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June 6, 2016

Mr. George Bower
Oil Conservation Division - District 1
1625 N. French Drive
Hobbs, New Mexico 88240

Subject: Western Refining Company, LP – State LPG Storage No. 1 MIT

Dear Mr. Bower,

Western Refining Company, LP has performed a nitrogen-brine MIT on one of their storage cavern wells, State LPG Storage No. 1 (API No. 30-025-35954), located in the Jal Station Field in Lea County, New Mexico.

Nitrogen was injected on April 26th, 2016. An hour casing test was performed successfully with the following parameters:

- Nitrogen-brine interface start depth: 1,509'
- Start Annulus Pressure: 1,058.25 psig
- Nitrogen-brine interface end depth: 1,509'
- End Annulus Pressure: 1,056.40 psig

The 60-minute casing test passed with the pressures following a stabilization trend throughout the casing test period. Nitrogen injection continued into the borehole and ceased with the nitrogen-brine interface at 1,531'. The well was shut in and allowed to stabilize overnight. The MIT was initialized on April 27th, 2016 at 09:10 with the following parameters:

- Annular pressure: 1,069.11 psig
- Tubing pressure: 331.36 psig
- Nitrogen-brine interface: 1,532.5'

The pressure was monitored throughout a 24 hour period and finalized on April 28th, 2016 at 09:17 with the following parameters:

- Annular pressure: 1,063.82 psig
- Tubing pressure: 323.43 psig
- Nitrogen-brine interface: 1,532.5'
- Test Gradient at Casing Shoe: 0.75 psi/ft
- Calculated Leak Rate: 55.94 bbls/yr
- Minimum Detectable Leak Rate: 244.18 bbls/year

It was determined that State LPG Storage No. 1, at the time of this test, demonstrated the mechanical integrity required for the storage of hydrocarbons.

Included in this package are:

- MIT Report for State LPG Storage No. 1
- Test Density Log
- Test Temperature Log

Please contact me by phone (832-216-0785) or via email (eric@lonquist.com) if you have any questions.

Sincerely,

Eric Busch
Senior Vice President

CC: Richard Lonquist – Lonquist Field Service, LLC

LONQUIST

FIELD SERVICE

Mechanical Integrity Test Report
State LPG Storage No.1
Operator: Western Refining Company, LP
API: 30-025-35954
Jal Station Field
Lea County, New Mexico, USA

Prepared for:

Western Refining Company, LP

By:

Lonquist Field Service, LLC
Texas Registered Firm No. F-9147
Houston, Texas

May 2016

Executive Summary

Lonquist Field Services, LLC was contracted by Western Refining Company, LP ("Western Refining") to conduct a Mechanical Integrity Test on State LPG Storage No. 1 ("Well No. 1"), operated by Western Refining Company, LP at the Jal Station Field in Lea County, New Mexico. The Nitrogen-Brine Interface Test Method was used for this test. Nitrogen was injected on April 26th, 2016 to achieve the desired interface depth below the casing shoe. The well was allowed to stabilize for approximately 13 hours and on April 27th, 2016 at 09:10 the MIT was initialized with an annulus (nitrogen) pressure of 1,069.11 psig and a tubing (brine) pressure of 331.36 psig with the nitrogen-brine interface at 1,532.5'. The test was finalized on April 28th, 2016 at 09:17 with an annulus (nitrogen) pressure of 1,063.82 psig and a tubing (brine) pressure of 323.43 psig with the nitrogen-brine interface at 1,532.5'. The calculations yielded a calculated leak rate ("CLR") of 48.38 barrels per year and a Minimum Detectable Leak Rate ("MDLR") of 244.18 barrels per year. The well was tested to a test gradient of 0.75 psi/ft at the 7" cemented casing shoe (1,521'). Considering these results and the guidelines set forth by the State of New Mexico Oil Conservation Division, Well No. 1 at the Jal Station Field, at the time of this test, demonstrated the mechanical integrity required for the storage of hydrocarbons.

Reviewed By:
Lonquist Field Service, LLC
Ben H. Bergman, Sr. Staff Engineer

Date Signed: May 31st, 2016
Houston, Texas

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Introduction

Lonquist Field Service, LLC was contracted by Western Refining Company, LP to conduct a Mechanical Integrity Test on State LPG Storage No. 1 ("Well No. 1") at the Jal Station Field in Lea County, New Mexico.

Well No. 1 was tested using the Nitrogen-Brine Interface Test Method (See Appendix A). Typically this procedure begins with an initial injection of nitrogen into the well to check for wellhead and casing leaks. The initial injection is followed by continued injection of nitrogen into the storage well until the interface is located below the casing shoe and a sufficient test pressure has been reached. The interface depth and the nitrogen (annulus) pressure are monitored during the test period. The test is evaluated by calculating the nitrogen mass (volume) at the commencement and completion of the test period. This difference yields an apparent mass (volume) change. As the test occurs over a finite time period, the apparent mass (volume) rate of change can be calculated and linearly forecasted to an annual rate. The annual mass (volume) rate of change is usually expressed in barrels of nitrogen per year (at average well pressure and temperature conditions). The mass (volume) rate of change is subject to the accuracy of the test or Minimum Detectable Leak Rate (MDLR), also expressed in barrels per year.

The following report will outline the mechanical integrity test for Well No. 1. The report includes the cavern and wellbore configuration, temperature logs, and density logs completed during the test.

Summary

On April 25th, 2016 at 07:30, wireline and nitrogen units were rigged up and a gauge run, base temperature log and base density log were completed. At 17:30, nitrogen was injected into Well No. 1 with a target temperature of 75° F. Nitrogen injection continued until operations were shut down for the night at 23:30.

On April 26th, 2016 at 08:55, nitrogen injection was resumed until the nitrogen-brine interface was measured at a depth of 1,509' at an adequate test pressure. The casing test began on April 26th, 2016 at 14:55 with the nitrogen-brine interface at 1,509' and with an annular (nitrogen) pressure of 1058.25 psig and a tubing (brine) pressure of 322.50 psig. The casing test ended with the nitrogen-brine interface at 1,509' and with an annular (nitrogen) pressure of 1056.40 psig and a tubing (brine) pressure of 320.40 psig. The 60-minute casing test passed with a stabilizing pressure trend throughout the testing period. Following the casing test, nitrogen injection continued until the nitrogen-brine interface was measured at a depth of 1,531' at an adequate test pressure.

After an approximate 13 hour stabilization period, on April 27th, 2016 at 09:10 the MIT on Well No. 1 was initialized with an annulus (nitrogen) pressure of 1,069.11 psig, a tubing (brine) pressure of 331.36 psig, and with the nitrogen-brine interface at a depth of 1,532.5'. The well was shut in for a 24 hour test period. On April 28th, 2016 at 09:17 the MIT on Well No. 1 was finalized with an annulus (nitrogen) pressure of 1,063.82 psig, a tubing (brine) pressure of 323.43 psig and with the nitrogen-brine interface at a depth of 1,532.5'. This concluded the MIT on Well No. 1.

Conclusions

The mechanical integrity of Well No. 1 was established with the Nitrogen-Brine Interface Test Method. This test monitored the Nitrogen-Brine Interface for a 24 hour test period. Well No. 1 was initialized with an annulus (nitrogen) pressure of 1,069.11 psig and a tubing (brine) pressure of 331.36 psig and the nitrogen-brine interface at 1,532.5'.

Well No. 1 was finalized with an annulus (nitrogen) pressure of 1,063.82 psig and a tubing (brine) pressure of 323.43 psig and the nitrogen-brine interface at 1,532.5'. Well No. 1 had a test length of 24 hours and a test gradient of 0.75 psi/ft at the 7" cemented casing shoe.

The total gas volume in the annulus and the wellbore was calculated to be 11,856.10 SCF at the start of the test and 11,800.15 SCF at the end of the test for a calculated "decrease" in gas volume of 55.94 SCF. The calculated gas volume was based on the measured wellhead pressure, measured wellbore temperature, known casing annulus volume, and calculated borehole volumes (Appendix D).

The calculated leak rate ("CLR") was 48.38 barrels per year. Considering the calculations, the calculated leak rate is less than the Minimum Detectable Leak Rate ("MDLR") of 244.18 barrels per year.

At the completion of this test, Well No. 1 exhibited the characteristics of a well that has mechanical integrity as required for hydrocarbon storage, in accordance with industry standards and the guidelines established by the State of New Mexico Oil Conservation Division.

Daily Activities

April 25th, 2016

Show up to location and spot equipment. Hold daily safety meeting and review JSAs. Rig up wireline, crane, and lubricator. Run in hole with gauge run and tag bend in tubing at 1,750'. Run in hole with wireline and record base temperature and density logs. Rig up fittings on 5-1/2" X 3-1/2" annulus for nitrogen injection. Start nitrogen injection. Rig down lubricator and crane. Secure well for the night.

April 26th, 2016

Show up to location, hold daily safety meeting, and review JSAs. Rig up lubricator and crane. Alternate injecting nitrogen and pumping brine in order to spot nitrogen-brine interface above the 7" casing shoe at 1,509' for the 60 minute casing test. The test started with an annulus pressure of 1,058.25 psig and a tubing pressure of 322.50 psig. The test ended with an annulus pressure of 1056.40 psig and a tubing pressure of 320.40 psig. The interface at the beginning and end of the test was measured at 1,509'. The pressure trend during the 60 minute casing test showed a stabilization curve with pressure flattening out over the test. The test passed and nitrogen injection was continued into the cavern borehole. Alternate injecting nitrogen and pumping brine in order to spot the nitrogen-brine interface at 1,531' at an adequate test pressure. Rig down lubricator, crane, and nitrogen unit. Secure well and allow to stabilize overnight.

April 27th, 2016

Show up to location, hold daily safety meeting, and review JSAs. Rig up lubricator and crane. Run in hole with temperature log and initialize test with density log. The nitrogen-brine interface was located at 1,532.5'. Test initialization annulus pressure was 1,069.11 psig and initialization tubing pressure was 331.36 psig. Rig down crane and lubricator. Secure well for the night.

April 28th, 2016

Show up to location, hold daily safety meeting, and review JSAs. Rig up lubricator and crane. Run in hole with temperature log and finalize test with density log. The nitrogen-brine interface was located at 1,532.5'. Test finalization annulus pressure was 1,063.82 psig and finalization tubing pressure was 323.43 psig. Rig down crane and lubricator. Secure and return well to Western Refining.

Test Participants

Western Refining Company, LP

Ken Parker.....Project Manager

Lonquist Field Service, LLC

Eric Busch.....Operations Manager
Will George.....Petroleum / Test Engineer
Ben Bergman.....Sr. Staff Engineer

Cased Hole Solutions

Cased Hole Solutions Personnel.....Wireline Operator

Pro Petro Services

Nitrogen Personnel.....Nitrogen Injection

Stone Oilfield Services

Stone Oilfield Personnel.....Pump Truck

Calculations

Minimum Detectable Leak Rate – MDLR

The test sensitivity is defined as the ability of the test calculations and measurements to determine the status of the mechanical integrity of the well and wellbore. The conventional test sensitivity calculation using this test methodology is the Minimum Detectable Leak Rate (MDLR).

$$MDLR = [B_V * L_R * (T_c)] / T_L$$

Where:

B_v	=	1.34 bbls/ft (APPENDIX D)
L_R	=	0.50 feet
T_c	=	365 days/year
T_L	=	1 day
MDLR	**=**	**244.18 bbls/year**

Therefore: (1.34 x 0.50 x 365)/1 = 244.18 bbls/year*
*Hand calculations may yield different final MDLR due to rounding.

Volume Calculations – Annular Space & Borehole

Using the methodology outlined in the MIT procedure the following volumes were calculated:

Initial Wellbore Volume ($V_{I(Borehole)}$)

- Annulus Pressure – 1,069.11 psig
- Tubing Pressure – 331.36 psig
- Wellbore Temperature – Logged (APPENDIX F)
- Volume
  - 5-1/2" x 3-1/2" Annulus – 0.011 bbls/ft
  - 7" x 3-1/2" Annulus – 0.027 bbls/ft
  - Borehole – APPENDIX D

$$(V_I) = \sum_o^{I/F} (N_2)_i$$

$V_{I(Borehole)}$ = 11,856.10 SCF

Final Wellbore Volume ($V_{F(Borehole)}$)

- Annulus Pressure – 1,063.82 psig
- Tubing Pressure – 323.43 psig
- Wellbore Temperature – Logged (APPENDIX F)
- Volume
  - 5-1/2" x 3-1/2" Annulus – 0.011 bbls/ft
  - 7" x 3-1/2" Annulus – 0.027 bbls/ft
  - Borehole – APPENDIX D

$$(V_F) = \sum_o^{I/F} (N_2)_i$$

$V_{F(Borehole)}$ = 11,800.15 SCF

Borehole Volume Change:

$$(\Delta V)_{STP(Borehole)} = (\Delta V)_{I(Borehole)} - (\Delta V)_{F(Borehole)}$$

$$(\Delta V)_{STP(Borehole)} = 55.94 SCF$$

The calculated volume/mass change is based on standard temperature and pressure and to evaluate the test results against the MDLR the calculated volume/mass change is converted to downhole conditions with the following equation:

$$(\Delta V_{WB}) = \left(\frac{[(Z_A)*(T_A)*R*(\Delta V)_{STP}]}{[(P_A)*N_{GC}]} \right)$$

Where:

(Z_A)	=	1.00002
(T_A)	=	534.68 ◦R
R	=	Specific Gas Constant
$(\Delta V)_{STP}$	=	55.94 SCF
(P_A)	=	1110.35 psi
N_{GC}	=	Nitrogen Gas Conversion (13.80 SCF = 1 lb)
(ΔV_{WB})	=	**0.74 ft³/day**

To calculate an annual volume change to compare to the MDLR the following calculations were completed:

$$(\Delta V_{ANNUAL}) = (\Delta V_{WB})*365(day/year)$$

Where:

(ΔV_{WB})	=	0.74 ft³/day
1 year	=	365 days
(ΔV_{ANNUAL})	=	**271.64 ft³ /yr**

Where:

(ΔV_{ANNUAL})	=	271.64 ft³/yr
1 bbl	=	5.6146 ft³
CLR (bbls/year)	=	(ΔV_{ANNUAL}) / 5.6146 ft³
Calculated Leak Rate	=	**48.38 bbls/year***

***Hand calculations may yield different final CLR due to rounding.**

Well Data Sheet

TEST INFORMATION AND RESULTS

Well Name:	Well No. 1
Operator:	Western Refining
State:	New Mexico
County:	Lea
Field:	Jal Station
API Number:	30-025-35954

WELL INFORMATION

Cemented Casing		
Casing Size	7	inches
Casing ID	6.366	inches
Casing Weight	23	lbs/ft
Grade	H-40	
Depth	1521	feet

Casing Liner		
Casing Size	5 1/2	inches
Casing ID	4.825	inches
Casing Weight	NA	lbs/ft
Grade	NA	
Depth	1480	feet

Hanging String No. 1		
Casing Size	3 1/2	inches
Casing ID	2.992	inches
Casing Weight	9	lbs/ft
Grade	J-55	
Depth	2308	feet

Hanging String No. 2		
Casing Size		inches
Casing ID		inches
Casing Weight		lbs/ft
Grade		
Depth		feet

Cavern		
Cavern Size	201,000.0	bbls
Compressibility	0.61	bbls/psi
Cavern TD	1900	feet

FINAL TEST INFORMATION

Effective Casing Shoe	1521	feet	Casing Shoe Pressure (avg)	1138.38	psi
Test Gradient	0.75	psi/ft	Interface Pressure (avg)	1138.82	psi
Brine Specific Gravity	1.2		Surface Tubing Pressure (avg)	327.39	psi
Nitrogen Temperature (avg)	75	deg F	Surface Annulus Pressure (avg)	1066.47	psi
Interface Depth	1532.5	feet	Pressure Increase	-5.30	psi
Gas Compressibility (avg)	1.00002		Conversion	14.70	psi

Volume		
Annular Volume No. 1	0.011	bbls/ft
Annular Volume No. 2	0.027	bbls/ft
Surface to Casing Shoe	17.0	bbls
Liner Shoe to Casing Shoe	1.1	bbls
Casing Shoe to Interface	11.4	bbls
Total	28.4	bbls

Nitrogen		
Surface to Casing Shoe (avg)	7134.74	SCF
Casing Shoe to Interface (avg)	4693.39	SCF
Total (avg)	11828.13	SCF
Brine		
Cavern Pre-Pressure	107	psi
Brine Injection	600	bbls

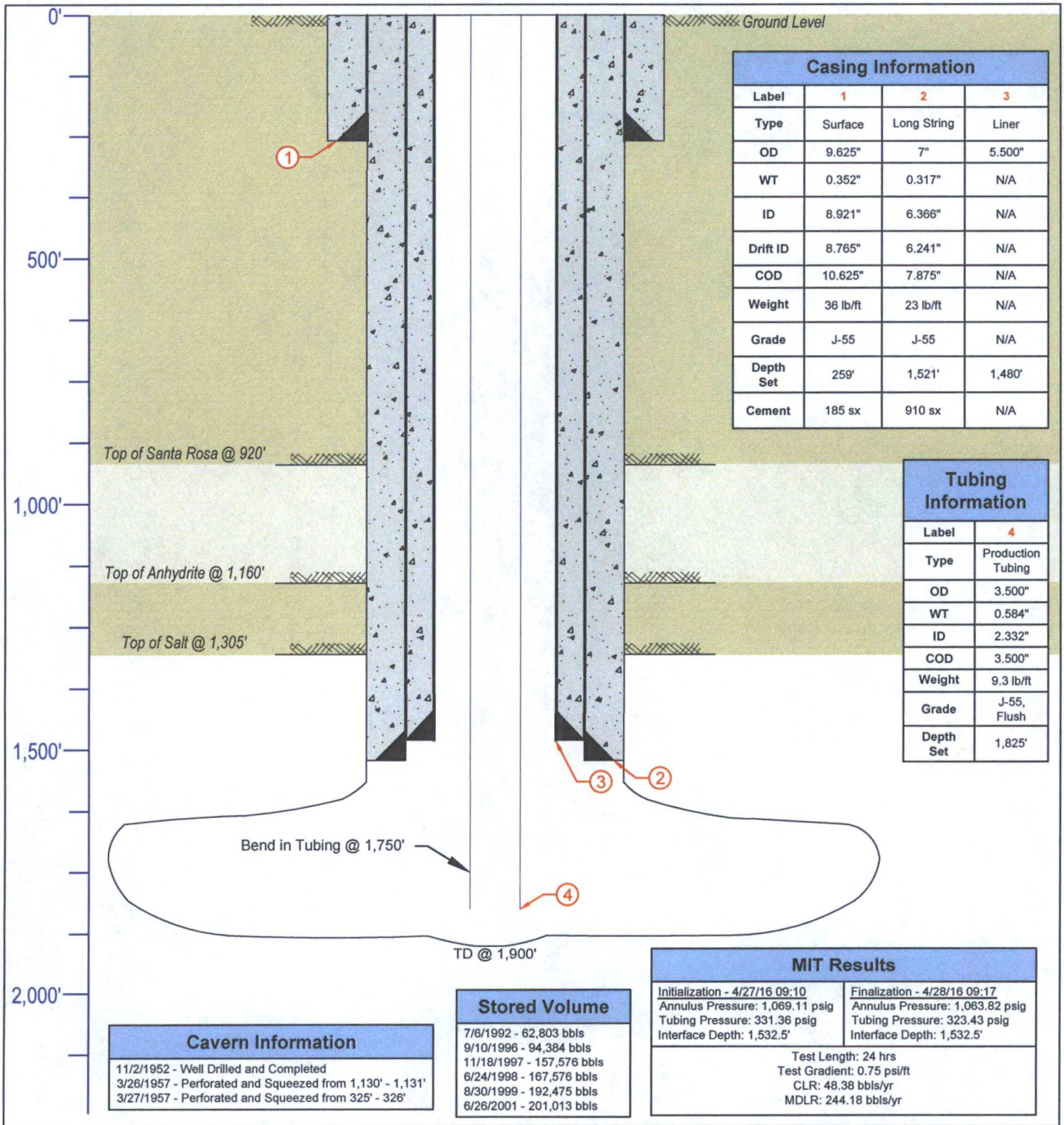
TEST RESULTS

Test Initialization Information		
Date / Time	4/27/16 9:10	
Tubing Pressure	331.36	psig
Annulus Pressure	1069.11	psig
Wellbore Temperature (avg)	75	deg F
Nitrogen/Brine Interface	1532.5	feet

Test Finalization Information		
Date / Time	4/28/16 9:17	
Tubing Pressure	323.43	psig
Annulus Pressure	1063.82	psig
Wellbore Temperature (avg)	75	deg F
Nitrogen/Brine Interface	1532.5	feet

Test Results					
MDLR	244.18	bbls/yr	Test Length	24	hours
Calculated Volume Change	55.94	bbls/yr	Test Length	1.0	days
Test Gradient	0.75	psi/ft	Logging Resolution	0.50	feet
Tubing Pressure Change	7.9	psi	Wireline TD	1750	feet
Annulus Pressure Change	5.3	psi			

MIT/Well Schematic



Casing Information

Label	1	2	3
Type	Surface	Long String	Liner
OD	9.625"	7"	5.500"
WT	0.352"	0.317"	N/A
ID	8.921"	6.366"	N/A
Drift ID	8.765"	6.241"	N/A
COD	10.625"	7.875"	N/A
Weight	36 lb/ft	23 lb/ft	N/A
Grade	J-55	J-55	N/A
Depth Set	259'	1,521'	1,480'
Cement	185 sx	910 sx	N/A

Tubing Information

Label	4
Type	Production Tubing
OD	3.500"
WT	0.584"
ID	2.332"
COD	3.500"
Weight	9.3 lb/ft
Grade	J-55, Flush
Depth Set	1,825'

Cavern Information

11/2/1952 - Well Drilled and Completed
3/26/1957 - Perforated and Squeezed from 1,130' - 1,131'
3/27/1957 - Perforated and Squeezed from 325' - 326'

Stored Volume

7/6/1992 - 62,803 bbls
9/10/1996 - 94,384 bbls
11/18/1997 - 157,576 bbls
6/24/1998 - 167,576 bbls
8/30/1999 - 192,475 bbls
6/26/2001 - 201,013 bbls

MIT Results

Initialization - 4/27/16 09:10	Finalization - 4/28/16 09:17
Annulus Pressure: 1,069.11 psig	Annulus Pressure: 1,063.82 psig
Tubing Pressure: 331.36 psig	Tubing Pressure: 323.43 psig
Interface Depth: 1,532.5'	Interface Depth: 1,532.5'

Test Length: 24 hrs
Test Gradient: 0.75 psi/ft
CLR: 48.38 bbls/yr
MDLR: 244.18 bbls/yr

LONQUIST & CO. LLC
PETROLEUM ENGINEERS | ENERGY ADVISORS
AUSTIN | WICHITA
HOUSTON | CALGARY

Texas License F-8952

3345 Bee Cave Road, Suite 201
Austin, Texas 78746
Tel: 512.732.9812
Fax: 512.732.9816

Western Refining Company, LP

State LPG Well No. 1 - MIT Results

Country: USA	**State/Province:** New Mexico	**County/Parish:** Lea
Survey/STR: M-32-23S-37E	**Site:** Jal	**Status:** Storage
API No.: 30-025-35954	**Field:**	**Ground Elevation:** 3,312'
Serial No.:	**Project No:**	**Date:** 5/10/2016
Drawn: WHG	**Reviewed:** BHB	**Approved:** ETB
Rev No:	**Notes:**	

Appendix A – MIT Test Procedure

LONQUIST FIELD SERVICE	**WELL TEST**	**Project No.:**
	Western Refining Company, LP **Well No. 1** **Mechanical Integrity Test**	**Date: March 2016**
		Page: 1 of 11

Well: No. 1	**State:** New Mexico	**County:** LEA	**Field:** Jal Station
API: 30-025-35954	**Oper:** Western Refining Company,LP	**Location:** Jal	**Status:** State LPG Well

INTRODUCTION

Well No. 1 is operated by Western Refining Company, LP located in the Jal Station Field in Lea County, New Mexico. The purpose of the Mechanical Integrity Test (MIT) procedure is to test the integrity of the underground storage system that includes the cavern, cemented casing, and wellhead to determine if the system demonstrates the mechanical integrity required to support hydrocarbon storage operations.

In accordance with the Oil Conservation Divisions of New Mexico Well No 1 is undergoing an MIT to remain compliant.

The test procedure will consist of the following basic steps:

1. Pre-pressure the cavern to the required pre pressure.
    - Annulus Pressure: **310.52 psig**
    - 0.75 psi/ft final test gradient at the effective casing shoe (1,521').
2. Complete pre-test density and temperature logs.
3. Inject nitrogen into Well No. 1 and monitor nitrogen/brine interface location to place above cemented casing to complete a preliminary test on the cemented casing.
4. Inject nitrogen into Well No. 1 and monitor nitrogen/brine interface location to place interface below the effective cemented casing shoe.
5. Monitor wellhead pressures, wellbore temperature, and the nitrogen/brine interface location during the specified test period.
6. Complete and submit MIT report to Western Refining Company, LP and the Oil Conservation Division of New Mexico within 45 days.
7. Place Well No. 1 in operation and return to Western Refining personnel.

The test procedure includes the following information:

- Nitrogen/Brine Interface Test Planning Sheet
- Wellbore Schematic
- Contact Information
- 2008 Sonar Data (Incomplete Sonar)

Well Preparation

1. Wellhead should be isolated from all surface piping during the test. This may include blind flanges, skillet flanges, and 1" or 2" test flanges.
    a. Wellhead should keep the ability to bleed excess brine pressure back into surface system during the test.
2. Install pressure recording equipment on wellhead. Pressure equipment should be able to record wellhead pressures and wellhead temperatures during the test period. Additional equipment to measure the nitrogen stream injected into the well will be necessary.
    a. All equipment calibration certifications to be provided with final reports.
3. Wellhead configuration should permit the use of a wireline lubricator and logging tools.
4. Pre-pressure the cavern to predetermined pressure with saturated brine
    a. See MIT Data Sheet
5. Wellhead pressure should be stable prior to starting the test.
    a. Stable wellhead pressure – Decline less than 10 psi/day

Well Injection Phase

6. Move in and rig up wireline unit, logging tools, pressure equipment, and nitrogen services.
7. Run CCL and a sinker bar as a gauge run to ensure density tools will pass through the tubing.
8. Complete base density log and wellbore temperature log
    a. Base Temperature Log – (0' –TD)
    b. Base Density Log – (TD' – 200' above effective casing shoe depth)
    c. Density logs should include: tubing collars, effective casing shoe, and approved logging scales.
    d. All depths are approximate
9. Start Nitrogen Injection at a slow rate (<500 SCFM). Nitrogen temperature should be regulated to the average wellbore temperature.
10. Monitor the nitrogen/brine interface and wellbore pressures to locate the interface above the casing shoe and conduct a preliminary casing test.
    a. Casing Test – Minimum of 60 minutes
    b. Monitor and record wellhead pressures and interface at the start and completion of the test
11. Continue nitrogen injection and monitor the nitrogen/brine interface and wellbore pressures to locate the nitrogen/brine interface below the effective casing shoe. The targeted gradient is 0.75 psi/ft at the effective casing shoe and cannot exceed a test pressure gradient of 0.81 psi/ft at the effective casing shoe at any time.
12. After nitrogen/brine interface is located sufficiently below the cemented casing shoe stop nitrogen injection and shut well in for a short stabilization period.

13. Shut in for 30 minutes – Monitor pressures, interface location, and check wellhead for possible leak paths.

14. Complete post injection density logs
    a. Post Injection Density Log – (TD' – 200' above effective casing shoe).
    b. Record wellhead pressures.
    c. Density logs should include: tubing collars, nitrogen/brine interface, production casing shoe, and approved logging scales.
    d. All depths are approximate

15. Remove logging tools and shut well for the stabilization period.

16. Complete pre-test calculations based on wellhead pressure measurements, nitrogen volume measurements, wellbore temperatures, and interface locations.
    a. Refer to Test Calculations Section

17. MIRU sonar tools and perform a sonar survey on the cavern
    a. Shoot the roof of the cavern with upshots
    b. Shoot the floor of the cavern with downshots
    c. Record data every 10'

Test Initialization

18. Move in and rig up wireline unit, logging tools, and pressure equipment.

19. Complete initial density log and wellbore temperature log
    a. Base Temperature Log – (0' – TD')
    b. Initial Density Log – (TD' – 200' above effective casing shoe)
    c. Density logs should include: tubing collars, nitrogen/brine interface, production casing shoe, and approved logging scales.
    d. All depths are approximate
20. Shut well in for test period – Minimum of 24 hours

Test Finalization

21. After planned test duration, move in and rig up wireline unit, logging tools, and pressure equipment.
    a. Complete final density log and wellbore temperature log
    b. Final Temperature Log – (0' – TD')
    c. Final Density Log – (TD' – 200' above effective casing shoe)
    d. Density logs should include: tubing collars, nitrogen/brine interface, production casing shoe, and approved logging scales.
    e. All depths are approximate

22. Determine if the test is complete based on results or if the test should be extended. Repeat Steps 15 - 17 if required.

Nitrogen/Brine Interface Test Calculations

The test methodology proposed in this procedure is developed using the industry standard nitrogen/brine interface test method.

The wellhead pressures and temperature, wellbore temperatures, nitrogen volumes, and interface location will be recorded throughout the test period and will allow for the calculation of the borehole volumes, test sensitivity, minimum test durations, and final test calculations.

All test calculations are based on the following measured parameters: wellhead pressure, nitrogen volumes, annular casing unit volume, wellbore temperatures, and interface locations. In addition to the measured parameters, the following calculated parameters are important in completing the test: unit borehole volume, MDLR, and test length.

To evaluate the test the calculated nitrogen volume/mass at the start of the test is compared to the calculated nitrogen volume/mass at the end of the test. This rate of volume change and it's comparison to the test sensitivity is one of the components in determining the final results of the MIT.

TEST SENSITIVITY AND TEST LENGTH

Test sensitivity calculations are the functions of three factors:

Casing volume – Calculated
Log Resolution – Recommended: 5":100' logging scale
Minimum test duration – 24 hours

The test sensitivity is defined at the ability of the test calculations and measurements to determine the status of the mechanical integrity of the well and wellbore. The conventional test sensitivity calculation using this test methodology is the Minimum Detectable Leak Rate (MDLR).

$$MDLR = {[B_V * L_R * (T_c)]}/{T_L}$$

Where:

MDLR	=	Minimum Detectable Leak Rate (bbl/year)
B_V	=	Borehole Volume (bbls/ft)
L_R	=	Log Resolution (feet)
T_c	=	Time Constant (365 days/year)
T_L	=	Test Length (days)

Using the MDLR method a reasonable and acceptable test accuracy and sensitivity can be calculated for the Mechanical Integrity Test. The MDLR calculation is based on downhole measurements of the test conditions.

The MDLR must be less than 1000 bbl/year for the designated test period. The length of the test must a minimum of 24 hours and sufficient in length to keep the MDLR below 1000 bbl/year and allow for a proper evaluation of the well test.

TEST EVALUATIONS

The volume/mass of nitrogen located in the wellbore can be affected by following: temperature stabilization, cavern leaching/creep, and volume changes. Using P-V-T gas calculations, any changes in the volume/mass of the nitrogen in the wellbore can be evaluated based on wellbore temperature changes, pressure changes, and/or wellbore leakage.

Pressure Calculations

The average wellbore pressure is calculated based on the wellhead surface pressure, wellbore temperature, and depth of the specific interval. The following equation is used to calculate the average wellbore pressure

$$(P_A)_i = (P_A)_{i-1}\left[1+\left(\frac{D}{(R)(Z_A)_i(T)_i}\right)\right]$$

Where:

$(P_A)_i$ = Pressure @ Depth Interval (Calculated) (psia)
$(P_A)_{i-1}$ = Pressure @ Previous Depth Interval (Calculated) (psi)
D = Depth Interval (ft)
$(Z_A)_i$ = Gas Compressibility Factor @ Depth Interval
R = Specific Gas Constant
$(T)_i$ = Wellbore Temperature (◦R)

Nitrogen Calculations

The following calculation is used to calculate the volume/mass of nitrogen for specific intervals over the entire wellbore at the start and end of the test period:

$$(N_2)_i = \left(\frac{[(P_A)_i * (B_v)_i]}{[(Z_A)_i * (T_A)_i * R]}\right) * N_{GC}$$

Where:

$(N_2)_i$ = Nitrogen Volume (SCF)
$(P_A)_i$ = Average Wellbore Pressure (psi)
$(B_v)_i$ = Wellbore Volume (ft^3)

$(Z_A)_i$ = Gas Compressibility Factor

$(T_A)_i$ = Wellbore Temperature (◦R)

R = Specific Gas Constant

N_{GC} = Nitrogen Gas Conversion (13.8 SCF = 1 lb)

Upon completion of each specific volume/mass calculation the sum of the each interval is calculated to determine the volume/mass of nitrogen in the wellbore at the beginning of the test. After the test is complete the calculation and summation is repeated to determine the final test results.

The following equations represent the summation of the intervals to the nitrogen/brine interface at the start and completion of the test:

$$(V_I) = \sum_o^{I/F} (N_2)_i$$

$$(V_F) = \sum_o^{I/F} (N_2)_i$$

The results of the beginning and completion of the test are compared and evaluated to determine the change in nitrogen volume during the test period. The following equation is used for the comparison:

$$(\Delta V)_{STP} = (V_I) - (V_F)$$

The calculated volume/mass change is based on standard temperature and pressure and to evaluate the test results against the MDLR the calculated volume/mass change is converted to downhole conditions with the following equation:

$$(\Delta V_{WB}) = \left(\frac{[(Z_A) * (T_A) * R * (\Delta V)_{STP}]}{[(P_A) * N_{GC}]} \right)$$

Where:

(ΔV_{WB}) = Nitrogen Volume Change (ft^3) – Wellbore Conditions

(Z_A) = Average Gas Compressibility Factor for Test Period

(T_A) = Average Wellbore Temperature (◦R) for Test Period

R = Specific Gas Constant

$(\Delta V)_{STP}$ = Nitrogen Volume Change (SCF) – Standard Conditions

(P_A) = Average Wellbore Pressure for Test Period (psi)

N_{GC} = Nitrogen Gas Conversion (13.8 SCF = 1 lb)

The change in wellbore volume for the test period is converted into a calculated annual volume change. The following equation determines this volume change:

$$(\Delta V_{ANNUAL}) = \frac{[(\Delta V_{WB}) * 24(hr/day) * 365(day/yr)]}{T_L}$$

Where:

(ΔV_{ANNUAL}) = Calculated Volume Change (bbls/year)

(ΔV_{WB}) = Nitrogen Volume Change (ft^3) – Wellbore Conditions

(T_L) = Test Length (hrs)

A positive change in wellbore volume indicates a calculated loss of nitrogen from the wellbore during the test period. A negative change in wellbore volume indicates a calculated increase (apparent nitrogen influx) in nitrogen volume during the test period.

Pass/Fail Criteria

Test results are evaluated for a successful test using the following criteria:

- MDLR less than 1000 bbls/day
- Calculated Annual Volume Change less than the MDLR
- Pressure response, wellbore temperature, and interface movement should respond in a way that represents the cavern has mechanical integrity

Test Reporting

A written report will be prepared within 45 days of completion and submitted to the Oil Conservation Division of New Mexico. The report will include the test procedures, test chronology, test results and conclusions, wireline logs, pressure information, and all supporting documentation.

LONQUIST FIELD SERVICE	**WELL TEST**	**Project No.:**
	Western Refining Company, LP **Well No. 1** **Mechanical Integrity Test**	**Date: March 2016**
		Page: 8 of 11

Well: No. 1	**State:** New Mexico	**County:** LEA	**Field:** Jal Station
API: 30-025-35954	**Oper:** Western Refining Company,LP	**Location:** Jal	**Status:** State LPG Well

TEST PLANNING SHEET

Well Name:	Well No. 1
Operator:	Western Refinery
State:	New Mexico
County:	Lea
Field:	Jal Station
API No:	30-025-35954

WELL INFORMATION

Cemented Casing			Casing Liner		
Casing Size	7	inches	Casing Size	5 1/2	inches
Casing ID	6.366	inches	Casing ID	4.825	inches
Casing Weight	23	lbs/ft	Casing Weight		lbs/ft
Grade	J-55		Grade		
Depth	1521	feet	Depth	1480	feet

Hanging String No. 1			Hanging String No. 2		
Casing Size	3 1/2	inches	Casing Size		inches
Casing ID	2.992	inches	Casing ID		inches
Casing Weight	9.3	lbs/ft	Casing Weight		lbs/ft
Grade	J-55		Grade		
Depth	1825	feet	Depth		feet

Cavern		
Cavern Size	201,000.0	bbls
Compressibility	0.61	bbls/psi
Cavern TD	1900	feet

TEST INFORMATION

Effective Casing Shoe	1521	feet	Casing Shoe Pressure	1140.75	psig
Test Gradient	0.75	psi/ft	Interface Pressure	1141.11	psig
Brine Specific Gravity	1.2		Surface Tubing Pressure	346.12	psig
Nitrogen Temperature	65	deg F	Surface Annulus Pressure	1083.01	psig
Interface Depth	1530	feet	Pressure Increase	35.60	psi
Gas Compressibility	0.9983		Conversion	14.70	psi

Volume			Nitrogen		
Annular Volume No. 1	0.011	bbls/ft	Surface to Casing Shoe	7288.652	SCF
Annular Volume No. 2	0.027	bbls/ft	Casing Shoe to Interface	2069.57	SCF
Surface to Liner Shoe	15.859	bbls	Total	9358.222	SCF
Liner Shoe to Casing Shoe	1.13	bbls	**Brine**		
Casing Shoe to Interface	4.70	bbls	Cavern Pre-Pressure	310.52	psig
Total	21.68	bbls	Brine Injection	189.13	bbls

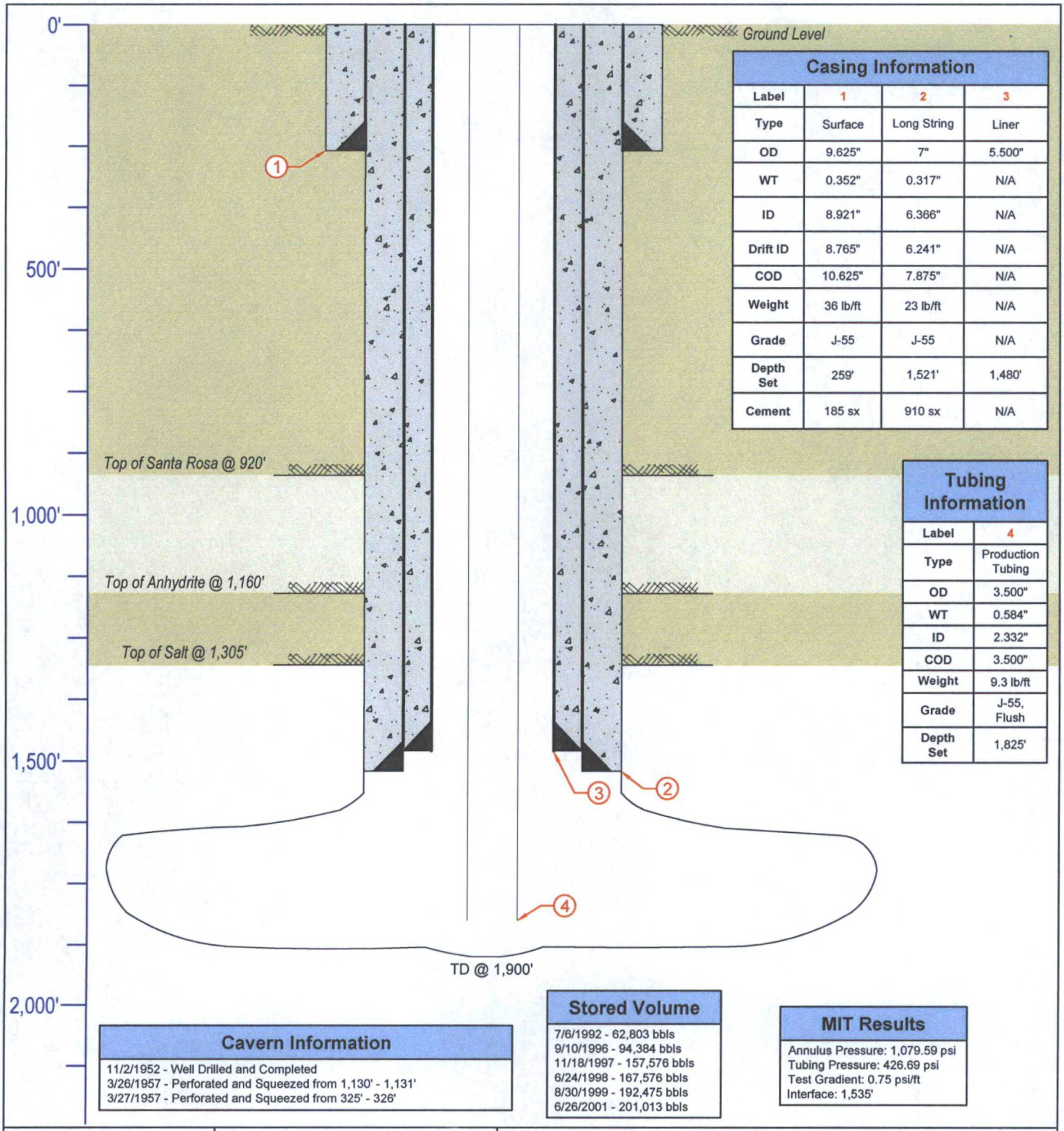
PREPARED BY	DATE	APPROVED BY	DATE	CLIENT APPROVAL	DATE	Lonquist Field Service, LLC
TMH	3/1/2016	ETB	3/1/2016			Texas Registration No. F-9147

LONQUIST FIELD SERVICE	WELL TEST	Project No.:
	Western Refining Company, LP Well No. 1 Mechanical Integrity Test	Date: March 2016
		Page: 9 of 11

Well: No. 1	**State:** New Mexico	**County:** LEA	**Field:** Jal Station
API: 30-025-35954	**Oper:** Western Refining Company,LP	**Location:** Jal	**Status:** State LPG Well

WELL SCHEMATIC

PREPARED BY	DATE	APPROVED BY	DATE	CLIENT APPROVAL	DATE	Lonquist Field Service, LLC
TMH	3/1/2016	ETB	3/1/2016			Texas Registration No. F-9147



Casing Information

Label	1	2	3
Type	Surface	Long String	Liner
OD	9.625"	7"	5.500"
WT	0.352"	0.317"	N/A
ID	8.921"	6.366"	N/A
Drift ID	8.765"	6.241"	N/A
COD	10.625"	7.875"	N/A
Weight	36 lb/ft	23 lb/ft	N/A
Grade	J-55	J-55	N/A
Depth Set	259'	1,521'	1,480'
Cement	185 sx	910 sx	N/A

Tubing Information

Label	4
Type	Production Tubing
OD	3.500"
WT	0.584"
ID	2.332"
COD	3.500"
Weight	9.3 lb/ft
Grade	J-55, Flush
Depth Set	1,825'

Cavern Information

11/2/1952 - Well Drilled and Completed
3/26/1957 - Perforated and Squeezed from 1,130' - 1,131'
3/27/1957 - Perforated and Squeezed from 325' - 326'

Stored Volume

7/6/1992 - 62,803 bbls
9/10/1996 - 94,384 bbls
11/18/1997 - 157,576 bbls
6/24/1998 - 167,576 bbls
8/30/1999 - 192,475 bbls
6/26/2001 - 201,013 bbls

MIT Results

Annulus Pressure: 1,079.59 psi
Tubing Pressure: 426.69 psi
Test Gradient: 0.75 psi/ft
Interface: 1,535'

LONQUIST & CO. LLC
PETROLEUM ENGINEERS | ENERGY ADVISORS
AUSTIN | WICHITA
HOUSTON | CALGARY

Texas License F-8952

3345 Bee Cave Road, Suite 201
Austin, Texas 78746
Tel: 512.732.9812
Fax: 512.732.9816

Western Refining Company, LP

State LPG Well No. 1

Country: USA	**State/Province:** New Mexico	**County/Parish:** Lea
Survey/STR: M-32-23S-37E	**Site:** Jal	**Status:** Storage
API No.: 30-025-35954	**Field:**	**Ground Elevation:** 3,312'
Serial No.:	**Project No:**	**Date:** 3/1/2016
Drawn: MMC	**Reviewed:**	**Approved:**
Rev No:	**Notes:**	

CONTACT INFORMATION

Well Owner

Western Refining
PO Box 1345
Jal, New Mexico 88252

- Ken Parker – Site Manager
  - Telephone – (505) 395-2632
  - Mobile – (915) 471-1607
  - Email – ken.parker@westernrefining.com

Engineering Consultants

Lonquist Field Service, LLC
1001 McKinney, Suite 1650
Houston, Texas 77002

- Eric Busch – Senior Vice President
  - Telephone – (832) 216-0785
  - Fax – (713) 559-9959
  - Email – eric@lonquist.com

- Tyler Hendrickson – Petroleum Engineer
  - Telephone – (713) 559 9988
  - Fax – (713) 559-9959
  - Email – tyler@lonquist.com

LONQUIST FIELD SERVICE	WELL TEST	Project No.:
	Western Refining Company, LP Well No. 1 Mechanical Integrity Test	Date: March 2016
		Page: 11 of 11

Well: No. 1	**State:** New Mexico	**County:** LEA	**Field:** Jal Station
API: 30-025-35954	**Oper:** Western Refining Company,LP	**Location:** Jal	**Status:** State LPG Well

2008 SONAR VOLUME TABLE

PREPARED BY	DATE	APPROVED BY	DATE	CLIENT APPROVAL	DATE	Lonquist Field Service, LLC
TMH	3/1/2016	ETB	3/1/2016			Texas Registration No. F-9147

1-0804.inv
SONARWIRE GLOBAL, LLC
Depth versus Volume

WESTERN REFINING
STORAGE WELL NO. 1

JAL, NM
Fri, Apr 18, 2008

Depth	Cubic ft. per ft.	Cubic ft. total	Barrels per ft.	Barrels total
1522	1.5	1.5	0.3	0.3
1523	1.6	3.1	0.3	0.6
1524	1.8	4.9	0.3	0.9
1525	2.1	7.0	0.4	1.2
1526	2.3	9.3	0.4	1.7
1527	3.6	13.0	0.6	2.3
1528	5.2	18.2	0.9	3.2
1529	4.5	22.7	0.8	4.0
1530	3.8	26.4	0.7	4.7
1531	3.1	29.6	0.6	5.3
1532	1116.8	1146.3	198.9	204.2
1533	1110.1	2256.5	197.7	401.9
1534	514.8	2771.3	91.7	493.6
1535	145.5	2916.8	25.9	519.5
1536	2.1	2918.8	0.4	519.9
1537	2.4	2921.2	0.4	520.3
1538	2.7	2924.0	0.5	520.8
1539	521.1	3445.1	92.8	613.6
1540	512.9	3958.0	91.3	704.9
1541	506.7	4464.7	90.3	795.2
1542	538.2	5002.9	95.9	891.0
1543	571.2	5574.0	101.7	992.8
1544	561.5	6135.5	100.0	1092.8
1545	552.0	6687.5	98.3	1191.1
1546	1.5	6689.0	0.3	1191.4
1547	546.6	7235.5	97.3	1288.7
1548	519.7	7755.2	92.6	1381.3
1549	493.6	8248.9	87.9	1469.2
1550	476.6	8725.5	84.9	1554.1
1551	460.3	9185.8	82.0	1636.1
1552	453.6	9639.5	80.8	1716.9
1553	447.3	10086.8	79.7	1796.5
1554	447.7	10534.5	79.7	1876.3
1555	448.6	10983.1	79.9	1956.2
1556	455.4	11438.5	81.1	2037.3
1557	462.7	11901.2	82.4	2119.7
1558	434.6	12335.8	77.4	2197.1
1559	408.0	12743.9	72.7	2269.8
1560	378.6	13122.4	67.4	2337.2
1561	352.4	13474.8	62.8	2400.0
1562	310.9	13785.6	55.4	2455.3
1563	273.7	14059.4	48.8	2504.1
1564	234.7	14294.1	41.8	2545.9
1565	199.2	14493.3	35.5	2581.4
1566	295.0	14788.3	52.5	2633.9
1567	418.9	15207.2	74.6	2708.5
1568	411.5	15618.6	73.3	2781.8
1569	404.7	16023.4	72.1	2853.9
1570	351.5	16374.9	62.6	2916.5
1571	302.5	16677.5	53.9	2970.4
1572	333.3	17010.7	59.4	3029.7
1573	366.0	17376.7	65.2	3094.9

Appendix B – Injection Pressure Data

Nitrogen Injection

Well Name:	Well No. 1
Operator:	Western Refining
State:	New Mexico
County:	Lea
Field:	Jal Station
API Number:	30-025-35954

Flow Conditions

	Annulus Gauge		Tubing Gauge		Flow Conditions
	Pressure	Temp	Pressure	Temp	Temp
Date / Time	psig	deg F	psig	deg F	deg F
4/25/16 18:11	254.17	92.16	109.38	92.81	100.34
4/25/16 18:20	255.09	91.89	109.11	92.47	97.55
4/25/16 18:30	255.98	90.56	109.12	91.09	94.78
4/25/16 18:40	276.54	90.11	109.23	90.62	92.98
4/25/16 18:50	392.81	89.62	110.79	90.10	92.51
4/25/16 19:00	637.08	89.24	115.87	89.68	89.04
4/25/16 19:10	722.08	88.90	119.25	89.31	87.84
4/25/16 19:20	721.81	88.39	118.61	88.80	87.10
4/25/16 19:30	721.79	86.74	118.81	87.85	84.90
4/25/16 19:40	728.71	86.31	97.91	86.83	82.99
4/25/16 19:50	730.17	85.82	64.08	86.14	82.35
4/25/16 20:00	743.88	84.50	157.62	87.28	81.90
4/25/16 20:10	758.86	83.74	175.35	87.40	81.28
4/25/16 20:20	773.20	82.02	193.45	83.65	80.48
4/25/16 20:30	777.80	79.65	60.55	79.81	79.29
4/25/16 20:40	776.94	77.17	59.29	77.14	78.08
4/25/16 20:50	776.31	73.74	58.52	74.01	77.13
4/25/16 21:00	775.77	72.18	58.02	72.16	75.97
4/25/16 21:10	783.71	71.08	57.78	70.96	73.95
4/25/16 21:20	811.88	70.19	59.02	70.07	73.40
4/25/16 21:30	811.43	69.44	58.04	69.32	71.75
4/25/16 21:40	822.55	68.80	199.85	69.54	71.14
4/25/16 21:50	839.35	68.55	231.44	70.48	70.32
4/25/16 22:00	855.51	67.92	252.55	71.09	69.19
4/25/16 22:10	871.23	67.25	274.46	71.62	68.22
4/25/16 22:20	871.60	66.42	131.78	66.65	67.23
4/25/16 22:30	874.41	65.95	130.71	65.91	67.12
4/25/16 22:40	879.56	65.10	131.86	65.02	64.91
4/25/16 22:50	878.70	64.05	2.99	63.95	65.48
4/25/16 23:00	878.16	63.10	2.52	62.96	64.58
4/25/16 23:10	877.70	62.41	127.32	62.31	63.83
4/25/16 23:20	877.31	61.54	127.21	61.39	62.91
4/25/16 23:30	876.94	60.75	126.80	60.60	62.24
4/25/16 23:40	876.66	60.42	126.43	60.29	61.70
4/25/16 23:50	876.38	61.65	126.09	61.62	61.56
4/26/16 0:00	876.05	62.29	125.77	62.25	61.59
4/26/16 0:10	875.81	61.48	125.48	61.43	60.99
4/26/16 0:20	875.59	60.02	125.22	59.96	60.06
4/26/16 0:30	875.34	60.09	124.96	59.96	60.08
4/26/16 0:40	875.14	60.30	124.72	60.23	60.22
4/26/16 0:50	874.93	60.44	124.49	60.39	60.35
4/26/16 1:00	874.75	60.45	124.27	60.41	60.31
4/26/16 1:10	874.55	60.40	124.07	60.40	60.17

Nitrogen Injection

Well Name:	Well No. 1
Operator:	Western Refining
State:	New Mexico
County:	Lea
Field:	Jal Station
API Number:	30-025-35954

Flow Conditions

	Annulus Gauge		Tubing Gauge		Flow Conditions
	Pressure	Temp	Pressure	Temp	Temp
Date / Time	psig	deg F	psig	deg F	deg F
4/26/16 1:20	874.36	60.08	123.88	60.07	59.91
4/26/16 1:30	874.21	59.99	123.69	59.98	59.67
4/26/16 1:40	874.01	59.93	123.50	59.92	59.53
4/26/16 1:50	873.88	59.04	123.34	58.98	58.96
4/26/16 2:00	873.77	58.28	123.18	58.22	58.39
4/26/16 2:10	873.60	57.72	123.02	57.66	57.97
4/26/16 2:20	873.46	57.42	122.85	57.37	57.65
4/26/16 2:30	873.32	56.92	122.70	56.87	57.21
4/26/16 2:40	873.20	55.98	122.57	55.91	56.62
4/26/16 2:50	873.05	55.34	122.42	55.24	56.22
4/26/16 3:00	872.94	54.78	122.29	54.68	55.81
4/26/16 3:10	872.84	54.37	122.16	54.25	55.44
4/26/16 3:20	872.70	53.99	122.04	53.90	55.10
4/26/16 3:30	872.60	53.46	121.91	53.36	54.66
4/26/16 3:40	872.50	53.14	121.79	53.06	54.25
4/26/16 3:50	872.41	52.93	121.68	52.85	53.87
4/26/16 4:00	872.30	52.92	121.56	52.90	53.66
4/26/16 4:10	872.20	53.15	121.45	53.14	53.50
4/26/16 4:20	872.11	52.98	121.34	52.98	53.28
4/26/16 4:30	872.03	53.37	121.23	53.39	53.20
4/26/16 4:40	871.91	53.40	121.13	53.44	53.07
4/26/16 4:50	871.83	53.12	121.03	53.15	52.85
4/26/16 5:00	871.74	52.73	120.93	52.74	52.61
4/26/16 5:10	871.63	51.53	120.85	51.52	52.11
4/26/16 5:20	871.56	50.14	120.74	50.09	51.55
4/26/16 5:30	871.48	49.18	120.66	49.15	51.05
4/26/16 5:40	871.42	48.51	120.57	48.47	50.60
4/26/16 5:50	871.34	47.95	120.48	47.91	50.12
4/26/16 6:00	871.25	48.16	120.40	48.17	49.89
4/26/16 6:10	871.17	49.04	120.30	49.10	49.90
4/26/16 6:20	871.09	49.58	120.21	49.65	49.81
4/26/16 6:30	870.99	49.37	120.13	49.41	49.59
4/26/16 6:40	870.95	48.70	120.05	48.72	49.20
4/26/16 6:50	870.86	47.88	119.97	47.88	48.74
4/26/16 7:00	870.80	47.26	119.90	47.26	48.35
4/26/16 7:10	870.74	46.78	119.84	46.79	48.07
4/26/16 7:20	870.67	46.26	119.76	46.26	47.79
4/26/16 7:30	870.61	46.80	1.93	46.82	47.85
4/26/16 7:40	870.53	48.46	1.96	48.44	48.71
4/26/16 7:50	9.17	51.04	-1.59	51.31	-76.00
4/26/16 8:00	-1.60	51.80	-1.58	51.86	-76.00
4/26/16 8:10	-1.61	51.78	-1.58	51.75	-76.00
4/26/16 8:20	-1.60	52.68	-1.59	52.73	-76.00

Nitrogen Injection

Well Name:	Well No. 1
Operator:	Western Refining
State:	New Mexico
County:	Lea
Field:	Jal Station
API Number:	30-025-35954

Flow Conditions

	Annulus Gauge		Tubing Gauge		Flow Conditions
	Pressure	Temp	Pressure	Temp	Temp
Date / Time	psig	deg F	psig	deg F	deg F
4/26/16 8:30	-1.61	52.67	-1.57	52.74	-76.00
4/26/16 8:40	-1.60	52.68	-1.58	52.75	-76.00
4/26/16 8:50	869.89	55.06	118.52	54.91	-76.00
4/26/16 9:00	876.44	58.38	240.29	58.45	68.80
4/26/16 9:10	889.73	60.53	221.51	60.69	71.98
4/26/16 9:20	902.26	62.72	243.96	62.92	75.14
4/26/16 9:30	913.72	65.51	254.95	65.71	77.87
4/26/16 9:40	925.72	67.97	284.33	68.21	81.21
4/26/16 9:50	934.20	70.57	214.92	70.82	84.44
4/26/16 10:00	932.96	72.47	214.17	72.64	80.79
4/26/16 10:10	934.51	73.98	213.50	74.05	84.20
4/26/16 10:20	937.29	74.41	213.09	74.37	83.25
4/26/16 10:30	940.32	76.36	212.76	76.16	85.29
4/26/16 10:40	940.84	76.15	227.01	76.86	89.39
4/26/16 10:50	954.16	77.40	305.17	77.63	91.76
4/26/16 11:00	966.96	78.74	313.64	78.89	94.70
4/26/16 11:10	978.33	80.06	322.69	80.21	96.91
4/26/16 11:20	989.29	81.93	336.36	81.81	98.60
4/26/16 11:30	999.29	83.45	341.00	83.06	100.10
4/26/16 11:40	1001.01	83.87	265.91	83.34	100.13
4/26/16 11:50	1004.43	84.39	265.04	83.89	99.09
4/26/16 12:00	1004.45	84.29	264.17	83.78	101.69
4/26/16 12:10	1003.75	84.12	263.37	83.61	102.31
4/26/16 12:20	1003.16	84.55	262.93	84.18	103.43
4/26/16 12:30	1012.93	84.54	350.11	84.18	104.65
4/26/16 12:40	1024.32	82.85	371.24	82.81	105.72
4/26/16 12:50	1035.05	83.67	389.90	83.98	107.05
4/26/16 13:00	1045.83	84.49	402.78	84.51	105.80
4/26/16 13:10	1056.32	87.48	409.30	87.44	107.34
4/26/16 13:20	1059.36	89.76	329.11	89.78	108.85
4/26/16 13:30	1058.18	89.68	327.78	89.65	108.91
4/26/16 13:40	1058.87	89.29	326.83	89.37	108.20
4/26/16 13:50	1059.97	88.34	326.13	88.29	106.16
4/26/16 14:00	1060.83	84.31	325.51	84.25	102.86
4/26/16 14:10	1060.21	84.99	324.80	84.92	102.01
4/26/16 14:20	1059.74	85.57	324.17	85.96	101.73
4/26/16 14:30	1059.23	86.46	323.82	86.53	101.68
4/26/16 14:40	1058.82	88.38	323.18	88.51	103.12
4/26/16 14:50	1058.45	88.71	322.73	88.80	103.76
4/26/16 15:00	1058.03	89.02	322.35	89.22	104.55
4/26/16 15:10	1057.74	88.59	321.88	88.81	103.91
4/26/16 15:20	1057.42	87.16	321.57	87.35	102.63
4/26/16 15:30	1057.09	88.72	321.27	89.00	103.48

Nitrogen Injection

Well Name:	Well No. 1
Operator:	Western Refining
State:	New Mexico
County:	Lea
Field:	Jal Station
API Number:	30-025-35954

Flow Conditions

	Annulus Gauge		Tubing Gauge		Flow Conditions
	Pressure	Temp	Pressure	Temp	Temp
Date / Time	psig	deg F	psig	deg F	deg F
4/26/16 15:40	1056.80	88.80	320.82	89.12	103.41
4/26/16 15:50	1056.50	87.87	320.52	88.22	102.88
4/26/16 16:00	1056.23	87.33	320.25	87.69	102.07
4/26/16 16:10	1055.99	86.78	319.92	87.15	101.40
4/26/16 16:20	1055.77	85.83	319.67	86.22	100.36
4/26/16 16:30	1056.74	85.88	319.51	86.33	100.08
4/26/16 16:40	1057.13	84.89	319.50	85.36	98.04
4/26/16 16:50	1057.22	84.69	318.28	85.16	97.22
4/26/16 17:00	1059.11	84.44	319.21	84.92	92.54
4/26/16 17:10	1061.30	83.86	320.64	84.35	83.92
4/26/16 17:20	1062.63	83.48	392.85	84.03	87.09
4/26/16 17:30	1074.92	83.46	417.15	84.02	88.74
4/26/16 17:40	1080.85	83.62	346.24	84.19	89.79
4/26/16 17:50	1081.48	83.40	345.98	83.95	89.66
4/26/16 18:00	1081.30	82.78	345.38	83.31	89.16
4/26/16 18:10	1080.84	82.28	344.87	82.81	87.45
4/26/16 18:20	1080.44	82.10	344.41	82.61	85.15
4/26/16 18:30	1080.06	81.57	343.99	82.08	82.83
4/26/16 18:40	1079.79	81.22	343.61	81.71	81.29
4/26/16 18:50	1079.41	80.50	343.31	80.98	79.97
4/26/16 19:00	1080.42	79.33	343.29	79.75	80.70

Appendix C – Test Pressure Data

TEST PRESSURE

Well Name:	Well No. 1
Operator:	Western Refining
State:	New Mexico
County:	Lea
Field:	Jal Station
API Number:	30-025-35954

PRESSURE INFORMATION

	Annulus Pressure		Tubing Pressure	
	Pressure	Temp	Pressure	Temp
Date / Time	psig	deg F	psig	deg F
4/27/16 9:10	1069.114	62.07	331.357	61.92
4/27/16 9:25	1069.105	62.95	330.085	63.02
4/27/16 9:40	1069.061	64.57	0.638	64.61
4/27/16 9:55	1069.002	66.46	0.750	66.55
4/27/16 10:10	1068.987	68.35	330.744	68.43
4/27/16 10:25	1068.962	70.21	330.631	70.16
4/27/16 10:40	1068.931	71.76	330.535	71.58
4/27/16 10:55	1068.878	72.25	330.430	72.27
4/27/16 11:10	1068.891	73.91	330.347	74.07
4/27/16 11:25	1068.858	77.58	330.271	76.96
4/27/16 11:40	1068.934	81.11	330.172	80.23
4/27/16 11:55	1069.152	82.16	330.087	81.14
4/27/16 12:10	1069.477	83.12	329.989	82.27
4/27/16 12:25	1069.553	83.17	329.892	82.62
4/27/16 12:40	1069.488	83.95	329.772	83.57
4/27/16 12:55	1069.403	82.88	329.691	82.78
4/27/16 13:10	1069.303	84.90	329.614	84.60
4/27/16 13:25	1069.259	85.96	329.501	85.75
4/27/16 13:40	1069.264	85.91	329.428	85.89
4/27/16 13:55	1069.150	85.94	329.326	86.10
4/27/16 14:10	1069.054	87.61	329.206	87.79
4/27/16 14:25	1069.008	87.96	329.150	88.02
4/27/16 14:40	1068.934	88.72	329.045	89.00
4/27/16 14:55	1068.849	89.06	328.940	89.45
4/27/16 15:10	1068.794	90.56	328.834	91.08
4/27/16 15:25	1068.706	88.52	328.771	89.17
4/27/16 15:40	1068.642	89.39	328.686	89.92
4/27/16 15:55	1068.562	89.00	328.595	89.77
4/27/16 16:10	1068.545	88.31	328.520	89.11
4/27/16 16:25	1068.364	88.94	328.404	89.73
4/27/16 16:40	1068.344	88.88	328.345	89.72
4/27/16 16:55	1068.255	87.46	328.253	88.32
4/27/16 17:10	1068.186	87.70	328.167	88.53
4/27/16 17:25	1068.091	86.36	328.083	87.17
4/27/16 17:40	1067.991	86.11	327.994	86.92
4/27/16 17:55	1067.885	86.21	327.903	87.00
4/27/16 18:10	1067.790	86.01	327.820	86.71
4/27/16 18:25	1067.717	85.42	327.733	86.17

TEST PRESSURE

Well Name:	Well No. 1
Operator:	Western Refining
State:	New Mexico
County:	Lea
Field:	Jal Station
API Number:	30-025-35954

PRESSURE INFORMATION

	Annulus Pressure		Tubing Pressure	
	Pressure	Temp	Pressure	Temp
Date / Time	psig	deg F	psig	deg F
4/27/16 18:40	1067.630	84.41	327.654	85.13
4/27/16 18:55	1067.545	83.28	327.583	83.93
4/27/16 19:10	1067.500	82.43	327.509	83.00
4/27/16 19:25	1067.395	81.24	327.434	81.77
4/27/16 19:40	1067.325	79.79	327.359	80.23
4/27/16 19:55	1067.268	78.02	327.299	78.27
4/27/16 20:10	1067.180	76.15	327.253	76.38
4/27/16 20:25	1067.102	73.71	327.197	73.75
4/27/16 20:40	1067.042	70.75	327.131	70.72
4/27/16 20:55	1066.980	68.25	327.081	68.17
4/27/16 21:10	1066.897	66.11	327.016	66.06
4/27/16 21:25	1066.856	64.29	326.930	64.21
4/27/16 21:40	1066.799	64.37	326.859	64.29
4/27/16 21:55	1066.720	63.67	326.781	63.63
4/27/16 22:10	1066.716	63.04	326.721	62.99
4/27/16 22:25	1066.670	61.84	326.685	61.80
4/27/16 22:40	1066.615	60.97	326.612	60.91
4/27/16 22:55	1066.527	59.31	326.549	59.24
4/27/16 23:10	1066.475	58.00	326.498	57.91
4/27/16 23:25	1066.419	57.00	326.437	56.91
4/27/16 23:40	1066.351	55.88	326.365	55.80
4/27/16 23:55	1066.290	54.40	326.301	54.35
4/28/16 0:10	1066.195	53.02	326.217	52.94
4/28/16 0:25	1066.139	51.86	326.172	51.78
4/28/16 0:40	1066.078	51.20	326.088	51.14
4/28/16 0:55	1066.009	50.31	326.018	50.25
4/28/16 1:10	1065.973	49.74	325.974	49.63
4/28/16 1:25	1065.868	49.35	325.895	49.31
4/28/16 1:40	1065.850	48.64	325.836	48.60
4/28/16 1:55	1065.803	48.25	325.772	48.23
4/28/16 2:10	1065.721	47.89	325.706	47.87
4/28/16 2:25	1065.665	47.16	325.649	47.12
4/28/16 2:40	1065.603	47.84	325.590	47.76
4/28/16 2:55	1065.546	47.99	325.522	47.93
4/28/16 3:10	1065.472	48.55	325.447	48.53
4/28/16 3:25	1065.420	47.84	325.399	47.84
4/28/16 3:40	1065.379	47.39	325.341	47.36
4/28/16 3:55	1065.331	47.91	325.287	47.88

TEST PRESSURE

Well Name:	Well No. 1
Operator:	Western Refining
State:	New Mexico
County:	Lea
Field:	Jal Station
API Number:	30-025-35954

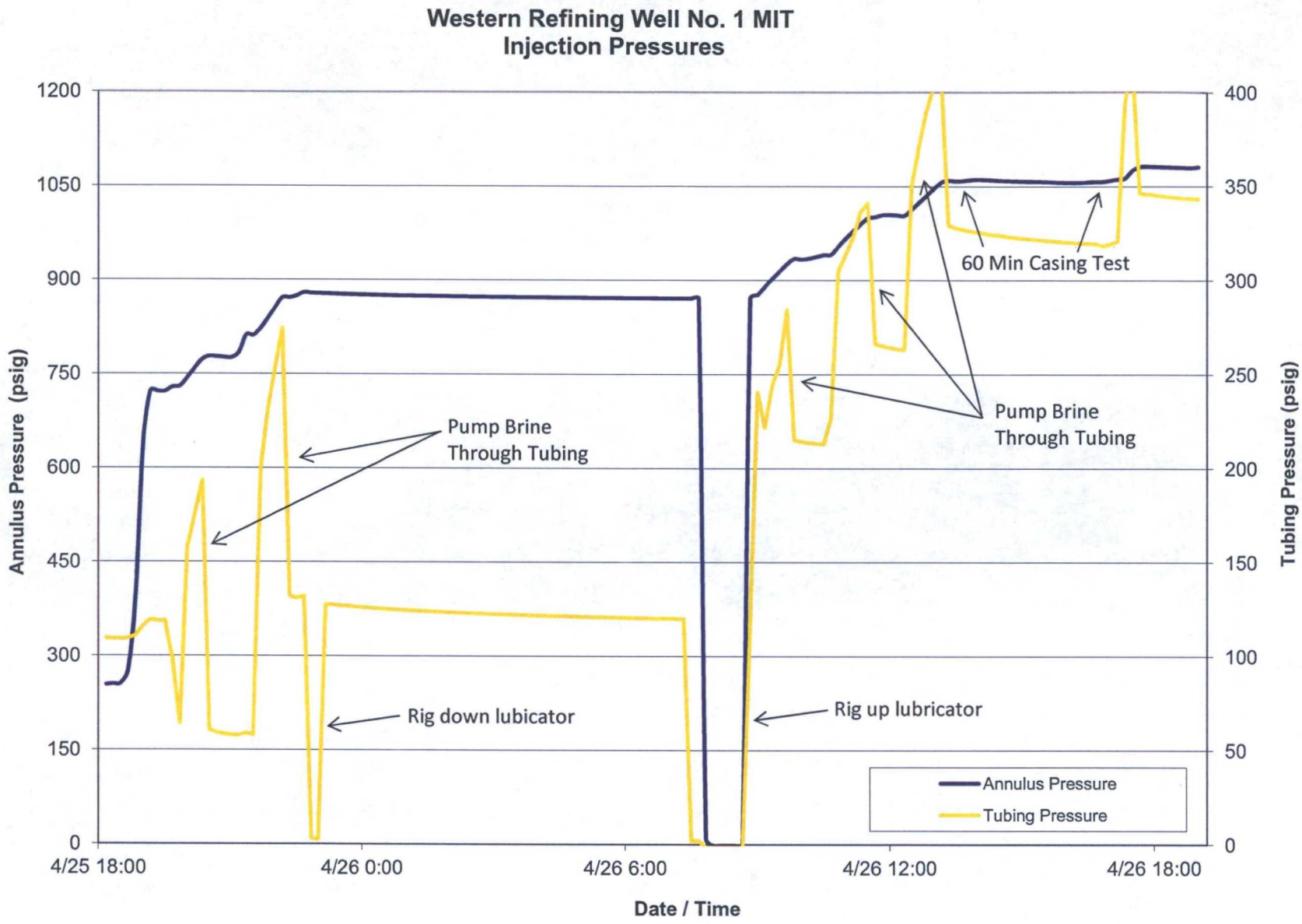
PRESSURE INFORMATION

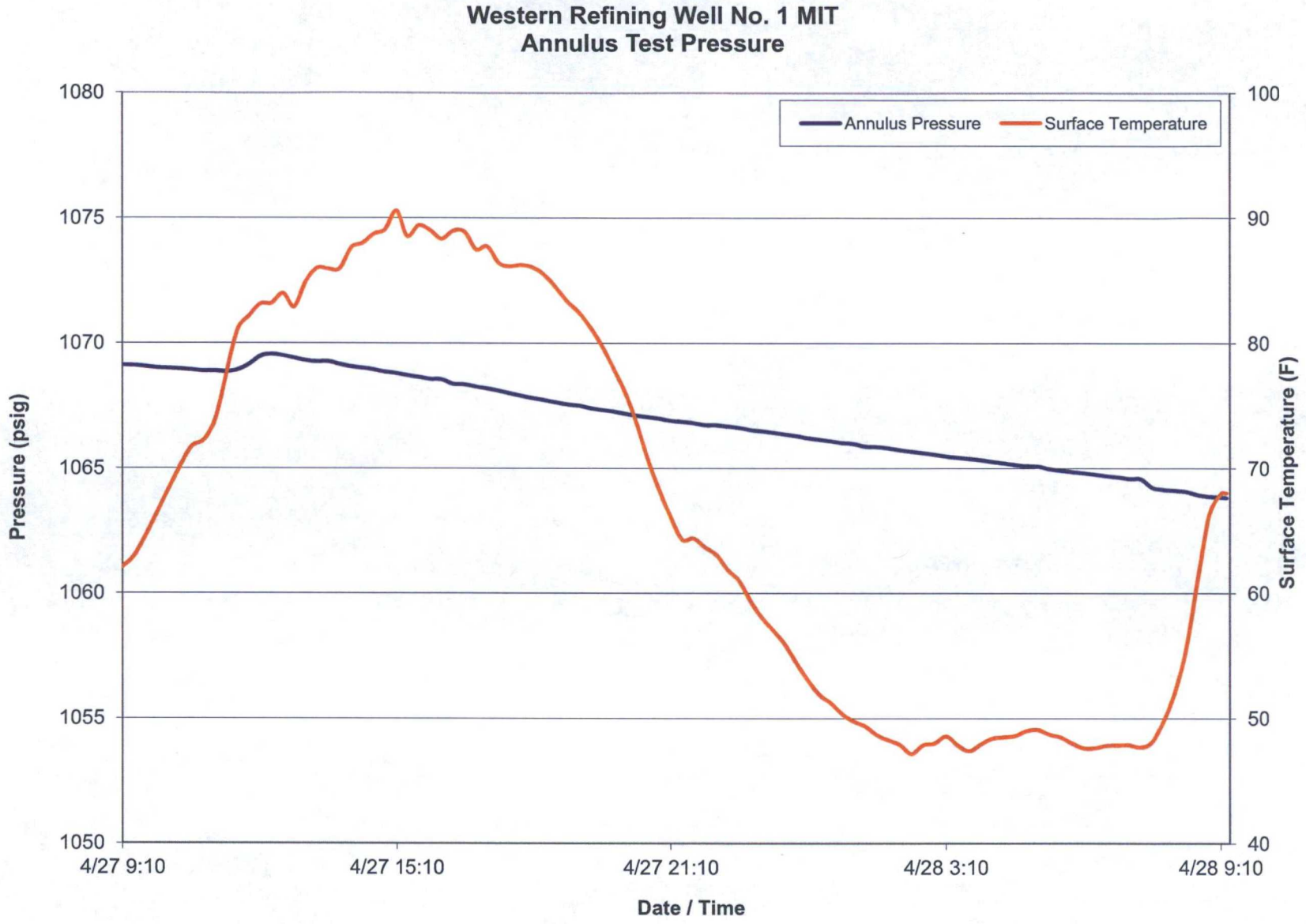
	Annulus Pressure		Tubing Pressure	
	Pressure	Temp	Pressure	Temp
Date / Time	psig	deg F	psig	deg F
4/28/16 4:10	1065.252	48.38	325.205	48.39
4/28/16 4:25	1065.203	48.49	325.145	48.50
4/28/16 4:40	1065.130	48.59	325.089	48.60
4/28/16 4:55	1065.087	48.98	325.025	48.99
4/28/16 5:10	1065.075	49.09	324.987	49.12
4/28/16 5:25	1064.967	48.71	324.916	48.75
4/28/16 5:40	1064.913	48.48	324.856	48.52
4/28/16 5:55	1064.852	47.99	324.800	48.03
4/28/16 6:10	1064.803	47.61	324.751	47.64
4/28/16 6:25	1064.749	47.61	324.700	47.66
4/28/16 6:40	1064.684	47.82	324.634	47.87
4/28/16 6:55	1064.640	47.83	324.577	47.90
4/28/16 7:10	1064.571	47.86	6.007	47.92
4/28/16 7:25	1064.563	47.68	0.581	47.89
4/28/16 7:40	1064.222	48.10	323.739	48.22
4/28/16 7:55	1064.138	49.76	323.696	49.71
4/28/16 8:10	1064.104	52.08	323.647	52.09
4/28/16 8:25	1064.056	55.66	323.654	55.36
4/28/16 8:40	1063.927	61.20	323.748	60.62
4/28/16 8:55	1063.865	66.32	323.477	65.71
4/28/16 9:10	1063.840	67.96	323.365	67.91
4/28/16 9:17	1063.817	68.00	323.427	68.10

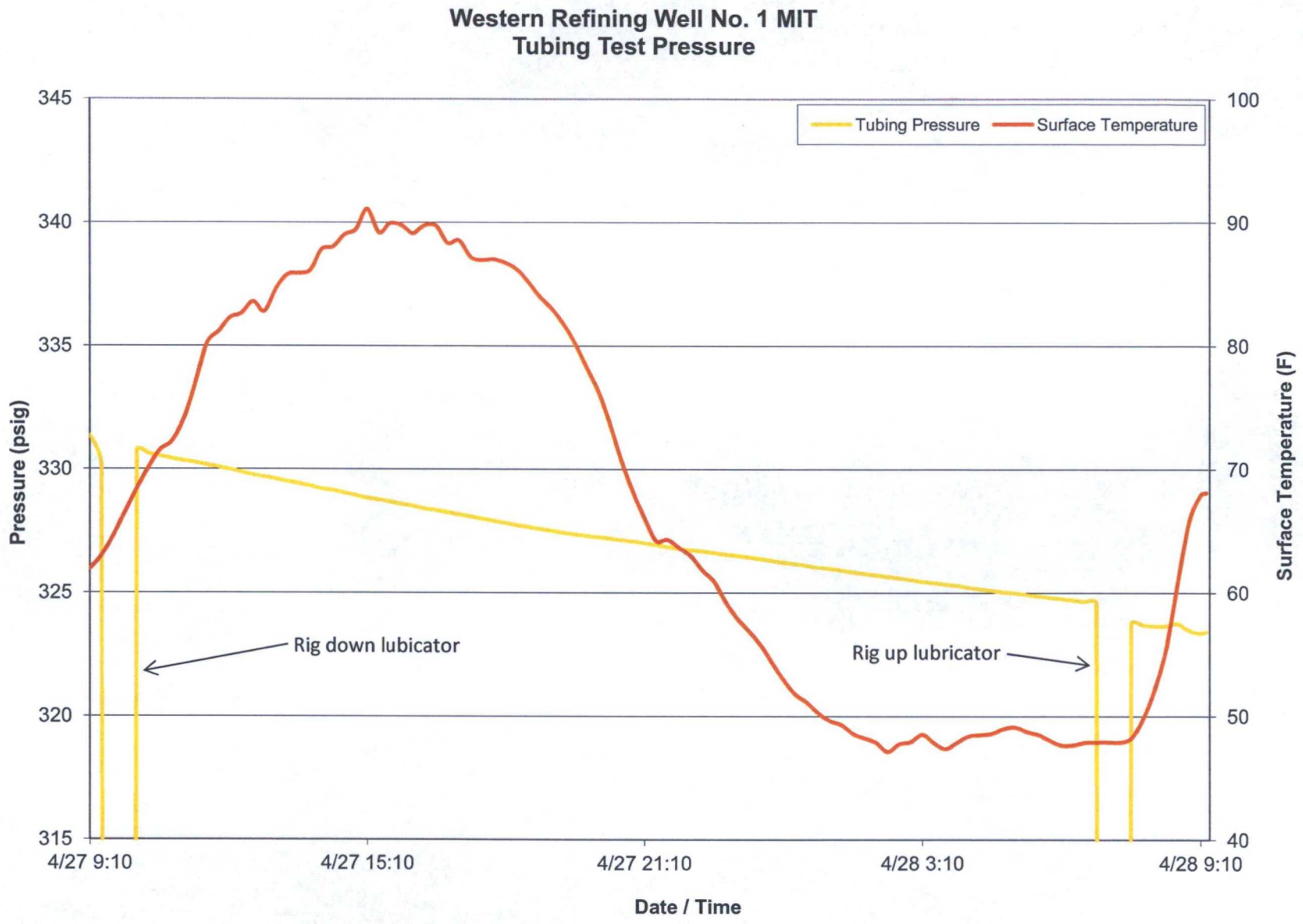
Appendix D – Calculated Borehole Volumes

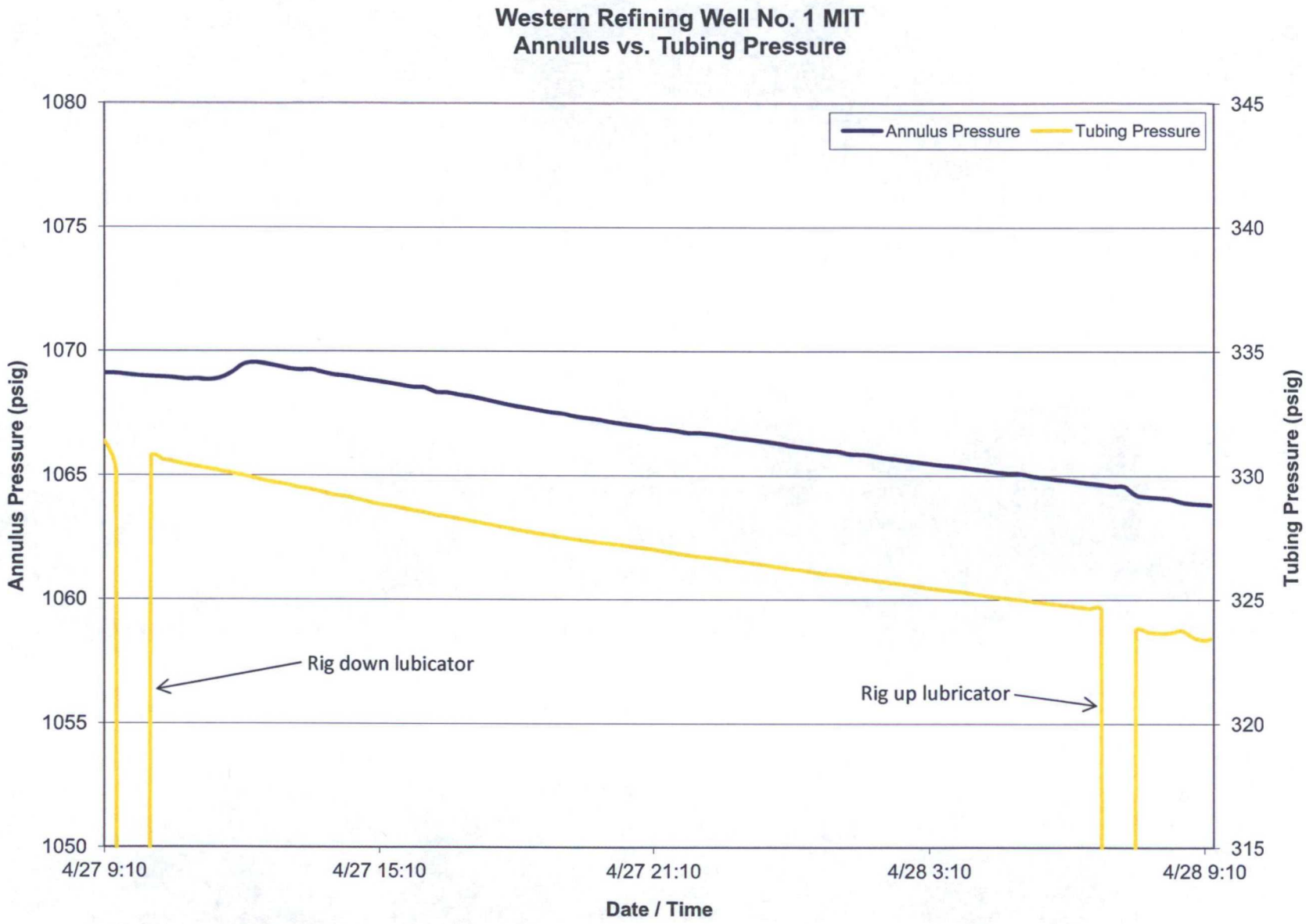
Western Refining Well No. 1 MIT - Borehole Calculations					
Inf Depth	N2 Volume	N2 Pressure	Borehole Volume	Borehole Volume	Borehole Volume
Logged	Turbine	Gauge	Cumulative	Incremental Per Interval	Incremental Per Foot
ft	scf	psig	bbls	bbls	bbls/ft
1,520	53,400	1,080.83	N/A	N/A	N/A
1,522	53,850	1,081.14	128.55	1.03	0.52
1,524	54,175	1,081.43	129.29	0.74	0.37
1,526	54,600	1,081.72	130.27	0.98	0.49
1,532.5	58,200	1,080.39	139.01	8.74	1.34

Appendix E – Pressure and Temperature Graphs

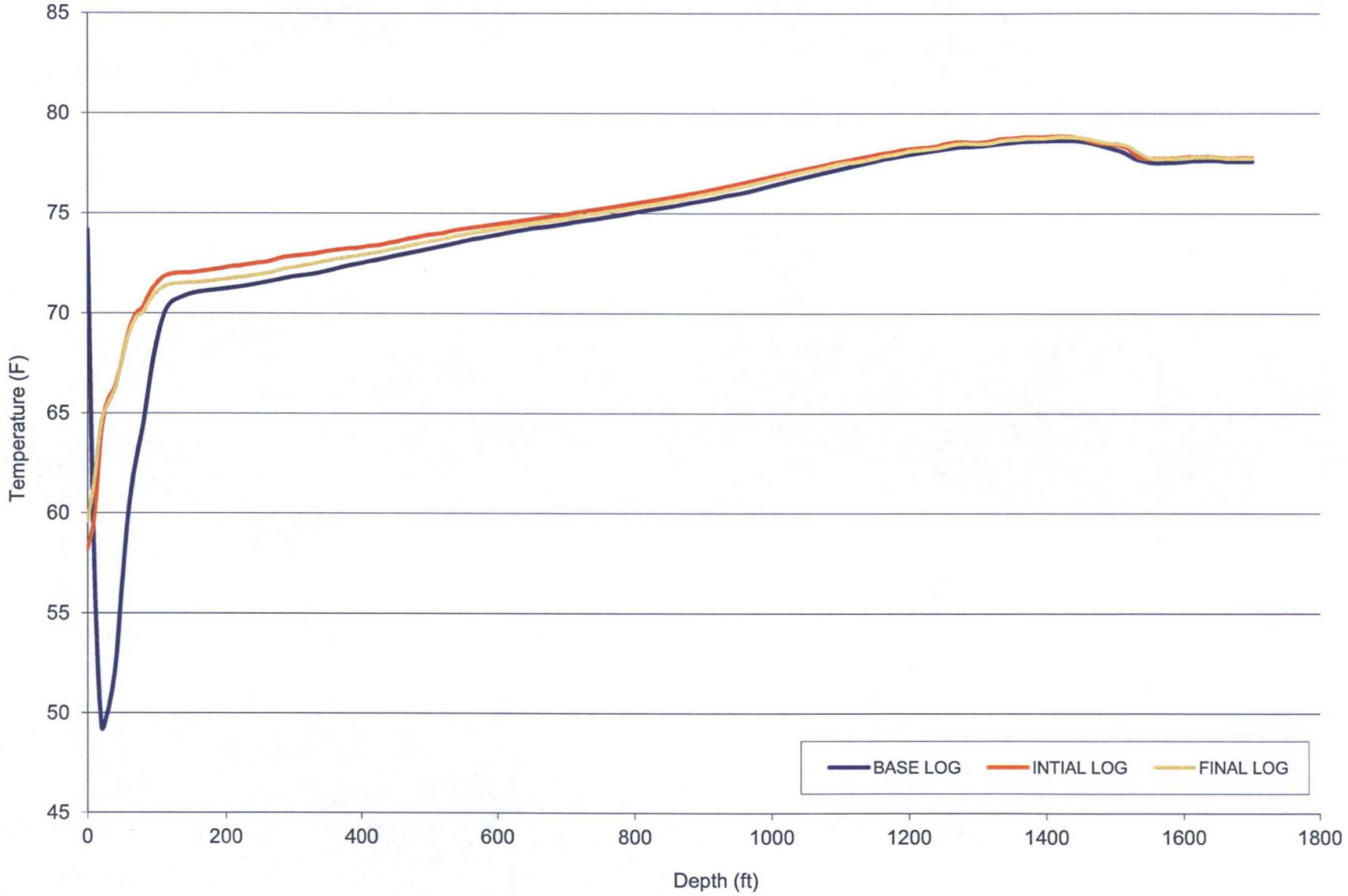

Western Refining Well No. 1 MIT
Injection Pressures
Annulus Pressure (psig)
Tubing Pressure (psig)
Date / Time
1200
1050
900
750
600
450
300
150
0
400
350
300
250
200
150
100
50
0
4/25 18:00
4/26 0:00
4/26 6:00
4/26 12:00
4/26 18:00
Pump Brine
Through Tubing
Pump Brine
Through Tubing
60 Min Casing Test
Rig down lubicator
Rig up lubricator
Annulus Pressure
Tubing Pressure


Western Refining Well No. 1 MIT
Annulus Test Pressure
Annulus Pressure
Surface Temperature
Pressure (psig)
Surface Temperature (F)
1080
1075
1070
1065
1060
1055
1050
100
90
80
70
60
50
40
4/27 9:10
4/27 15:10
4/27 21:10
4/28 3:10
4/28 9:10
Date / Time


Western Refining Well No. 1 MIT
Tubing Test Pressure
Tubing Pressure
Surface Temperature
Pressure (psig)
Surface Temperature (F)
345
340
335
330
325
320
315
100
90
80
70
60
50
40
Rig down lubicator
Rig up lubricator
4/27 9:10
4/27 15:10
4/27 21:10
4/28 3:10
4/28 9:10
Date / Time


Western Refining Well No. 1 MIT
Annulus vs. Tubing Pressure
Annulus Pressure
Tubing Pressure
1080
1075
1070
1065
1060
1055
1050
345
340
335
330
325
320
315
Annulus Pressure (psig)
Tubing Pressure (psig)
Rig down lubicator
Rig up lubricator
4/27 9:10
4/27 15:10
4/27 21:10
4/28 3:10
4/28 9:10
Date / Time

Western Refining Well No. 1 MIT
Wellbore Temperature Graph



Appendix F – Well Logs

Casedhole Solutions

MIT DENSITY SURVEY

Company WESTERN REFINING COMPANY
Well STATE LPG WELL #1
Field JAL
County LEA State NEW MEXICO

Location: API # :

SEC M-32TWP 23S RGE 37E

Other Services

Elevation

Permanent Datum Elevation 3312
Log Measured From BOTTOM FLANGE
Drilling Measured From

K.B.
D.F.
G.L. 3312

Company WESTERN REFINING COMPANY
Well STATE LPG WELL #1
Field JAL
County LEA
State NEW MEXICO

Date	4-25-16		
Run Number	ONE		
Depth Driller			
Depth Logger	1750		
Bottom Logged Interval	1750		
Top Log Interval	SURFACE		
Open Hole Size			
Type Fluid	WATER		
Density / Viscosity			
Max. Recorded Temp.			
Estimated Cement Top			
Time Well Ready			
Time Logger on Bottom			
Equipment Number	0839		
Location	HUTCHINSON KS.		
Recorded By	WILL GEORGE		
Witnessed By	THOMASON		

Borehole Record				Tubing Record			
Run Number	Bit	From	To	Size	Weight	From	To

Casing Record	Size	Wgt/Ft	Top	Bottom
Surface String	9-5/8"	36 lb/ft	Surface	259'
Prot. String				
Production String	7"	23 lb/ft	Surface	1521'
Liner	5-1/2"	N/A		
Tubing	3-1/2"	9.3 LB/FT	Surface	1825'

<<< Fold Here >>>

All interpretations are opinions based on inferences from electrical or other measurements and we cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to our general terms and conditions set out in our current Price Schedule.

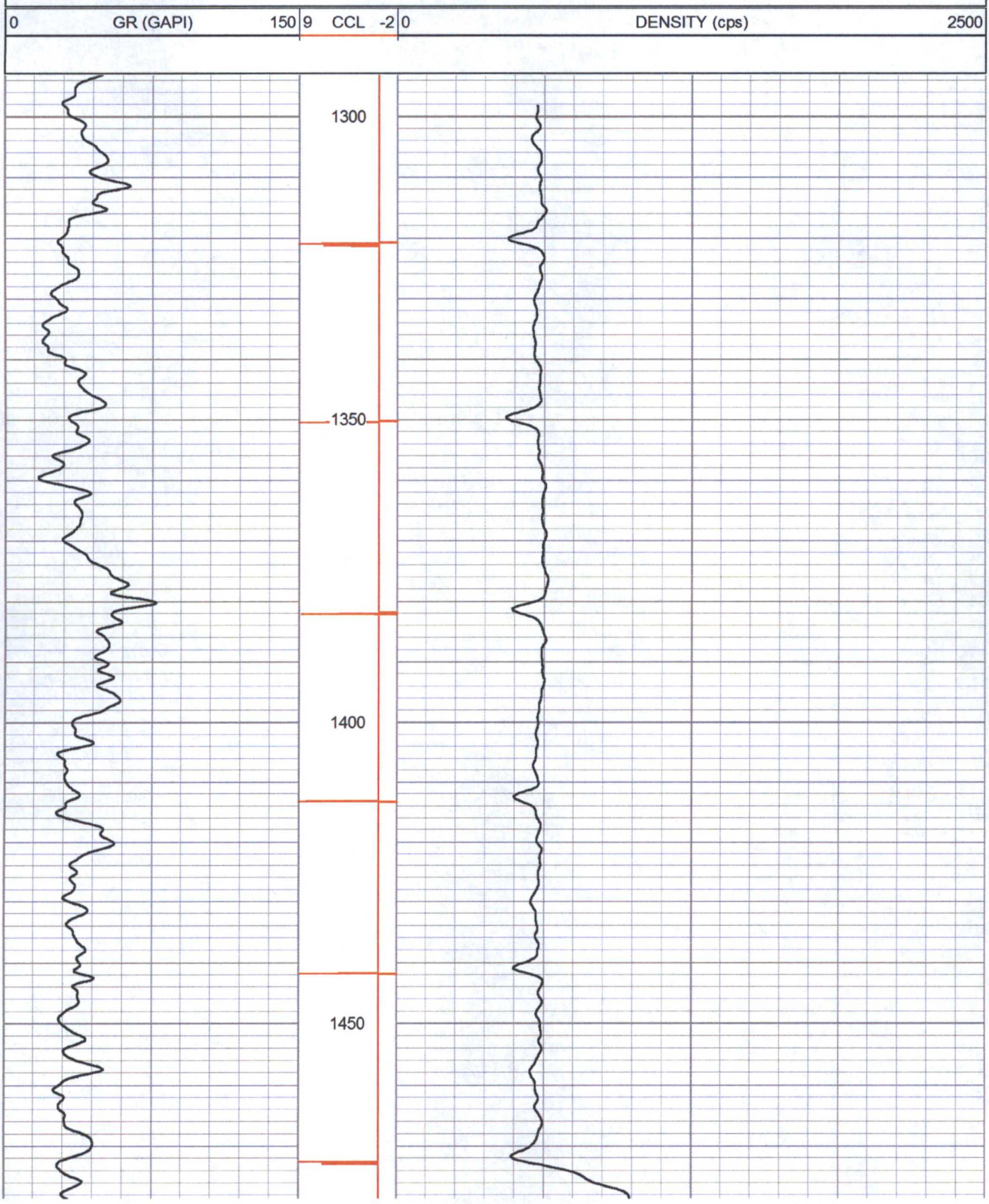
Comments

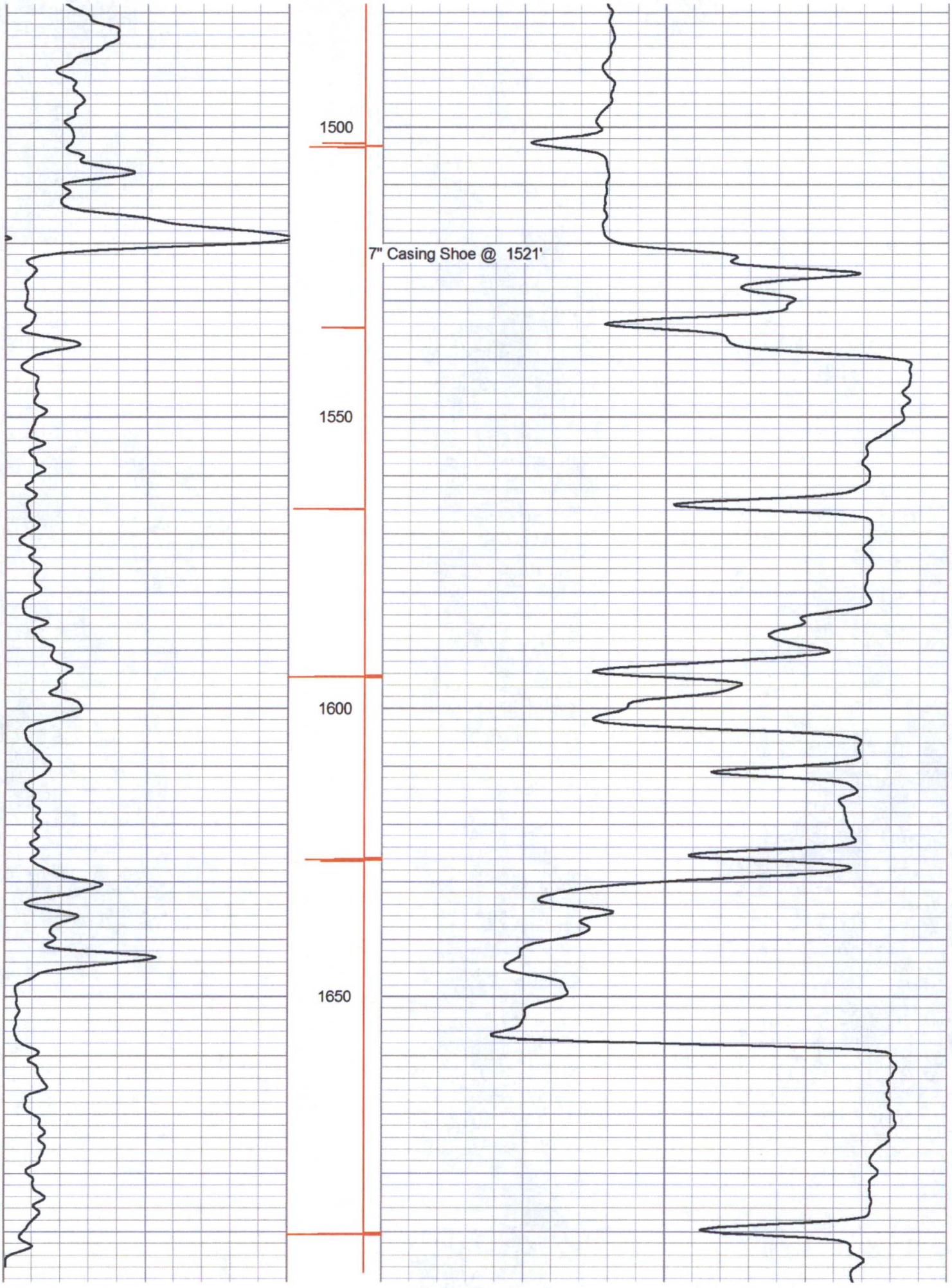
THANK YOU FOR USING CASEDHOLE SOULTIONS
Bend in Tubing @ 1750'

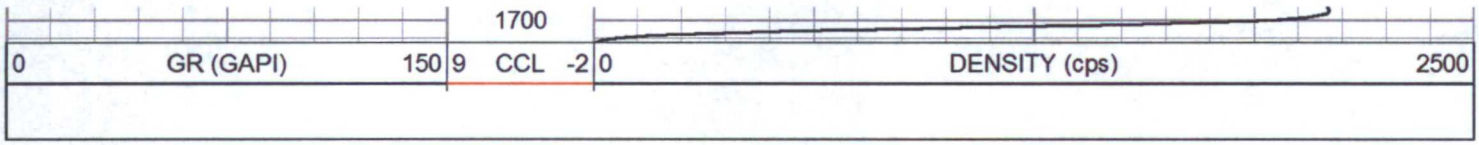
Casedhole Solutions

BASE DENSITY PASS

Database File: western refining #1.db
Dataset Pathname: pass4.4
Presentation Format: gr-n-ccl
Dataset Creation: Mon Apr 25 17:01:47 2016 by Calc Std Casedhole 09061
Charted by: Depth in Feet scaled 1:240



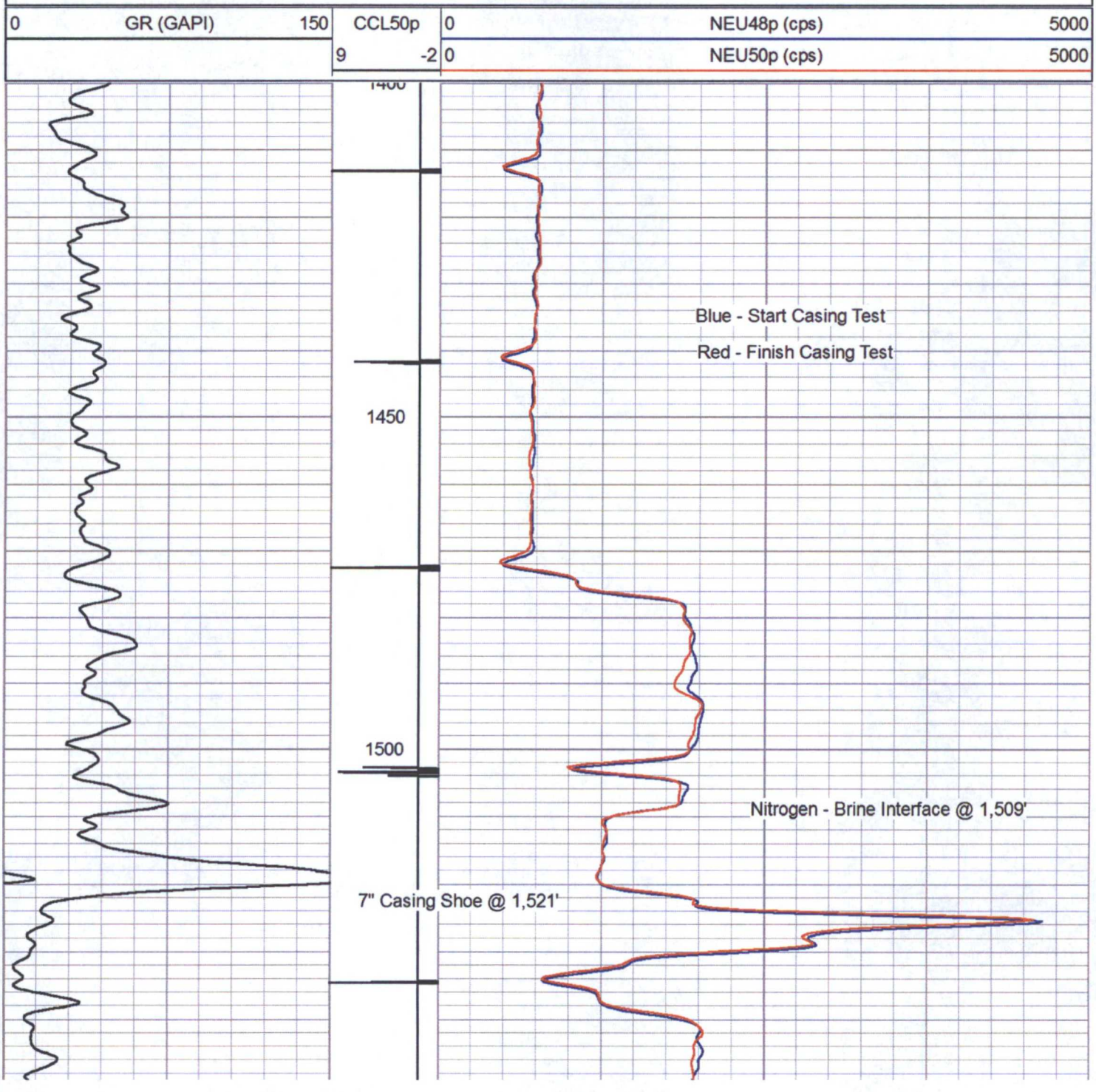

1500
7" Casing Shoe @ 1521'
1550
1600
1650

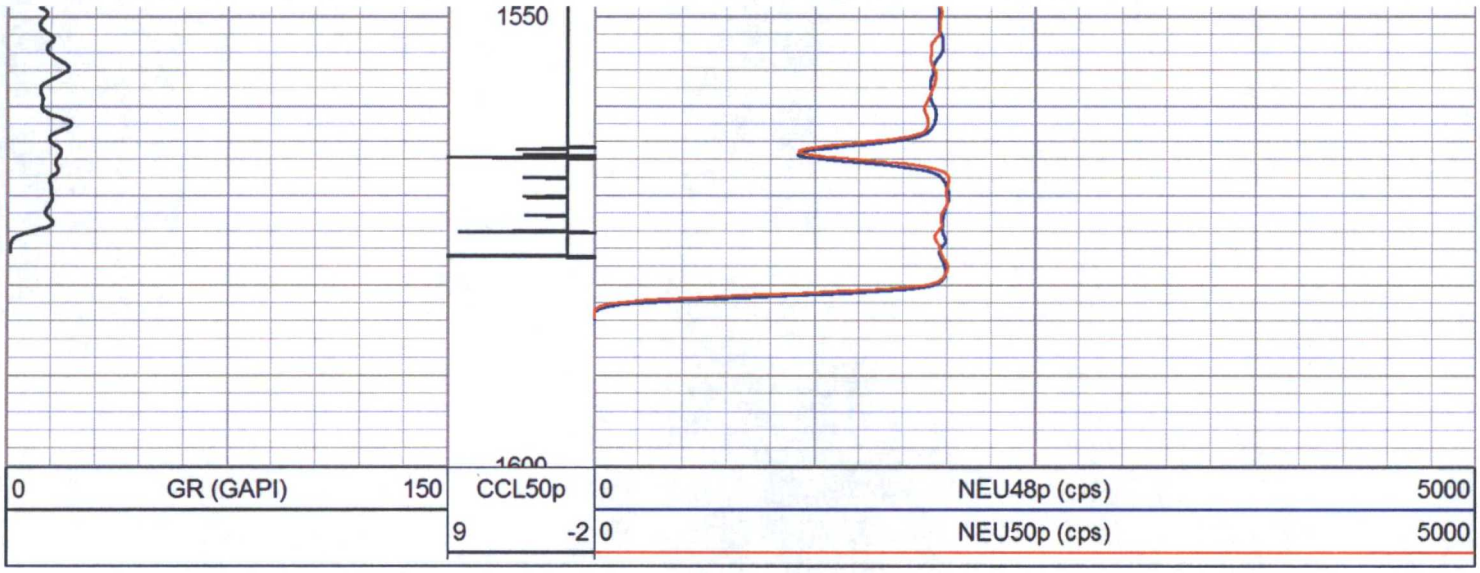


Casedhole Solutions

CASING TEST

Database File:	western refining #1.db
Dataset Pathname:	pass48ct
Presentation Format:	gr-n-ccl
Dataset Creation:	Wed May 11 14:29:56 2016
Charted by:	Depth in Feet scaled 1:240

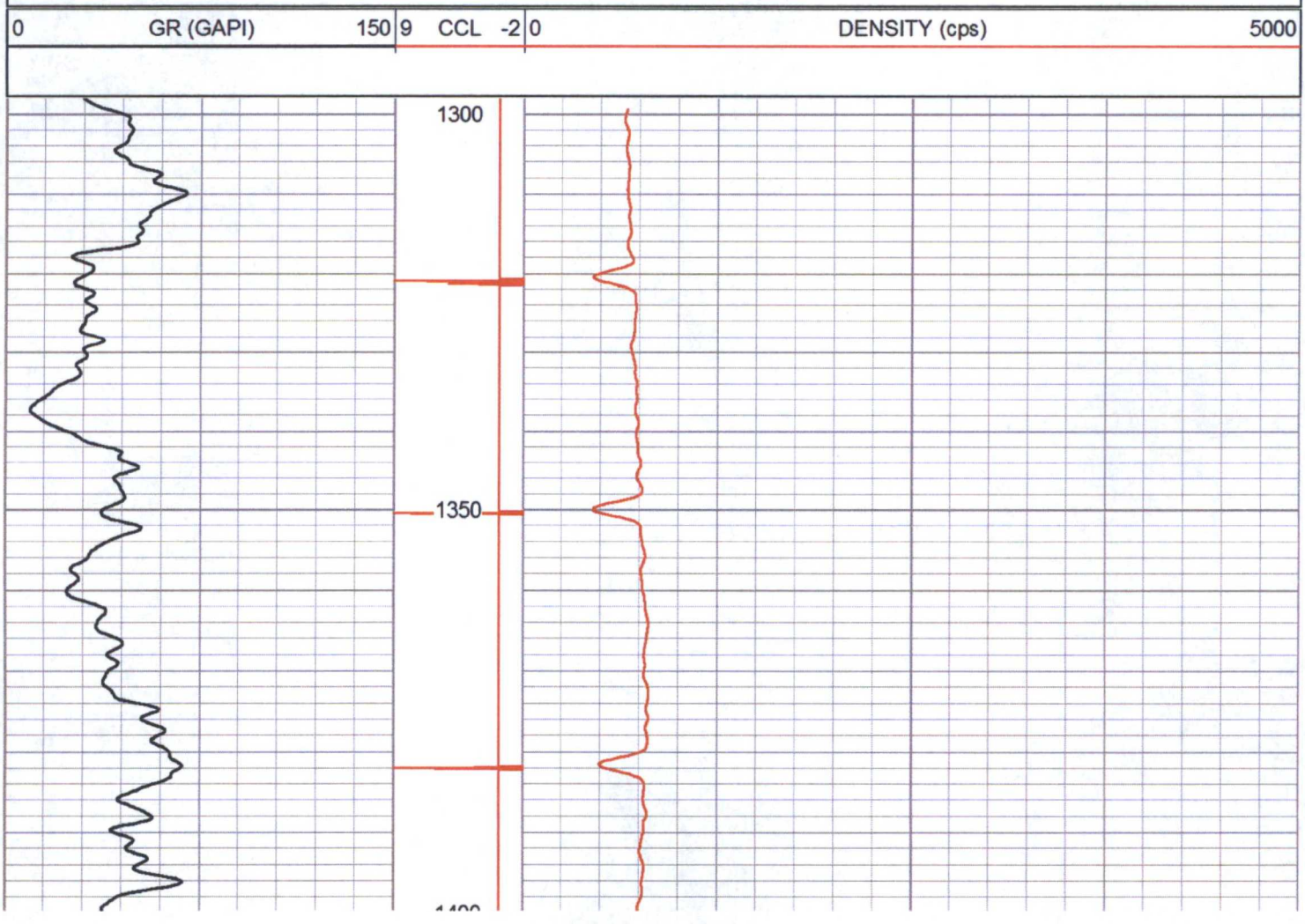


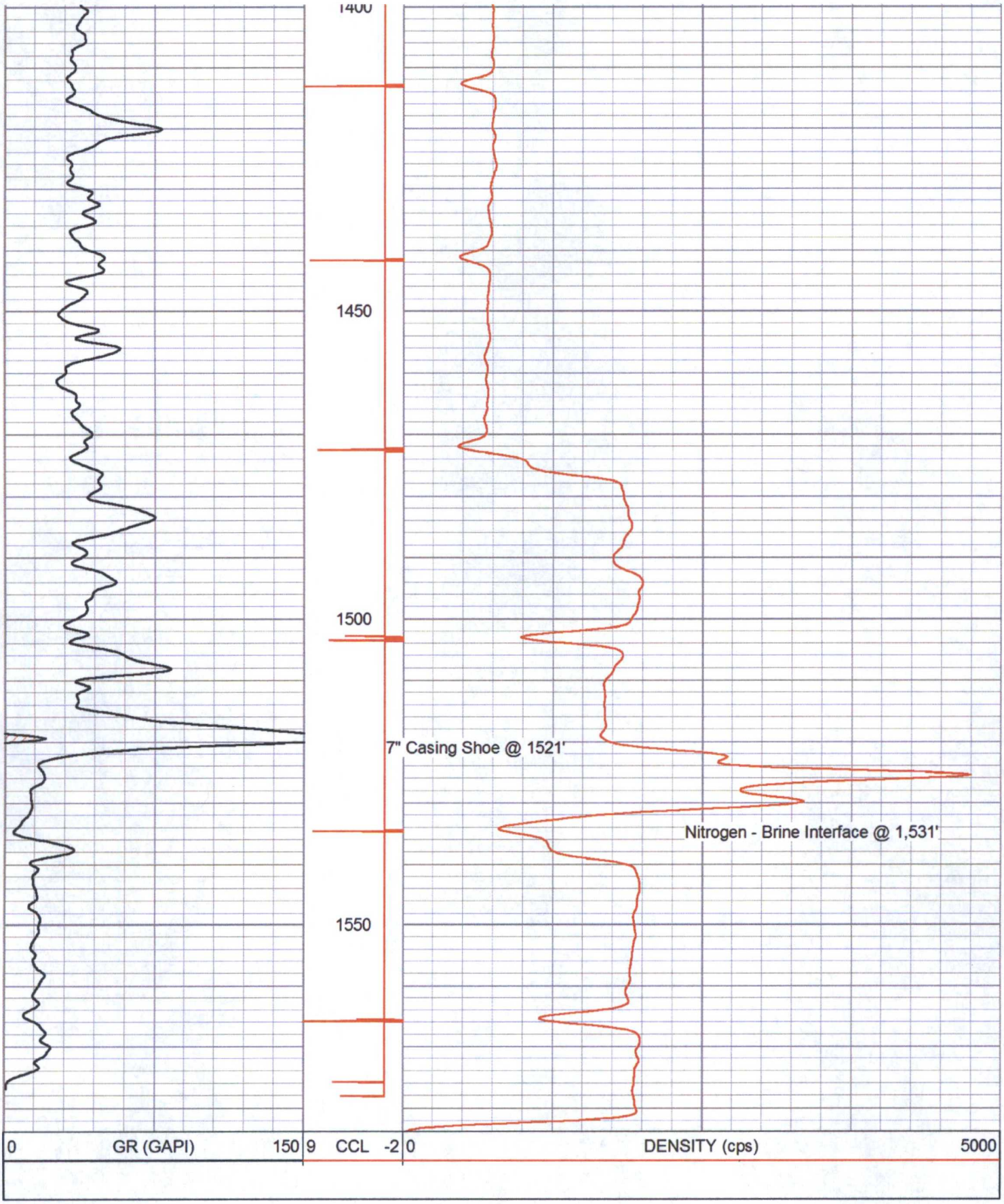


Casedhole Solutions

POST INJECTION PASS

Database File:	western refining #1.db
Dataset Pathname:	pass78
Presentation Format:	gr-n-ccl
Dataset Creation:	Tue Apr 26 19:24:19 2016 by Log Std Casedhole 09061
Charted by:	Depth in Feet scaled 1:240

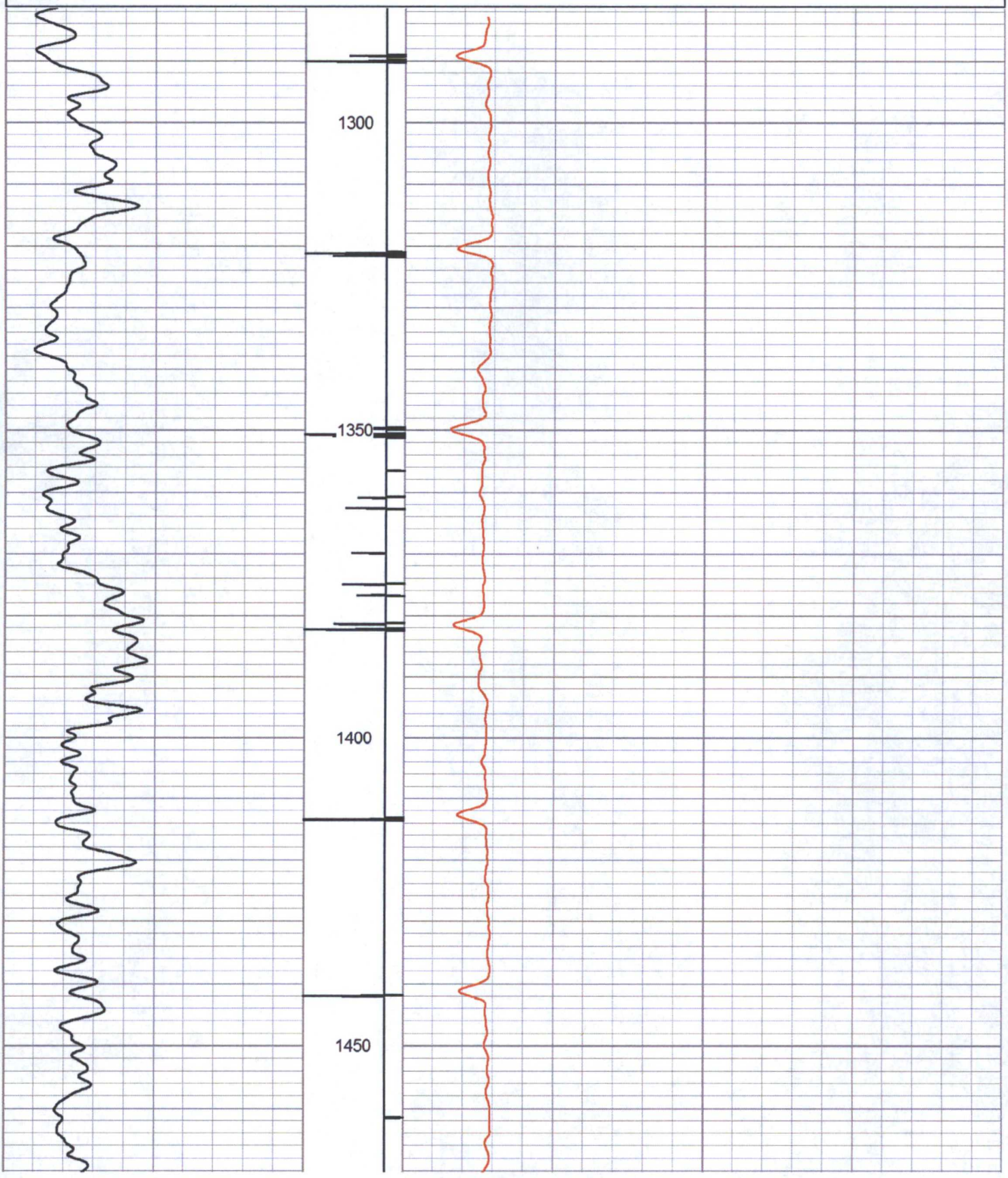


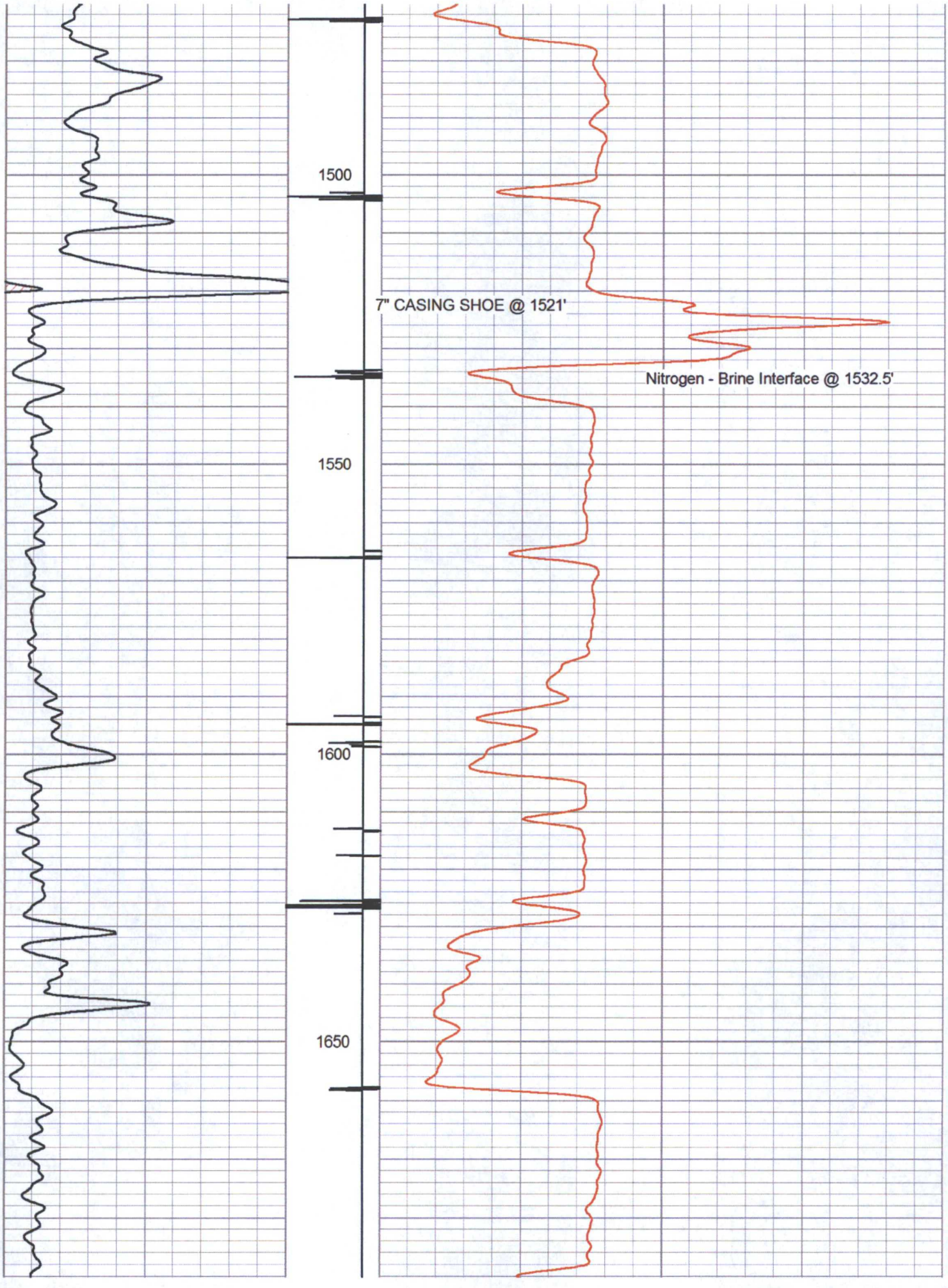


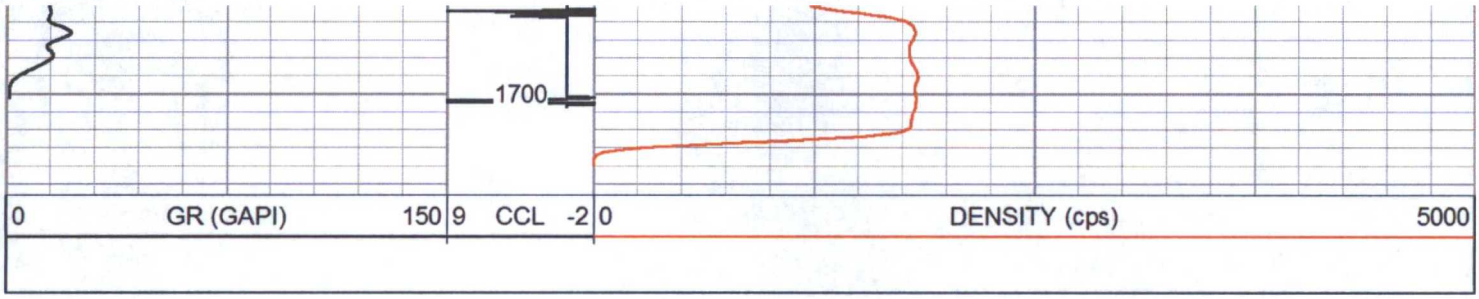
Casedhole Solutions

INITIALIZATION LOG

Database File:	western refining #1.db
Dataset Pathname:	pass80
Presentation Format:	gr-n-ccl
Dataset Creation:	Wed Apr 27 08:12:17 2016 by Log Std Casedhole 09061
Charted by:	Depth in Feet scaled 1:240



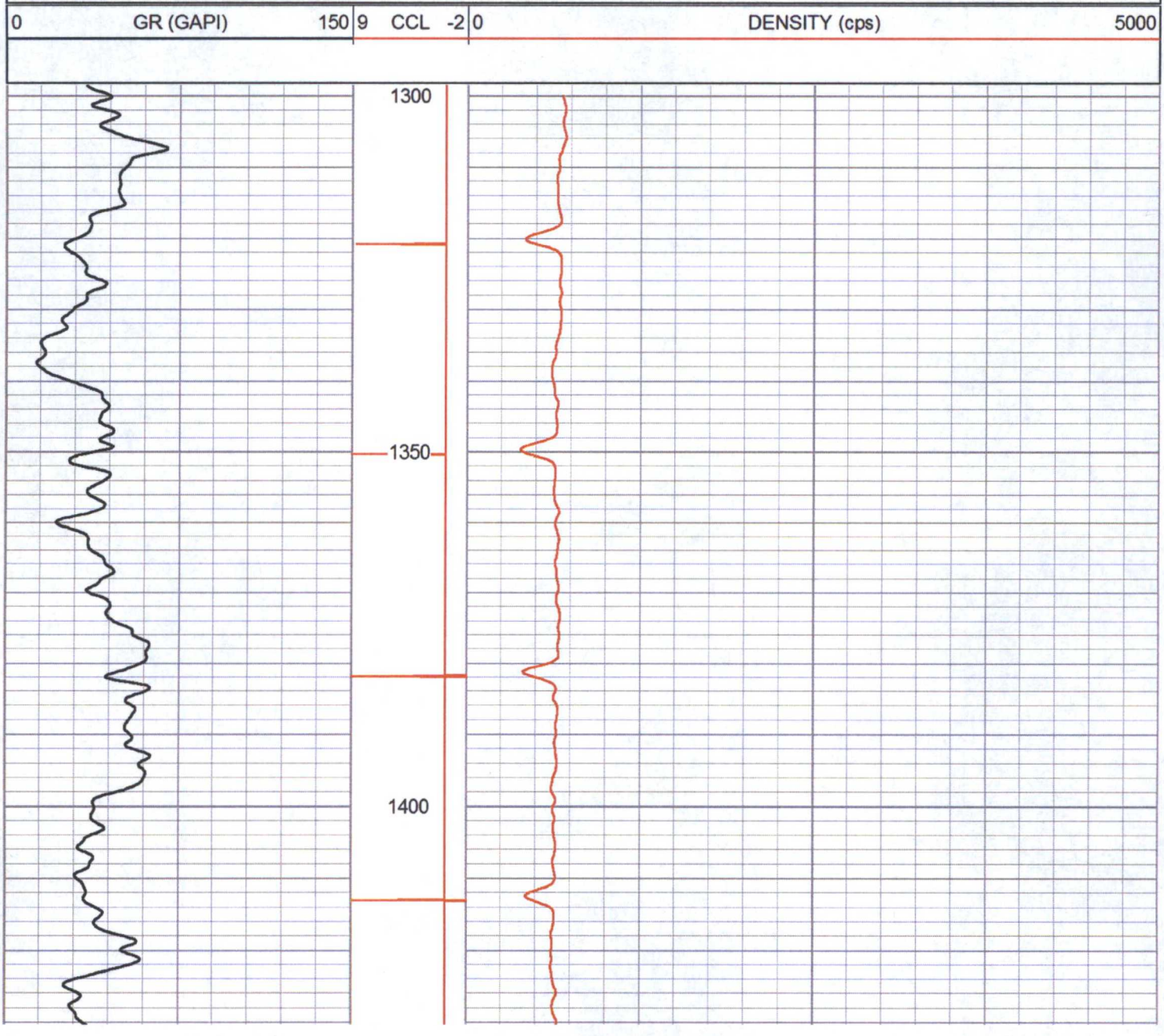

1500
7" CASING SHOE @ 1521'
Nitrogen - Brine Interface @ 1532.5'
1550
1600
1650

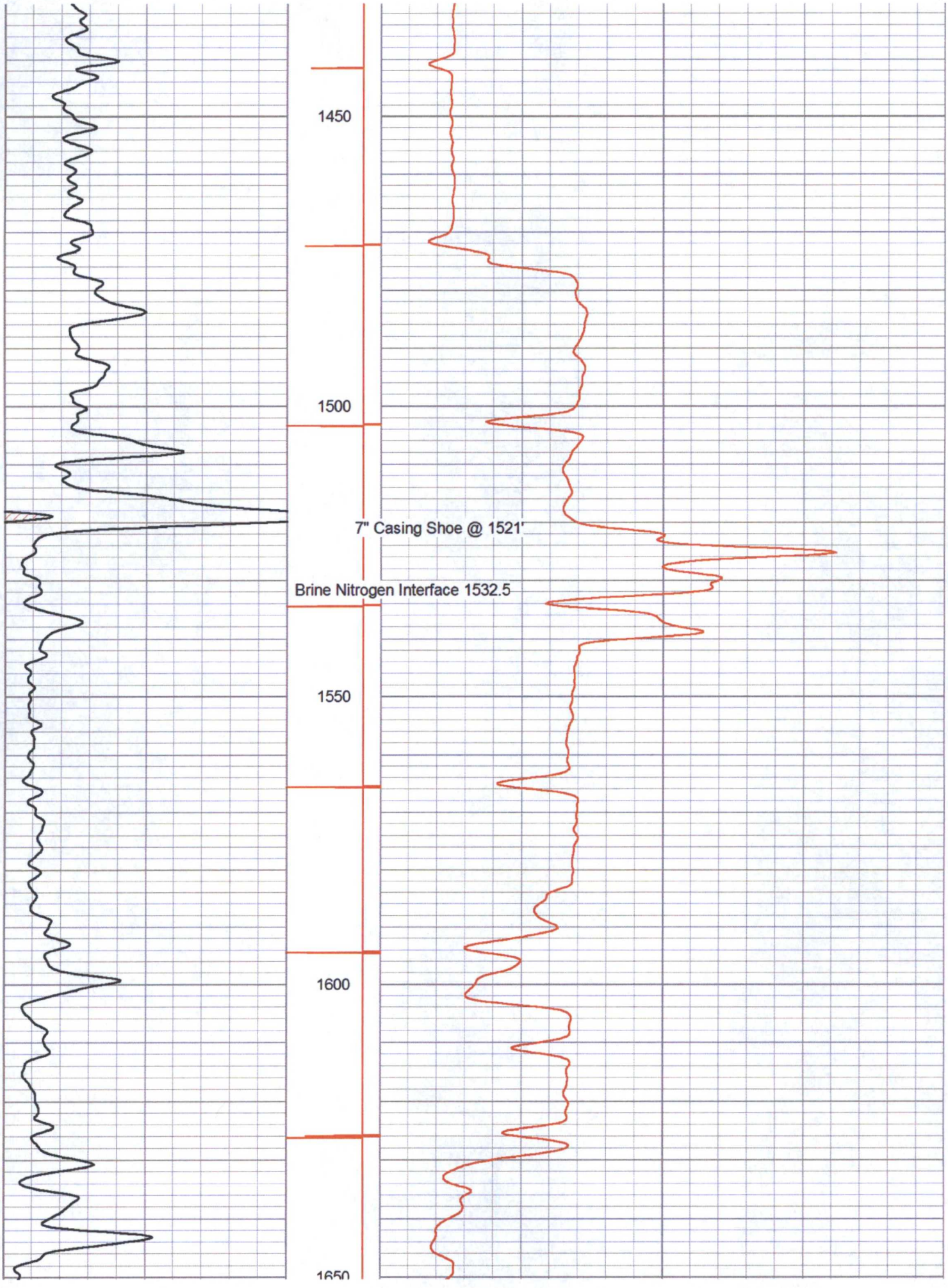


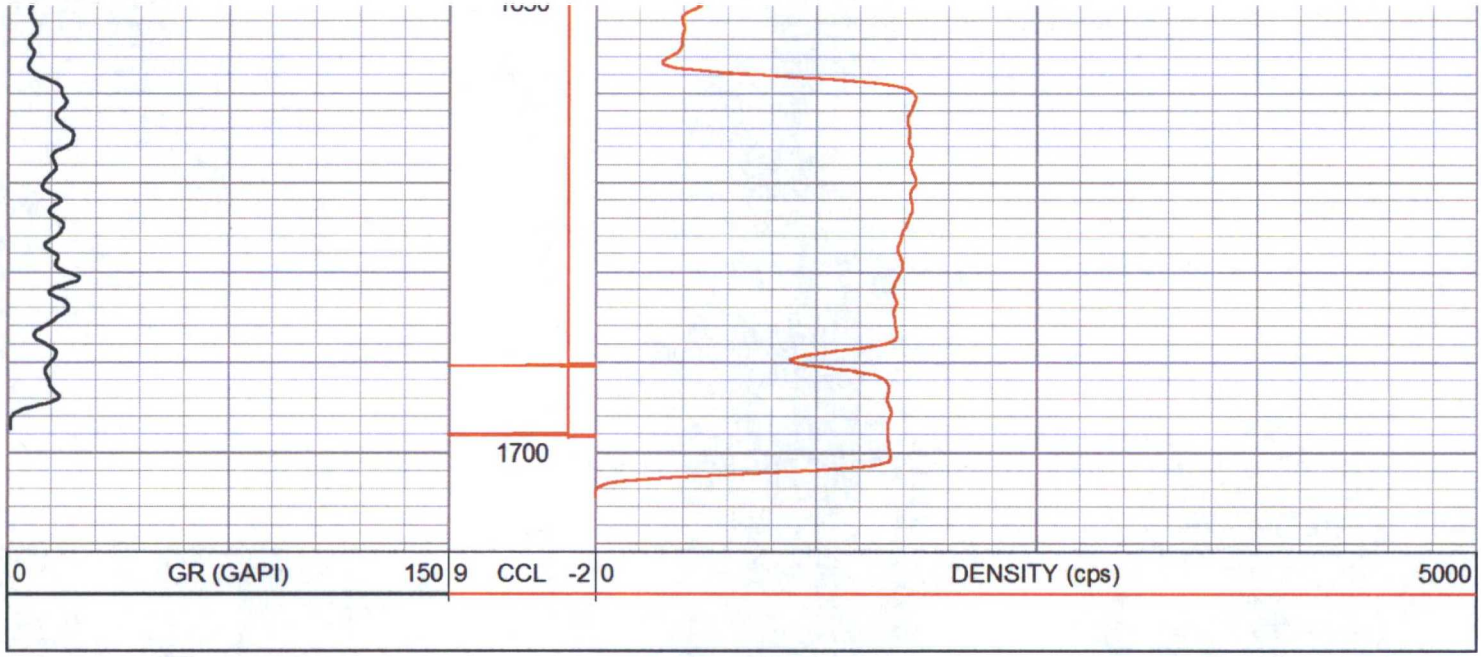
Casedhole Solutions

Finalization Log

Database File:	western refining #1.db
Dataset Pathname:	pass83
Presentation Format:	gr-n-ccl
Dataset Creation:	Thu Apr 28 08:16:45 2016 by Log Std Casedhole 09061
Charted by:	Depth in Feet scaled 1:240



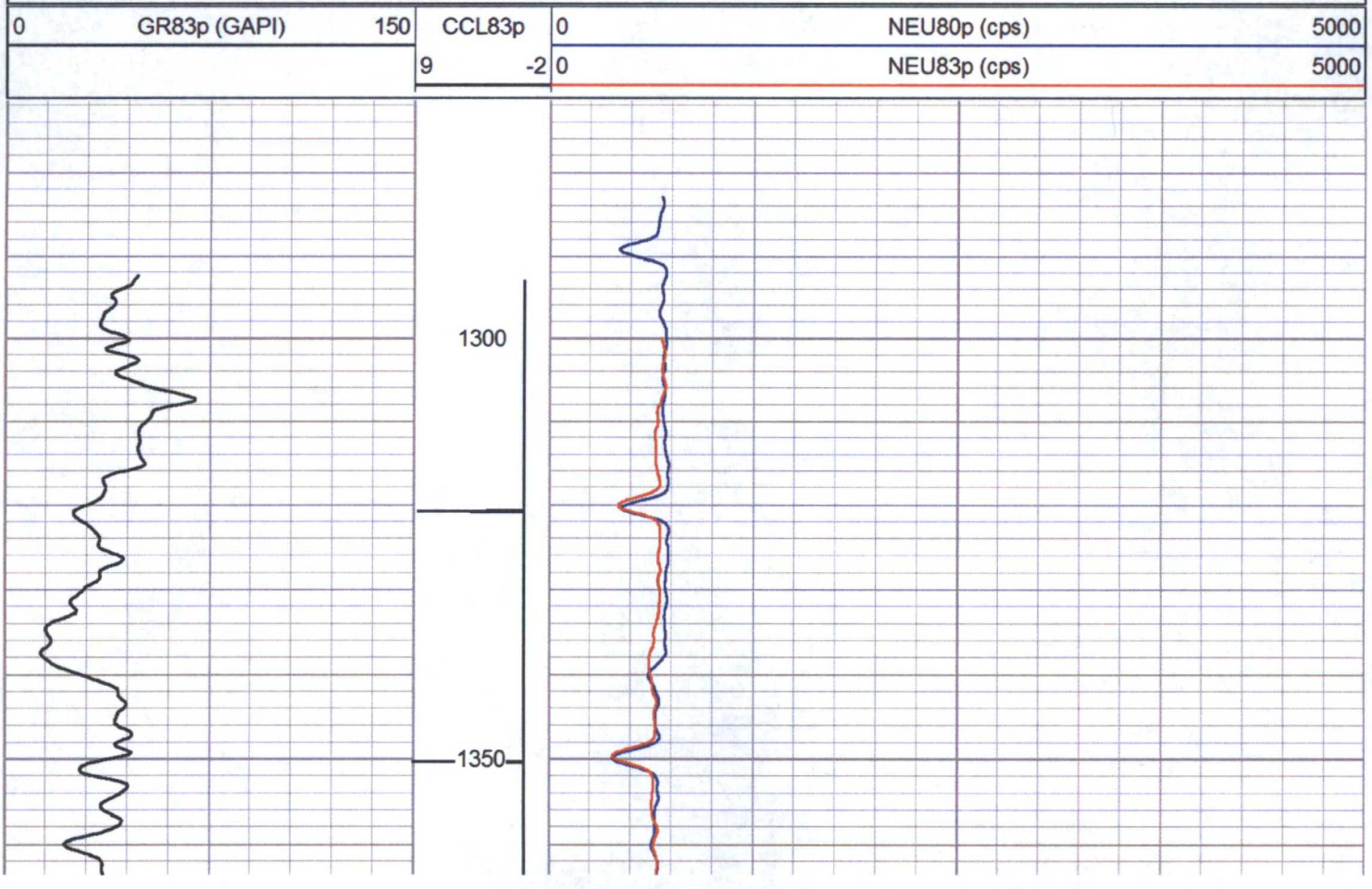

1450
1500
7" Casing Shoe @ 1521'
Brine Nitrogen Interface 1532.5
1550
1600
1650

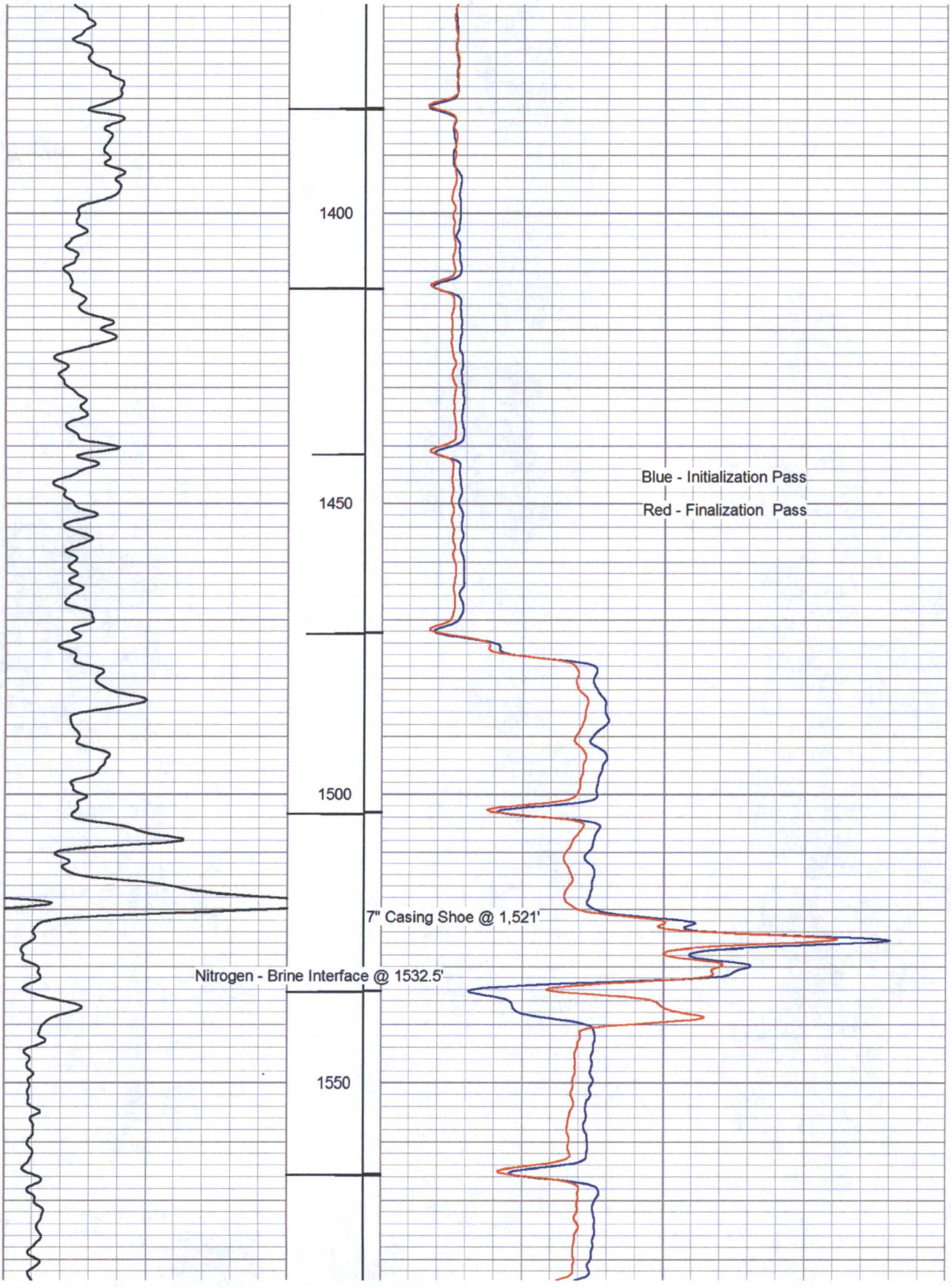


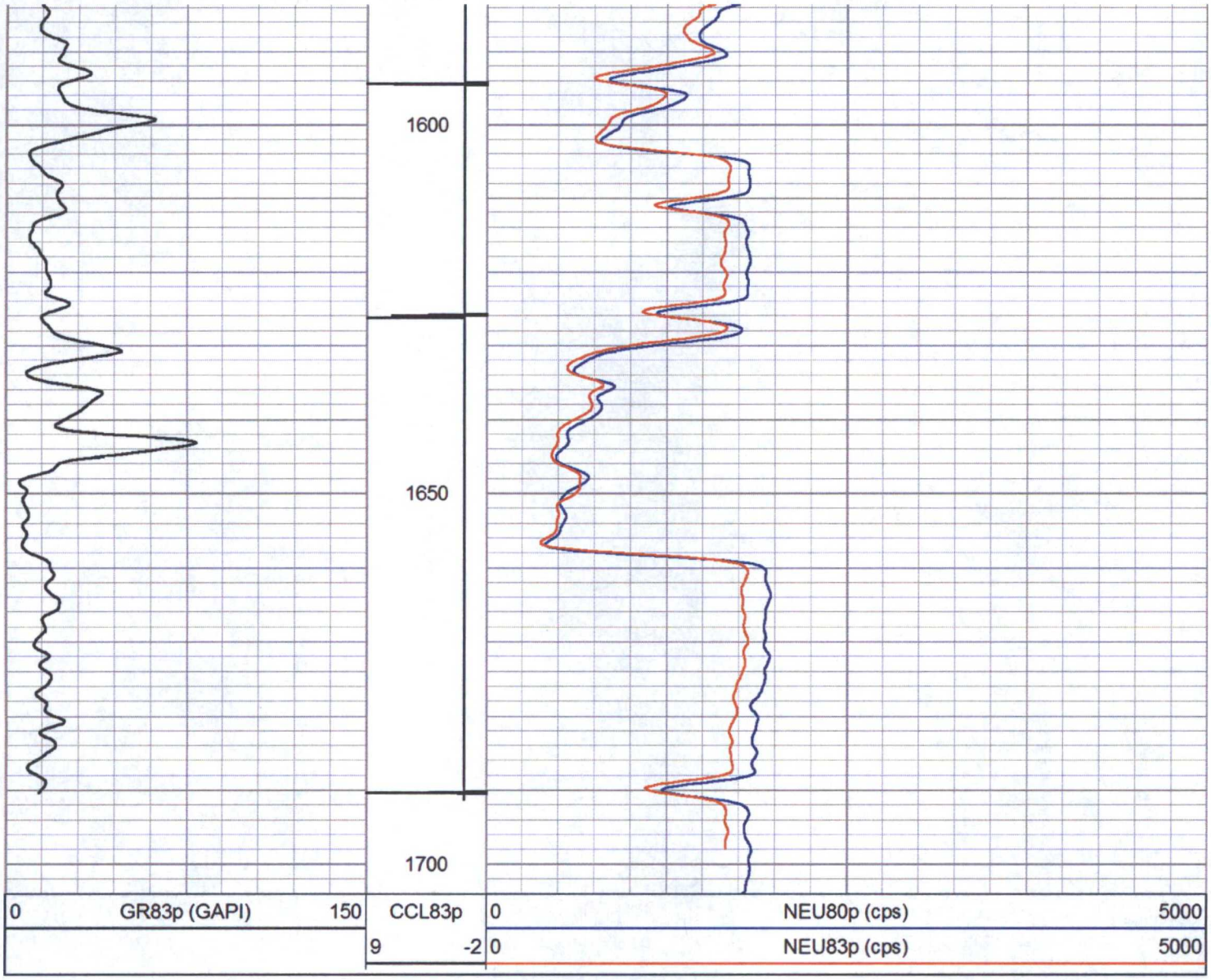
Casedhole Solutions

DENSITY MERGE

Database File:	western refining #1.db
Dataset Pathname:	pass83m
Presentation Format:	gr-n-ccl
Dataset Creation:	Thu May 12 11:41:07 2016
Charted by:	Depth in Feet scaled 1:240




1400
1450
1500
1550
Blue - Initialization Pass
Red - Finalization Pass
7" Casing Shoe @ 1,521'
Nitrogen - Brine Interface @ 1532.5'


1600
1650
1700
0
GR83p (GAPI)
150
CCL83p
9
-2
0
NEU80p (cps)
5000
0
NEU83p (cps)
5000

Casedhole Solutions

MIT TEMPERATURE SURVEY

Company WESTERN REFINING COMPANY
Well STATE LPG WELL #1
Field JAL
County LEA State NEW MEXICO

Location: API # :

SEC M-32TWP 23S RGE 37E

Other Services

Permanent Datum Elevation 3312
Log Measured From BOTTOM FLANGE
Drilling Measured From

Elevation
K.B.
D.F.
G.L. 3312

Company WESTERN REFINING COMPANY
Well STATE LPG WELL #1
Field JAL
County LEA
State NEW MEXICO

Date	4-25-16		
Run Number	ONE		
Depth Driller			
Depth Logger	1750		
Bottom Logged Interval	1750		
Top Log Interval	SURFACE		
Open Hole Size			
Type Fluid	WATER		
Density / Viscosity			
Max. Recorded Temp.			
Estimated Cement Top			
Time Well Ready			
Time Logger on Bottom			
Equipment Number	0839		
Location	HUTCHINSON KS.		
Recorded By	WILL GEORGE		
Witnessed By	THOMASON		

Borehole Record				Tubing Record			
Run Number	Bit	From	To	Size	Weight	From	To

Casing Record	Size	Wgt/Ft	Top	Bottom
Surface String	9-5/8"	36 lb/ft	Surface	259'
Prot. String				
Production String	7"	23 lb/ft	Surface	1521'
Liner	5-1/2"	N/A		
Tubing	3-1/2"	9.3 LB/FT	Surface	1825'

<<< Fold Here >>>

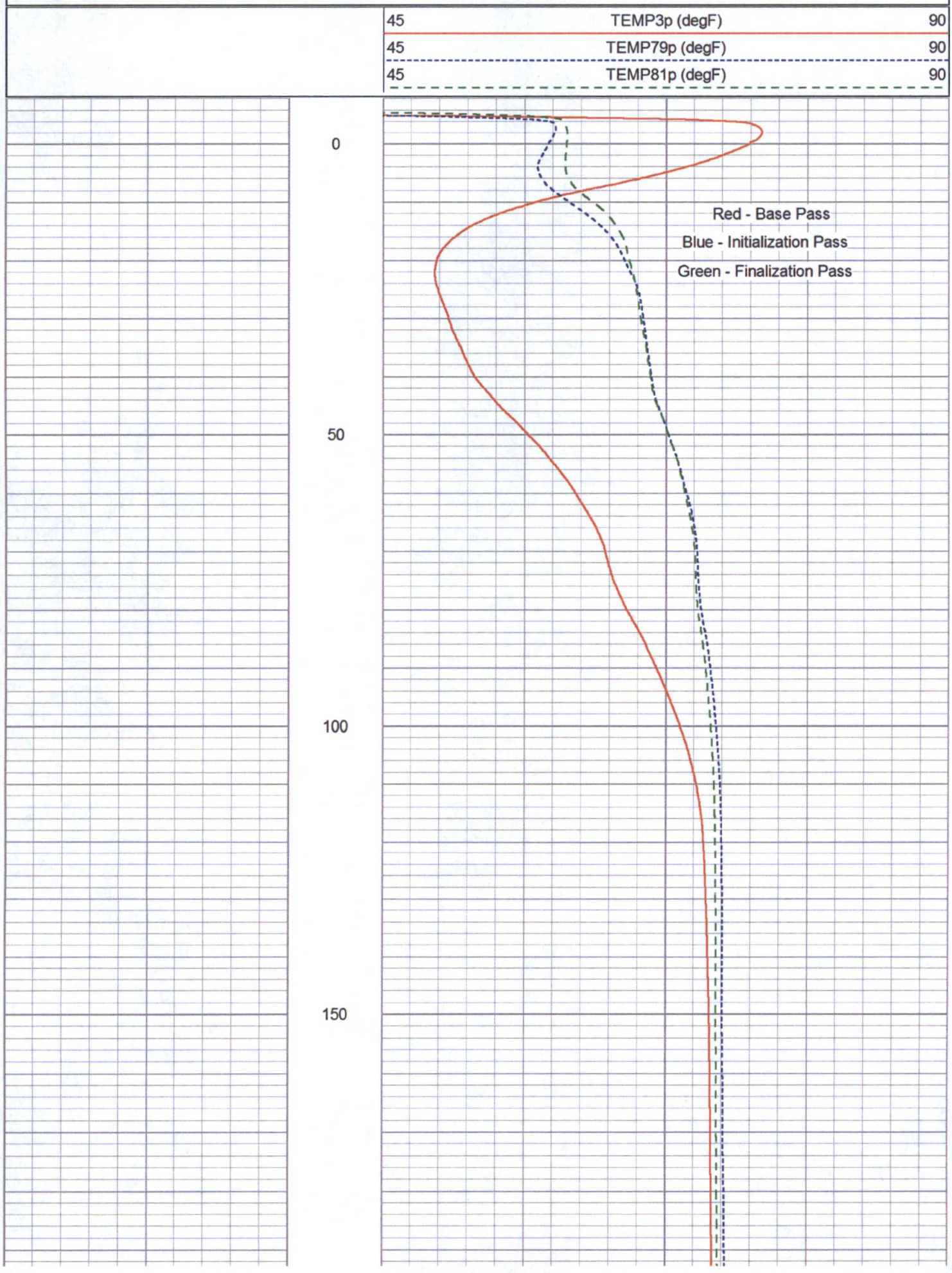
All interpretations are opinions based on inferences from electrical or other measurements and we cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to our general terms and conditions set out in our current Price Schedule.

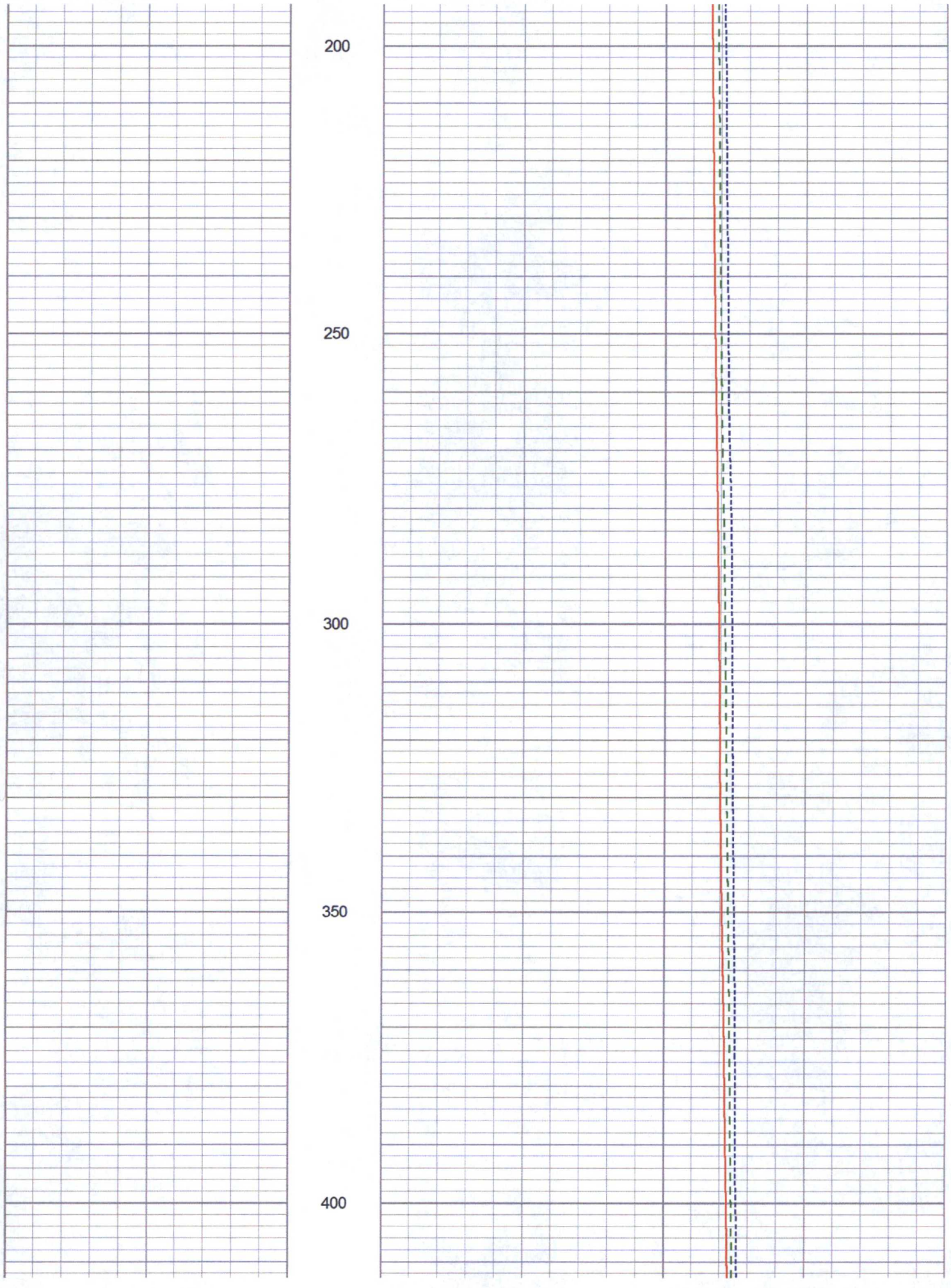
Comments

THANK YOU FOR USING CASEDHOLE SOULTIONS
Bend in Tubing @ 1750'

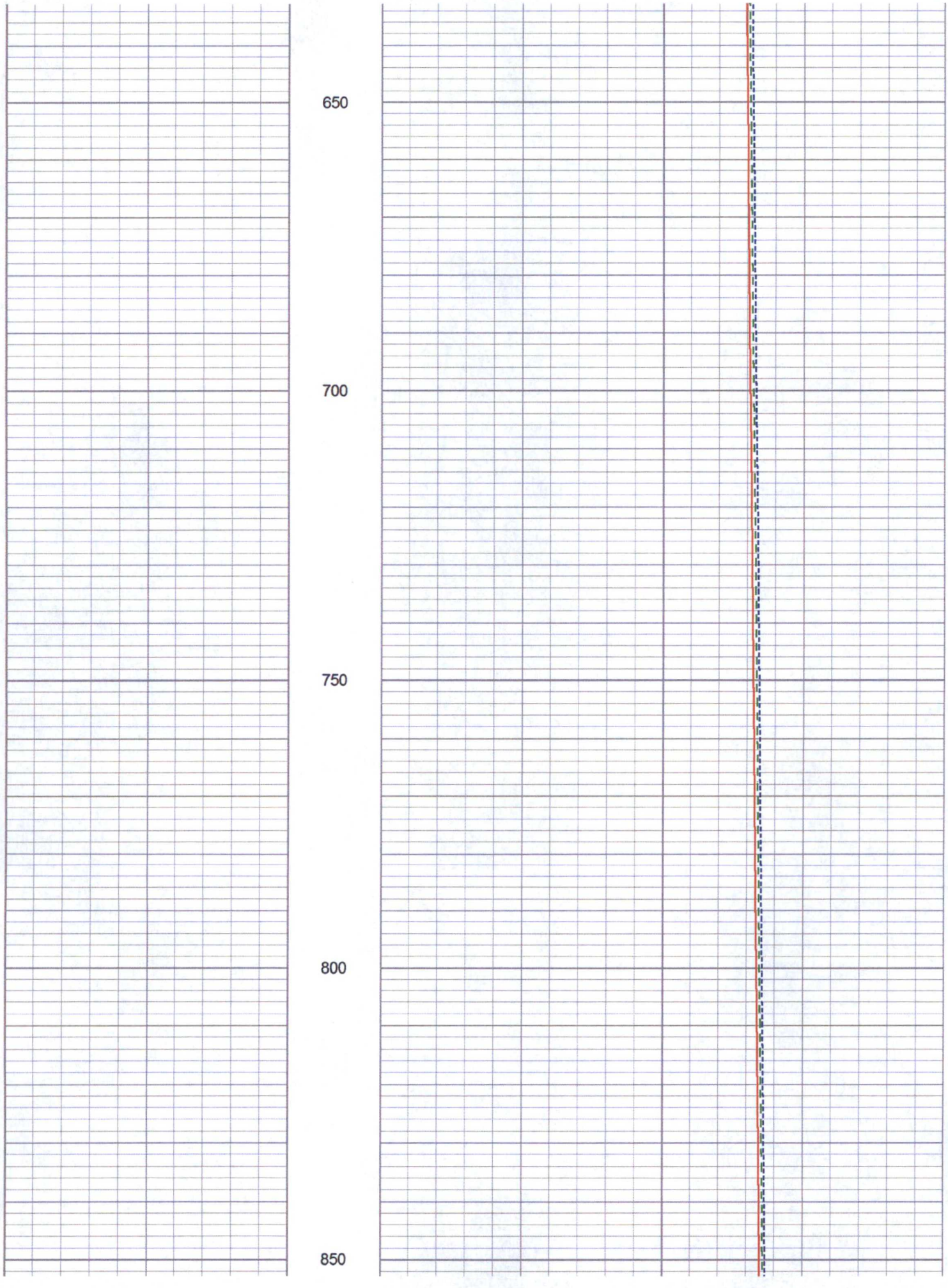
Database File: western refining #1.db
Dataset Pathname: pass3tm
Presentation Format: temp
Dataset Creation: Wed May 11 13:25:34 2016
Charted by: Depth in Feet scaled 1:240

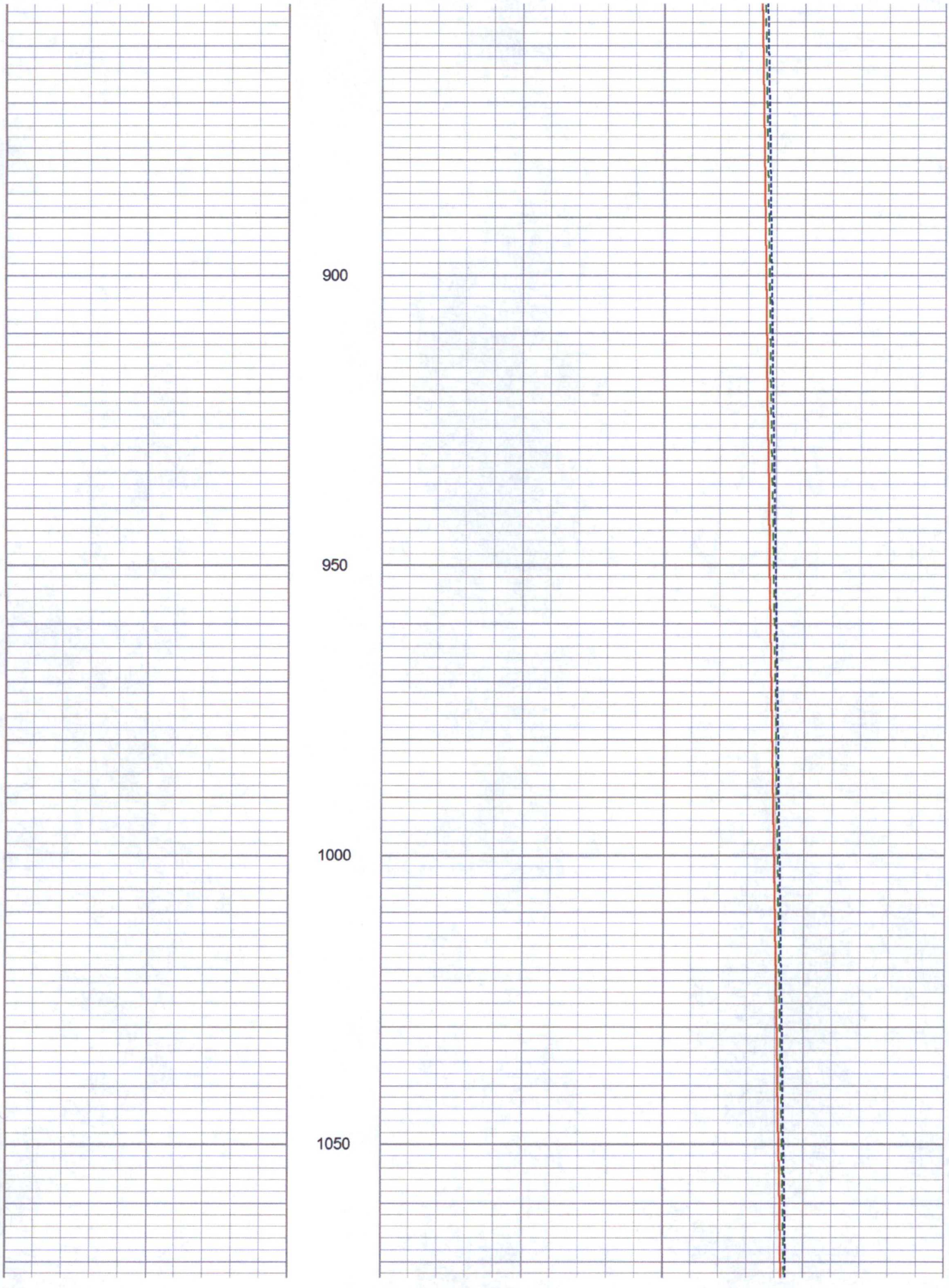
Charted by: Depth in Feet scaled 1:240

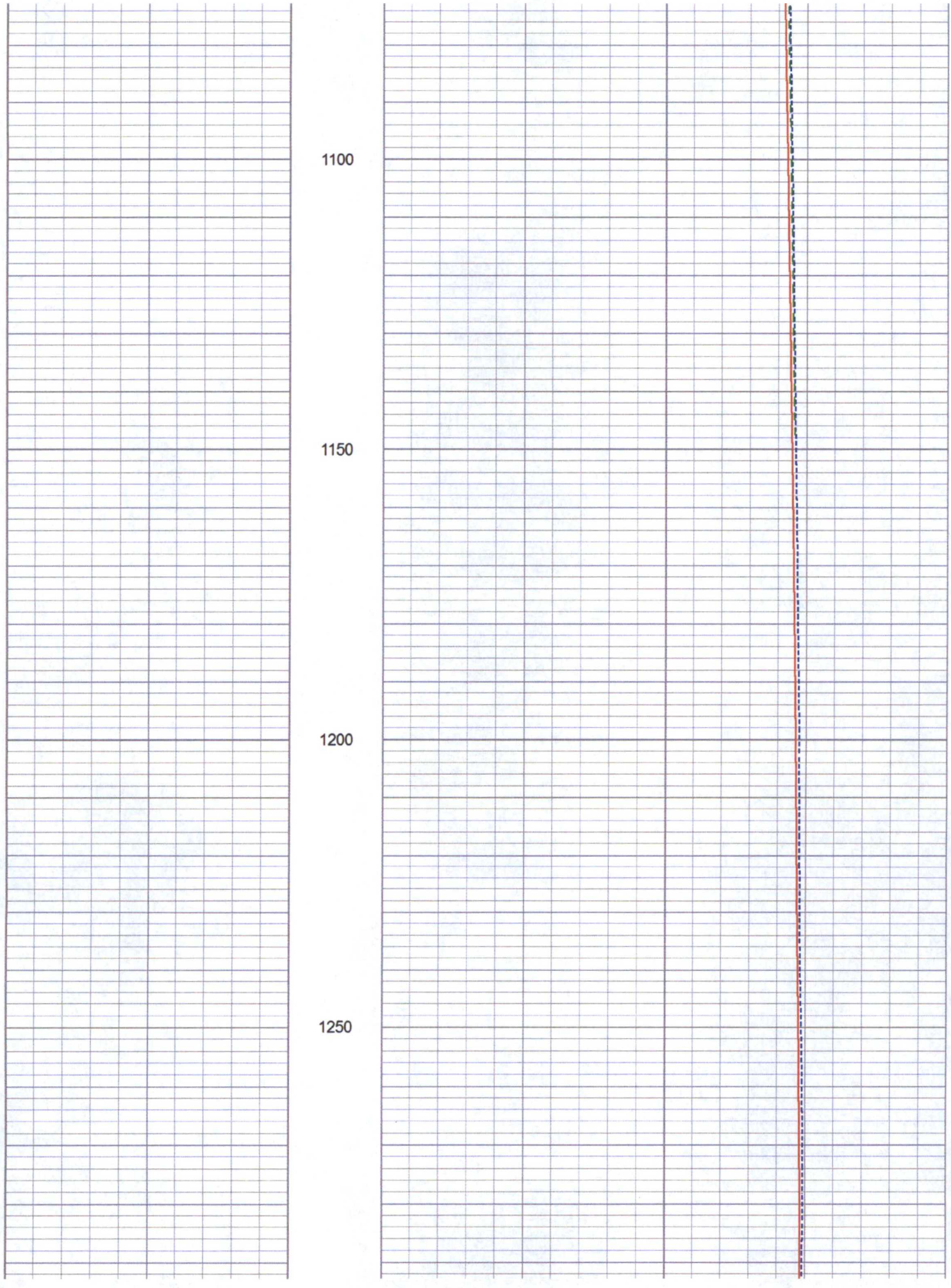



200
250
300
350
400

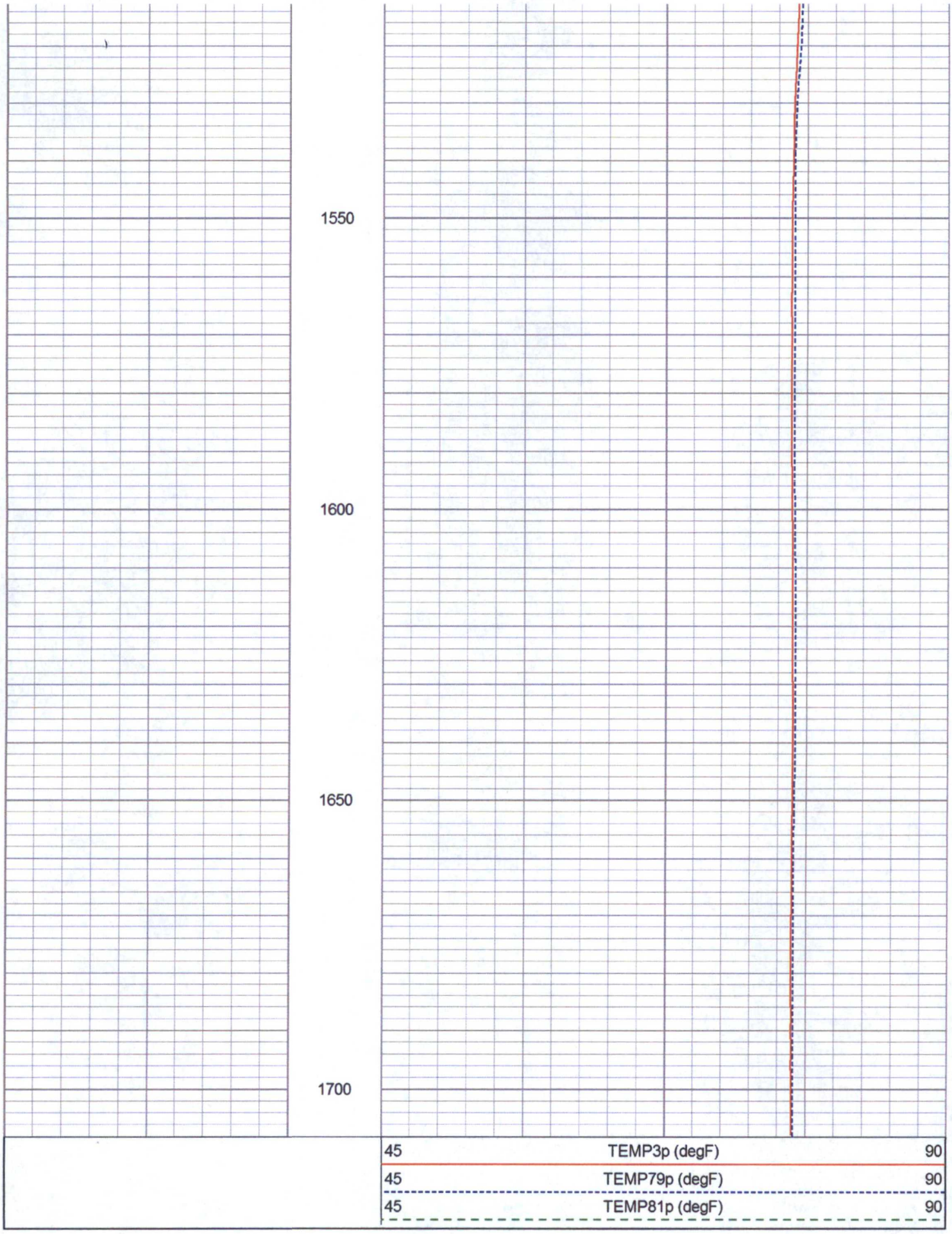

450
500
550
600


650
700
750
800
850


900
950
1000
1050


1100
1150
1200
1250


1300
1350
1400
1450
1500


1550
1600
1650
1700
45
TEMP3p (degF)
90
45
TEMP79p (degF)
90
45
TEMP81p (degF)
90