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WDW-4
FOT

2018

2018 PRESSURE FALLOFF TEST REPORT
NAVAJO REFINING, LLC

WASTE DISPOSAL WELL WDW-4
Artesia, NM

October 2018

Houston, TX

Project No. 192080D

Prepared by Larry R. McDonald Reviewed by Lyn J. Jones

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CD CONTAINING RAW PRESSURE AND TEMPERATURE DATA

CERTIFICATION STATEMENT

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attached documents, and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete.

I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Client:	Navajo Refining LLC.
Well Name:	WDW-1
Test Dates:	August 15, 2018 to August 16, 2018

Name: Ted L. Jose

Title: Project Engineer

Phone Number: 281-589-5900

Signature _____ Date Signed _____

Texas Professional Engineer

License No. 121609

WSP USA Inc.

Texas Engineering Firm F-2263

EXECUTIVE SUMMARY

WSP USA Inc. (WSP) performed the initial pressure falloff test on Navajo Refining , LLC's (Navajo) newly drilled and completed Waste Disposal Well No. 4 (WDW-4) from August 15, 2018 to August 16, 2018.

Because the "Post Construction" parameters exceed the parameters of the reservoir model used in the permit application, the cone of influence and pressure buildup were not recalculated because the reservoir model in the permit application is sufficient. The "Post Construction" parameters that exceed the reservoir model will result in a lower injection pressure and therefore a smaller cone of influence and lower pressure buildup as calculated in the permit application.

1.0 INTRODUCTION

WSP conducted the initial pressure falloff test on WDW-4 as part of the well testing operations during the installation of the well. The 2018 pressure falloff testing was conducted in accordance with the pressure falloff testing procedure outlined in the approved Permit Application.

2.0 REPORT OF FIELD OPERATIONS

All depths in this report are referenced to the drilling rig rotary kelly bushing (RKB), which is 20 feet above ground level. The as-built wellbore schematic is presented in Figure 1.

Field operations began on August 15, 2018. Renegade Wireline Services (Renegade) rigged up on and ran downhole memory gauges to 10,327 feet RKB. Cudd was rigged up and pumped 4783 barrels of 8.9 ppg fluid into the well at a rate of 420 gpm for approximately nine hours. The well was shut in and the pressure falloff was monitored for 24 hours.

On August 16, 2018, the bottom-hole pressure gauges were pulled out of the well and static pressure gradient stops were made at 1000-foot intervals while pulling the gauges out of the well. The gauge calibration certificates are presented in Appendix A.

3.0 PRESSURE FALLOFF ANALYSIS

Pressure falloff testing was conducted on WDW-4 from August 15, 2018 to August 16, 2018. WDW-4 was shut in at 1700 hours on August 15, 2018 and the falloff data were recorded for 24 hours. Pertinent pre-test information is presented in Table 1.

Injection Period

The injection period used in the analysis was based on the injection period on August 15, 2018 where 4783 barrels of 8.9 ppg fluid into the well at a rate of 10 bpm or 420 gpm for approximately nine hours. Pertinent data relevant to the injection period are presented in Table 2.

Falloff Period

WDW-4 was shut in at 1700 hours on August 15, 2018 and remained shut-in for 24 hours while bottom-hole pressure and temperature were recorded. The pressure and temperature data recorded during the pressure falloff test are included in Attachment A. Pertinent data relevant to the falloff period are presented in Table 3.

Analysis of Falloff Test

The pressure data obtained during the falloff test were analyzed utilizing the commercially available pressure transient analysis software program PanSystem®. Figure 2 shows the pressure response recorded by the surface pressure tool from the time the tool was in place through the 24-hour shut-in period. Figure 3 is a Cartesian plot of the pressure data recorded during the falloff period. The superposition time function was used to account for rate changes occurring during the injection period.

Figure 4 is a log-log diagnostic plot of the falloff data, showing change in pressure and pressure derivative versus elapsed shut-in time. Radial flow begins to appear at an elapsed shut-in time of 0.108 hours and continues until 0.996 hours.

The reservoir permeability was determined from the radial flow region of the superposition Horner plot (Figure 5). The radial flow regime begins at a superposition Horner time of 69.68 and continues to 7.44. Figure 6 shows an expanded view of the superposition Horner plot. The slope of the radial flow period was determined to be 0.6089 psi/cycle.

An estimate of mobility-thickness, kh/μ, for the reservoir was determined from the following equation:

$$\frac{k\ h}{\mu} = 162.6\frac{q\ B}{m}$$

where,

kh/μ = formation mobility-thickness, millidarcy-feet/centipoise

q	=	rate prior to shut-in, BPD
B	=	formation volume factor, reservoir volume/surface volume
m	=	slope radial flow period, psi/cycle

With the following values, the mobility-thickness was found to be 3,845,360 md-ft/cp:

q	=	420 gpm = 14,400 barrels/day
m	=	0.6089 psi/cycle
B	=	1.0 reservoir barrel/surface barrel

$$\frac{k\,h}{\mu} = 162.6\frac{(14{,}400)(1.0)}{0.6089}$$

$$= 3{,}845{,}360 \text{ md-ft/cp}$$

The permeability-thickness, kh, was determined to be 2,191,855 md-ft by multiplying the mobility-thickness, kh/μ, by the viscosity of the reservoir fluid, μ_{res}, of 0.57 centipoise:

$$k\,h = \left(\frac{k\,h}{\mu}\right)\mu_{res}$$

$$= 3{,}845{,}360 \times 0.57$$

$$= 2{,}191{,}855 \text{ md-ft}$$

The average reservoir permeability using the total sand thickness of 330 feet was determined to be 6642 md:

$$k = \frac{(kh)}{h}$$

$$= \frac{2{,}191{,}855}{330}$$

$$= 6642 \text{ md}$$

The skin factor was determined from the following equation:

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

where,

s	=	formation skin damage at open perforations, dimensionless
1.151	=	constant
p_{wf}	=	flowing pressure immediately prior to shut-in, psia
p_{1hr}	=	pressure determined by extrapolating the radial flow semi-log line to a Δt of one hour, psi
m	=	slope of the radial flow semi-log line, psi/cycle
k	=	permeability of the formation, md
ϕ	=	porosity of the injection interval, fraction
μ	=	viscosity of the fluid the pressure transient is traveling through, centipoise
c_t	=	total compressibility of the formation plus fluid, psi^{-1}
r_w	=	radius of the wellbore, feet
3.23	=	constant

The final flowing pressure was 4523.64 psia. The pressure determined by extrapolating the radial flow semi-log line to a Δt of one hour, p_{1hr}, was 4520.96 psia. The porosity of the injection interval, ϕ, is 0.25 and the total compressibility, c_t, is 8.4×10^{-6} psi^{-1}. The wellbore radius, r_w, is 0.3532 feet. Using these values in addition to the previously determined parameters, m and k, results in a skin of -3.47:

$$s = 1.151 \left[\frac{4523.64 - 4520.96}{0.6089} - \log \left(\frac{6642}{(0.25)(0.57)(8.4 \times 10^{-6})(0.3532)^2} \right) + 3.23 \right]$$

$$= -3.47$$

The results of the pressure falloff analysis are summarized in Table 4. The output from the PanSystem analysis software is presented as Appendix A.

4.0 BOTTOM-HOLE PRESSURE MEASUREMENT AND STATIC GRADIENT SURVEY

On August 16, 2018, the downhole pressure memory tools were pulled out of WDW-4, and a static pressure gradient survey was performed at 1000-foot intervals to the surface. The bottom-hole pressure and temperature, after 24 hours of shut-in at 10,327 feet, were 4519.13 psia and 165.44°F, respectively. The pressure and temperature data recorded during the static pressure gradient survey are included in Attachment A. A tabulation of the survey results is provided as Table 5. The data are depicted graphically in Figure 7.

The bottom-hole pressure gauge calibration certificate is presented in Appendix B and shows the gauge has been calibrated as specified by the gauge manufacturer.

5.0 COMPARISON TO APPROVED PERMIT

WSP performed the initial pressure falloff test on WDW-4 from August 15, 2018 to August 16, 2018. The results of the pressure falloff analysis indicate a reservoir mobility-thickness, kh/μ of 3,844,211 md-ft/cp and a permeability, k, of 6642 md. Analysis of logs indicates the average porosity of the injection interval is 25%. The net open-hole thickness is 330 feet.

The following table compares the parameters used in the permit application to the parameters determined following construction of the well:

Parameter	Permit Application	Post Construction
Permeability, md	32	6642
Thickness, feet	75	330
Porosity, percent	8.5	25
Temperature, °F	141*	141
Viscosity, cp	0.57	0.57

*BHT just below the at top of injection interval at 10,320 feet KB

Because the "Post Construction" parameters exceed the parameters of the reservoir model used in the permit application, the cone of influence and pressure buildup were not recalculated because the reservoir model in the permit application is sufficient. The "Post Construction" parameters that exceed the reservoir model will result in a lower injection pressure and therefore a smaller cone of influence and lower pressure buildup as calculated in the permit application.

TABLE 1

PRE-TEST PERIOD

PRE-TEST PERIOD	
Date of Test	August 15, 2018 to August 16, 2018
Shut-in Time Prior to Test	New Well
Stabilized Pressure Prior to Test	4517.25 psia
Stabilized Temperature Prior to Test	140.59°F
Cumulative Injection Into Completed Interval	200,886 gallons
Wellbore Radius	0.3532 feet
Completed Interval	10,327 feet to 10,700 feet
Type of Completion	Open-Hole
Formation Fluid Viscosity	0.57 centipoise
Porosity	0.25
Total Compressibility	8.4×10^{-6} psi $^{-1}$
Formation Volume Factor	1 RB/STB
Initial Bottom-Hole Pressure	4517.25 at 10,327 feet
Initial Bottom-Hole Temperature	140.59°F at 10,327 feet

TABLE 2

INJECTION PERIOD

INJECTION PERIOD	
Time of Injection Period	8.58 hours
Test Fluid	8.9 ppg brine water
Injection Rate	420 gpm
Final Injection Pressure	4523.64 psia
Final Injection Temperature	90.67°F
Gauge Type	Spartek Systems
Gauge Serial No.	79513
Accuracy	0.03% of Full Scale
Resolution	0.01% of Full Scale
Gauge Depth	10,327 feet RKB

TABLE 3

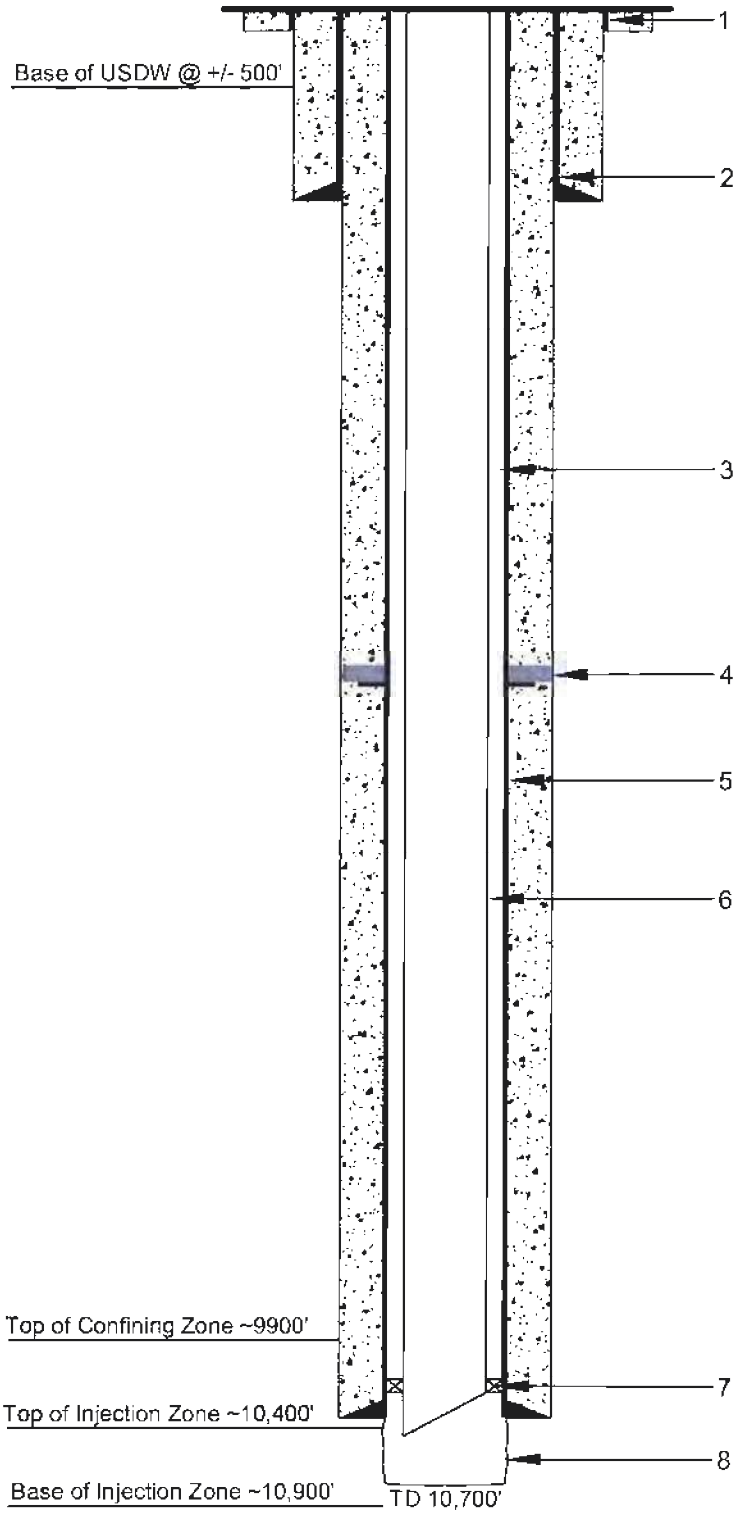
FALLOFF PERIOD

FALLOFF PERIOD	
Total Shut-in Time	24 hours
Final Shut-in Pressure	4519.13 psia at 10,327 feet RKB
Final Shut-in Temperature	165.44°F @ 10,327 feet RKB

TABLE 4

SUMMARY OF RESULTS

LOG-LOG AND DERIVATIVE INFORMATION		
Total Shut-in Time	$t_{Shut\text{-}in}$	24 hours
Elapsed Shut-in Time to Start of Semi-Log Straight Line	$t_{semi\text{-}log}$	0.108 hours
Horner Time at Start of Semi-Log Straight Line	$t_{h\ semi\text{-}log}$	69.68
INFORMATION FROM HORNER PLOT		
Slope of Semi-Log Straight Line	m	0.6089 psi/cycle
Pressure at Infinite Shut-in Time from Extrapolation of Semi-Log Straight Line	p^*	4520.40 psia
Pressure at 1-Hour Shut-in Time From Extrapolation of Semi-Log Straight Line	$p_{1\text{-}hr}$	4520.96 psia
HORNER ANALYSIS		
Mobility-Thickness	kh/μ	3,845,360 md-ft/cp
Viscosity of the Reservoir Fluid	μ	0.57 cp
Permeability-Thickness	kh	2,191,855 md-ft
Permeability	k	6642 md
Formation Skin Damage	s	-3.47



BELOW GROUND DETAILS

(feet below KB - KB=20' above GL)

1. Conductor Pipe - 20", 129.33 lb/ft 0.625" wall), API 5LX-56, plain-end, beveled conductor set in 24" augered hole at 80' BGL and cemented to the surface with redi-mix.

2. Surface Casing - $13\frac{3}{8}$", 54.5 lb/ft, K-55, ST&C, set at 1,680' in a 17½" hole and cemented to the surface.

3. Annulus Fluid - injection tubing and protection casing annulus filled with 263 bbl of brine water containing a corrosion inhibitor, a bactericide and an oxygen scavenger.

4. Stage Tool: $9\frac{5}{8}$" stage tool set at 5,800'

5. Protection Casing - $9\frac{5}{8}$", 47 lb/ft, N-80, LT&C set in a 12¼" hole at 10,327' with a DV Tool at 5,800' and cemented to the surface.

6. Injection Tubing - 7", 26 lb/ft, K-55, LT&C set in packer at approximately 10,265'.

7. Injection Packer - 7" x $9\frac{5}{8}$" set at approximately 10,265'.

8. Open Hole - $8\frac{1}{2}$" to 10,700'

WSP USA Inc
16200 Park Row Ste. 200
Houston TX 77084
TEL: (281) 589-5900

FIGURE 1

HOLLYFRONTIER NAVAJO REFINING LLC
ARTESIA, NEW MEXICO

AS BUILT BELOW GROUND WELL SCHEMATIC

DATE: 10/23/18	CHECKED BY: TJJ	JOB NO: 192080D
DRAWN BY: WDD	APPROVED BY: TJJ	DWG. NO:

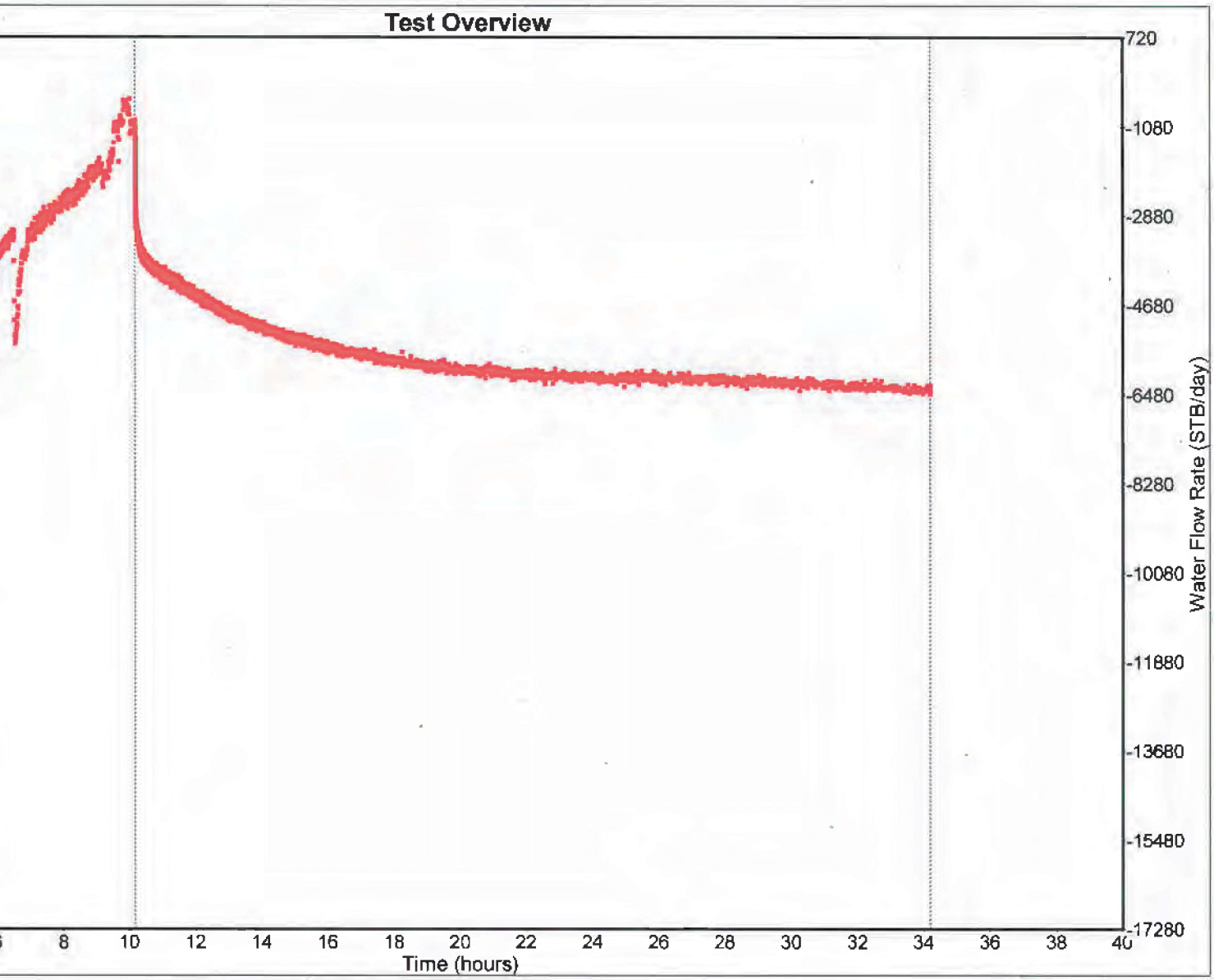

Test Overview
720
-1080
-2880
-4680
-6480
-8280
-10080
-11880
-13680
-15480
-17280
Water Flow Rate (STB/day)
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
Time (hours)

FIGURE 2

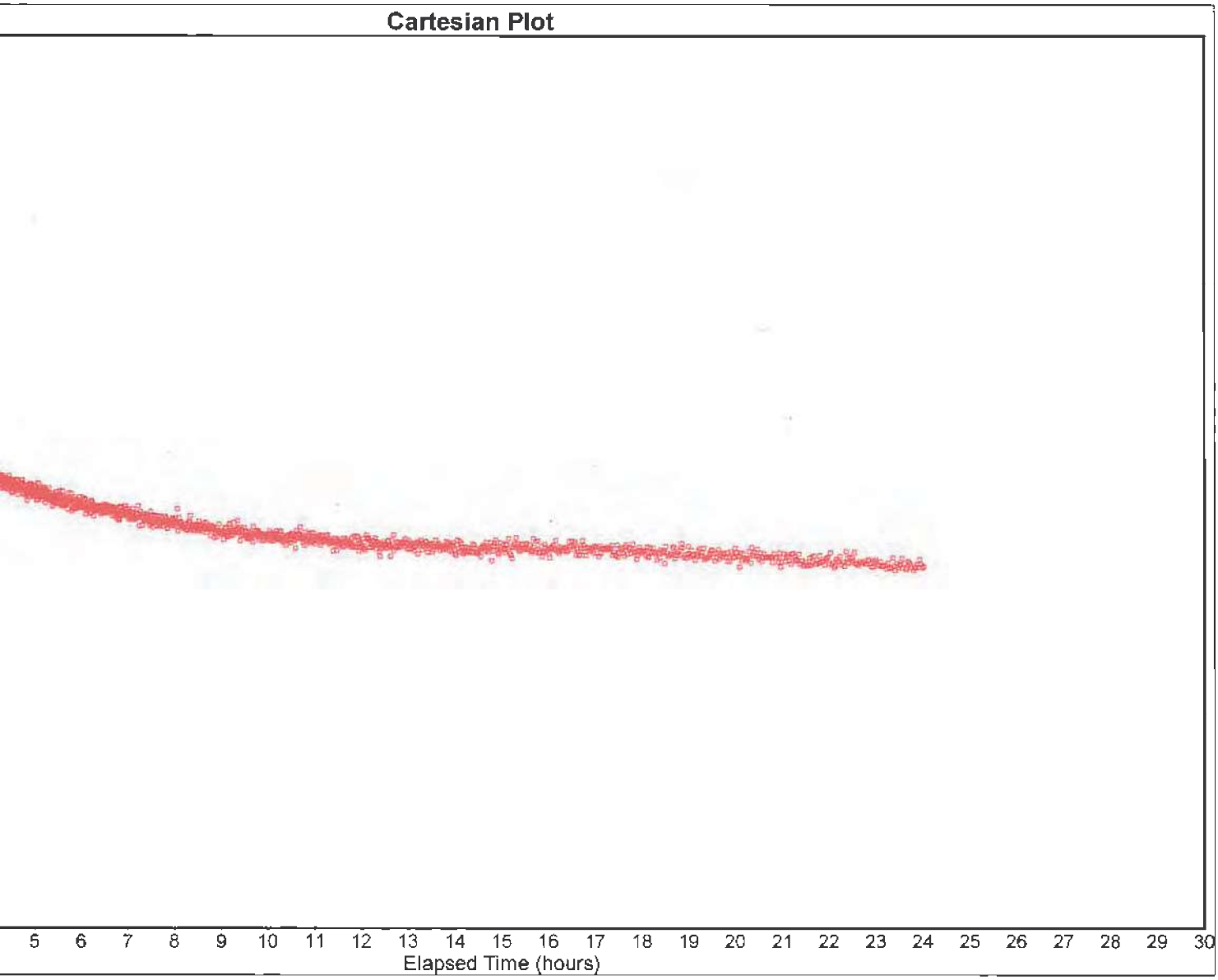

Cartesian Plot
5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
Elapsed Time (hours)

FIGURE 3

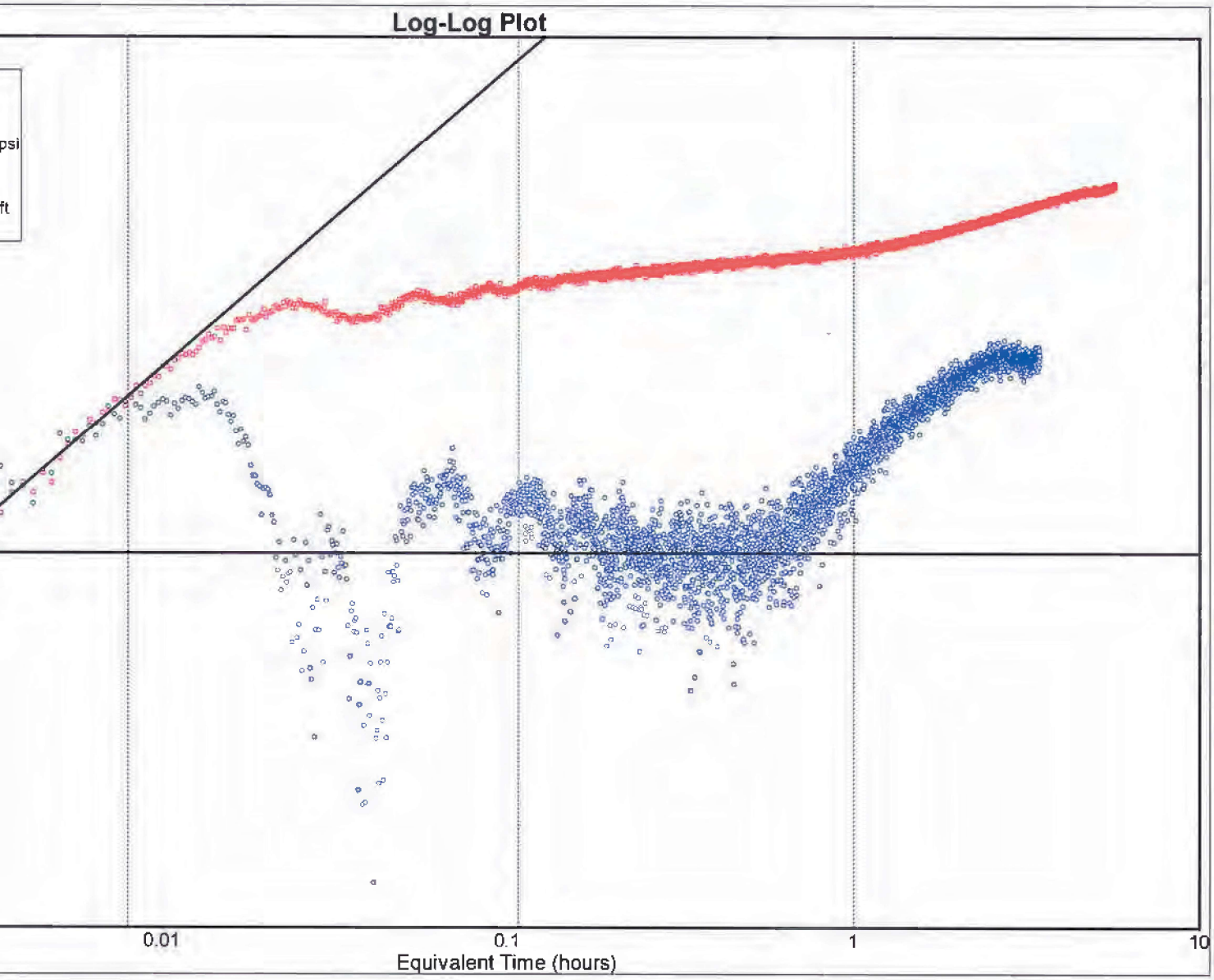


FIGURE 4

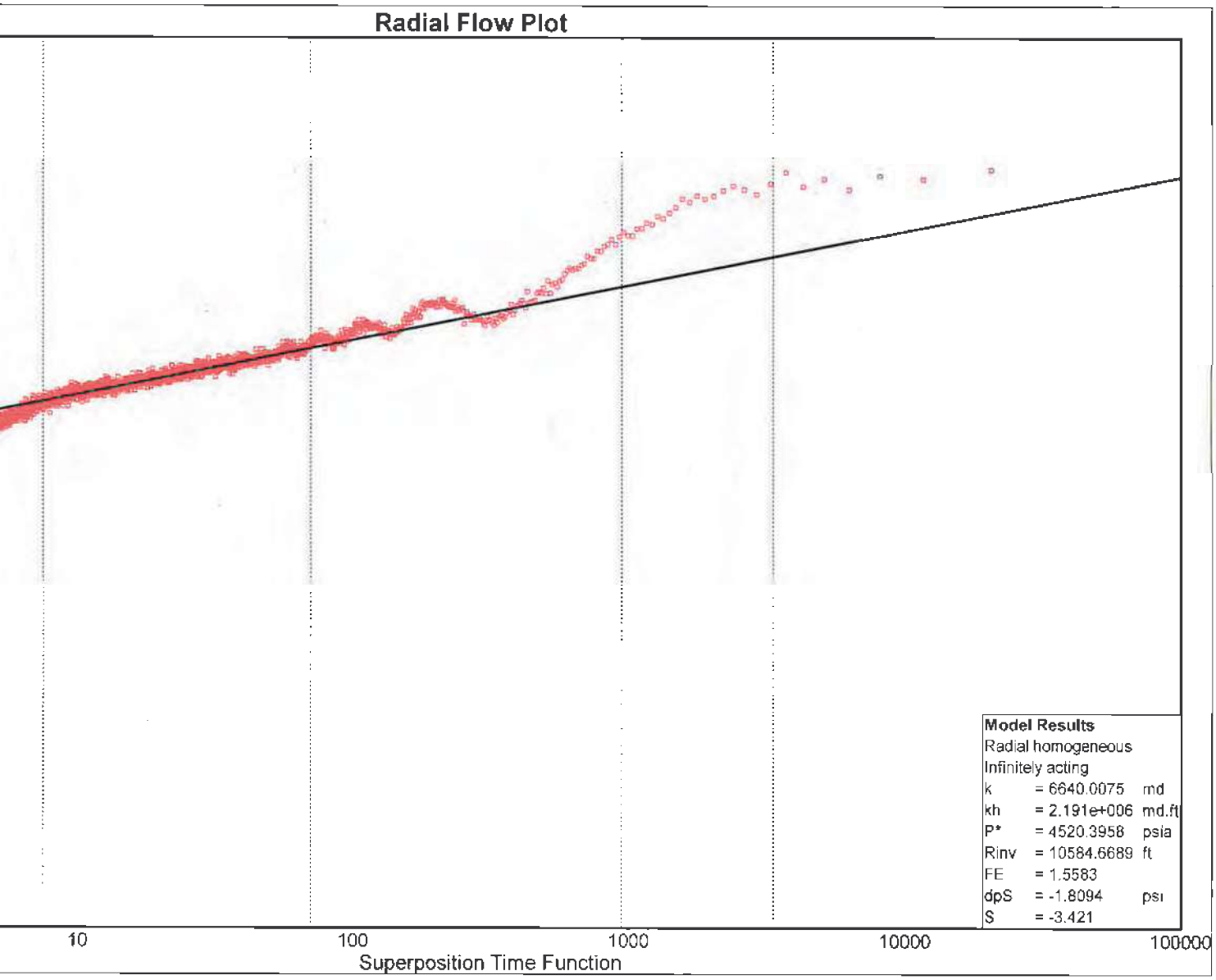

Radial Flow Plot
Model Results
Radial homogeneous
Infinitely acting
k = 6640.0075 md
kh = 2.191e+006 md.ft
P* = 4520.3958 psia
Rinv = 10584.6689 ft
FE = 1.5583
dpS = -1.8094 psi
S = -3.421
10
100
1000
10000
100000
Superposition Time Function

FIGURE 5

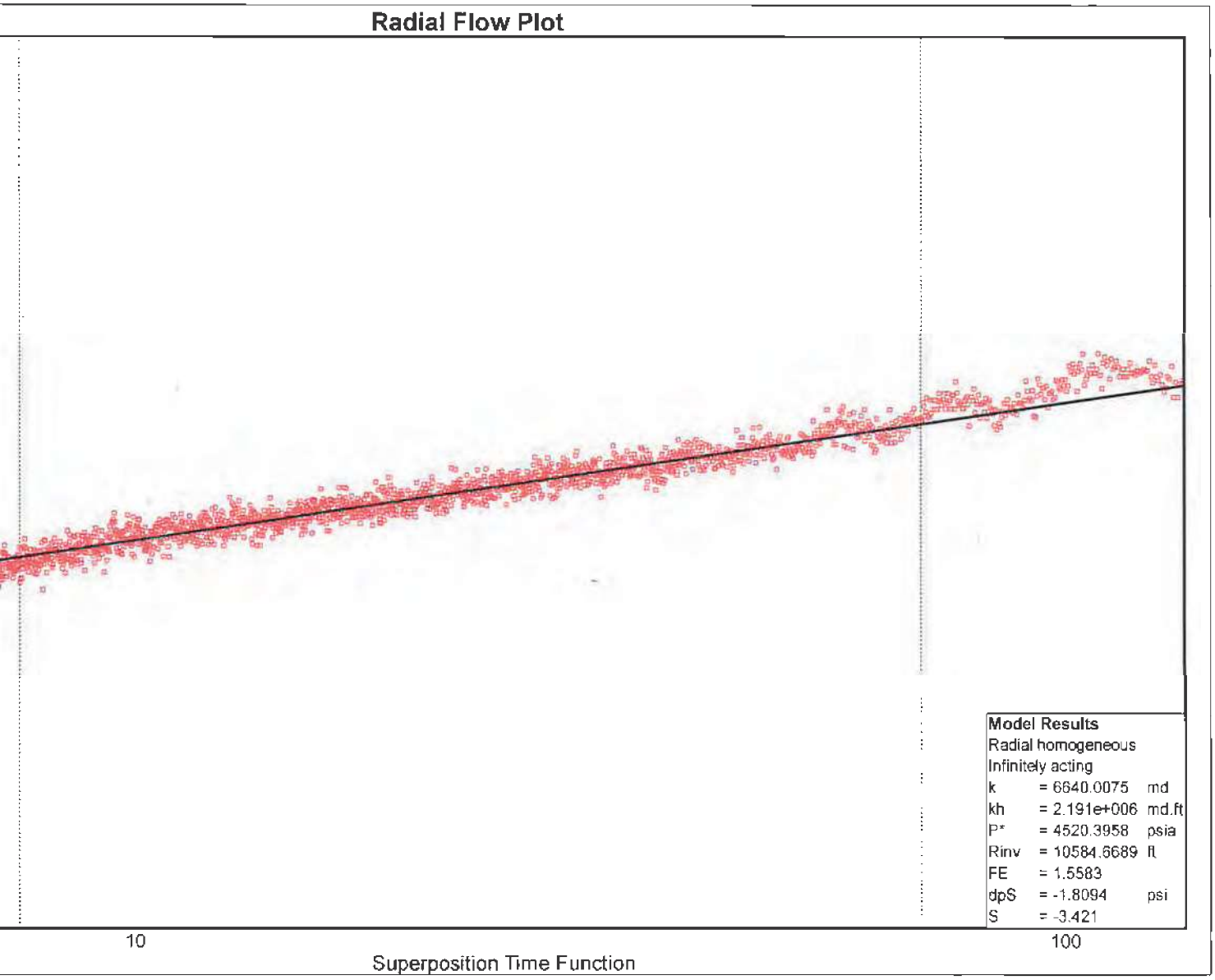

Radial Flow Plot
Model Results
Radial homogeneous
Infinitely acting
k = 6640.0075 md
kh = 2.191e+006 md.ft
P* = 4520.3958 psia
Rinv = 10584.6689 ft
FE = 1.5583
dpS = -1.8094 psi
S = -3.421
10
100
Superposition Time Function

FIGURE 6

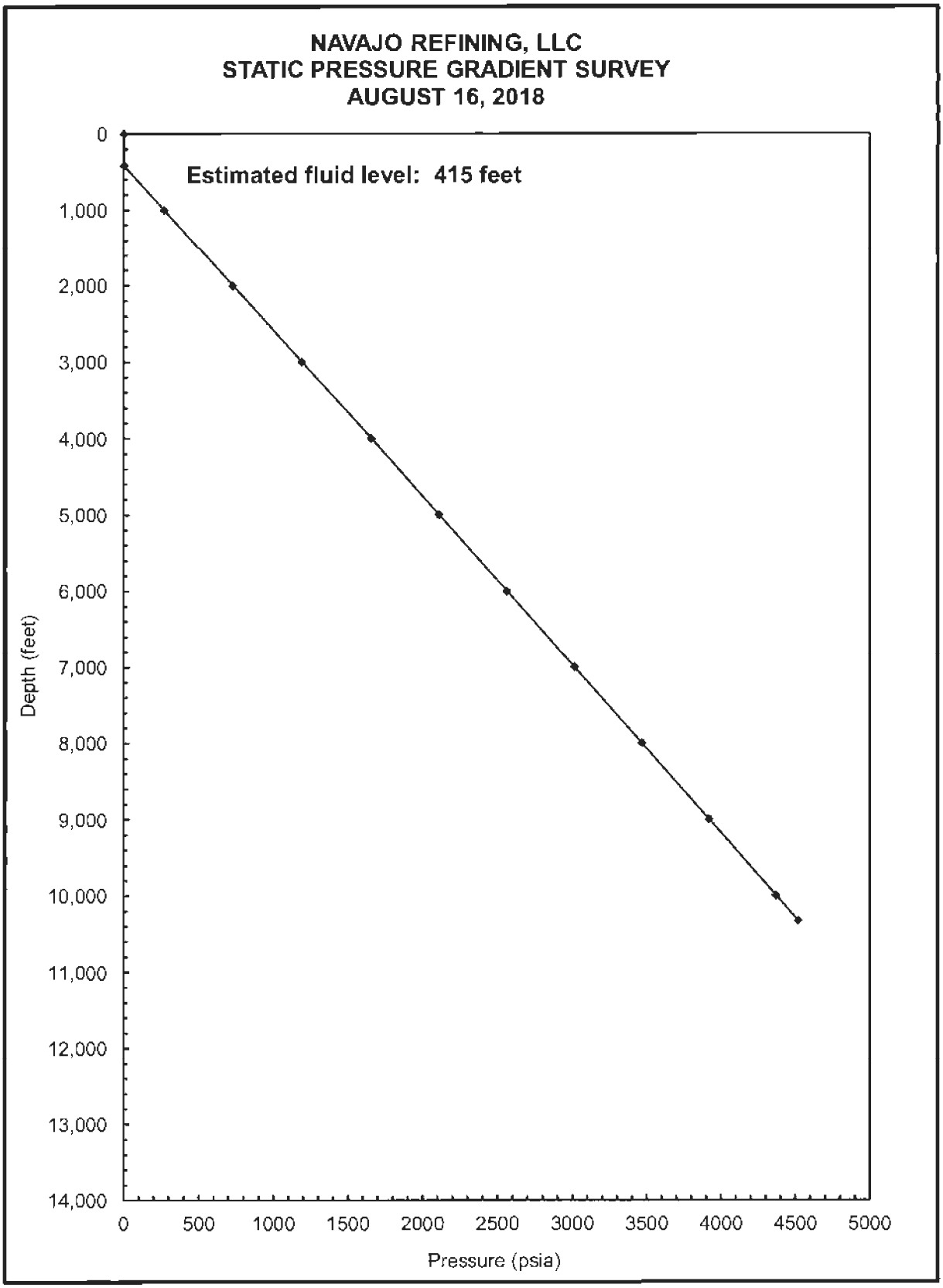

NAVAJO REFINING, LLC
STATIC PRESSURE GRADIENT SURVEY
AUGUST 16, 2018
Estimated fluid level: 415 feet
Depth (feet)
0
1,000
2,000
3,000
4,000
5,000
6,000
7,000
8,000
9,000
10,000
11,000
12,000
13,000
14,000
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
Pressure (psia)

FIGURE 7

Company	Navajo Refinery LLC.
Well	Waste Disposal Well No. 4
Location	Artesia, NM
Type Test	Pressure Buildup/Pressure Falloff
Test Dates	August 15, 2018 to August 16, 2018
Gauge Depth	10,327 feet
Completion Type	Open-Hole
Completion Interval	10,320 feet to 10,700 feet
Analyst	LKM
WSP USA Project No.	192080D

Reservoir Description
Fluid type : Water
Well orientation : Vertical
Number of wells : 1
Number of layers : 1

Layer Parameters Data

	Layer 1
Formation thickness	330.0000 ft
Average formation porosity	0.2500
Water saturation	0.0000
Gas saturation	0.0000
Formation compressibility	0.000000 psi-1
Total system compressibility	8.4000e-6 psi-1
Layer pressure	4520.395793 psia
Temperature	140.590000 deg F

Well Parameters Data

	WDW-4
Well radius	0.3542 ft
Distance from observation to active well	0.000000 ft
Wellbore storage coefficient	5.357063 bbl/psi
Storage Amplitude	0.000000 psi
Storage Time Constant	0.000000 hr
Second Wellbore Storage	0.000000 bbl/psi
Time Change for Second Storage	0.000000 hr
Well offset - x direction	0.0000 ft
Well offset - y direction	0.0000 ft

Fluid Parameters Data

	Layer 1
Oil gravity	0.000000 API
Gas gravity	0.000000 sp grav
Gas-oil ratio (produced)	0.000000 scf/STB
Water cut	0.000000
Water salinity	0.000000 ppm
Check Pressure	4517.294000 psia
Check Temperature	140.590000 deg F
Gas-oil ratio (solution)	0.000000 scf/STB
Bubble-point pressure	0.000000 psia
Oil density	0.000 lb/ft3

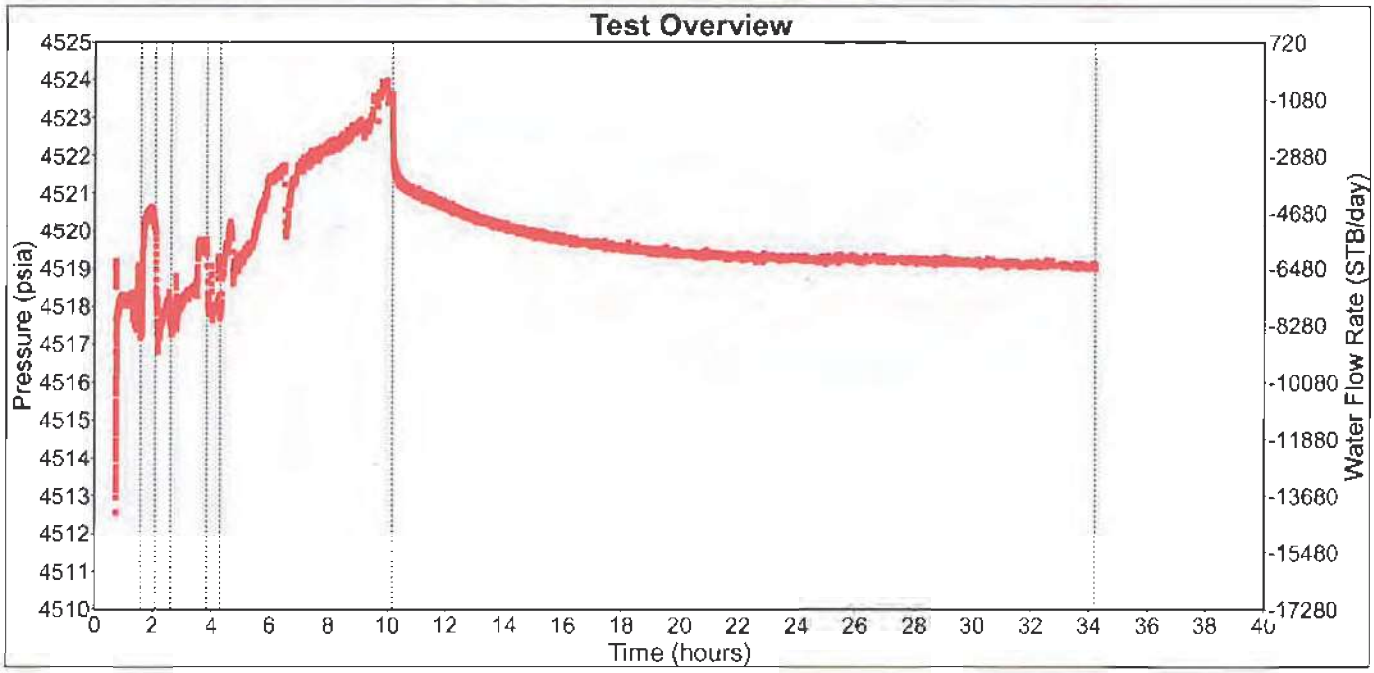
Fluid Parameters Data (cont)

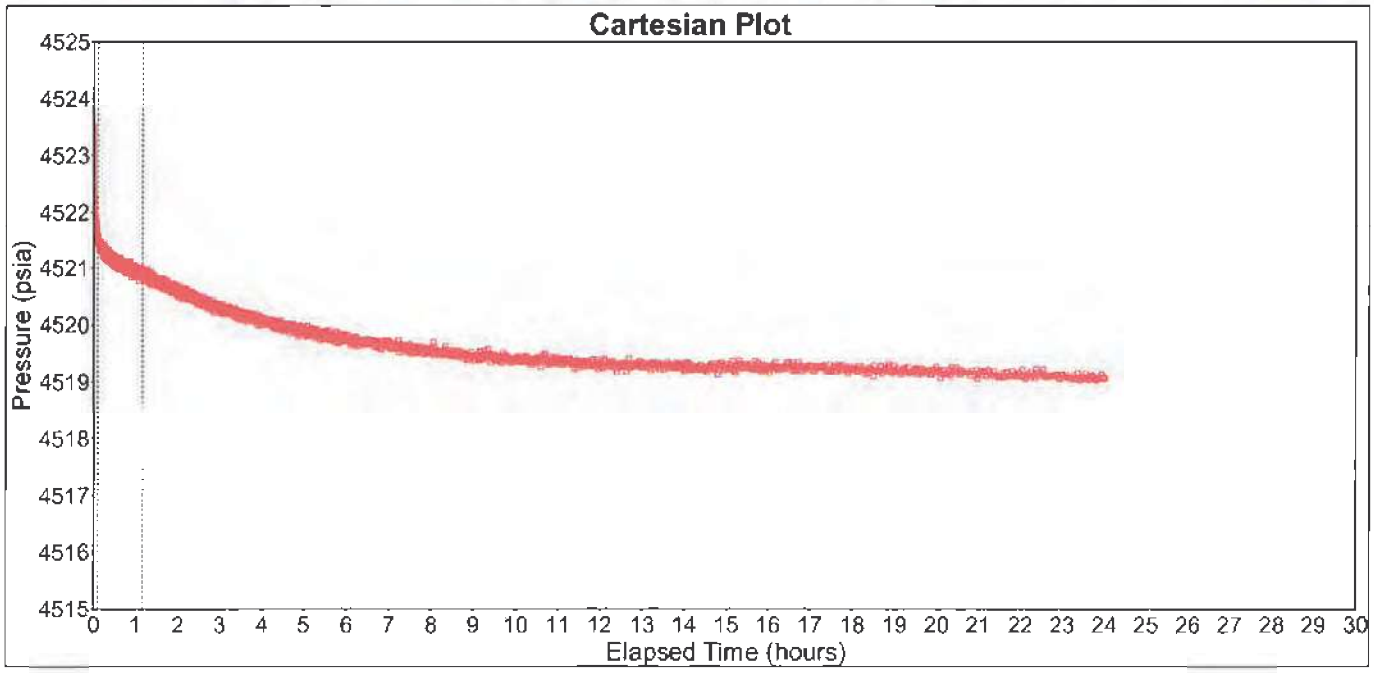
	Layer 1
Oil viscosity	0.000 cp
Oil formation volume factor	0.000 RB/STB
Gas density	0.000 lb/ft3
Gas viscosity	0.0 cp
Gas formation volume factor	0.000 ft3/scf
Water density	0.000 lb/ft3
Water viscosity	0.570 cp
Water formation volume factor	1.000 RB/STB
Oil compressibility	0.000000 psi-1
Initial Gas compressibility	0.000000 psi-1
Water compressibility	0.000000 psi-1

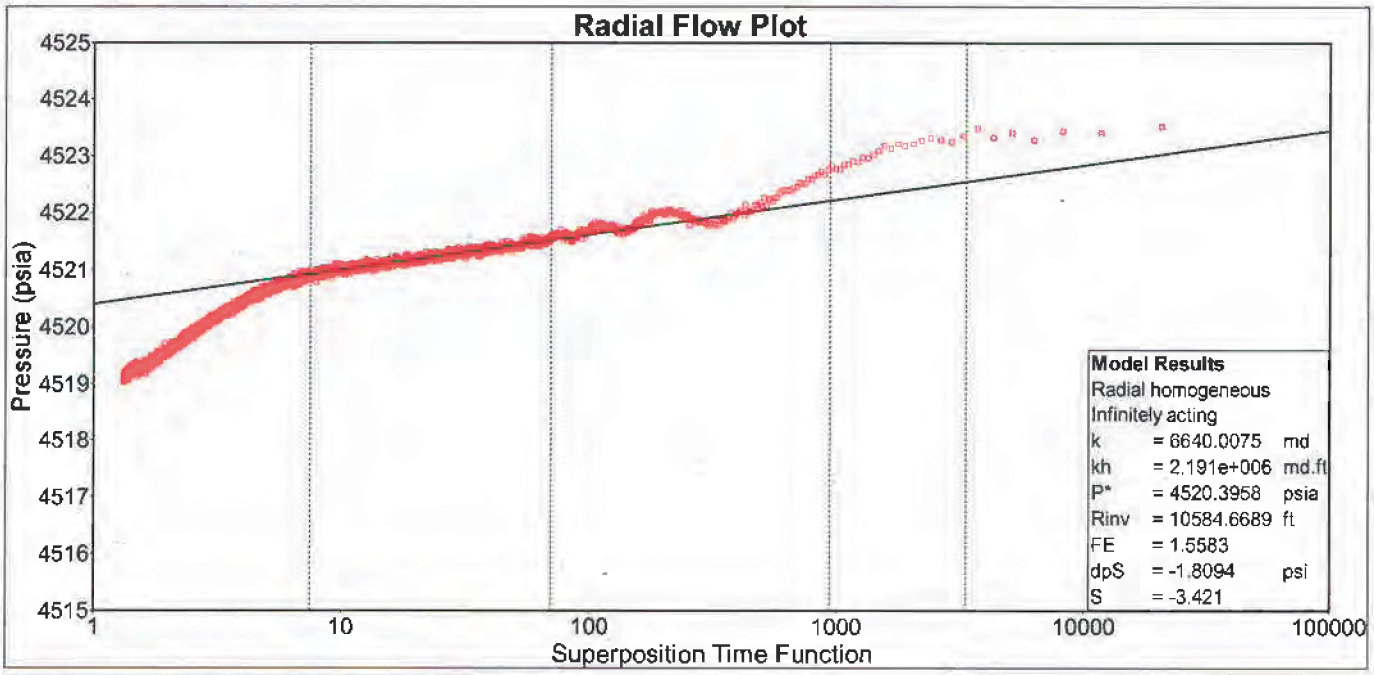
Layer 1 Correlations
Not Used

Rate Change Data

Time Hours	Pressure psia	Rate STB/day
1.594167	4517.294000	0.000000
2.090278	4520.182000	-1.7280e4
2.625278	4517.274000	0.000000
3.836389	4519.786000	-1.4400e4
4.294167	4517.774000	0.000000
10.170470	4523.637000	-1.4400e4
34.185556	4519.066000	0.000000


Test Overview
Pressure (psia)
Water Flow Rate (STB/day)
Time (hours)
4525
4524
4523
4522
4521
4520
4519
4518
4517
4516
4515
4514
4513
4512
4511
4510
720
-1080
-2880
-4680
-6480
-8280
-10080
-11880
-13680
-15480
-17280
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40


Cartesian Plot
Pressure (psia)
4525
4524
4523
4522
4521
4520
4519
4518
4517
4516
4515
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
Elapsed Time (hours)



Radial Flow Plot Model Results
Radial homogeneous - Infinitely acting

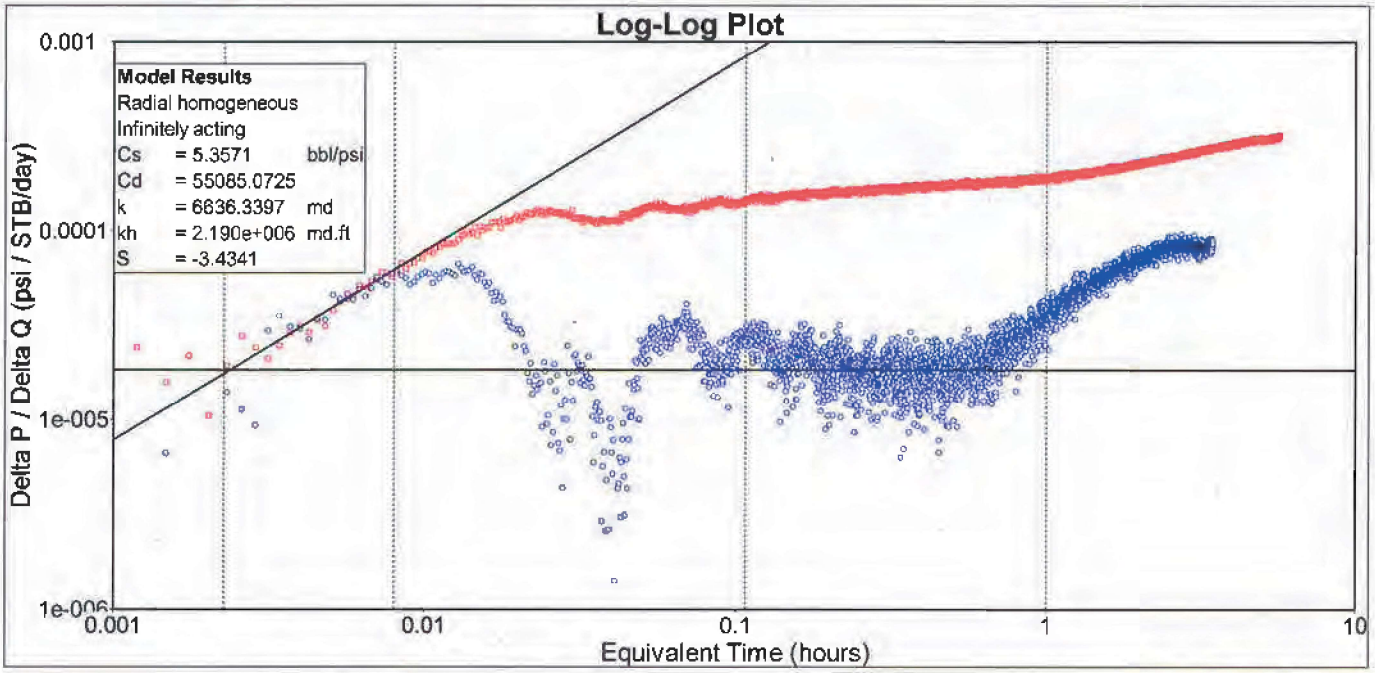
Classic Wellbore Storage

	Value
Permeability	6640.007534 md
Permeability-thickness	2.1912e6 md.ft
Extrapolated pressure	4520.395793 psia
Radius of investigation	1.0585e4 ft
Flow efficiency	1.558264
dP skin (constant rate)	-1.809449 psi
Skin factor	-3.421029

Radial Flow Plot Line Details
Line type : Radial flow
Slope : 0.608941
Intercept : 4520.4
Coefficient of Determination : 0.940054

	Radial flow
Extrapolated pressure	4520.395793 psia
Pressure at dt = 1 hour	4520.962337 psia

Number of Intersections = 0



Log-Log Plot Model Results
Radial homogeneous - Infinitely acting

Classic Wellbore Storage

	Value
Wellbore storage coefficient	5.357063 bbl/psi
Dimensionless wellbore storage	5.5085e4
Permeability	6636.339684 md
Permeability-thickness	2.1900e6 md.ft
Skin factor	-3.434096

Log-Log Plot Line Details
Line type : Wellbore storage
Slope : 1
Intercept : 0.00777789
Coefficient of Determination : Not Used

Line type : Radial flow
Slope : 0
Intercept : 1.83754e-005
Coefficient of Determination : Not Used

Number of Intersections = 0

APPENDIX B

SPARTEK SYSTEMS
GEOPHYSICAL INSTRUMENTATION
"Providing our customers with Best in Class Technology"

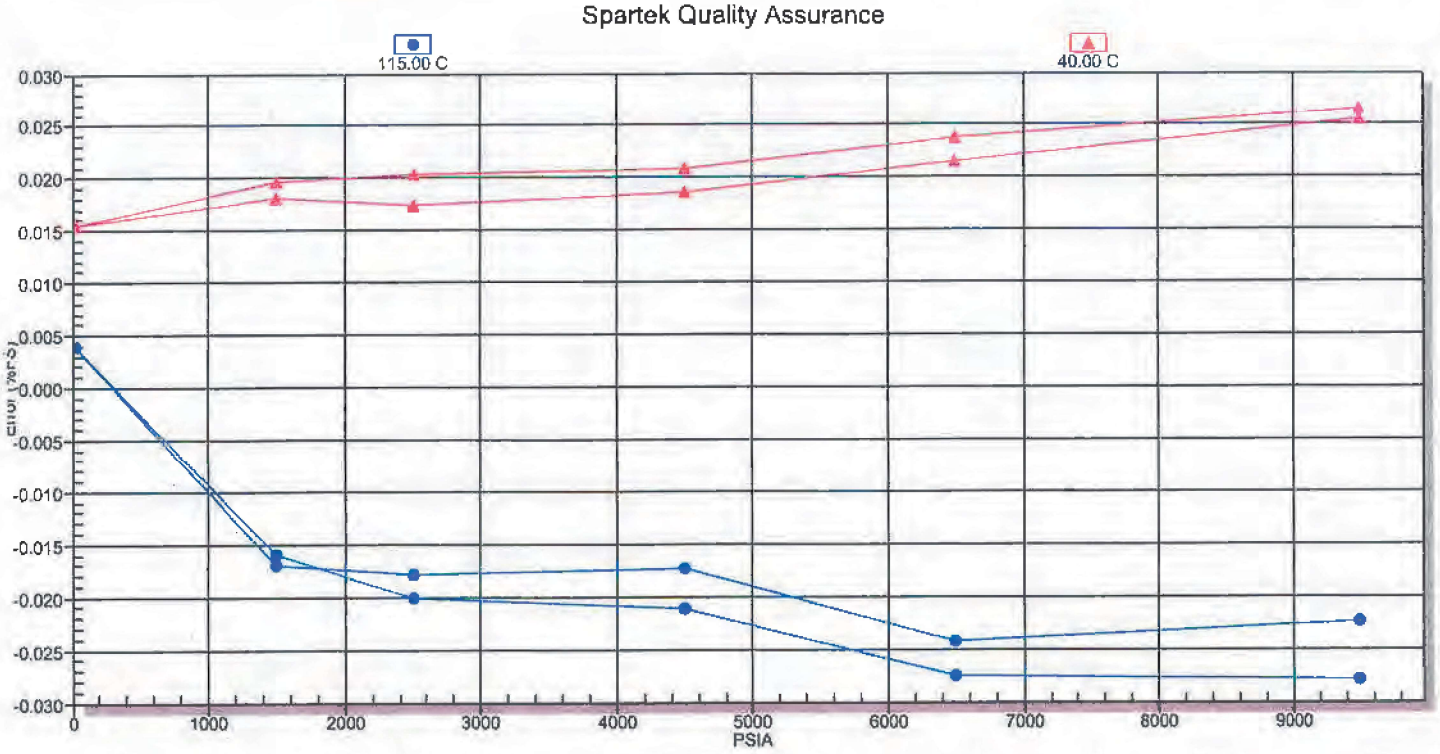
#1 Thevenaz Industrial Trail
Sylvan Lake, AB, Ca, T4S 2J6
Phone (403) 887-2443
Fax (403) 887-4050
www.sparteksystems.com

Pressure Gauge Certificate of Conformance

SERIAL NUMBER	79513	CALIBRATION DATE	MAY 06/15
MODEL NUMBER	1139 FF8	TRACEABILITY DOC.	CAL-STANDARD-001
PRESSURE RANGE	15.30 - 10000.00 psi	PRESSURE REFERENCE	NIST Traceable
TEMP. RANGE	25.00 - 135.00 °C	TEMP. REFERENCE	NIST Traceable

Testing and Verification Completed on APR 30/15. The instrument response is within the stated specifications for this type of pressure gauge.

As shown in the graph below, this Spartek Gauge conformed to within +/- 0.030 %F.S. of the pressure standard used in calibration, which is accurate to within +/- 0.01% of reading. This gives an overall accuracy of +/-(0.030%F.S. + 0.01% of reading)



Accepted By: _____

SPARTEK SYSTEMS INC. Corporate SEAL

Date: MAY 06/15

Ramp report: Serial # 79513
Gauge range = 10000.000 PSI, Max, DIFF, = 3.000
Ramp check result: PASS, Max Err = 0.028% F.S.

DW Pressure	Gauge Pressure	RPM4 Pressure	Differential	%F.S.	Oven Temp.	Gauge Temp.
9500.00	9497.21	9500.49	-2.79	0.0279	115.00	115.06
6500.00	6497.25	6500.61	-2.75	0.0275	115.00	114.71
4500.00	4497.89	4500.50	-2.11	0.0211	115.00	114.62
2500.00	2498.00	2500.39	-2.00	0.0200	115.00	114.68
1500.00	1498.40	1500.30	-1.60	0.0160	115.00	114.79
15.40	15.79	15.42	0.39	0.0039	115.00	114.95
1500.00	1498.31	1500.28	-1.69	0.0169	115.00	114.82
2500.00	2498.22	2500.35	-1.78	0.0178	115.00	114.74
4500.00	4498.27	4500.44	-1.73	0.0173	115.00	114.70
6500.00	6497.57	6500.44	-2.43	0.0243	115.00	114.77
9500.00	9497.78	9500.39	-2.22	0.0222	115.00	115.12
9500.00	9502.66	9500.91	2.66	0.0266	40.00	40.60
6500.00	6502.38	6500.53	2.38	0.0238	40.00	39.93
4500.00	4502.09	4500.40	2.09	0.0209	40.00	39.74
2500.00	2502.04	2500.34	2.04	0.0204	40.00	39.76
1500.00	1501.97	1500.22	1.97	0.0197	40.00	39.82
15.30	16.85	15.10	1.55	0.0155	40.00	39.98
1500.00	1501.81	1500.10	1.81	0.0181	40.00	39.83
2500.00	2501.75	2500.24	1.75	0.0175	40.00	39.77
4500.00	4501.87	4500.25	1.87	0.0187	40.00	39.79
6500.00	6502.17	6500.39	2.17	0.0217	40.00	39.99
9500.00	9502.55	9500.30	2.55	0.0255	40.00	40.65

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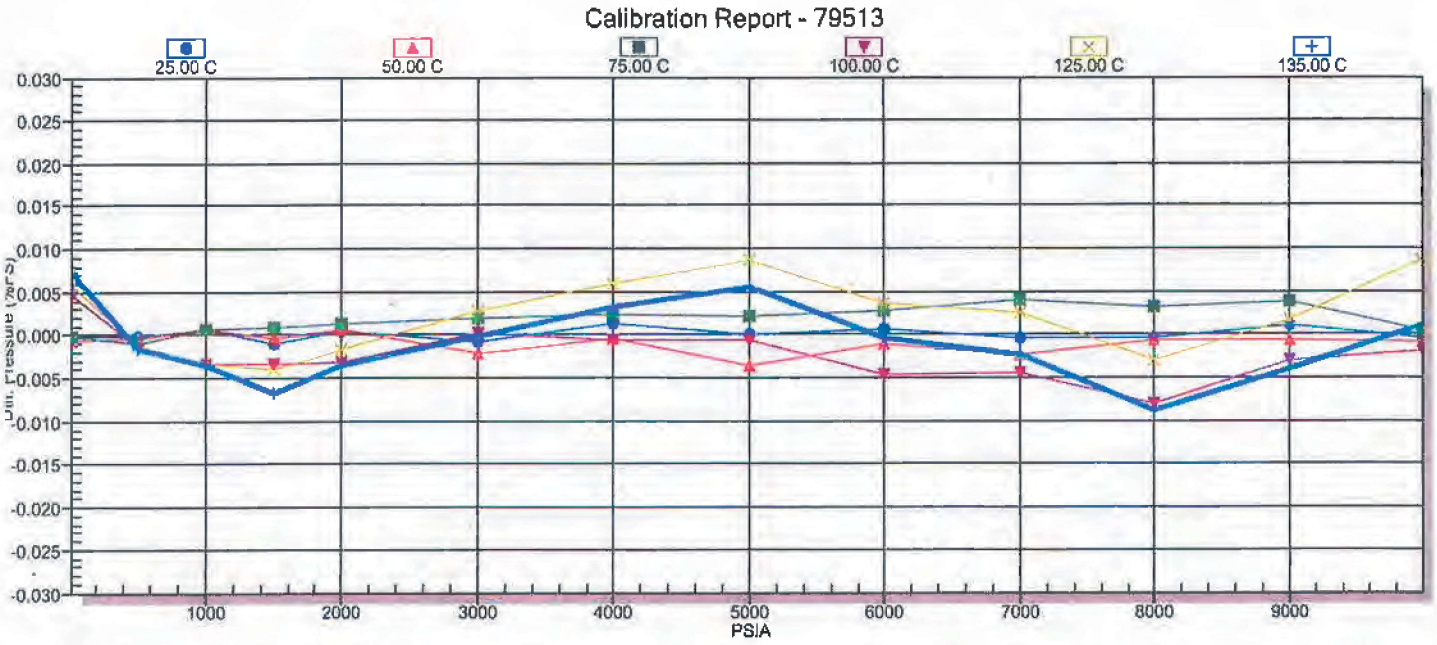
Pressure Gauge Certificate of Calibration



GAUGE NUMBER: 79513

2-D POLYNOMIAL LMS CURVEFIT

Source of f:	Pres	Temp	Pressure Equation:
Fit Order:	3	4	Pressure (PSI) = A + xp(B + xp(C + xp(D)))
Prescale:	xp = m * (fp - fp0)	xt = m * (ft - ft0)	
m:	0.01	0.01	Temperature Compenstation:
	fp0 = 693601	ft0 = 162819	A = A0 + xt(A1 + xt(A2 + xt(A3 + xt(A4))))
			B = B0 + xt(B1 + xt(B2 + xt(B3 + xt(B4))))
			C = C0 + xt(C1 + xt(C2 + xt(C3 + xt(C4))))
			D = D0 + xt(D1 + xt(D2 + xt(D3 + xt(D4))))

0	1	2	3	4
Pressure (psi) STANDARD FIT COEFFICIENTS:				
A 15.28452883	0.1150484485	0.0001388226785	-8.430123952E-07	-4.122388758E-09
B 2.529418986	-0.002048668411	-1.005399787E-06	-4.083499483E-09	1.347698503E-12
C 5.940630886E-06	2.986010317E-08	6.621728793E-10	3.152163479E-12	3.065423199E-15
D 2.512759017E-10	-8.927226156E-12	-1.507972208E-13	-7.808240201E-16	-9.863655329E-19

Temperature (C) STANDARD FIT COEFFICIENTS

A 24.9971515

B -0.3595287142

C -7.543271929E-05

D -3.371885395E-07

Error File: Gauge # 79513

Pressure psi	Temperature Deg. C	Count (Pres)	Count (Temp)	DIFF (press) psi
15.30	25.00	693601.50	162819.63	0.00
500.00	25.00	712758.00	162844.38	-0.01
1000.00	25.00	732509.67	162862.00	0.07
1500.00	25.00	752237.67	162877.88	-0.09
2000.00	25.00	771967.33	162900.88	0.06
3000.00	25.00	811326.33	162896.88	-0.07
4000.00	25.00	850632.50	162909.13	0.13
5000.00	25.00	889771.67	162870.88	0.02
5999.95	25.00	928843.00	162854.75	0.07
7000.00	25.00	967701.83	162787.50	-0.03
8000.00	25.00	1006463.00	162735.38	-0.03
9000.00	25.00	1044991.67	162643.88	0.11
10000.00	25.00	1083382.33	162562.75	-0.03
15.30	50.00	693869.17	155802.00	-0.05
500.00	50.00	712019.83	155816.63	-0.02
1000.00	50.00	730735.33	155839.38	0.07
1500.00	50.00	749424.50	155839.88	-0.03
2000.00	50.00	768123.33	155877.50	0.08
3000.00	50.00	805410.67	155866.63	-0.20
4000.00	50.00	842667.67	155888.38	-0.03
5000.00	50.00	879767.33	155857.50	-0.34
6000.00	50.00	916824.67	155849.88	-0.10
7000.00	50.00	953685.83	155794.63	-0.23
8000.00	50.00	990489.17	155763.38	-0.05
9000.00	50.00	1027053.17	155682.13	-0.04
10000.00	50.00	1063543.83	155626.63	-0.08
15.30	75.00	694054.33	148712.63	-0.01
500.00	75.00	711292.33	148736.13	-0.09
1000.00	75.00	729071.33	148755.13	0.06
1500.00	75.00	746830.17	148763.00	0.11
2000.00	75.00	764581.33	148787.75	0.13
3000.00	75.00	800012.17	148786.88	0.19
4000.00	75.00	835384.33	148801.00	0.25
5000.00	75.00	870648.00	148785.88	0.21
6000.00	75.00	905843.00	148779.25	0.29
7000.05	75.00	940885.83	148731.63	0.42
8000.00	75.00	975866.17	148711.63	0.32
9000.00	75.00	1010652.00	148643.88	0.39
10000.00	75.00	1045363.83	148600.50	0.05
15.35	100.00	694234.67	141882.25	0.47
500.05	100.00	710616.50	141901.88	-0.14
1000.00	100.00	727521.83	141920.88	-0.33
1500.00	100.00	744423.33	141926.75	-0.32
2000.00	100.00	761314.33	141934.50	-0.30
3000.00	100.00	795069.17	141950.88	0.03
4000.00	100.00	828751.00	141961.38	-0.05
5000.00	100.00	862348.00	141950.50	-0.05
6000.00	100.00	895872.67	141953.38	-0.46
7000.00	100.00	929276.17	141921.00	-0.44
8000.00	100.00	962589.83	141899.75	-0.79
9000.05	100.00	995763.33	141844.88	-0.28
10000.00	100.00	1028842.00	141807.75	-0.19
15.35	125.00	694496.33	135316.75	0.59
500.00	125.00	710061.33	135336.25	-0.12
999.95	125.00	726137.50	135354.25	-0.34
1500.00	125.00	742220.17	135361.63	-0.40
2000.00	125.00	758317.50	135389.13	-0.16
3000.00	125.00	790471.67	135384.88	0.29
4000.00	125.00	822610.33	135409.38	0.60
5000.00	125.00	854658.17	135387.88	0.87
6000.00	125.00	886649.17	135392.63	0.37
7000.00	125.00	918531.33	135364.75	0.27
8000.00	125.00	950343.17	135357.50	-0.29
9000.05	125.00	981997.83	135304.63	0.17
9999.95	125.00	1013597.50	135281.63	0.88
15.40	135.00	694655.33	132826.75	0.72
500.00	135.00	709896.67	132841.25	-0.16
1000.00	135.00	725653.67	132860.75	-0.34
1500.00	135.00	741406.67	132860.50	-0.67
2000.00	135.00	757192.33	132867.25	-0.36

3000.00	135.00	788728.00	132883.50	-0.02
4000.00	135.00	820267.00	132907.75	0.32
5000.00	135.00	851729.33	132889.50	0.56
6000.00	135.00	883153.00	132903.75	-0.04
7000.00	135.00	914457.00	132871.50	-0.22
8000.00	135.00	945708.33	132868.25	-0.88
9000.00	135.00	976818.33	132824.00	-0.40
10000.00	135.00	1007858.67	132802.50	0.11