR	PRE-ONGARD WELL #031	30-015-21569	Oil	Plugged (site released)	32.82139	-104.26438	1-Jan-00	1-Jan-00
PRE-ONGARD WELL OPERATOR	PRE-ONGARD WELL #002	30-015-21443	Oil	Plugged (site released)	32.81427	-104.26441	1-Jan-00	1-Jan-00
PRE-ONGARD WELL OPERATOR	PRE-ONGARD WELL #001	30-015-00470	Oil	Plugged (site released)	32.82051	-104.26116	1-Jan-00	1-Jan-00
Redwood Operating LLC	EAGLE 27 FEDERAL #001	30-015-29936	Oil	Active	32.81157	-104.26072	15-Oct-98	N/A
Murchison Oil and Gas, LLC	MARALO FEDERAL #002	30-015-30532	Gas	Active	32.82231	-104.2633	19-Dec-98	N/A
PRE-ONGARD WELL OPERATOR	PRE-ONGARD WELL #001	30-015-01237	Oil	Plugged (site released)	32.81071	-104.25907	1-Jan-00	1-Jan-01
Murchison Oil and Gas, LLC	MARALO FEDERAL #004	30-015-30795	Gas	Plugged (site released)	32.81752	-104.2601	10-Dec-99	27-Feb-07
COG OPERATING LLC	RJ UNIT #105	30-015-29803	Oil	Plugged (site released)	32.81087	-104.25907	11-Dec-97	16-Oct-14
PRE-ONGARD WELL OPERATOR	PRE-ONGARD WELL #001	30-015-00458	Oil	Plugged (site released)	32.82779	-104.25898	1-Jan-00	1-Jan-01
OXY USA WTP LIMITED PARTNERSHIP	YESO VIKING FEDERAL #002	30-015-41339	Oil	Active	32.81862	-104.25677	6-Nov-13	N/A
PRE-ONGARD WELL OPERATOR	PRE-ONGARD WELL #001	30-015-00581	Oil	Plugged (site released)	32.81158	-104.25691	1-Jan-00	1-Jan-00
PRE-ONGARD WELL OPERATOR	PRE-ONGARD WELL #001	30-015-00454	Oil	Plugged (site released)	32.82779	-104.25683	1-Jan-00	1-Jan-01
Spur Energy Partners LLC	ARCO B FEDERAL COM #001	30-015-21047	Gas	Active	32.80353	-104.25591	31-Dec-73	N/A
PRE-ONGARD WELL OPERATOR	PRE-ONGARD WELL #002	30-015-00686	Oil	Plugged (site released)	32.80794	-104.2548	1-Jan-00	1-Jan-01
OXY USA WTP LIMITED PARTNERSHIP	YESO VIKING FEDERAL #006	30-015-41342	Oil	Active	32.81511	-104.25689	28-Nov-13	N/A
OXY USA WTP LIMITED PARTNERSHIP	OXY CHARLEMAGNE FEDERAL #001	30-015-30181	Oil	Active	32.80795	-104.25587	23-Jun-98	N/A
PRE-ONGARD WELL OPERATOR	PRE-ONGARD WELL #001	30-015-00583	Oil	Plugged (site released)	32.80787	-104.2548	1-Jan-00	1-Jan-00
PRE-ONGARD WELL OPERATOR	PRE-ONGARD WELL #001	30-015-00582	Oil	Plugged (site released)	32.80975	-104.25478	1-Jan-00	1-Jan-01
PRE-ONGARD WELL OPERATOR	PRE-ONGARD WELL #001	30-015-00589	Oil	Plugged (site released)	32.80344	-104.25595	1-Jan-00	1-Jan-00
PRE-ONGARD WELL OPERATOR	PRE-ONGARD WELL #006	30-015-00474	Oil	Plugged (site released)	32.81338	-104.25475	1-Jan-00	1-Jan-00
PRE-ONGARD WELL OPERATOR	PRE-ONGARD WELL #001	30-015-00471	Oil	Plugged (site released)	32.82506	-104.25469	1-Jan-00	1-Jan-01
CONCHO EXPLORATION	HONDO FEDERAL GAS COM #003	30-015-32614	Gas	Plugged (site released)	32.80899	-104.26446	22-May-03	13-Jun-03
OXY USA WTP LIMITED PARTNERSHIP	OXY ROSENKAVLIER FEDERAL #001	30-015-30908	Gas	Active	32.82507	-104.25576	5-Feb-00	N/A
OXY USA WTP LIMITED PARTNERSHIP	OXY VIKING FEDERAL #001	30-015-29281	Gas	Active	32.81427	-104.25259	28-Dec-96	N/A
OXY USA WTP LIMITED PARTNERSHIP	YESO VIKING FEDERAL #003	30-015-41340	Oil	Active	32.81861	-104.25248	22-Jul-13	N/A
ALAMO PERMIAN RESOURCES, LLC	BERRY FEDERAL #029	30-015-00472	Gas	Plugged (site released)	32.82142	-104.25149	22-Jan-62	30-Jan-13
PRE-ONGARD WELL OPERATOR	PRE-ONGARD WELL #001	30-015-00584	Oil	Plugged (site released)	32.80608	-104.25052	1-Jan-00	1-Jan-01
OXY USA WTP LIMITED PARTNERSHIP	YESO VIKING FEDERAL #007	30-015-41425	Oil	Active	32.81348	-104.25068	27-Dec-13	N/A
OXY USA WTP LIMITED PARTNERSHIP	YESO VIKING FEDERAL #004	30-015-41341	Oil	Active	32.81849	-104.24792	30-Jul-13	N/A
PRE-ONGARD WELL OPERATOR	PRE-ONGARD WELL #005	30-015-00473	Oil	Plugged (site released)	32.81876	-104.24834	1-Jan-00	1-Jan-00
OXY USA WTP LIMITED PARTNERSHIP	YESO VIKING FEDERAL #008	30-015-41468	Oil	Active	32.81528	-104.24786	4-Jan-14	N/A
SDX RESOURCES INC	WODEN FEDERAL #001	30-015-30386	Gas	Plugged (site released)	32.82502	-104.24618	15-Jul-99	6-Aug-99
HANSON ENERGY	BERRY FEDERAL #034	30-015-31113	Oil	Plugged (site released)	32.8223	-104.24619	9-May-00	18-Jan-08
PRE-ONGARD WELL OPERATOR	PRE-ONGARD WELL #010	30-015-00588	Oil	Plugged (site released)	32.80244	-104.24406	1-Jan-00	1-Jan-00
ALAMO PERMIAN RESOURCES, LLC	BERRY FEDERAL #030	30-015-21510	Gas	Plugged (site released)	32.81433	-104.24728	31-Dec-99	30-Nov-12
OXY USA WTP LIMITED PARTNERSHIP	YESO VIKING FEDERAL #009	30-015-41261	Oil	Active	32.81554	-104.24457	9-Feb-14	N/A
PRE-ONGARD WELL OPERATOR	PRE-ONGARD WELL #001	30-015-00587	Oil	Plugged (site released)	32.80426	-104.24406	1-Jan-00	1-Jan-01
PRE-ONGARD WELL OPERATOR	PRE-ONGARD WELL #014	30-015-00585	Oil	Plugged (site released)	32.80602	-104.24406	1-Jan-00	1-Jan-00
LIME ROCK RESOURCES A, L.P.	TRIGG FEDERAL #002	30-015-31193	Oil	Plugged (site released)	32.80604	-104.2462	28-Aug-00	5-Oct-10
PRE-ONGARD WELL OPERATOR	PRE-ONGARD WELL #006	30-015-00580	Oil	Plugged (site released)	32.80965	-104.24406	1-Jan-00	1-Jan-00
OXY USA WTP LIMITED PARTNERSHIP	OXY HARVESTER FEDERAL #001	30-015-30882	Gas	Active	32.80334	-104.24298	7-Mar-00	N/A
OXY USA WTP LIMITED PARTNERSHIP	YESO VIKING FEDERAL #005	30-015-41260	Oil	Active	32.81696	-104.24362	9-Dec-13	N/A
PRE-ONGARD WELL OPERATOR	PRE-ONGARD WELL #001	30-015-00453	Oil	Plugged (site released)	32.82773	-104.24187	1-Jan-00	1-Jan-00
PRE-ONGARD WELL OPERATOR	PRE-ONGARD WELL #015	30-015-00586	Oil	Plugged (site released)	32.806	-104.24191	1-Jan-00	1-Jan-00
PRE-ONGARD WELL OPERATOR	PRE-ONGARD WELL #007	30-015-00475	Oil	Plugged (site released)	32.81326	-104.24191	1-Jan-00	1-Jan-01
PRE-ONGARD WELL OPERATOR	PRE-ONGARD WELL #001	30-015-00579	Oil	Plugged (site released)	32.81177	-104.24152	1-Jan-00	1-Jan-01
Redwood Operating LLC	MATTHEWS 25 FEDERAL #003	30-015-41698	Oil	Active	32.80963	-104.23976	18-Jan-17	N/A
Contango Resources, Inc.	TRIGG FEDERAL #001	30-015-30956	Oil	Active	32.81094	-104.24621	1-May-00	N/A
Redwood Operating LLC	MATTHEWS 25 FEDERAL #001	30-015-40804	Oil	Active	32.80648	-104.23976	8-Nov-12	N/A
PRE-ONGARD WELL OPERATOR	PRE-ONGARD WELL #036	30-015-31179	Oil	Plugged (site released)	32.82227	-104.23798	1-Jan-00	1-Jan-01
ALAMO PERMIAN RESOURCES, LLC	BERRY FEDERAL #027	30-015-00483	Gas	Plugged (site released)	32.82227	-104.23759	31-Dec-99	13-Dec-11
OXY USA WTP LIMITED PARTNERSHIP	OXY CHOPSTICKS FEDERAL #002	30-015-31743	Gas	Active	32.81509	-104.23546	4-Jun-01	N/A
Spur Energy Partners LLC	DOGWOOD FEDERAL #003	30-015-39763	Oil	Active	32.80778	-104.23624	6-Apr-12	N/A
ALAMO PERMIAN RESOURCES, LLC	BERRY A #022	30-015-00497	Gas	Plugged (site released)	32.81866	-104.23545	31-Dec-99	9-Jun-12
PRE-ONGARD WELL OPERATOR	PRE-ONGARD WELL #001	30-015-01532	Oil	Plugged (site released)	32.81413	-104.23438	1-Jan-00	1-Jan-01
PRE-ONGARD WELL OPERATOR	PRE-ONGARD WELL #019	30-015-00499	Oil	Plugged (site released)	32.81693	-104.23457	1-Jan-00	1-Jan-00
Spur Energy Partners LLC	REDBUD FEDERAL #001	30-015-32694	Oil	Active	32.81093	-104.23498	31-Mar-03	N/A
ROVER OPERATING, LLC	BERRY A #033	30-015-25154	Inj	Active	32.81684	-104.23418	1-Apr-85	N/A
ALAMO PERMIAN RESOURCES, LLC	BERRY A #011	30-015-00498	Gas	Plugged (site released)	32.81684	-104.2333	31-Dec-99	29-Nov-21
SDX RESOURCES INC	BERRY A #021	30-015-01239	Oil	Plugged (site released)	32.81865	-104.2333	31-Dec-99	23-Mar-00

Attachment 7
Digital Data

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 82497

COMMENTS

Operator: NAVAJO REFINING COMPANY, L.L.C. P.O. Box 159 Artesia, NM 88211	OGRID: 15694
	Action Number: 82497
	Action Type: [UF-DP] Discharge Permit (DISCHARGE PERMIT)

COMMENTS

Created By	Comment	Comment Date
cchavez	WDW-4 Fall Off Test (FOT) December 2021	5/11/2022

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	Action Number: 82497
	Action Type: [UF-DP] Discharge Permit (DISCHARGE PERMIT)

CONDITIONS

Created By	Condition	Condition Date
cchavez	None	5/11/2022