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Well Casing Baseline Analysis for the West Hackberry Strategic Petroleum Reserve Site

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Abstract

This report analyzes the data from multi-arm caliper (MAC) surveys taken at the West Hackberry SPR site to determine any casing deviations from the as-built drawings. Radial arm data from MAC surveys were used to calculate the approximate wall thickness of each well. Results from this study indicate that well casings can have larger or smaller internal diameters which can lead to thinner or thicker wall thicknesses, respectively. Wells 009B, 106A, 109, and 115 exhibit potentially dangerous deviances from the as-built drawings as some casings have thinner, and therefore weaker, well walls. In addition, the only well surveyed more than once, WH 011B, shows inconsistent data between surveys. Additional analysis is suggested to determine the accuracy and repeatability of MAC surveys.

ACKNOWLEDGMENTS

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NOMENCLATURE

ASTM	American Society for Testing and Materials
BHF	Bradenhead Flange
DOE	Department of Energy
ID	Internal Diameter
MAC	Multi-Arm Caliper
SNL	Sandia National Laboratories
SPR	Strategic Petroleum Reserve
WH	West Hackberry
WT	Wall Thickness

1. INTRODUCTION

The Strategic Petroleum Reserve (SPR) stores large amounts of oil in subsurface salt caverns to supply the United States in times of national shortage. To achieve these goals SPR must assure the integrity of cavern wells. One method for monitoring well integrity is through the use of multi- arm caliper (MAC) surveys. MAC surveys measure the internal dimensions of the well which can be used to infer the structural integrity of each well section. Each well is designed to withstand the stresses and strains they will experience at a given depth. Generally, these stresses and strains will increase with depth, therefore thicker and stronger well sections will be used at greater depths (PB-KBB Inc., n.d.). Since the outer diameter of the well casing remains constant, the inner diameter is varied to account for thicker well walls.

A previous report by B. Roberts [1] suggested some of the installed well casings at the SPR sites may be different from the as-built drawings. A subsequent report by Moriarty and Roberts [2] analyzed the well dimensions at the Big Hill SPR site showing several wells had installed casings that did not match the original as-built specifications. If the installed well casing is not as designed there are potentially disastrous ramifications. The worst case scenario is a casing section being weaker than designed and collapsing. Besides possible well collapse, there is a small possibility that an instrument will become stuck in a section with a smaller inner diameter. Finally, the internal volume of each casing section is needed for accurate pressure modelling.

This report investigates the casings of all wells at the West Hackberry (WH) SPR site to determine if the installed casings match the as-built specifications. MAC data will be used to find the internal, or inner, diameter. The inner diameter of the well will be used to estimate the wall thickness and subsequently the type of each casing. The casing types are differentiated by their outside diameter, material, and weight per linear foot. While there is no way to accurately determine the casing's material, the outside diameter and casing weight can be determined from the drawings and MAC surveys.

2. METHODOLOGY

The methods used in this report are taken from the aforementioned Well Casing Baseline Analysis for the Big Hill Strategic Petroleum Reserve Site SAND report by Moriarty and Roberts [2].

Since 2010, the SPR has been measuring the internal dimensions of wells using multi-arm caliper surveys. In this type of survey the tool is lowered into the well and can sample at a vertical resolution between 0.025 and 0.1 feet. Each MAC can have up to 60 arms that measure the distance between the well wall and a central point inside the tool to get an arm length. Individual internal diameters can be obtained by adding the lengths given by two arms on opposite sides of the sampling tool. This means there can be up to 30 individual internal diameter measurements from a MAC tool sampling every 0.025 ft. For the purpose of this analysis, the individual internal diameters for each sampling depth were condensed into one metric: the average internal diameter of the well which is subsequently referred to as internal or inner diameter. All depths of internal diameters are reported with respect to the bradenhead flange (BHF).

This analysis relies on two important parameters: the internal diameter and the relative wall displacement which is a function of internal diameter. The internal diameter is simply the average of all individual internal diameter measurements at a given depth. A median filter with a window size of 2 ft was also applied to minimize noise in the internal diameter data that can occur near the casing collar. Figure 1 shows the difference between the raw internal diameter data and the median filtered internal diameter data.

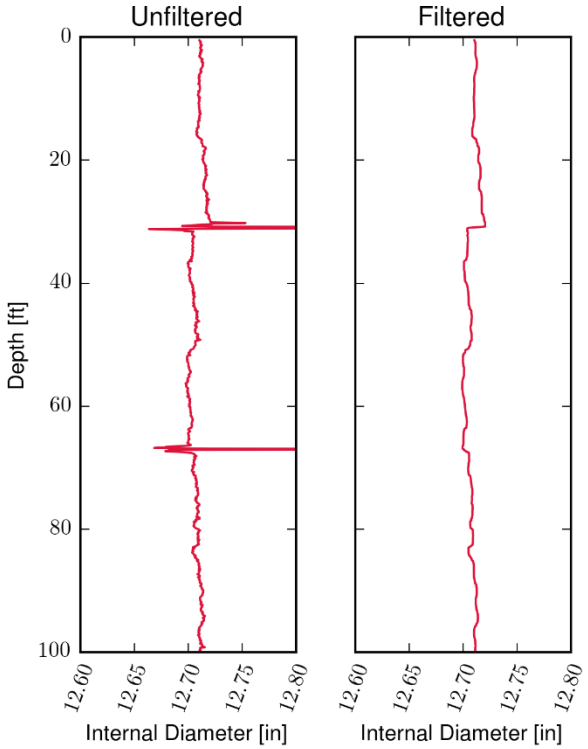

Figure 1 - Difference between the unfiltered raw internal diameter measurements (left) and the filtered measurements (right)

Although noise in the internal diameter measurements was seen near collar depths a more accurate and consistent parameter had to be used to accurately identify the boundaries of well casing sections. In this study, relative wall displacement (RWD) was used to identify casing collar depths. This parameter was adapted from a 2015 Roberts report [1] and is the maximum absolute difference between the measured and expected internal radii normalized by the expected casing wall thickness (Equation 1). The RWD is presented as follows:

$$RWD = \frac{0.5 \times MAX\left(\left|MID_{min} - EID\right|, \left|MID_{max} - EID\right|\right)}{EOD - EID} \quad (1)$$

where MID_{min} and MID_{max} are the minimum and maximum measured internal diameters, respectively, EID is the expected internal diameter, and EOD is the expected outer diameter. The RWD is sensitive to the jumps seen near the collar regardless of casing weight and is therefore useful in identifying the depths of casing sections. Figure 2, below, is an example of how RWD values were used to determine casing section depths.

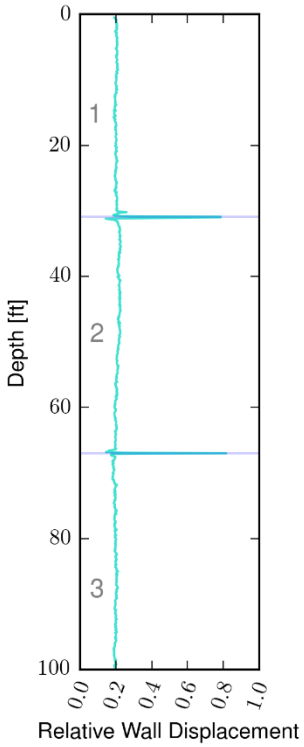

Figure 2 – Example of relative wall displacement with calculated collar locations marked by the horizontal blue lines and casing sections numbered on the left section of the graph.

Determination of Well Casing Weight

All of the individual casing sections at West Hackberry are approximately 40 ft. long, but their diameters are considerably different. The surveyed casing sizes range from 7 in. liners to 20 in. wells. Each well type has its own tolerance for wall thickness. The weight of a casing section is a

function of the wall thickness. As the wall thickness increases, so does the casing's weight per linear foot. Each casing weight is given an allowable tolerance as described by ATSM A999. ATSM A999 states that the actual wall thickness may not be less than 85% of the nominal wall thickness [3]. This threshold was used to determine the actual casing weights of each section. In addition, it is possible that the measured wall thickness is greater than the specified wall thickness. For the purposes of this report the maximum allowable wall thickness is 115% of the nominal wall thickness.

The MAC survey results were compared with the designed casing weights from the as-built drawings. Each section had between 400 and 1600 internal diameter measurements and it was common to see a single section of casing both inside and outside the expected range. For the purposes of this report a casing section was considered out of tolerance if the majority of internal diameter measurements in that section were out of tolerance.

3. RESULTS

The general results are presented in Table 1 below. Well inner diameters could either be smaller or larger than the designed parameters. These can be grouped into both chronic and acute occurrences. Chronic occurrences indicate the median internal diameter is consistently outside of tolerance. This could be due to poor well casing manufacturing or poorly calibrated MAC surveys. This is in contrast to acute occurrences where there are abrupt changes in the casing weight baseline. This is likely due to an unexpected change in casing weight. It is possible for a single well to experience all types of occurrences. Generally, there will not be any structural issues in casings with thicker walls, however, it may be more difficult to pass through an instrument due to the decreased inner diameter. Thinner walls are generally of greater concern (especially in the acute case) as these casings will have reduced strength. Wells that have the greatest potential risks are labelled ***red*** in Table 1.

Table 1 – General baseline casing analysis results

	Thicker Walls		Thinner Walls		
	Chronic	Acute	Chronic	Acute	Notes
WH006					
WH006B					
WH006C					
WH007B					Likely survey error
WH008					Max ID outside tolerance throughout
WH008A					
WH008B					Need to compare with updated liner info
WH009					
WH009A					Max ID outside tolerance throughout
WH009B					
WH011					
WH011A					Some max ID outside tolerance
WH011B					Surveys are different
WH101					Some max ID outside tolerance
WH102					Increased ovality near bottom of well
WH103					Likely error in as-built drawings
WH106A					
WH107					
WH108					Likely error in as-built drawings
WH109					Max ID outside tolerance throughout
WH111					Some Max ID outside tolerance
WH112					
WH113					
WH114					Some Max ID outside tolerance
WH115					
WH117A					Increased ovality near bottom of well
WH117B					Increased ovality near bottom of well

Along with the general results, the specific results for each well are discussed below. The MAC survey determined well configuration is shown graphically alongside the as-built specifications for the surveyed well.

Each figure shows information regarding the measured (greyscale) and expected inner diameter (blues). The black line represents the median measured inner diameter while the grey area shows the extents between the minimum and maximum measured diameters. This is overlaid on the dashed blue line which is the nominal inner diameter. The light blue area shows the tolerance of inner diameter for that particular casing weight. The areas measured outside of this tolerance is highlighted with reds. Each figure also shows the estimated extents of each casing section, and numbered in grey for reference. If the majority of median inner diameter measurements for a given section are outside the expected tolerance, the casing section number is shown in black.

The as-built casing specification table shows the parameters for each type of well casing that makes up the well. The first two parameters are the outside diameter of the well and the well's material. The second set of information represents the specific casing weight seen in the well. All weights are represented in pound per linear foot. The extent of these sections are represented in the "From" and "To" columns as depth below the bradenhead flange. These depths were taken from the as-built drawings. Along with the depths, the wall thickness (WT) and inner diameter (ID) are shown for each casing and outer diameter combination. Finally, the collapse pressure specified by the American Petroleum Institute (API), in psi, is shown [4]. This quantity represents the pressure differential between the external and internal pressures necessary to collapse the well from the outside.

West Hackberry 006

All casing sections are within tolerance. The inner diameter of section 5 is slightly larger than expected and therefore the maximum measurements are outside tolerance.

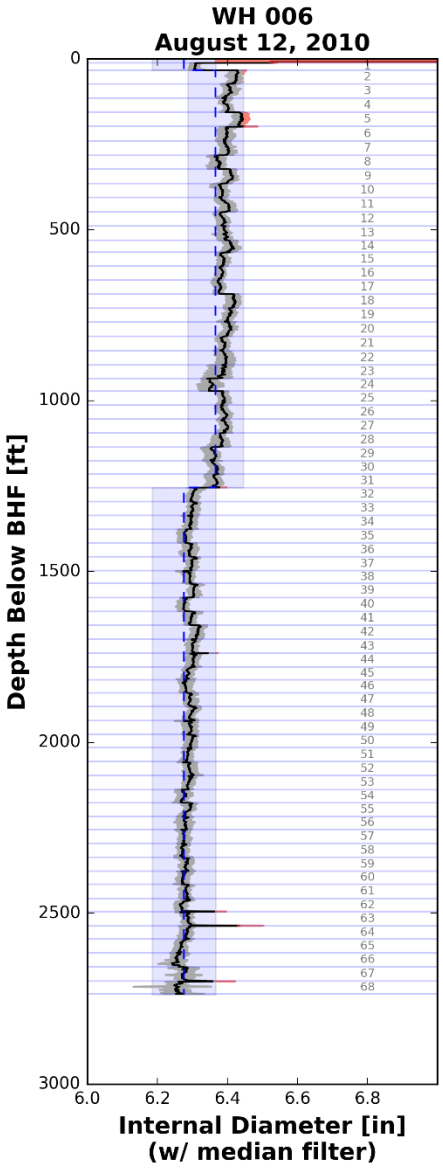

Figure 3 – Measured internal diameter of WH 006

Table 2 – WH 006 as-built specifications

Outside Diameter	Grade
7"	K-55

#/F	From [ft]	To [ft]	WT [in]	ID [in]	Collapse [psi]
26	0	31	0.362	6.276	4320
23	31	1255	0.317	6.366	3270
26	1255	2743	0.362	6.276	4320

West Hackberry 006B

Most of the casing inner diameters are near, or outside the prescribed tolerance. However, there is little variation throughout the well which indicates all well casings are approximately the same weight. The middle of the well (between 20 and 47) show the highest population of casing sections out of tolerance.

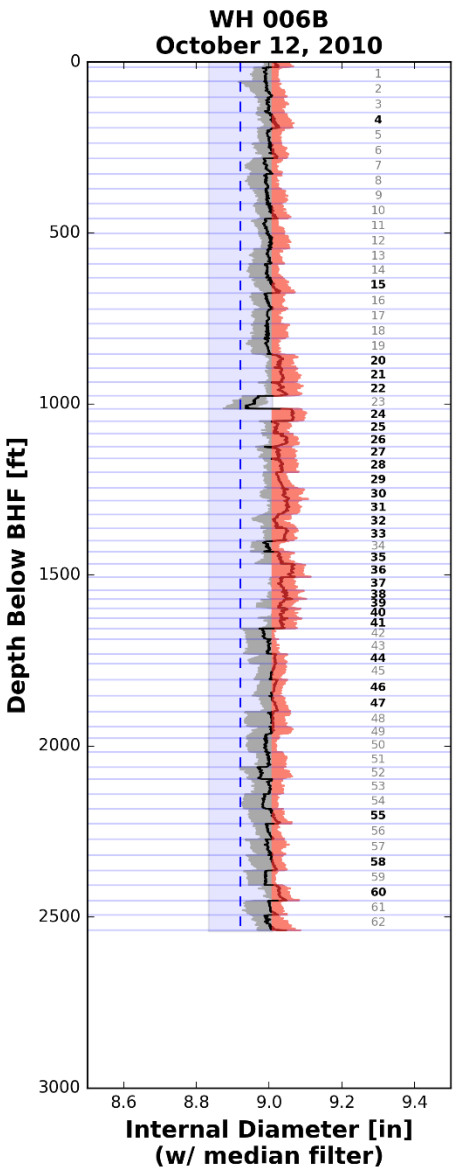

Figure 4 – Measured internal diameter of WH 006B

Table 3 – WH 006B as-built specifications

Outside Diameter	Grade
9 5/8"	K-55

#/F	From [ft]	To [ft]	WT [in]	ID [in]	Collapse [psi]
36	0	2583	0.352	8.921	2020

West Hackberry 006C

Information from the 9 5/8" liner survey is shown. Most of the sections are near or outside tolerance. The inner diameters are larger than expected which indicates thinner casing walls. While most sections are outside tolerance, they are close to the recommended tolerance. It is suggested that another analysis take place after the well is surveyed again.

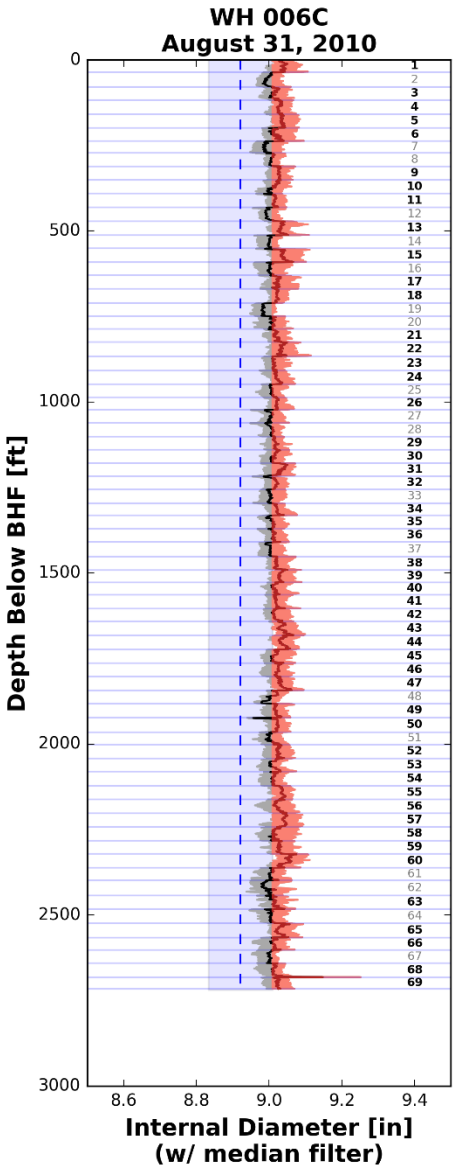

Figure 5 - Measured internal diameter of WH 006C

Table 4 - WH 006C as-built specifications

Outside Diameter	Grade
9 5/8"	K-55

#/F	From [ft]	To [ft]	WT [in]	ID [in]	Collapse [psi]
36	0	3160	0.352	8.921	2020

West Hackberry 007B

The median inner diameters for well 7B are all within tolerance, however, the data seems to be skewed towards the minimum value. This suggests there is at least one MAC arm reading high generating measured diameter values larger than actual. In addition, sections 1 through 8 show a large maximum inner diameter. A maximum value of this magnitude likely suggests an error in the MAC data.

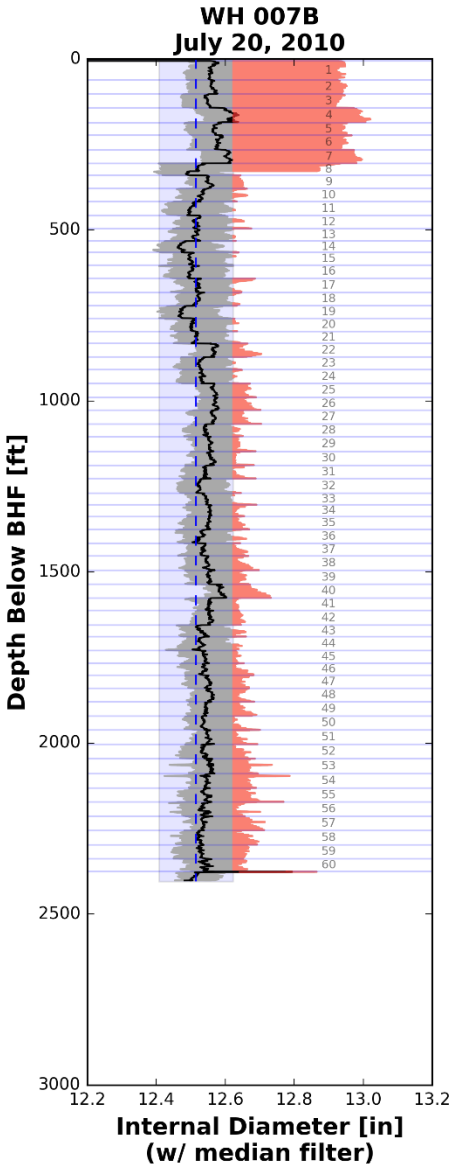

Figure 6 – Measured internal diameter of WH 007B

Table 5 - WH 007B as-built specifications

Outside Diameter	Grade
13 3/8"	K-55

#/F	From [ft]	To [ft]	WT [in]	ID [in]	Collapse [psi]
61	0	2416	0.43	12.515	1540

West Hackberry 008

All but one casing sections are within the given tolerance, however, most of the inner diameter measurements are larger than the nominal value. The only section outside tolerance is section 21 which shows a larger inner diameter than expected. As seen in West Hackberry 007B, the median measurements are skewed slightly towards the minimum measured inner diameter.

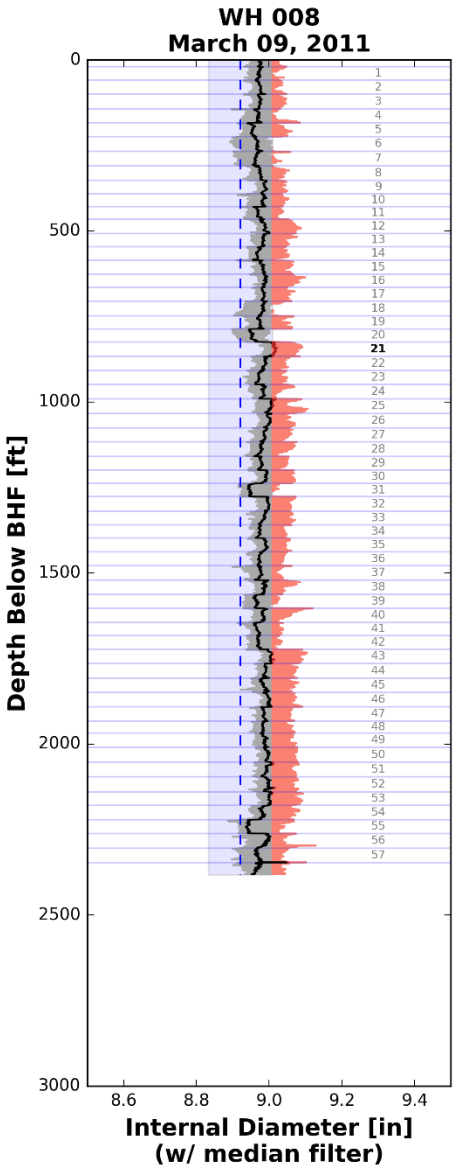

Figure 7 – Measured internal diameter of WH 008

Table 6 – WH 008 as-built specifications

Outside Diameter	Grade
9 5/8"	K-55

#/F	From [ft]	To [ft]	WT [in]	ID [in]	Collapse [psi]
36	0	2411	0.352	8.921	2020

West Hackberry 008A

West Hackberry 008A shows most of the measured inner diameters are within the expected tolerance. The values are only slightly larger than the nominal value.

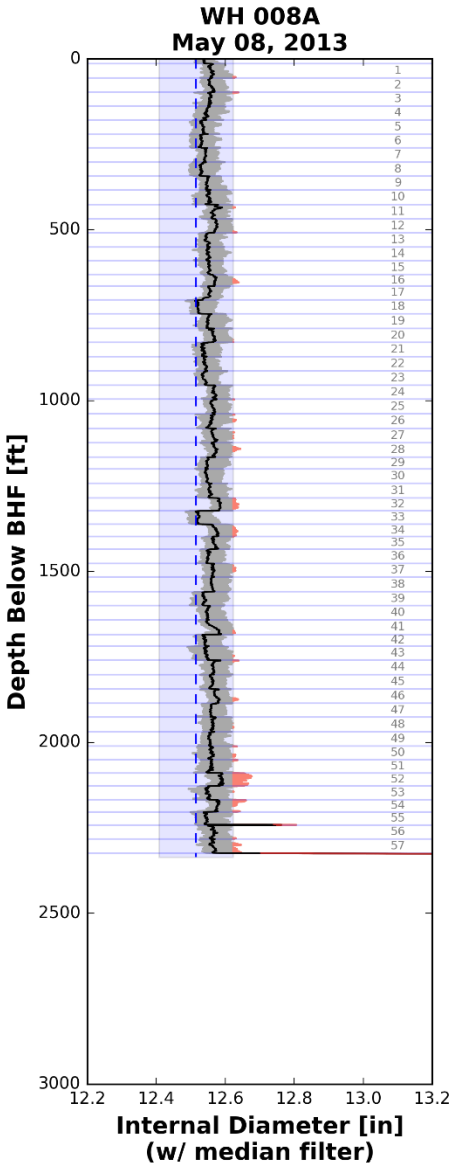

Figure 8 – Measured internal diameter of WH 008A

Table 7 – WH 008A as-built specifications

Outside Diameter	Grade
13 3/8"	K-55

#/F	From [ft]	To [ft]	WT [in]	ID [in]	Collapse [psi]
61	0	2337	0.43	12.515	1540

West Hackberry 008B

The WH 008B MAC survey is presented in two figures due to the difference in the internal diameters of the liner and original well. Both liner and the measured original well casings are within tolerance.

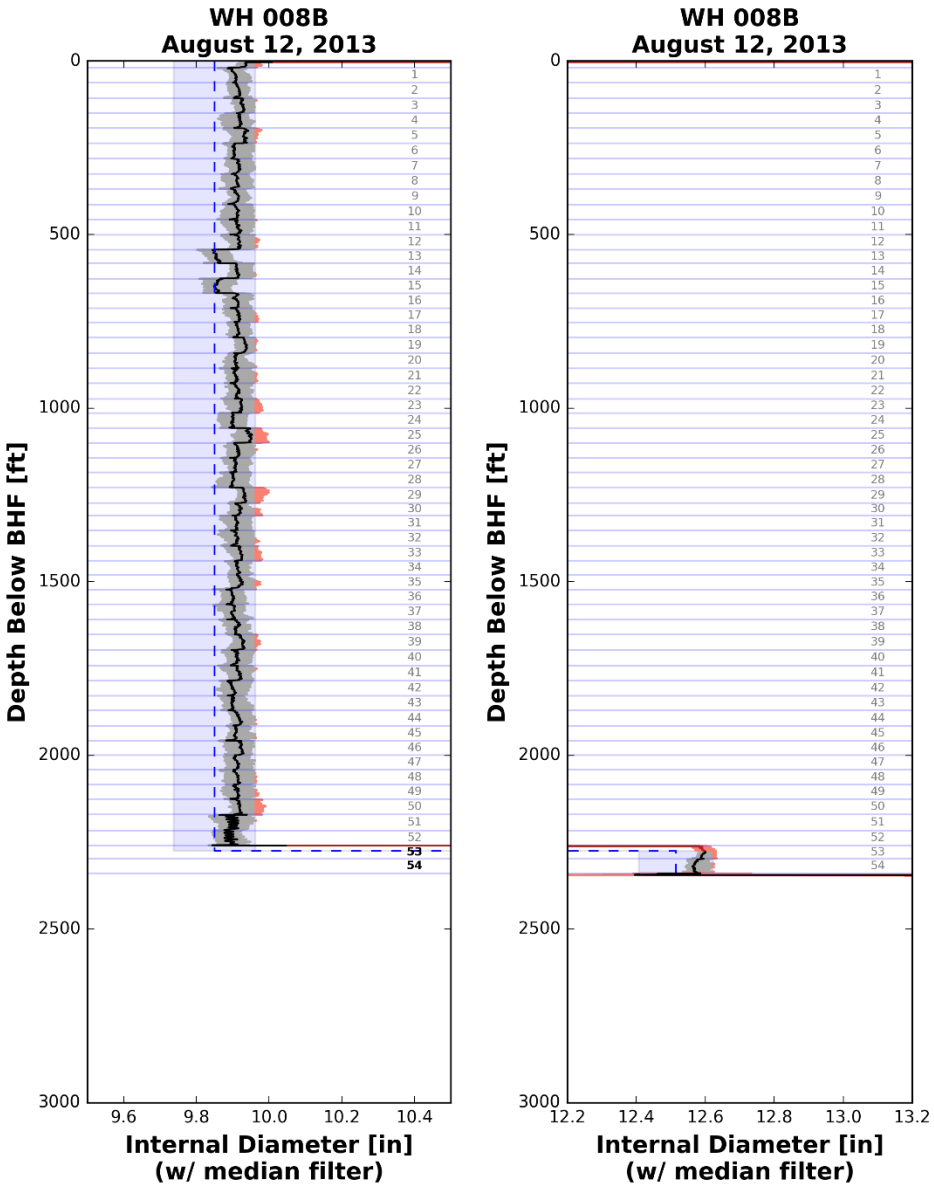

Figure 9 – Measured internal diameter of WH 008B with the liner on the left and the original on the right

Table 8 – WH 008B as-built specifications for the original well

Outside Diameter	Grade
13 3/8"	K-55

#/F	From [ft]	To [ft]	WT [in]	ID [in]	Collapse [psi]
61	0	2338	0.43	12.515	1540

Table 9 – WH 008B as-built specifications for the liner

Outside Diameter	Grade
10 3/4"	K-55

#/F	From [ft]	To [ft]	WT [in]	ID [in]	Collapse [psi]
51	0	2257	0.45	9.850	2700

West Hackberry 009

Like WH 008B, this survey had to be presented in two graphs. This well consists largely of 9 5/8" casings. Most of the measurements are outside the given tolerance. Because of this, there might be some concern for the structural integrity of the well. This is in contrast to the 7" well casing attached to the bottom of the 9 5/8" casing which was measured to have a smaller diameter than expected. This could indicate a greater wall thickness and should be considered when passing and instrument through that portion of the well.

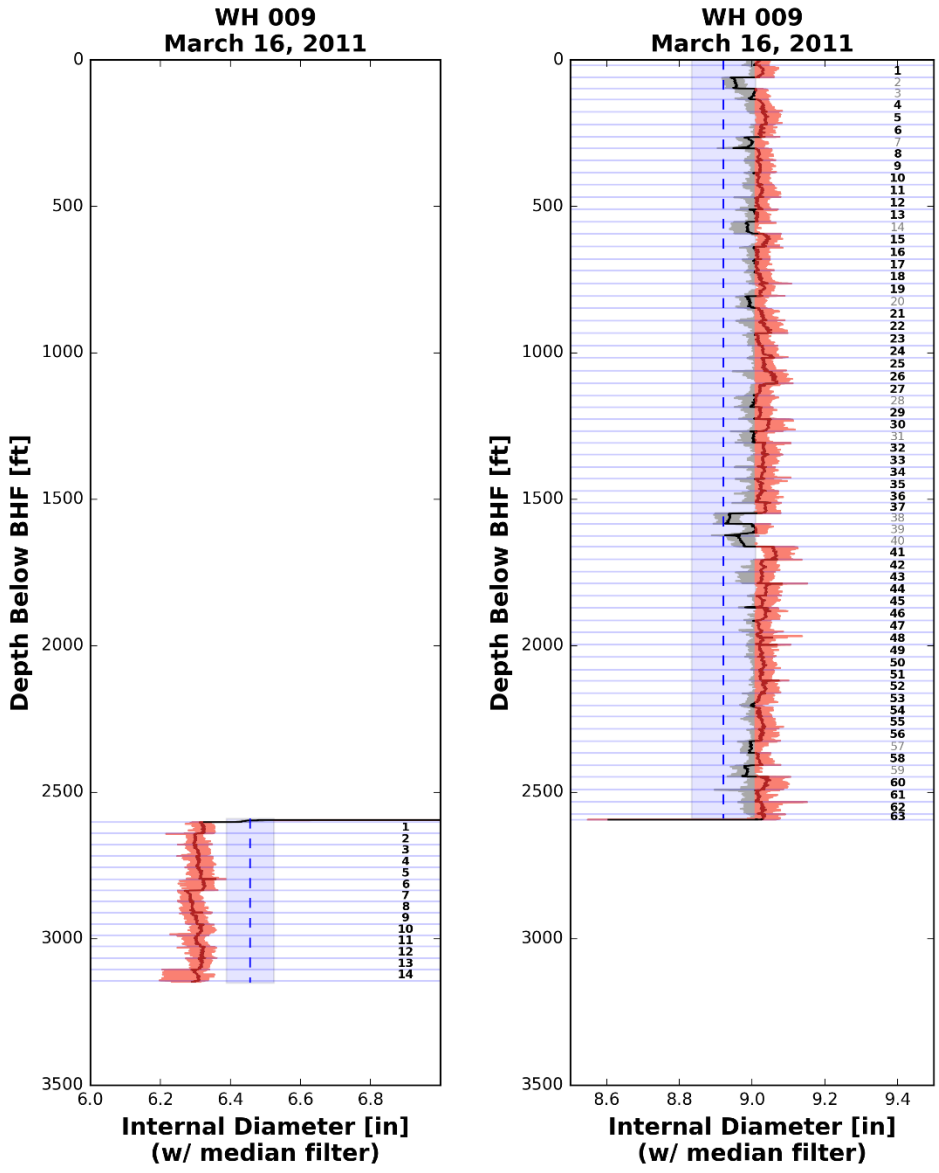

Figure 10 – Measured internal diameter of WH 009 with the 7" well sections on the left and the 9 5/8" well sections on the right.

Table 10 – WH 009 as-built specifications for the 9 5/8" well casing

Outside Diameter	Grade
9 5/8"	K-55

#/F	From [ft]	To [ft]	WT [in]	ID [in]	Collapse [psi]
36	0	2700	0.352	8.921	2020

Table 11 – WH 009 as-built specifications for the 9 5/8" well casing

Outside Diameter	Grade
7"	K-55

#/F	From [ft]	To [ft]	WT [in]	ID [in]	Collapse [psi]
20	2590	3215	0.272	6.456	2270

West Hackberry 009A

Most of the inner diameter measurements are near or slightly beyond the required tolerance for the given casing weight. There are four sections (6, 17, 52, and 58) that show the majority of measured points outside of the manufacturing tolerance. Like several other wells, the data is skewed towards the minimum measured inner diameter.

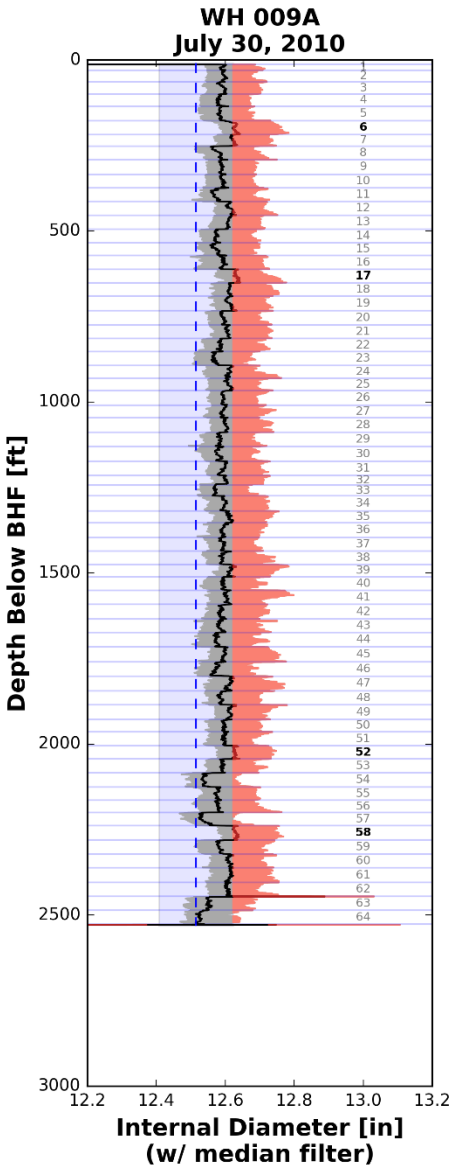

Figure 11 – Measured internal diameter of WH 009A

Table 12 – WH 009A as-built specifications

Outside Diameter	Grade
13 3/8"	K-55

#/F	From [ft]	To [ft]	WT [in]	ID [in]	Collapse [psi]
61	0	2537	0.43	12.515	1540

West Hackberry 009B

Most casing sections in WH 009B are within tolerance, however, there are some sections that have a larger inner diameter and may indicate reduced wall thickness. Sections 37, 52, and 65 may have thinner walls than engineered and could be a weak point in the well. This type of installation error is likely the most dangerous and should be closely monitored in the future.

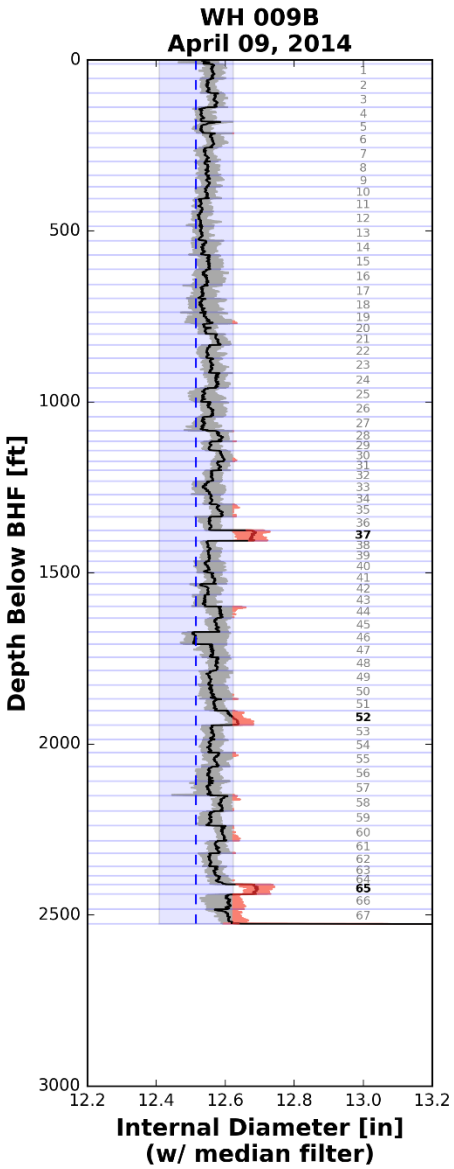

Figure 12 – Measured internal diameter of WH 009B

Table 13 – WH 009B as-built specifications

Outside Diameter	Grade
13 3/8"	K-55

#/F	From [ft]	To [ft]	WT [in]	ID [in]	Collapse [psi]
61	0	2525	0.43	12.515	1540

West Hackberry 011

West Hackberry 011 showed consistent internal diameters outside tolerance. Depending on the accuracy of the survey, this could suggest thinner wall thicknesses or could be due to a systematic error in the MAC survey. If the data accurately represents the internal diameter, then this well could be weaker than designed.

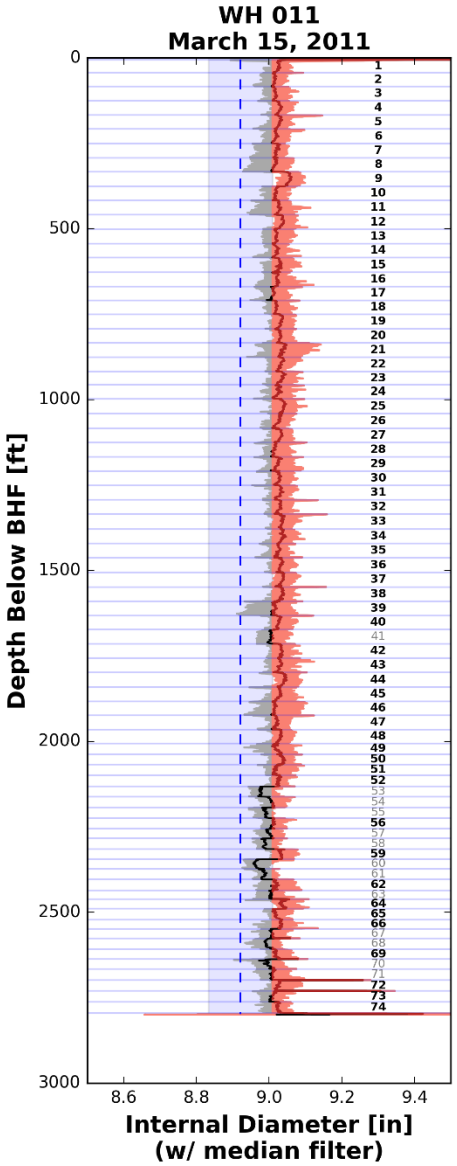

Figure 13 – Measured internal diameter of WH 011

Table 14 – WH 011 as-built specifications

Outside Diameter	Grade
9 5/8"	K-55

#/F	From [ft]	To [ft]	WT [in]	ID [in]	Collapse [psi]
36	0	2798	0.352	8.921	2020

West Hackberry 011A

Most of the MAC measurements are within tolerance. Section 46 had a smaller inner diameter than expected. While this poses no structural risk to the well, it should be considered when passing an instrument through the section. The minimum and maximum internal diameter measurements diverge near the bottom of the well which suggests the well becomes more oval shaped.

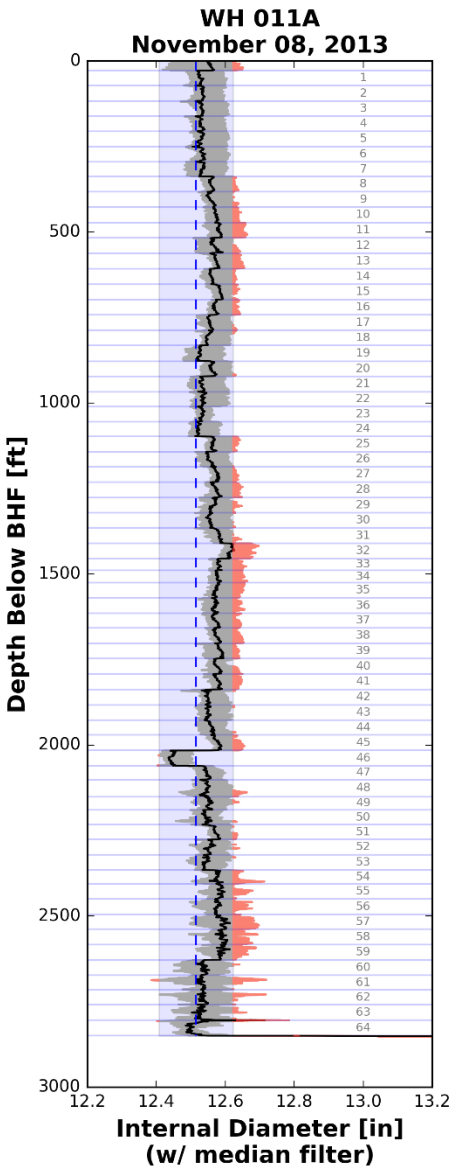

Figure 14 – Measured internal diameter of WH 011A

Table 15 – WH 011A as-built specifications

Outside Diameter	Grade
13 3/8"	K-55

#/F	From [ft]	To [ft]	WT [in]	ID [in]	Collapse [psi]
61	0	2850	0.43	12.515	1540

West Hackberry 011B

At the time of writing this report, West Hackberry 011B is the only well that has been surveyed more than once. The as-built drawings indicate the walls become thinner with depth. This is unlikely the case. It is assumed that the casing weights were transposed in the drawings. While both surveys show the same relative pattern of internal diameters, the two surveys suggest two very different scenarios. There is a difference of approximately 0.1 inch between the median values of the two surveys. In addition, the difference between the minimum and maximum inner diameters are much larger in the first (2010) survey. Despite these differences, both surveys show an increased ovality between 2200 and 2500 ft. below the BHF. The contrast in data calls into question the accuracy and repeatability of the MAC surveys.

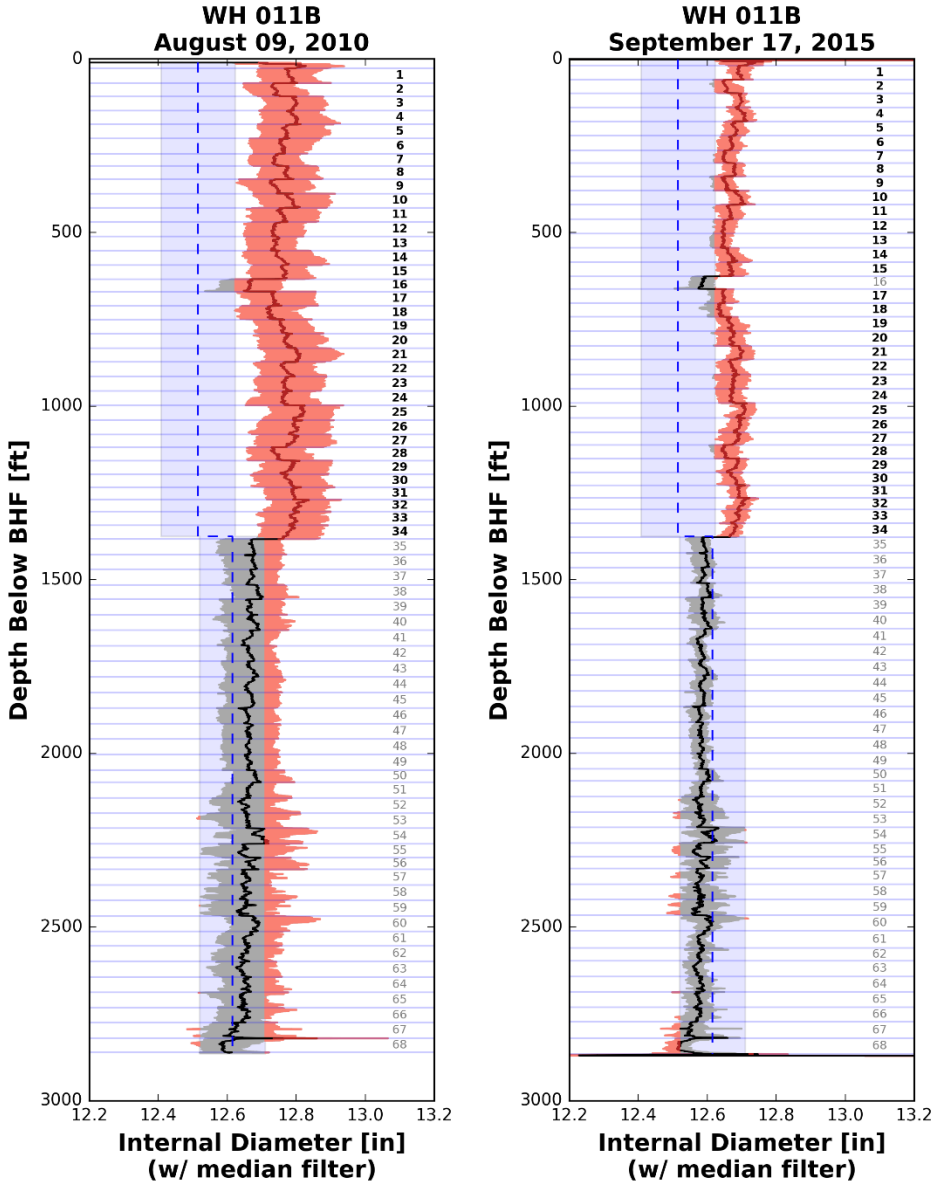

Figure 15 – Measured internal diameter of WH 011B in 2010 and 2015

Table 16 – WH 011B as-built specifications

Outside Diameter	Grade
13 3/8"	K-55

#/F	From [ft]	To [ft]	WT [in]	ID [in]	Collapse [psi]
61	0	1375	0.43	12.515	1540
54.5	1375	2866	0.38	12.615	1130

West Hackberry 101

Most of the measured median values were within tolerance. Section 20, while not out of tolerance, looked like it was 106.5 #/ft. casing as opposed to the listed 94 #/ft. casing. There should not be any structural issues due to the installation of a heavier casing. It should also be mentioned that there is an offset between the as-built drawing and the estimated casing depths.

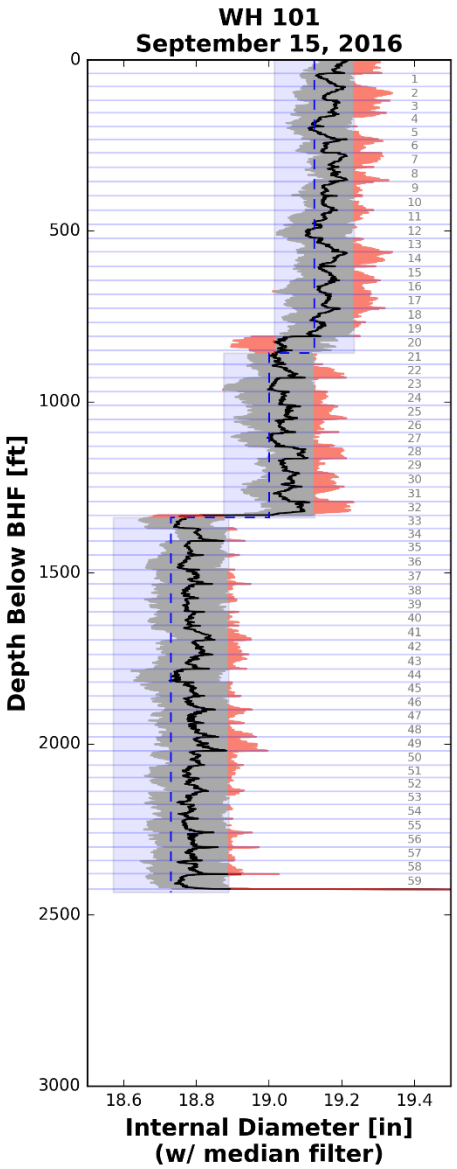

Figure 16 – Measured internal diameter of WH 101

Table 17 – WH 101 as-built specifications

Outside Diameter	Grade
20"	K-55

#/F	From [ft]	To [ft]	WT [in]	ID [in]	Collapse [psi]
94	0	857	0.438	19.124	520
106.5	857	1338	0.5	19	770
133	1338	2434	0.635	18.73	1500

West Hackberry 102

All of the measured median internal diameters are near the expected casing weight dimensions. The minimum and maximum values between 2200 ft. and 2400 ft. tend to diverge suggesting there is an increase in ovality in these casings.

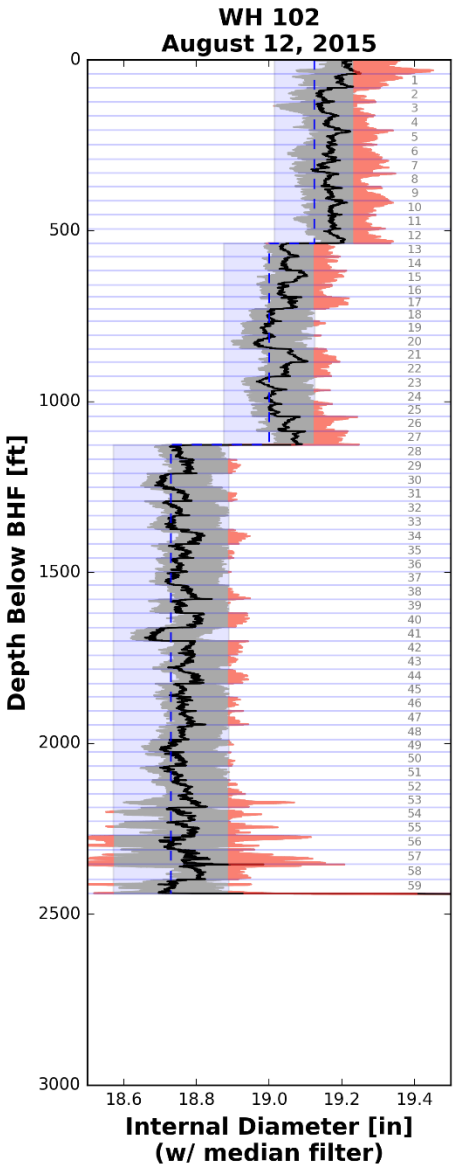

Figure 17 – Measured internal diameter of WH 102

Table 18 – WH 102 as-built specifications

Outside Diameter	Grade
20"	K-55

#/F	From [ft]	To [ft]	WT [in]	ID [in]	Collapse [psi]
94	0	537	0.438	19.124	520
106.5	537	1126	0.5	19	770
133	1126	2440	0.635	18.73	1500

West Hackberry 103

The results show the casings are not as expected, however, it is likely the as-built drawings show incorrect data. The drawings indicate the casing weight becomes lighter with depth. This is unconventional as lithostatic pressure increases with depth and therefore a heavier casing weight is needed. In addition to the wrong casing weight being listed, there is also a disparity in the location of casing depth change. Regardless, there is also a large difference between the minimum and maximum diameter. This could indicate the well is more oval shaped. The ovality sees additional increases at depths between 2250 ft. and the bottom of the well. It should be mentioned that the contractor used unconventional casings for this well and specifications for collapse pressure could not be found.

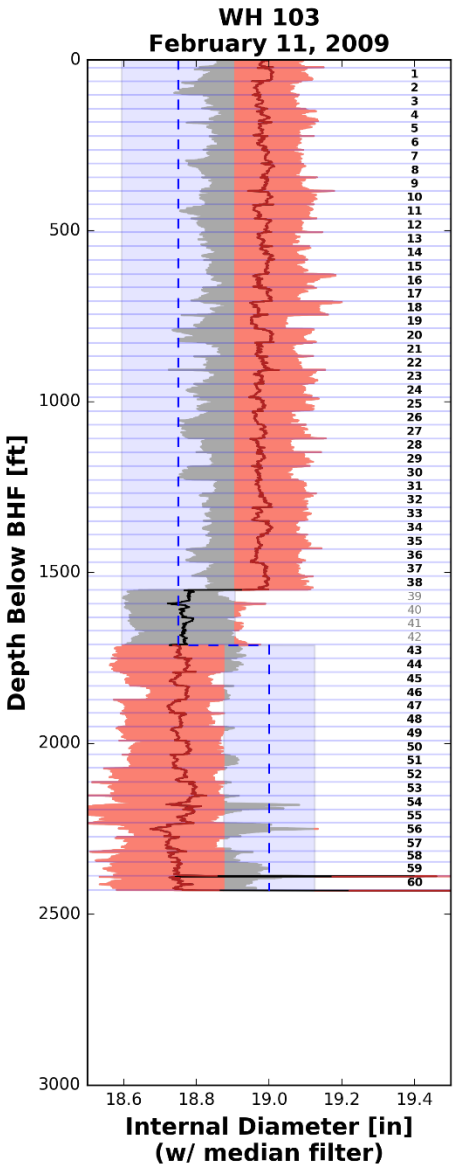

Figure 18 – Measured internal diameter of WH 103

Table 19 – WH 103 as-built specifications

Outside Diameter	Grade
20"	Grade B

#/F	From [ft]	To [ft]	WT [in]	ID [in]	Collapse [psi]
129	0	1713	0.625	18.750	Unknown
104	1713	2432	0.500	19.000	Unknown

West Hackberry 106A

The January 2004 MAC survey is shown in two figures due to the significantly different internal diameters. The as-built drawings show a 16” casing inside a 20” casing. The 16” casing sections (left) do not correlate with the as-built drawings. The drawings indicate there are three different casing weights at four different levels, however, the MAC survey shows two, possibly three different casing weights in the well. In addition, there are several sections between 1000 ft. and 1500 ft. that have a significantly smaller inner diameter than the surrounding casings. While there is no strength penalty for a thicker wall the smaller internal diameter should be taken into consideration when passing an instrument through the liner.

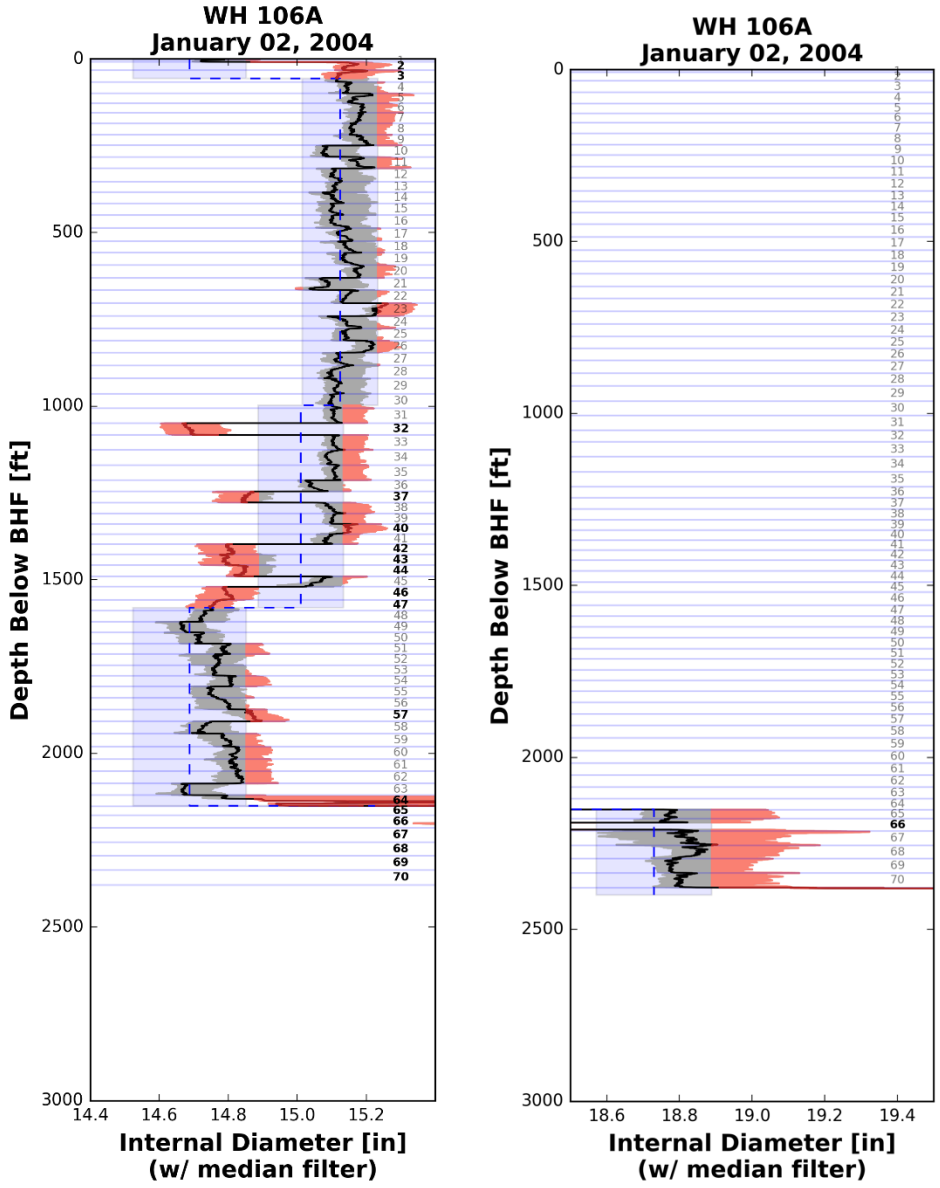

Figure 19 – Measured internal diameter of WH 106A for both 16” (left) and 20” (right) diameter well casings

Table 20 – WH 106A as-built specifications for well liner

Outside Diameter	Grade
16"	K-55

#/F	From [ft]	To [ft]	WT [in]	ID [in]	Collapse [psi]
109	0	56	0.656	14.688	2560
75	56	997	0.438	15.124	1020
84	997	1580	0.495	15.010	1410
109	1580	2151	0.656	14.688	2560

Table 21 – WH 106A as-built specifications for original well

Outside Diameter	Grade
20"	K-55

#/F	From [ft]	To [ft]	WT [in]	ID [in]	Collapse [psi]
94	0	977	0.438	19.124	520
106.5	977	1398	0.5	19	770
133	1398	2400	0.635	18.73	1500

West Hackberry 107

Most of the casing sections have inner diameters close to the as-built drawings and all but two are within tolerance. Section 47 and 55 have inner diameters closer to 109 #/ft. casings. While thicker walls are stronger, the inner diameter is smaller and should be considered when passing an instrument through. In addition, sections 2, 3, 13, 14, and 21 have inner diameters that resemble 84 #/ft. casings instead of the documented 75 #/ft casings.

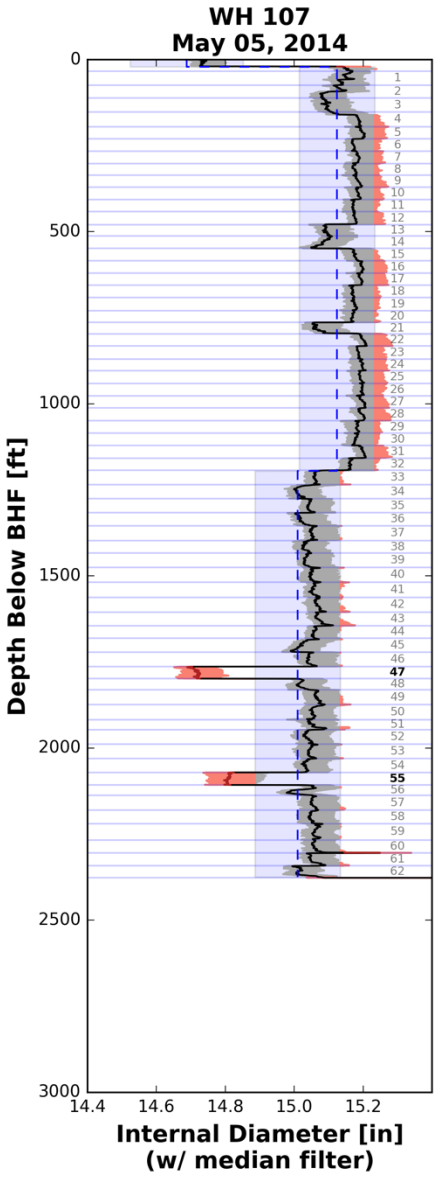

Figure 20 – Measured internal diameter of WH 107

Table 22 – WH 107 as-built specifications

Outside Diameter	Grade
16"	K-55

#/F	From [ft]	To [ft]	WT [in]	ID [in]	Collapse [psi]
109	0	21	0.656	14.688	2560
75	21	1195	0.438	15.124	1020
84	1195	2374	0.495	15.010	1410

West Hackberry 108

The measured inner diameter is significantly different than the as-built drawings. It is likely the as-built drawings supplied to Sandia are incorrect. None of the other 20" casings have designs like the one specified in the WH 108 drawings. It looks as though the drawings may have transposed the first two sets of casings. In addition, the collar depths in the as-built drawings are significantly different from the estimated collar depths. Assuming WH 108 is of similar design to the other 20" casings, most of the internal diameters are only slightly larger than the nominal diameter.

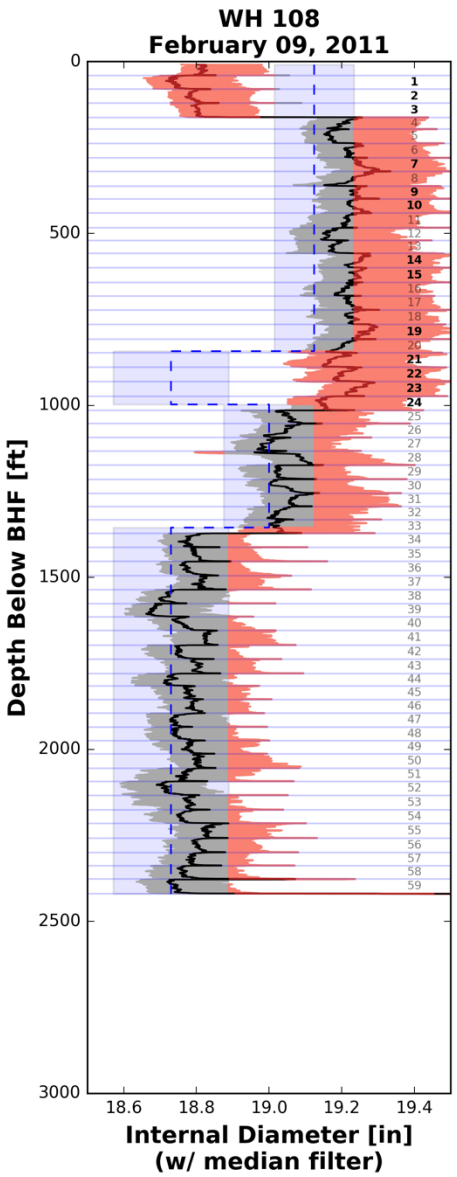

Figure 21 – Measured internal diameter of WH 108

Table 23 – WH 108 as-built specifications

Outside Diameter	Grade
20"	K-55

#/F	From [ft]	To [ft]	WT [in]	ID [in]	Collapse [psi]
94	0	842	0.438	19.124	520
133	842	997	0.635	18.730	1500
106.5	997	1355	0.5	19	770
133	1355	2420	0.635	18.73	1500

West Hackberry 109

Most of the casings are of within the tolerance, however, section 46 is suspected to be 106.5 #/ft. instead of 133 #/ft. That particular section of the well has thinner wall and reduced strength. This is cause for concern as the collapse strength is reduced by nearly half (from 1500 psi to 770 psi).

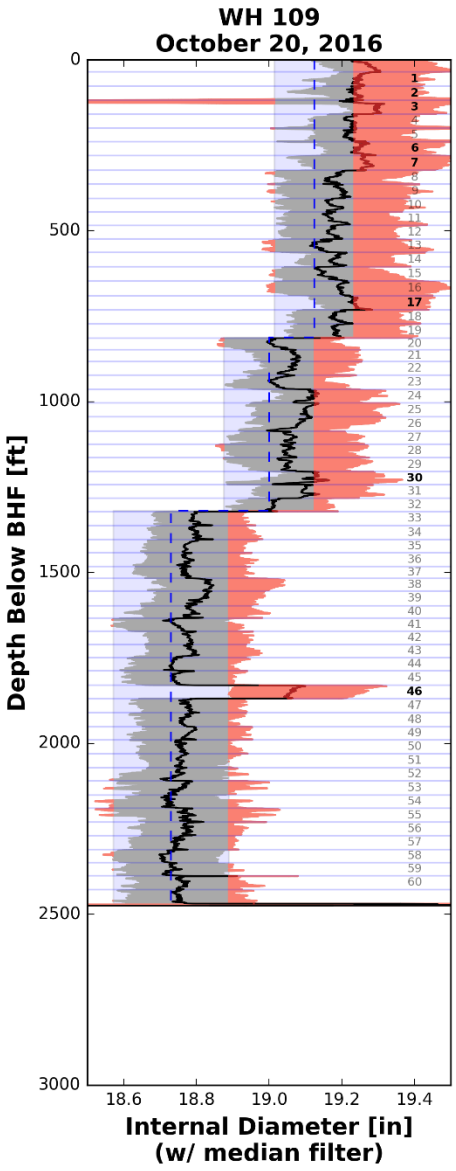

Figure 22 – Measured internal diameter of WH 109

Table 24 – WH 109 as-built specifications

Outside Diameter	Grade
20"	K-55

#/F	From [ft]	To [ft]	WT [in]	ID [in]	Collapse [psi]
94	0	812	0.438	19.124	520
106.5	812	1319	0.5	19	770
133	1319	2469	0.635	18.73	1500

West Hackberry 111

WH 111 shows that all but one section within tolerance. Section 20 looks as if it is a 106.5 #/ft. casing as opposed to the 94 #/ft. shown in the drawings.

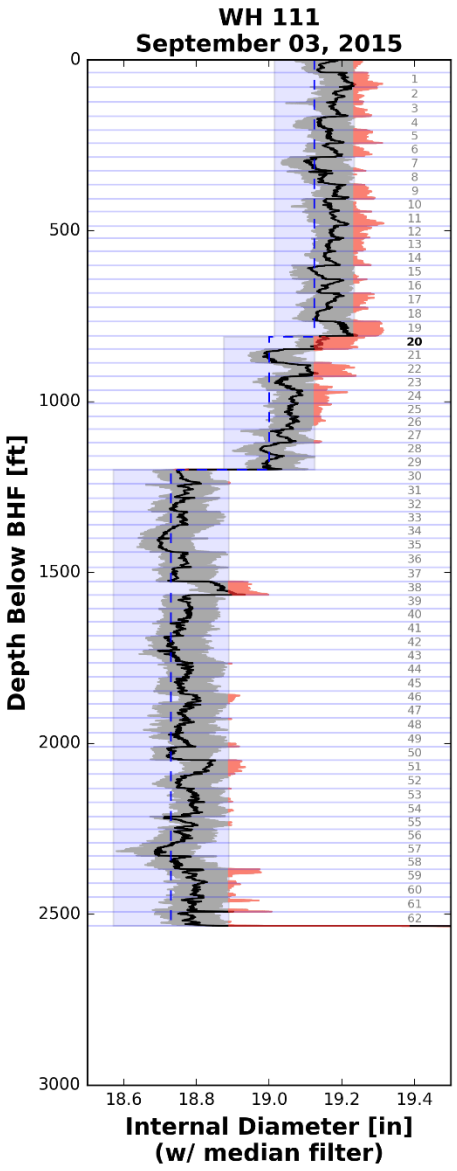

Figure 23 – Measured internal diameter of WH 111

Table 25 – WH 111 as-built specifications

Outside Diameter	Grade
20"	K-55

#/F	From [ft]	To [ft]	WT [in]	ID [in]	Collapse [psi]
94	0	810	0.438	19.124	520
106.5	810	1199	0.5	19	770
133	1199	2534	0.635	18.73	1500

West Hackberry 112

There are two sections that indicate incorrect casing weights. Sections 19 and 33 look as though they were switched during installation. There should not be much concern for the structural integrity of these sections, however, the decreased inner diameter should be considered when passing instrumentation through section 19. It is also worth mentioning that, even with filtering, the collar kicks are more pronounced than in other wells. There is currently no explanation for this phenomenon.

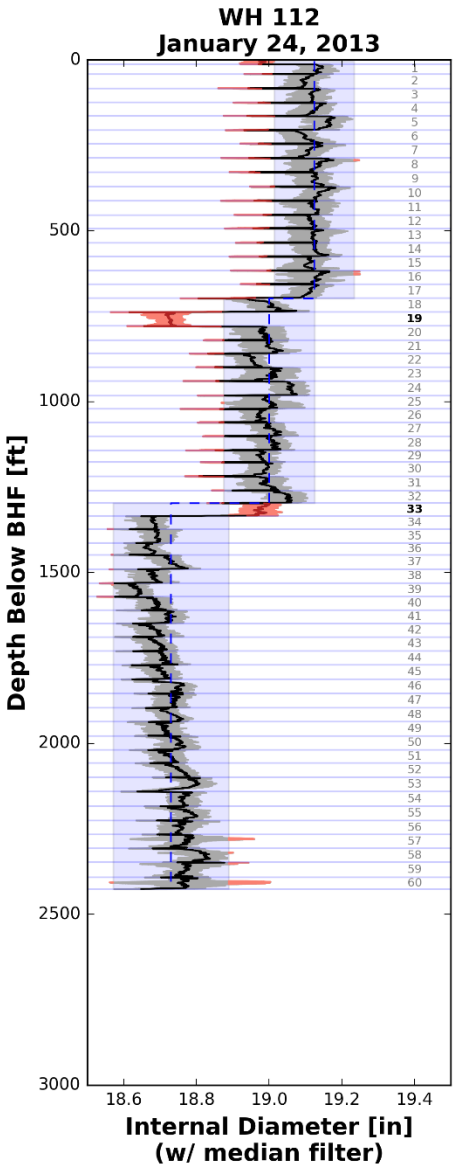

Figure 24 – Measured internal diameter of WH 112

Table 26 – WH 112 as-built specifications

Outside Diameter	Grade
20"	K-55

#/F	From [ft]	To [ft]	WT [in]	ID [in]	Collapse [psi]
94	0	698	0.438	19.124	520
106.5	698	1297	0.5	19	770
133	1297	2437	0.635	18.73	1500

West Hackberry 113

Most sections are within the expected tolerance, however, sections 22, 24-26, 54, and 67-69 show a smaller inner diameter and, therefore, a higher casing weight. It looks as if all the aforementioned sections are 109 #/ft. sections instead of the 84 or 75 #/ft. sections the as-built drawings indicate. In addition, the as-built drawings indicate the casings weight should decrease in the deepest part of the well. This is atypical and may be in error.

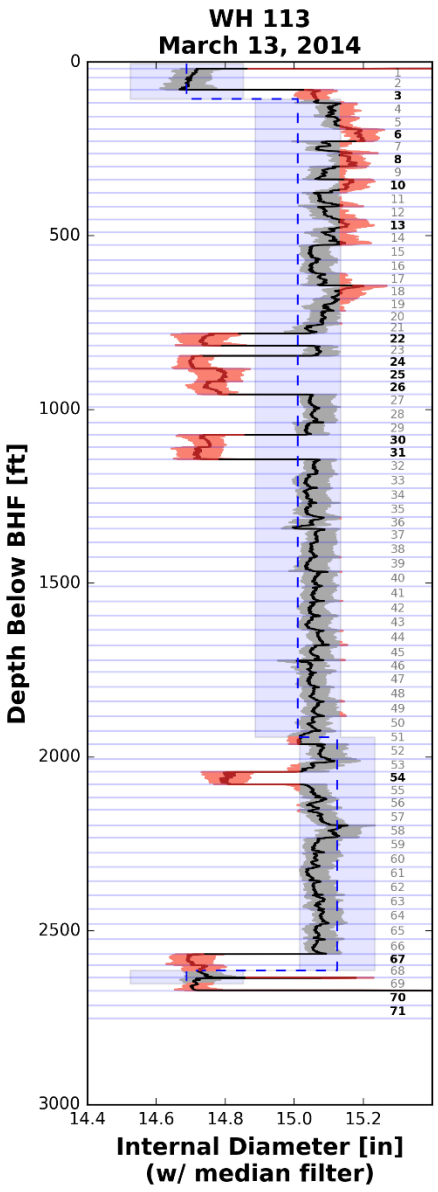

Figure 25 – Measured internal diameter of WH 113

Table 27 – WH 113 as-built specifications

Outside Diameter	Grade
16"	K-55

#/F	From [ft]	To [ft]	WT [in]	ID [in]	Collapse [psi]
109	0	106	0.656	14.688	2560
84	106	1943	0.495	15.010	1410
75	1943	2614	0.438	15.124	1020
109	2614	2652	0.656	14.688	2560

West Hackberry 114

Section 32 is the only casing that is out of tolerance, however, there is little difference between section 32 and the surrounding casing sections.

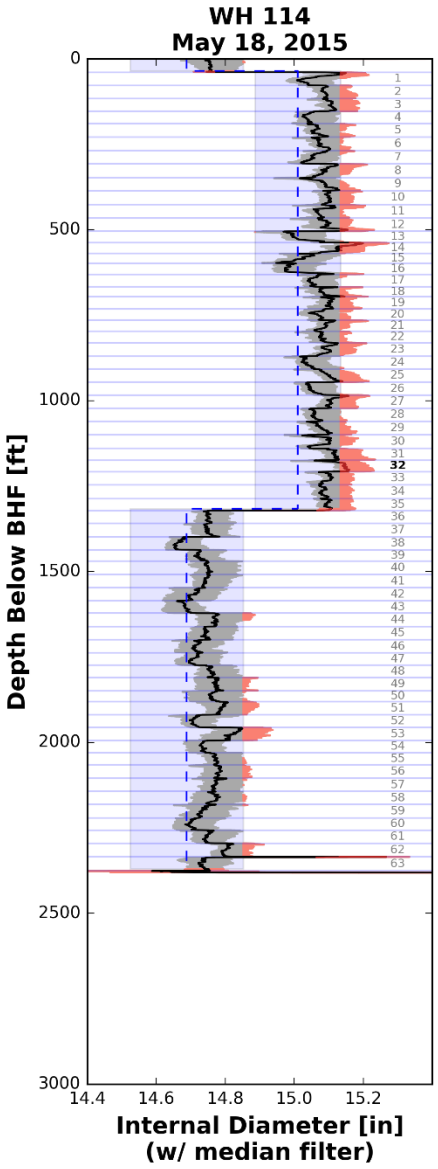

Figure 26 – Measured internal diameter of WH 114

Table 28 – WH 114 as-built specifications

Outside Diameter	Grade
16"	K-55

#/F	From [ft]	To [ft]	WT [in]	ID [in]	Collapse [psi]
109	0	35	0.656	14.688	2560
84	35	1316	0.495	15.010	1410
109	1316	2370	0.656	14.688	2560

West Hackberry 115

According to the MAC survey conducted in 2012, the majority of casings are out of tolerance. Sections 1-32 show smaller inner diameters. Again, this will not adversely affect structural integrity, but it may affect the ability to pass through an instrument. Most sections between 33-60 are within tolerance but composed of at least two casing weights. Sections 33-35, 37-38, 45-47, and 51 have greater inner diameters and look as if they are 106.5 #/ft. casings. Section 41 has an inner diameter similar to the 94 #/ft. sections. This particular section will likely have reduced strength. The nominal collapse strength of the in place well is 65% less than the designed casing weight.

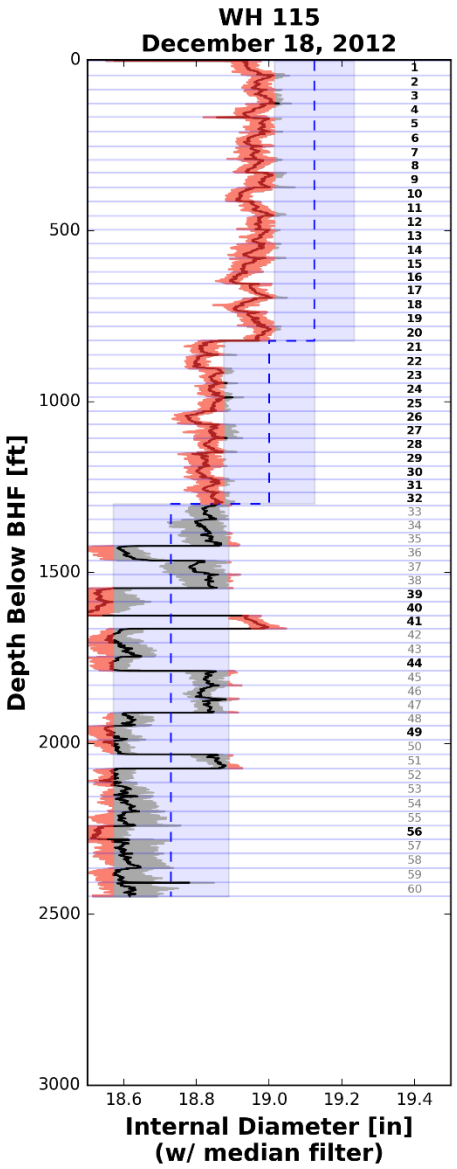

Figure 27 – Measured internal diameter of WH 115

Table 29 – WH 115 as-built specifications

Outside Diameter	Grade
20"	K-55

#/F	From [ft]	To [ft]	WT [in]	ID [in]	Collapse [psi]
94	0	822	0.438	19.124	520
106.5	822	1299	0.5	19	770
133	1299	2450	0.635	18.73	1500

West Hackberry 117A

Most of the well sections in the 54.5 #/ft. portion of the well have a larger inner diameter than expected. All of the other sections in the well are within tolerance. While within tolerance, section 29 is a different casing weight. It looks to be 61 #/ft. instead of 54.5 #/ft. Most of the minimum and maximum values are consistent, however, there is a section 56 shows an abrupt divergence in min and max values. This type of signal could indicate an increase in ovality.

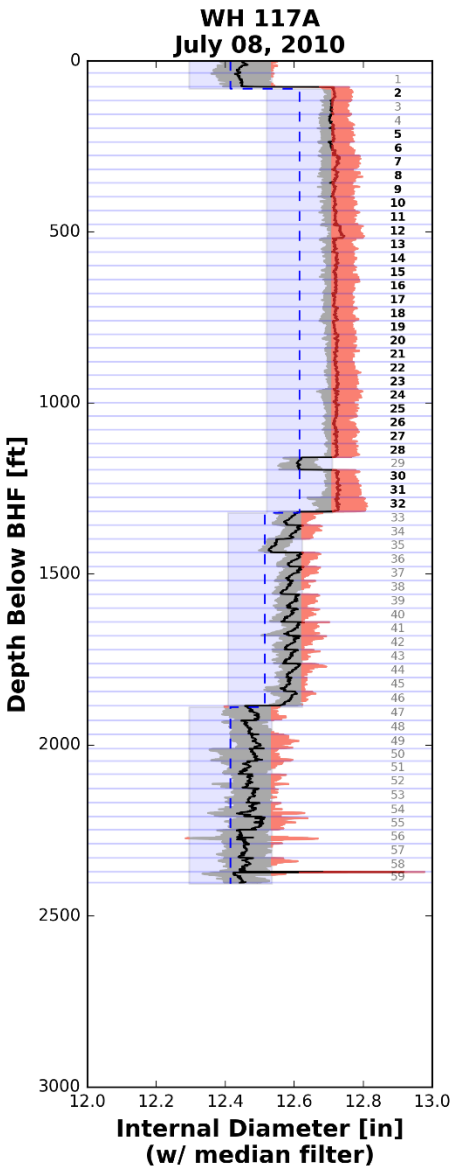

Figure 28 – Measured internal diameter of WH 117A

Table 30 – WH 117A as-built specifications

Outside Diameter	Grade
13 3/8"	K-55

#/F	From [ft]	To [ft]	WT [in]	ID [in]	Collapse [psi]
68	0	81	0.48	12.415	1950
54.5	81	1321	0.38	12.615	1130
61	1321	1889	0.43	12.515	1540
68	1889	2415	0.78	12.415	1950

West Hackberry 117B

The majority of sections are within tolerance. Only sections 3, 8-10, 19, 21, and 33 are out of tolerance but they are similar to the surrounding wells. As seen West Hackberry 117A there could be an abrupt increase in ovality in section 55. This phenomenon should be further investigated as it was seen in two wells that are in close proximity to each other.

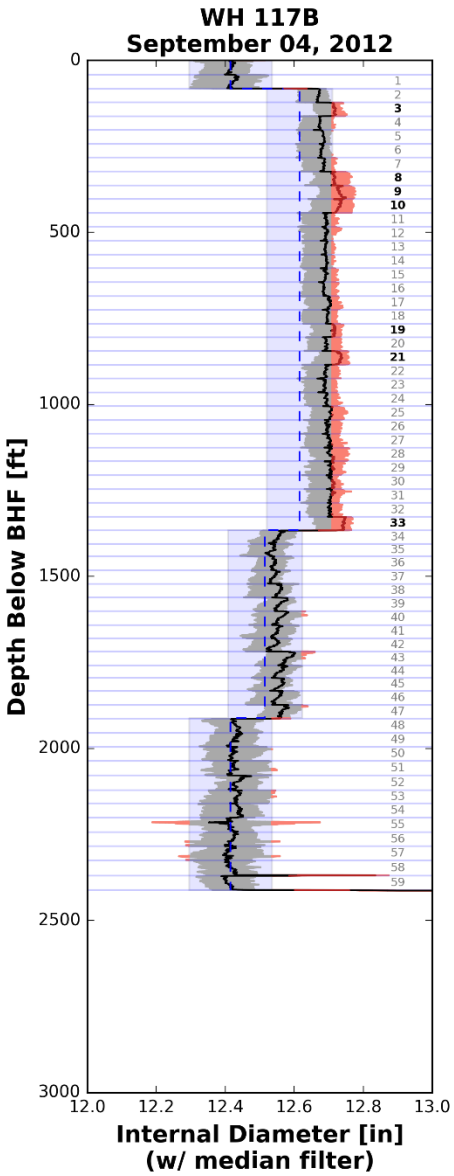

Figure 29 – Measured internal diameter of 117B

Table 31 – WH 117B as-built specifications

Outside Diameter	Grade
13 3/8"	K-55

#/F	From [ft]	To [ft]	WT [in]	ID [in]	Collapse [psi]
68	1	82	0.48	12.415	1950
54.5	82	1365	0.38	12.615	1130
61	1365	1911	0.43	12.515	1540
68	1911	2412	0.78	12.415	1950

4. CONCLUSIONS

Based on the baseline casing analysis most of the wells have one or more sections that are outside tolerance, however, wells 009B, 106A, 109, and 115 show traits that could be hazardous to the structural integrity of the well. These wells have sections that have walls considerably thinner than the as-built specifications show. In addition to the sections that have thinner walls, there are also sections with thicker walls than specified in the as-built drawings. These sections are less of a problem as their structural integrity is not compromised. They may, however, affect pass through of an instrument due to the constricted inner diameter.

Wells 103, 108, and 113 were assumed to have incorrect as-built drawings. These wells were shown to have an atypical design or significantly differed from the measured inner diameter.

Another topic for consideration is the accuracy and repeatability of the multi-arm caliper data. Well 011B was the only well at West Hackberry to be surveyed more than once at the time of writing this report. The results from each survey are somewhat different. The trends are the same but the absolute median, minimum, and maximum diameters change significantly between surveys. The difference is especially concerning as warping was not believed to cause the difference. It is suggested that a follow-up study be conducted to determine the repeatability and accuracy of each MAC survey as accurate data is paramount for baseline analyses.

4. REFERENCES

[1] B. L. Roberts, “Analysis of Multi-Arm Caliper Data for the U . S . Strategic Petroleum Reserve,” Albuquerque, NM, 2015.

[2] D. Moriarty and B. L. Roberts, “Well Casing Baseline Analysis for the Big Hill Strategic Petroleum Reserve Site,” Albuquerque, NM, 2016.

[3] ASTM International, “Standard Specification for General Requirements for Alloy and Stainless Steel Pipe.” West Conshohocken, PA, 2004.

[4] “Bulletin on Formulas and Calculations for Casing, Tubing, Drill Pipe, and Line Pipe Properties - API Bulletin 5C3,” 1994.

APPENDIX A – CALCULATED CASING WEIGHTS FOR EACH CASING SECTION

The tables presented in this section show the survey results by well section. Within each table, there is the casing number along with essential well information. First, there is the maximum depth of the section from the BHF. Depths were obtained using the RWD as described in the methodology section and then rounded to the nearest tenth of a foot. The third column shows expected casing weight which was taken from the as-built drawings. The next column is the casing weight that is calculated to be closest to the measured well section. The fifth column is populated by Boolean values that indicate if the majority of the points in each section are within the expected inner diameter range/threshold. If the majority of the measurements are within the expected range, the calculated casing weight is considered to be the expected casing weight (even if there is a different casing weight closer to the measured values). If the majority of the section measurements are not within the threshold, then the closest casing weight is chosen as the calculated casing weight. Rows highlighted red are cases in which the majority of measurements in a section are outside of the expected range.

West Hackberry 006

			Nominal Values			Measured Values			
Casing Number	Begin Casing Depth	End Casing Depth	Outside Diameter	Casing Weight	Internal Diameter	Internal Diameter	Closest Casing Weight	Within Threshold?	Calculated Casing Weight
-	*ft*	*ft*	*in*	*kg/ft*	*in*	*in*	*kg/ft*	-	*kg/ft*
1	11.5	33.1	7	26	6.276	6.308	26	TRUE	26
2	33.1	72.7	7	23	6.366	6.426	20	TRUE	23
3	72.7	114.9	7	23	6.366	6.404	23	TRUE	23
4	114.9	156.0	7	23	6.366	6.399	23	TRUE	23
5	156.0	198.0	7	23	6.366	6.439	20	TRUE	23
6	198.0	239.9	7	23	6.366	6.397	23	TRUE	23
7	239.9	281.7	7	23	6.366	6.400	23	TRUE	23
8	281.7	322.2	7	23	6.366	6.374	23	TRUE	23
9	322.2	364.6	7	23	6.366	6.409	23	TRUE	23
10	364.6	405.0	7	23	6.366	6.384	23	TRUE	23
11	405.0	447.3	7	23	6.366	6.402	23	TRUE	23
12	447.3	488.5	7	23	6.366	6.387	23	TRUE	23
13	488.5	530.6	7	23	6.366	6.394	23	TRUE	23
14	530.6	566.1	7	23	6.366	6.409	23	TRUE	23
15	566.1	606.4	7	23	6.366	6.388	23	TRUE	23
16	606.4	647.4	7	23	6.366	6.384	23	TRUE	23
17	647.4	687.8	7	23	6.366	6.378	23	TRUE	23
18	687.8	728.9	7	23	6.366	6.419	20	TRUE	23
19	728.9	769.5	7	23	6.366	6.405	23	TRUE	23
20	769.5	812.1	7	23	6.366	6.405	23	TRUE	23
21	812.1	853.2	7	23	6.366	6.388	23	TRUE	23
22	853.2	895.6	7	23	6.366	6.395	23	TRUE	23
23	895.6	934.7	7	23	6.366	6.387	23	TRUE	23
24	934.7	972.2	7	23	6.366	6.351	23	TRUE	23
25	972.2	1013.2	7	23	6.366	6.387	23	TRUE	23
26	1013.2	1053.8	7	23	6.366	6.390	23	TRUE	23
27	1053.8	1094.8	7	23	6.366	6.395	23	TRUE	23
28	1094.8	1135.7	7	23	6.366	6.383	23	TRUE	23
29	1135.7	1175.7	7	23	6.366	6.362	23	TRUE	23
30	1175.7	1214.6	7	23	6.366	6.370	23	TRUE	23
31	1214.6	1254.1	7	23	6.366	6.367	23	TRUE	23
32	1254.1	1294.9	7	26	6.276	6.300	26	TRUE	26
33	1294.9	1335.7	7	26	6.276	6.300	26	TRUE	26
34	1335.7	1376.4	7	26	6.276	6.295	26	TRUE	26
35	1376.4	1416.5	7	26	6.276	6.281	26	TRUE	26
36	1416.5	1457.0	7	26	6.276	6.293	26	TRUE	26
37	1457.0	1497.3	7	26	6.276	6.299	26	TRUE	26
38	1497.3	1534.8	7	26	6.276	6.293	26	TRUE	26
39	1534.8	1576.0	7	26	6.276	6.304	26	TRUE	26
40	1576.0	1616.6	7	26	6.276	6.277	26	TRUE	26
41	1616.6	1657.0	7	26	6.276	6.297	26	TRUE	26
42	1657.0	1698.1	7	26	6.276	6.316	26	TRUE	26
43	1698.1	1739.2	7	26	6.276	6.301	26	TRUE	26
44	1739.2	1779.2	7	26	6.276	6.303	26	TRUE	26
45	1779.2	1816.6	7	26	6.276	6.287	26	TRUE	26
46	1816.6	1855.3	7	26	6.276	6.281	26	TRUE	26
47	1855.3	1894.9	7	26	6.276	6.293	26	TRUE	26
48	1894.9	1936.4	7	26	6.276	6.298	26	TRUE	26
49	1936.4	1976.1	7	26	6.276	6.295	26	TRUE	26
50	1976.1	2015.6	7	26	6.276	6.298	26	TRUE	26

West Hackberry 006 (continued)

			Nominal Values			Measured Values			
Casing Number	Begin Casing Depth	End Casing Depth	Outside Diameter	Casing Weight	Internal Diameter	Internal Diameter	Closest Casing Weight	Within Threshold?	Calculated Casing Weight
-	*ft*	*ft*	*in*	*kg/ft*	*in*	*in*	*kg/ft*	-	*kg/ft*
51	2015.6	2056.1	7	26	6.276	6.287	26	TRUE	26
52	2056.1	2097.3	7	26	6.276	6.292	26	TRUE	26
53	2097.3	2138.0	7	26	6.276	6.289	26	TRUE	26
54	2138.0	2176.9	7	26	6.276	6.275	26	TRUE	26
55	2176.9	2216.0	7	26	6.276	6.291	26	TRUE	26
56	2216.0	2254.8	7	26	6.276	6.280	26	TRUE	26
57	2254.8	2295.4	7	26	6.276	6.276	26	TRUE	26
58	2295.4	2336.5	7	26	6.276	6.272	26	TRUE	26
59	2336.5	2376.7	7	26	6.276	6.283	26	TRUE	26
60	2376.7	2415.1	7	26	6.276	6.273	26	TRUE	26
61	2415.1	2457.2	7	26	6.276	6.284	26	TRUE	26
62	2457.2	2495.3	7	26	6.276	6.271	26	TRUE	26
63	2495.3	2536.9	7	26	6.276	6.288	26	TRUE	26
64	2536.9	2575.6	7	26	6.276	6.285	26	TRUE	26
65	2575.6	2616.2	7	26	6.276	6.267	26	TRUE	26
66	2616.2	2656.3	7	26	6.276	6.256	26	TRUE	26
67	2656.3	2699.0	7	26	6.276	6.277	26	TRUE	26
68	2699.0	2735.7	7	26	6.276	6.257	26	TRUE	26

West Hackberry 006B

			Nominal Values			Measured Values			
Casing Number	Begin Casing Depth	End Casing Depth	Outside Diameter	Casing Weight	Internal Diameter	Internal Diameter	Closest Casing Weight	Within Threshold?	Calculated Casing Weight
-	*ft*	*ft*	*in*	*kg/ft*	*in*	*in*	*kg/ft*	-	*kg/ft*
1	15.3	57.1	9.625	36	8.921	8.990	32.3	TRUE	36
2	57.1	103.2	9.625	36	8.921	8.995	32.3	TRUE	36
3	103.2	147.7	9.625	36	8.921	8.997	32.3	TRUE	36
4	147.7	193.2	9.625	36	8.921	9.011	32.3	FALSE	32.3
5	193.2	237.2	9.625	36	8.921	8.999	32.3	TRUE	36
6	237.2	282.0	9.625	36	8.921	9.008	32.3	TRUE	36
7	282.0	327.7	9.625	36	8.921	8.992	32.3	TRUE	36
8	327.7	370.0	9.625	36	8.921	8.992	32.3	TRUE	36
9	370.0	413.1	9.625	36	8.921	8.994	32.3	TRUE	36
10	413.1	458.0	9.625	36	8.921	9.007	32.3	TRUE	36
11	458.0	502.0	9.625	36	8.921	8.991	32.3	TRUE	36
12	502.0	546.2	9.625	36	8.921	9.003	32.3	TRUE	36
13	546.2	589.8	9.625	36	8.921	8.998	32.3	TRUE	36
14	589.8	630.2	9.625	36	8.921	8.994	32.3	TRUE	36
15	630.2	676.0	9.625	36	8.921	9.010	32.3	FALSE	32.3
16	676.0	722.3	9.625	36	8.921	8.996	32.3	TRUE	36
17	722.3	765.3	9.625	36	8.921	8.995	32.3	TRUE	36
18	765.3	808.8	9.625	36	8.921	8.995	32.3	TRUE	36
19	808.8	854.0	9.625	36	8.921	8.996	32.3	TRUE	36
20	854.0	895.7	9.625	36	8.921	9.028	32.3	FALSE	32.3
21	895.7	935.9	9.625	36	8.921	9.035	29.3	FALSE	29.3
22	935.9	976.2	9.625	36	8.921	9.032	29.3	FALSE	29.3
23	976.2	1013.8	9.625	36	8.921	8.959	36	TRUE	36
24	1013.8	1049.6	9.625	36	8.921	9.064	29.3	FALSE	29.3
25	1049.6	1086.6	9.625	36	8.921	9.019	32.3	FALSE	32.3
26	1086.6	1124.4	9.625	36	8.921	9.045	29.3	FALSE	29.3
27	1124.4	1159.3	9.625	36	8.921	9.024	32.3	FALSE	32.3
28	1159.3	1199.5	9.625	36	8.921	9.034	29.3	FALSE	29.3
29	1199.5	1245.6	9.625	36	8.921	9.028	32.3	FALSE	32.3
30	1245.6	1282.4	9.625	36	8.921	9.043	29.3	FALSE	29.3
31	1282.4	1323.3	9.625	36	8.921	9.048	29.3	FALSE	29.3
32	1323.3	1363.5	9.625	36	8.921	9.020	32.3	FALSE	32.3
33	1363.5	1399.2	9.625	36	8.921	9.044	29.3	FALSE	29.3
34	1399.2	1432.6	9.625	36	8.921	8.996	32.3	TRUE	36
35	1432.6	1467.0	9.625	36	8.921	9.030	32.3	FALSE	32.3
36	1467.0	1506.3	9.625	36	8.921	9.062	29.3	FALSE	29.3
37	1506.3	1545.1	9.625	36	8.921	9.034	29.3	FALSE	29.3
38	1545.1	1570.5	9.625	36	8.921	9.046	29.3	FALSE	29.3
39	1570.5	1596.8	9.625	36	8.921	9.032	32.3	FALSE	32.3
40	1596.8	1626.1	9.625	36	8.921	9.036	29.3	FALSE	29.3
41	1626.1	1656.1	9.625	36	8.921	9.036	29.3	FALSE	29.3
42	1656.1	1687.6	9.625	36	8.921	8.985	32.3	TRUE	36
43	1687.6	1730.3	9.625	36	8.921	8.998	32.3	TRUE	36
44	1730.3	1758.5	9.625	36	8.921	9.016	32.3	FALSE	32.3
45	1758.5	1806.0	9.625	36	8.921	9.009	32.3	TRUE	36
46	1806.0	1853.3	9.625	36	8.921	9.014	32.3	FALSE	32.3
47	1853.3	1899.6	9.625	36	8.921	9.016	32.3	FALSE	32.3
48	1899.6	1942.9	9.625	36	8.921	9.008	32.3	TRUE	36
49	1942.9	1977.3	9.625	36	8.921	9.004	32.3	TRUE	36
50	1977.3	2018.2	9.625	36	8.921	8.991	32.3	TRUE	36

West Hackberry 006B (continued)

			Nominal Values			Measured Values			
Casing Number	Begin Casing Depth	End Casing Depth	Outside Diameter	Casing Weight	Internal Diameter	Internal Diameter	Closest Casing Weight	Within Threshold?	Calculated Casing Weight
-	*ft*	*ft*	*in*	*kg/ft*	*in*	*in*	*kg/ft*	-	*kg/ft*
51	2018.2	2061.4	9.625	36	8.921	8.998	32.3	TRUE	36
52	2061.4	2097.0	9.625	36	8.921	8.977	32.3	TRUE	36
53	2097.0	2140.6	9.625	36	8.921	9.002	32.3	TRUE	36
54	2140.6	2183.4	9.625	36	8.921	8.985	32.3	TRUE	36
55	2183.4	2227.1	9.625	36	8.921	9.012	32.3	FALSE	32.3
56	2227.1	2272.6	9.625	36	8.921	8.997	32.3	TRUE	36
57	2272.6	2318.4	9.625	36	8.921	8.996	32.3	TRUE	36
58	2318.4	2363.8	9.625	36	8.921	9.009	32.3	FALSE	32.3
59	2363.8	2406.7	9.625	36	8.921	8.990	32.3	TRUE	36
60	2406.7	2452.1	9.625	36	8.921	9.029	32.3	FALSE	32.3
61	2452.1	2493.8	9.625	36	8.921	9.003	32.3	TRUE	36
62	2493.8	2538.6	9.625	36	8.921	8.997	32.3	TRUE	36

West Hackberry 006C

			Nominal Values			Measured Values			
Casing Number	Begin Casing Depth	End Casing Depth	Outside Diameter	Casing Weight	Nominal Internal Diameter	Measured Internal Diameter	Closest Casing Weight	Within Threshold?	Calculated Casing Weight
-	*ft*	*ft*	*in*	*kg/ft*	*in*	*in*	*kg/ft*	-	*kg/ft*
1	0.0	35.8	9.625	36	8.921	9.039	29.3	FALSE	29.3
2	35.8	79.4	9.625	36	8.921	8.995	32.3	TRUE	36
3	79.4	116.7	9.625	36	8.921	9.016	32.3	FALSE	32.3
4	116.7	159.3	9.625	36	8.921	9.029	32.3	FALSE	32.3
5	159.3	198.3	9.625	36	8.921	9.036	29.3	FALSE	29.3
6	198.3	237.3	9.625	36	8.921	9.016	32.3	FALSE	32.3
7	237.3	272.2	9.625	36	8.921	8.988	32.3	TRUE	36
8	272.2	310.9	9.625	36	8.921	9.006	32.3	TRUE	36
9	310.9	351.3	9.625	36	8.921	9.028	32.3	FALSE	32.3
10	351.3	390.8	9.625	36	8.921	9.015	32.3	FALSE	32.3
11	390.8	431.2	9.625	36	8.921	9.015	32.3	FALSE	32.3
12	431.2	471.1	9.625	36	8.921	8.993	32.3	TRUE	36
13	471.1	512.3	9.625	36	8.921	9.033	29.3	FALSE	29.3
14	512.3	550.7	9.625	36	8.921	9.001	32.3	TRUE	36
15	550.7	591.3	9.625	36	8.921	9.038	29.3	FALSE	29.3
16	591.3	629.7	9.625	36	8.921	9.002	32.3	TRUE	36
17	629.7	669.5	9.625	36	8.921	9.023	32.3	FALSE	32.3
18	669.5	711.0	9.625	36	8.921	9.021	32.3	FALSE	32.3
19	711.0	748.7	9.625	36	8.921	8.983	32.3	TRUE	36
20	748.7	786.3	9.625	36	8.921	9.008	32.3	TRUE	36
21	786.3	825.2	9.625	36	8.921	9.019	32.3	FALSE	32.3
22	825.2	866.3	9.625	36	8.921	9.034	29.3	FALSE	29.3
23	866.3	907.8	9.625	36	8.921	9.012	32.3	FALSE	32.3
24	907.8	947.8	9.625	36	8.921	9.020	32.3	FALSE	32.3
25	947.8	985.8	9.625	36	8.921	9.007	32.3	TRUE	36
26	985.8	1022.3	9.625	36	8.921	9.020	32.3	FALSE	32.3
27	1022.3	1061.0	9.625	36	8.921	9.003	32.3	TRUE	36
28	1061.0	1100.8	9.625	36	8.921	9.006	32.3	TRUE	36
29	1100.8	1139.2	9.625	36	8.921	9.016	32.3	FALSE	32.3
30	1139.2	1179.0	9.625	36	8.921	9.015	32.3	FALSE	32.3
31	1179.0	1217.1	9.625	36	8.921	9.032	32.3	FALSE	32.3
32	1217.1	1255.5	9.625	36	8.921	9.017	32.3	FALSE	32.3
33	1255.5	1295.9	9.625	36	8.921	9.002	32.3	TRUE	36
34	1295.9	1331.0	9.625	36	8.921	9.022	32.3	FALSE	32.3
35	1331.0	1370.2	9.625	36	8.921	9.009	32.3	FALSE	32.3
36	1370.2	1409.5	9.625	36	8.921	9.012	32.3	FALSE	32.3
37	1409.5	1452.0	9.625	36	8.921	9.003	32.3	TRUE	36
38	1452.0	1491.5	9.625	36	8.921	9.020	32.3	FALSE	32.3
39	1491.5	1527.0	9.625	36	8.921	9.029	32.3	FALSE	32.3
40	1527.0	1563.2	9.625	36	8.921	9.017	32.3	FALSE	32.3
41	1563.2	1604.1	9.625	36	8.921	9.019	32.3	FALSE	32.3
42	1604.1	1641.9	9.625	36	8.921	9.014	32.3	FALSE	32.3
43	1641.9	1682.2	9.625	36	8.921	9.039	29.3	FALSE	29.3
44	1682.2	1723.8	9.625	36	8.921	9.038	29.3	FALSE	29.3
45	1723.8	1763.7	9.625	36	8.921	9.014	32.3	FALSE	32.3
46	1763.7	1802.3	9.625	36	8.921	9.025	32.3	FALSE	32.3
47	1802.3	1843.2	9.625	36	8.921	9.032	29.3	FALSE	29.3
48	1843.2	1881.4	9.625	36	8.921	9.003	32.3	TRUE	36
49	1881.4	1922.8	9.625	36	8.921	9.019	32.3	FALSE	32.3
50	1922.8	1965.0	9.625	36	8.921	9.022	32.3	FALSE	32.3

West Hackberry 006C (continued)

			Nominal Values			Measured Values			
Casing Number	Begin Casing Depth	End Casing Depth	Outside Diameter	Casing Weight	Internal Diameter	Internal Diameter	Closest Casing Weight	Within Threshold?	Calculated Casing Weight
-	*ft*	*ft*	*in*	*kg/ft*	*in*	*in*	*kg/ft*	-	*kg/ft*
51	1965.0	2001.0	9.625	36	8.921	9.001	32.3	TRUE	36
52	2001.0	2042.0	9.625	36	8.921	9.025	32.3	FALSE	32.3
53	2042.0	2080.9	9.625	36	8.921	9.017	32.3	FALSE	32.3
54	2080.9	2121.9	9.625	36	8.921	9.012	32.3	FALSE	32.3
55	2121.9	2161.9	9.625	36	8.921	9.036	29.3	FALSE	29.3
56	2161.9	2203.0	9.625	36	8.921	9.023	32.3	FALSE	32.3
57	2203.0	2241.7	9.625	36	8.921	9.043	29.3	FALSE	29.3
58	2241.7	2282.8	9.625	36	8.921	9.013	32.3	FALSE	32.3
59	2282.8	2320.8	9.625	36	8.921	9.028	32.3	FALSE	32.3
60	2320.8	2361.9	9.625	36	8.921	9.053	29.3	FALSE	29.3
61	2361.9	2398.5	9.625	36	8.921	9.005	32.3	TRUE	36
62	2398.5	2442.8	9.625	36	8.921	8.992	32.3	TRUE	36
63	2442.8	2483.0	9.625	36	8.921	9.014	32.3	FALSE	32.3
64	2483.0	2523.9	9.625	36	8.921	9.004	32.3	TRUE	36
65	2523.9	2565.8	9.625	36	8.921	9.030	32.3	FALSE	32.3
66	2565.8	2602.2	9.625	36	8.921	9.014	32.3	FALSE	32.3
67	2602.2	2640.7	9.625	36	8.921	9.001	32.3	TRUE	36
68	2640.7	2682.1	9.625	36	8.921	9.012	32.3	FALSE	32.3
69	2682.1	2715.7	9.625	36	8.921	9.023	32.3	FALSE	32.3

West Hackberry 007B

			Nominal Values			Measured Values			
Casing Number	Begin Casing Depth	End Casing Depth	Outside Diameter	Casing Weight	Nominal Internal Diameter	Measured Internal Diameter	Closest Casing Weight	Within Threshold?	Calculated Casing Weight
-	*ft*	*ft*	*in*	*kg/ft*	*in*	*in*	*kg/ft*	-	*kg/ft*
1	5.9	61.2	13.375	61	12.515	12.557	61	TRUE	61
2	61.2	102.4	13.375	61	12.515	12.562	61	TRUE	61
3	102.4	142.7	13.375	61	12.515	12.549	61	TRUE	61
4	142.7	187.1	13.375	61	12.515	12.616	54.5	TRUE	61
5	187.1	222.8	13.375	61	12.515	12.568	54.5	TRUE	61
6	222.8	265.7	13.375	61	12.515	12.579	54.5	TRUE	61
7	265.7	304.9	13.375	61	12.515	12.610	54.5	TRUE	61
8	304.9	340.6	13.375	61	12.515	12.518	61	TRUE	61
9	340.6	379.1	13.375	61	12.515	12.551	61	TRUE	61
10	379.1	417.0	13.375	61	12.515	12.532	61	TRUE	61
11	417.0	457.6	13.375	61	12.515	12.499	61	TRUE	61
12	457.6	496.0	13.375	61	12.515	12.516	61	TRUE	61
13	496.0	532.0	13.375	61	12.515	12.517	61	TRUE	61
14	532.0	566.2	13.375	61	12.515	12.473	61	TRUE	61
15	566.2	602.3	13.375	61	12.515	12.499	61	TRUE	61
16	602.3	641.5	13.375	61	12.515	12.499	61	TRUE	61
17	641.5	682.5	13.375	61	12.515	12.520	61	TRUE	61
18	682.5	721.8	13.375	61	12.515	12.521	61	TRUE	61
19	721.8	758.0	13.375	61	12.515	12.472	61	TRUE	61
20	758.0	796.3	13.375	61	12.515	12.504	61	TRUE	61
21	796.3	832.1	13.375	61	12.515	12.516	61	TRUE	61
22	832.1	871.4	13.375	61	12.515	12.567	54.5	TRUE	61
23	871.4	908.7	13.375	61	12.515	12.526	61	TRUE	61
24	908.7	948.7	13.375	61	12.515	12.532	61	TRUE	61
25	948.7	989.7	13.375	61	12.515	12.568	54.5	TRUE	61
26	989.7	1026.3	13.375	61	12.515	12.572	54.5	TRUE	61
27	1026.3	1067.4	13.375	61	12.515	12.565	61	TRUE	61
28	1067.4	1104.4	13.375	61	12.515	12.542	61	TRUE	61
29	1104.4	1147.2	13.375	61	12.515	12.554	61	TRUE	61
30	1147.2	1188.3	13.375	61	12.515	12.558	61	TRUE	61
31	1188.3	1226.9	13.375	61	12.515	12.541	61	TRUE	61
32	1226.9	1269.5	13.375	61	12.515	12.525	61	TRUE	61
33	1269.5	1303.9	13.375	61	12.515	12.545	61	TRUE	61
34	1303.9	1338.4	13.375	61	12.515	12.555	61	TRUE	61
35	1338.4	1375.7	13.375	61	12.515	12.552	61	TRUE	61
36	1375.7	1416.1	13.375	61	12.515	12.529	61	TRUE	61
37	1416.1	1453.4	13.375	61	12.515	12.536	61	TRUE	61
38	1453.4	1494.9	13.375	61	12.515	12.547	61	TRUE	61
39	1494.9	1536.0	13.375	61	12.515	12.553	61	TRUE	61
40	1536.0	1575.9	13.375	61	12.515	12.587	54.5	TRUE	61
41	1575.9	1612.7	13.375	61	12.515	12.553	61	TRUE	61
42	1612.7	1655.3	13.375	61	12.515	12.555	61	TRUE	61
43	1655.3	1689.2	13.375	61	12.515	12.530	61	TRUE	61
44	1689.2	1730.2	13.375	61	12.515	12.526	61	TRUE	61
45	1730.2	1767.0	13.375	61	12.515	12.541	61	TRUE	61
46	1767.0	1802.2	13.375	61	12.515	12.537	61	TRUE	61
47	1802.2	1840.3	13.375	61	12.515	12.551	61	TRUE	61
48	1840.3	1879.5	13.375	61	12.515	12.560	61	TRUE	61
49	1879.5	1920.8	13.375	61	12.515	12.543	61	TRUE	61
50	1920.8	1962.0	13.375	61	12.515	12.536	61	TRUE	61

West Hackberry 007B

			Nominal Values			Measured Values			
Casing Number	Begin Casing Depth	End Casing Depth	Outside Diameter	Casing Weight	Nominal Internal Diameter	Measured Internal Diameter	Closest Casing Weight	Within Threshold?	Calculated Casing Weight
-	*ft*	*ft*	*in*	*kg/ft*	*in*	*in*	*kg/ft*	-	*kg/ft*
51	1962.0	2003.7	13.375	61	12.515	12.550	61	TRUE	61
52	2003.7	2046.2	13.375	61	12.515	12.537	61	TRUE	61
53	2046.2	2089.9	13.375	61	12.515	12.558	61	TRUE	61
54	2089.9	2131.6	13.375	61	12.515	12.545	61	TRUE	61
55	2131.6	2172.4	13.375	61	12.515	12.542	61	TRUE	61
56	2172.4	2214.3	13.375	61	12.515	12.536	61	TRUE	61
57	2214.3	2255.6	13.375	61	12.515	12.536	61	TRUE	61
58	2255.6	2297.2	13.375	61	12.515	12.525	61	TRUE	61
59	2297.2	2338.8	13.375	61	12.515	12.531	61	TRUE	61
60	2338.8	2376.1	13.375	61	12.515	12.542	61	TRUE	61

West Hackberry 008

			Nominal Values			Measured Values			
Casing Number	Begin Casing Depth	End Casing Depth	Outside Diameter	Casing Weight	Nominal Internal Diameter	Measured Internal Diameter	Closest Casing Weight	Within Threshold?	Calculated Casing Weight
-	*ft*	*ft*	*in*	*kg/ft*	*in*	*in*	*kg/ft*	-	*kg/ft*
1	19.8	59.6	9.625	36	8.921	8.973	32.3	TRUE	36
2	59.6	99.9	9.625	36	8.921	8.976	32.3	TRUE	36
3	99.9	142.9	9.625	36	8.921	8.974	32.3	TRUE	36
4	142.9	183.7	9.625	36	8.921	8.968	32.3	TRUE	36
5	183.7	224.1	9.625	36	8.921	8.954	36	TRUE	36
6	224.1	266.7	9.625	36	8.921	8.967	32.3	TRUE	36
7	266.7	308.8	9.625	36	8.921	8.963	32.3	TRUE	36
8	308.8	352.2	9.625	36	8.921	8.976	32.3	TRUE	36
9	352.2	391.4	9.625	36	8.921	8.988	32.3	TRUE	36
10	391.4	429.0	9.625	36	8.921	8.984	32.3	TRUE	36
11	429.0	466.2	9.625	36	8.921	8.969	32.3	TRUE	36
12	466.2	507.4	9.625	36	8.921	8.988	32.3	TRUE	36
13	507.4	545.6	9.625	36	8.921	8.984	32.3	TRUE	36
14	545.6	585.8	9.625	36	8.921	8.969	32.3	TRUE	36
15	585.8	626.4	9.625	36	8.921	8.983	32.3	TRUE	36
16	626.4	664.2	9.625	36	8.921	8.989	32.3	TRUE	36
17	664.2	705.6	9.625	36	8.921	8.983	32.3	TRUE	36
18	705.6	748.3	9.625	36	8.921	8.983	32.3	TRUE	36
19	748.3	786.1	9.625	36	8.921	8.975	32.3	TRUE	36
20	786.1	824.8	9.625	36	8.921	8.953	36	TRUE	36
21	824.8	866.6	9.625	36	8.921	9.014	32.3	FALSE	32.3
22	866.6	908.2	9.625	36	8.921	8.988	32.3	TRUE	36
23	908.2	948.9	9.625	36	8.921	8.971	32.3	TRUE	36
24	948.9	990.8	9.625	36	8.921	8.984	32.3	TRUE	36
25	990.8	1033.7	9.625	36	8.921	9.005	32.3	TRUE	36
26	1033.7	1075.3	9.625	36	8.921	9.000	32.3	TRUE	36
27	1075.3	1116.7	9.625	36	8.921	8.987	32.3	TRUE	36
28	1116.7	1159.6	9.625	36	8.921	8.977	32.3	TRUE	36
29	1159.6	1199.2	9.625	36	8.921	8.977	32.3	TRUE	36
30	1199.2	1238.1	9.625	36	8.921	8.992	32.3	TRUE	36
31	1238.1	1277.0	9.625	36	8.921	8.947	36	TRUE	36
32	1277.0	1319.6	9.625	36	8.921	8.997	32.3	TRUE	36
33	1319.6	1359.5	9.625	36	8.921	8.986	32.3	TRUE	36
34	1359.5	1397.9	9.625	36	8.921	8.973	32.3	TRUE	36
35	1397.9	1438.0	9.625	36	8.921	8.990	32.3	TRUE	36
36	1438.0	1478.9	9.625	36	8.921	8.973	32.3	TRUE	36
37	1478.9	1521.0	9.625	36	8.921	8.975	32.3	TRUE	36
38	1521.0	1562.9	9.625	36	8.921	8.987	32.3	TRUE	36
39	1562.9	1603.0	9.625	36	8.921	8.963	32.3	TRUE	36
40	1603.0	1645.2	9.625	36	8.921	8.984	32.3	TRUE	36
41	1645.2	1682.7	9.625	36	8.921	8.966	32.3	TRUE	36
42	1682.7	1723.2	9.625	36	8.921	8.970	32.3	TRUE	36
43	1723.2	1764.8	9.625	36	8.921	9.004	32.3	TRUE	36
44	1764.8	1807.5	9.625	36	8.921	8.990	32.3	TRUE	36
45	1807.5	1848.8	9.625	36	8.921	8.985	32.3	TRUE	36
46	1848.8	1891.5	9.625	36	8.921	8.998	32.3	TRUE	36
47	1891.5	1932.8	9.625	36	8.921	8.986	32.3	TRUE	36
48	1932.8	1967.9	9.625	36	8.921	8.983	32.3	TRUE	36
49	1967.9	2009.6	9.625	36	8.921	8.988	32.3	TRUE	36
50	2009.6	2052.7	9.625	36	8.921	8.995	32.3	TRUE	36

West Hackberry 008 (continued)

			Nominal Values			Measured Values			
Casing Number	Begin Casing Depth	End Casing Depth	Outside Diameter	Casing Weight	Nominal Internal Diameter	Measured Internal Diameter	Closest Casing Weight	Within Threshold?	Calculated Casing Weight
-	*ft*	*ft*	*in*	*kg/ft*	*in*	*in*	*kg/ft*	-	*kg/ft*
51	2052.7	2095.9	9.625	36	8.921	8.993	32.3	TRUE	36
52	2095.9	2139.2	9.625	36	8.921	8.997	32.3	TRUE	36
53	2139.2	2179.7	9.625	36	8.921	9.001	32.3	TRUE	36
54	2179.7	2220.6	9.625	36	8.921	8.981	32.3	TRUE	36
55	2220.6	2261.7	9.625	36	8.921	8.943	36	TRUE	36
56	2261.7	2304.2	9.625	36	8.921	8.993	32.3	TRUE	36
57	2304.2	2346.7	9.625	36	8.921	8.968	32.3	TRUE	36

West Hackberry 008A

			Nominal Values			Measured Values			
Casing Number	Begin Casing Depth	End Casing Depth	Outside Diameter	Casing Weight	Nominal Internal Diameter	Measured Internal Diameter	Closest Casing Weight	Within Threshold?	Calculated Casing Weight
-	*ft*	*ft*	*in*	*kg/ft*	*in*	*in*	*kg/ft*	-	*kg/ft*
1	13.7	55.7	13.375	61	12.515	12.559	61	TRUE	61
2	55.7	97.2	13.375	61	12.515	12.557	61	TRUE	61
3	97.2	137.6	13.375	61	12.515	12.555	61	TRUE	61
4	137.6	179.2	13.375	61	12.515	12.546	61	TRUE	61
5	179.2	220.3	13.375	61	12.515	12.535	61	TRUE	61
6	220.3	260.3	13.375	61	12.515	12.530	61	TRUE	61
7	260.3	301.9	13.375	61	12.515	12.542	61	TRUE	61
8	301.9	343.1	13.375	61	12.515	12.530	61	TRUE	61
9	343.1	383.5	13.375	61	12.515	12.548	61	TRUE	61
10	383.5	425.9	13.375	61	12.515	12.552	61	TRUE	61
11	425.9	468.6	13.375	61	12.515	12.566	54.5	TRUE	61
12	468.6	508.6	13.375	61	12.515	12.573	54.5	TRUE	61
13	508.6	551.1	13.375	61	12.515	12.547	61	TRUE	61
14	551.1	590.3	13.375	61	12.515	12.550	61	TRUE	61
15	590.3	631.2	13.375	61	12.515	12.553	61	TRUE	61
16	631.2	664.8	13.375	61	12.515	12.569	54.5	TRUE	61
17	664.8	704.6	13.375	61	12.515	12.554	61	TRUE	61
18	704.6	746.1	13.375	61	12.515	12.521	61	TRUE	61
19	746.1	789.0	13.375	61	12.515	12.549	61	TRUE	61
20	789.0	829.4	13.375	61	12.515	12.565	61	TRUE	61
21	829.4	871.0	13.375	61	12.515	12.536	61	TRUE	61
22	871.0	913.6	13.375	61	12.515	12.541	61	TRUE	61
23	913.6	955.2	13.375	61	12.515	12.538	61	TRUE	61
24	955.2	995.7	13.375	61	12.515	12.568	54.5	TRUE	61
25	995.7	1038.6	13.375	61	12.515	12.564	61	TRUE	61
26	1038.6	1081.0	13.375	61	12.515	12.559	61	TRUE	61
27	1081.0	1122.8	13.375	61	12.515	12.565	61	TRUE	61
28	1122.8	1165.7	13.375	61	12.515	12.569	54.5	TRUE	61
29	1165.7	1200.3	13.375	61	12.515	12.548	61	TRUE	61
30	1200.3	1242.1	13.375	61	12.515	12.546	61	TRUE	61
31	1242.1	1284.9	13.375	61	12.515	12.555	61	TRUE	61
32	1284.9	1322.2	13.375	61	12.515	12.583	54.5	TRUE	61
33	1322.2	1361.9	13.375	61	12.515	12.521	61	TRUE	61
34	1361.9	1397.1	13.375	61	12.515	12.575	54.5	TRUE	61
35	1397.1	1434.6	13.375	61	12.515	12.567	54.5	TRUE	61
36	1434.6	1476.5	13.375	61	12.515	12.550	61	TRUE	61
37	1476.5	1516.4	13.375	61	12.515	12.564	61	TRUE	61
38	1516.4	1559.1	13.375	61	12.515	12.561	61	TRUE	61
39	1559.1	1599.9	13.375	61	12.515	12.537	61	TRUE	61
40	1599.9	1641.4	13.375	61	12.515	12.549	61	TRUE	61
41	1641.4	1684.2	13.375	61	12.515	12.567	54.5	TRUE	61
42	1684.2	1717.9	13.375	61	12.515	12.540	61	TRUE	61
43	1717.9	1759.2	13.375	61	12.515	12.545	61	TRUE	61
44	1759.2	1801.1	13.375	61	12.515	12.565	54.5	TRUE	61
45	1801.1	1843.8	13.375	61	12.515	12.561	61	TRUE	61
46	1843.8	1885.5	13.375	61	12.515	12.574	54.5	TRUE	61
47	1885.5	1926.2	13.375	61	12.515	12.559	61	TRUE	61
48	1926.2	1968.8	13.375	61	12.515	12.564	61	TRUE	61
49	1968.8	2010.4	13.375	61	12.515	12.556	61	TRUE	61
50	2010.4	2049.9	13.375	61	12.515	12.559	61	TRUE	61

West Hackberry 008A (continued)

			Nominal Values			Measured Values			
Casing Number	Begin Casing Depth	End Casing Depth	Outside Diameter	Casing Weight	Nominal Internal Diameter	Measured Internal Diameter	Closest Casing Weight	Within Threshold?	Calculated Casing Weight
-	*ft*	*ft*	*in*	*kg/ft*	*in*	*in*	*kg/ft*	-	*kg/ft*
51	2049.9	2089.3	13.375	61	12.515	12.559	61	TRUE	61
52	2089.3	2127.4	13.375	61	12.515	12.589	54.5	TRUE	61
53	2127.4	2168.1	13.375	61	12.515	12.550	61	TRUE	61
54	2168.1	2203.1	13.375	61	12.515	12.577	54.5	TRUE	61
55	2203.1	2241.6	13.375	61	12.515	12.544	61	TRUE	61
56	2241.6	2282.3	13.375	61	12.515	12.565	54.5	TRUE	61
57	2282.3	2324.1	13.375	61	12.515	12.566	54.5	TRUE	61

West Hackberry 008B

			Nominal Values			Measured Values			
Casing Number	Begin Casing Depth	End Casing Depth	Outside Diameter	Casing Weight	Nominal Internal Diameter	Measured Internal Diameter	Closest Casing Weight	Within Threshold?	Calculated Casing Weight
-	*ft*	*ft*	*in*	*kg/ft*	*in*	*in*	*kg/ft*	-	*kg/ft*
1	19.4	62.4	10.75	51	9.85	9.907	45.5	TRUE	51
2	62.4	106.5	10.75	51	9.85	9.916	45.5	TRUE	51
3	106.5	150.2	10.75	51	9.85	9.927	45.5	TRUE	51
4	150.2	193.2	10.75	51	9.85	9.919	45.5	TRUE	51
5	193.2	237.0	10.75	51	9.85	9.933	45.5	TRUE	51
6	237.0	280.9	10.75	51	9.85	9.904	45.5	TRUE	51
7	280.9	325.3	10.75	51	9.85	9.916	45.5	TRUE	51
8	325.3	367.9	10.75	51	9.85	9.912	45.5	TRUE	51
9	367.9	413.4	10.75	51	9.85	9.911	45.5	TRUE	51
10	413.4	456.2	10.75	51	9.85	9.912	45.5	TRUE	51
11	456.2	500.0	10.75	51	9.85	9.914	45.5	TRUE	51
12	500.0	543.2	10.75	51	9.85	9.917	45.5	TRUE	51
13	543.2	582.5	10.75	51	9.85	9.854	51	TRUE	51
14	582.5	627.0	10.75	51	9.85	9.912	45.5	TRUE	51
15	627.0	669.5	10.75	51	9.85	9.857	51	TRUE	51
16	669.5	712.2	10.75	51	9.85	9.913	45.5	TRUE	51
17	712.2	753.1	10.75	51	9.85	9.916	45.5	TRUE	51
18	753.1	796.1	10.75	51	9.85	9.913	45.5	TRUE	51
19	796.1	841.4	10.75	51	9.85	9.934	45.5	TRUE	51
20	841.4	885.0	10.75	51	9.85	9.908	45.5	TRUE	51
21	885.0	928.3	10.75	51	9.85	9.908	45.5	TRUE	51
22	928.3	973.0	10.75	51	9.85	9.911	45.5	TRUE	51
23	973.0	1013.5	10.75	51	9.85	9.923	45.5	TRUE	51
24	1013.5	1056.9	10.75	51	9.85	9.900	51	TRUE	51
25	1056.9	1099.7	10.75	51	9.85	9.946	45.5	TRUE	51
26	1099.7	1143.0	10.75	51	9.85	9.914	45.5	TRUE	51
27	1143.0	1184.6	10.75	51	9.85	9.908	45.5	TRUE	51
28	1184.6	1228.2	10.75	51	9.85	9.900	51	TRUE	51
29	1228.2	1273.1	10.75	51	9.85	9.931	45.5	TRUE	51
30	1273.1	1309.1	10.75	51	9.85	9.918	45.5	TRUE	51
31	1309.1	1352.6	10.75	51	9.85	9.910	45.5	TRUE	51
32	1352.6	1396.3	10.75	51	9.85	9.910	45.5	TRUE	51
33	1396.3	1438.8	10.75	51	9.85	9.922	45.5	TRUE	51
34	1438.8	1480.2	10.75	51	9.85	9.913	45.5	TRUE	51
35	1480.2	1523.1	10.75	51	9.85	9.919	45.5	TRUE	51
36	1523.1	1564.9	10.75	51	9.85	9.898	51	TRUE	51
37	1564.9	1608.7	10.75	51	9.85	9.902	45.5	TRUE	51
38	1608.7	1652.0	10.75	51	9.85	9.910	45.5	TRUE	51
39	1652.0	1696.2	10.75	51	9.85	9.927	45.5	TRUE	51
40	1696.2	1740.8	10.75	51	9.85	9.911	45.5	TRUE	51
41	1740.8	1784.1	10.75	51	9.85	9.917	45.5	TRUE	51
42	1784.1	1828.3	10.75	51	9.85	9.898	51	TRUE	51
43	1828.3	1870.2	10.75	51	9.85	9.899	51	TRUE	51
44	1870.2	1915.7	10.75	51	9.85	9.917	45.5	TRUE	51
45	1915.7	1957.5	10.75	51	9.85	9.908	45.5	TRUE	51
46	1957.5	1999.4	10.75	51	9.85	9.923	45.5	TRUE	51
47	1999.4	2041.6	10.75	51	9.85	9.911	45.5	TRUE	51
48	2041.6	2084.1	10.75	51	9.85	9.914	45.5	TRUE	51
49	2084.1	2125.6	10.75	51	9.85	9.913	45.5	TRUE	51
50	2125.6	2170.5	10.75	51	9.85	9.919	45.5	TRUE	51

West Hackberry 008B (continued)

			Nominal Values			Measured Values			
Casing Number	Begin Casing Depth	End Casing Depth	Outside Diameter	Casing Weight	Nominal Internal Diameter	Measured Internal Diameter	Closest Casing Weight	Within Threshold?	Calculated Casing Weight
-	*ft*	*ft*	*in*	*kg/ft*	*in*	*in*	*kg/ft*	-	*kg/ft*
51	2170.5	2216.1	10.75	51	9.85	9.899	51	TRUE	51
52	2216.1	2259.5	10.75	51	9.85	9.894	51	TRUE	51
53	2259.5	2297.8	13.375	61	12.515	12.591	54.5	TRUE	61
54	2297.8	2339.8	13.375	61	12.515	12.570	54.5	TRUE	61

West Hackberry 009

			Nominal Values			Measured Values			
Casing Number	Begin Casing Depth	End Casing Depth	Outside Diameter	Casing Weight	Nominal Internal Diameter	Measured Internal Diameter	Closest Casing Weight	Within Threshold?	Calculated Casing Weight
-	*ft*	*ft*	*in*	*kg/ft*	*in*	*in*	*kg/ft*	-	*kg/ft*
1	18.9	59.4	9.625	36	8.921	9.027	32.3	FALSE	32.3
2	59.4	97.6	9.625	36	8.921	8.954	36	TRUE	36
3	97.6	135.0	9.625	36	8.921	9.005	32.3	TRUE	36
4	135.0	177.8	9.625	36	8.921	9.028	32.3	FALSE	32.3
5	177.8	220.5	9.625	36	8.921	9.037	29.3	FALSE	29.3
6	220.5	263.4	9.625	36	8.921	9.025	32.3	FALSE	32.3
7	263.4	302.6	9.625	36	8.921	8.994	32.3	TRUE	36
8	302.6	343.0	9.625	36	8.921	9.018	32.3	FALSE	32.3
9	343.0	384.8	9.625	36	8.921	9.022	32.3	FALSE	32.3
10	384.8	425.9	9.625	36	8.921	9.016	32.3	FALSE	32.3
11	425.9	468.3	9.625	36	8.921	9.025	32.3	FALSE	32.3
12	468.3	509.9	9.625	36	8.921	9.015	32.3	FALSE	32.3
13	509.9	552.5	9.625	36	8.921	9.012	32.3	FALSE	32.3
14	552.5	593.2	9.625	36	8.921	8.988	32.3	TRUE	36
15	593.2	637.5	9.625	36	8.921	9.038	29.3	FALSE	29.3
16	637.5	680.3	9.625	36	8.921	9.013	32.3	FALSE	32.3
17	680.3	719.8	9.625	36	8.921	9.012	32.3	FALSE	32.3
18	719.8	763.1	9.625	36	8.921	9.022	32.3	FALSE	32.3
19	763.1	806.4	9.625	36	8.921	9.026	32.3	FALSE	32.3
20	806.4	846.8	9.625	36	8.921	8.993	32.3	TRUE	36
21	846.8	889.7	9.625	36	8.921	9.027	32.3	FALSE	32.3
22	889.7	932.5	9.625	36	8.921	9.037	29.3	FALSE	29.3
23	932.5	975.1	9.625	36	8.921	9.017	32.3	FALSE	32.3
24	975.1	1017.0	9.625	36	8.921	9.030	32.3	FALSE	32.3
25	1017.0	1060.7	9.625	36	8.921	9.032	29.3	FALSE	29.3
26	1060.7	1105.1	9.625	36	8.921	9.060	29.3	FALSE	29.3
27	1105.1	1146.4	9.625	36	8.921	9.021	32.3	FALSE	32.3
28	1146.4	1185.5	9.625	36	8.921	9.008	32.3	TRUE	36
29	1185.5	1226.8	9.625	36	8.921	9.022	32.3	FALSE	32.3
30	1226.8	1266.7	9.625	36	8.921	9.044	29.3	FALSE	29.3
31	1266.7	1307.1	9.625	36	8.921	9.005	32.3	TRUE	36
32	1307.1	1346.6	9.625	36	8.921	9.031	32.3	FALSE	32.3
33	1346.6	1389.8	9.625	36	8.921	9.030	32.3	FALSE	32.3
34	1389.8	1430.3	9.625	36	8.921	9.029	32.3	FALSE	32.3
35	1430.3	1471.7	9.625	36	8.921	9.023	32.3	FALSE	32.3
36	1471.7	1511.2	9.625	36	8.921	9.018	32.3	FALSE	32.3
37	1511.2	1547.4	9.625	36	8.921	9.037	29.3	FALSE	29.3
38	1547.4	1584.0	9.625	36	8.921	8.936	36	TRUE	36
39	1584.0	1625.0	9.625	36	8.921	9.004	32.3	TRUE	36
40	1625.0	1661.9	9.625	36	8.921	8.971	32.3	TRUE	36
41	1661.9	1705.5	9.625	36	8.921	9.062	29.3	FALSE	29.3
42	1705.5	1746.9	9.625	36	8.921	9.027	32.3	FALSE	32.3
43	1746.9	1787.9	9.625	36	8.921	9.025	32.3	FALSE	32.3
44	1787.9	1829.2	9.625	36	8.921	9.038	29.3	FALSE	29.3
45	1829.2	1870.7	9.625	36	8.921	9.027	32.3	FALSE	32.3
46	1870.7	1913.0	9.625	36	8.921	9.036	29.3	FALSE	29.3
47	1913.0	1954.4	9.625	36	8.921	9.018	32.3	FALSE	32.3
48	1954.4	1996.3	9.625	36	8.921	9.023	32.3	FALSE	32.3
49	1996.3	2038.8	9.625	36	8.921	9.023	32.3	FALSE	32.3
50	2038.8	2081.5	9.625	36	8.921	9.031	32.3	FALSE	32.3

West Hackberry 009 (continued)

			Nominal Values			Measured Values			
Casing Number	Begin Casing Depth	End Casing Depth	Outside Diameter	Casing Weight	Nominal Internal Diameter	Measured Internal Diameter	Closest Casing Weight	Within Threshold?	Calculated Casing Weight
-	*ft*	*ft*	*in*	*kg/ft*	*in*	*in*	*kg/ft*	-	*kg/ft*
51	2081.5	2119.0	9.625	36	8.921	9.024	32.3	FALSE	32.3
52	2119.0	2161.1	9.625	36	8.921	9.035	29.3	FALSE	29.3
53	2161.1	2203.4	9.625	36	8.921	9.018	32.3	FALSE	32.3
54	2203.4	2241.3	9.625	36	8.921	9.019	32.3	FALSE	32.3
55	2241.3	2283.6	9.625	36	8.921	9.028	32.3	FALSE	32.3
56	2283.6	2325.0	9.625	36	8.921	9.025	32.3	FALSE	32.3
57	2325.0	2365.8	9.625	36	8.921	8.996	32.3	TRUE	36
58	2365.8	2408.2	9.625	36	8.921	9.019	32.3	FALSE	32.3
59	2408.2	2447.1	9.625	36	8.921	8.985	32.3	TRUE	36
60	2447.1	2490.7	9.625	36	8.921	9.038	29.3	FALSE	29.3
61	2490.7	2532.8	9.625	36	8.921	9.016	32.3	FALSE	32.3
62	2532.8	2574.8	9.625	36	8.921	9.027	32.3	FALSE	32.3
63	2574.8	2593.6	9.625	36	8.921	9.031	32.3	FALSE	32.3
64	2602.1	2640.7	7	20	6.456	6.322	23	FALSE	23
65	2640.7	2679.0	7	20	6.456	6.299	26	FALSE	26
66	2679.0	2717.9	7	20	6.456	6.306	26	FALSE	26
67	2717.9	2757.2	7	20	6.456	6.308	26	FALSE	26
68	2757.2	2797.0	7	20	6.456	6.315	26	FALSE	26
69	2797.0	2835.3	7	20	6.456	6.324	23	FALSE	23
70	2835.3	2873.5	7	20	6.456	6.285	26	FALSE	26
71	2873.5	2911.0	7	20	6.456	6.291	26	FALSE	26
72	2911.0	2950.2	7	20	6.456	6.303	26	FALSE	26
73	2950.2	2988.5	7	20	6.456	6.315	26	FALSE	26
74	2988.5	3026.9	7	20	6.456	6.304	26	FALSE	26
75	3026.9	3066.8	7	20	6.456	6.321	26	FALSE	26
76	3066.8	3104.9	7	20	6.456	6.316	26	FALSE	26
77	3104.9	3144.1	7	20	6.456	6.306	26	FALSE	26

West Hackberry 009A

			Nominal Values			Measured Values			
Casing Number	Begin Casing Depth	End Casing Depth	Outside Diameter	Casing Weight	Nominal Internal Diameter	Measured Internal Diameter	Closest Casing Weight	Within Threshold?	Calculated Casing Weight
-	*ft*	*ft*	*in*	*kg/ft*	*in*	*in*	*kg/ft*	-	*kg/ft*
1	13.2	29.6	13.375	61	12.515	12.592	54.5	TRUE	61
2	29.6	64.1	13.375	61	12.515	12.595	54.5	TRUE	61
3	64.1	99.6	13.375	61	12.515	12.597	54.5	TRUE	61
4	99.6	135.4	13.375	61	12.515	12.581	54.5	TRUE	61
5	135.4	177.3	13.375	61	12.515	12.585	54.5	TRUE	61
6	177.3	218.0	13.375	61	12.515	12.629	54.5	FALSE	54.5
7	218.0	251.5	13.375	61	12.515	12.623	54.5	TRUE	61
8	251.5	291.6	13.375	61	12.515	12.583	54.5	TRUE	61
9	291.6	333.9	13.375	61	12.515	12.589	54.5	TRUE	61
10	333.9	374.4	13.375	61	12.515	12.593	54.5	TRUE	61
11	374.4	413.8	13.375	61	12.515	12.570	54.5	TRUE	61
12	413.8	453.6	13.375	61	12.515	12.616	54.5	TRUE	61
13	453.6	494.6	13.375	61	12.515	12.609	54.5	TRUE	61
14	494.6	533.8	13.375	61	12.515	12.573	54.5	TRUE	61
15	533.8	571.8	13.375	61	12.515	12.576	54.5	TRUE	61
16	571.8	612.2	13.375	61	12.515	12.593	54.5	TRUE	61
17	612.2	651.3	13.375	61	12.515	12.633	54.5	FALSE	54.5
18	651.3	690.3	13.375	61	12.515	12.613	54.5	TRUE	61
19	690.3	733.5	13.375	61	12.515	12.615	54.5	TRUE	61
20	733.5	774.6	13.375	61	12.515	12.593	54.5	TRUE	61
21	774.6	814.3	13.375	61	12.515	12.608	54.5	TRUE	61
22	814.3	852.6	13.375	61	12.515	12.586	54.5	TRUE	61
23	852.6	892.8	13.375	61	12.515	12.568	54.5	TRUE	61
24	892.8	930.5	13.375	61	12.515	12.612	54.5	TRUE	61
25	930.5	966.5	13.375	61	12.515	12.608	54.5	TRUE	61
26	966.5	1008.9	13.375	61	12.515	12.593	54.5	TRUE	61
27	1008.9	1046.0	13.375	61	12.515	12.593	54.5	TRUE	61
28	1046.0	1088.1	13.375	61	12.515	12.601	54.5	TRUE	61
29	1088.1	1130.7	13.375	61	12.515	12.584	54.5	TRUE	61
30	1130.7	1173.1	13.375	61	12.515	12.580	54.5	TRUE	61
31	1173.1	1214.8	13.375	61	12.515	12.597	54.5	TRUE	61
32	1214.8	1242.5	13.375	61	12.515	12.600	54.5	TRUE	61
33	1242.5	1274.8	13.375	61	12.515	12.570	54.5	TRUE	61
34	1274.8	1318.1	13.375	61	12.515	12.596	54.5	TRUE	61
35	1318.1	1352.9	13.375	61	12.515	12.611	54.5	TRUE	61
36	1352.9	1396.4	13.375	61	12.515	12.594	54.5	TRUE	61
37	1396.4	1436.2	13.375	61	12.515	12.594	54.5	TRUE	61
38	1436.2	1475.0	13.375	61	12.515	12.591	54.5	TRUE	61
39	1475.0	1511.2	13.375	61	12.515	12.615	54.5	TRUE	61
40	1511.2	1550.4	13.375	61	12.515	12.594	54.5	TRUE	61
41	1550.4	1592.0	13.375	61	12.515	12.605	54.5	TRUE	61
42	1592.0	1634.4	13.375	61	12.515	12.587	54.5	TRUE	61
43	1634.4	1673.5	13.375	61	12.515	12.584	54.5	TRUE	61
44	1673.5	1716.1	13.375	61	12.515	12.574	54.5	TRUE	61
45	1716.1	1760.2	13.375	61	12.515	12.597	54.5	TRUE	61
46	1760.2	1801.3	13.375	61	12.515	12.572	54.5	TRUE	61
47	1801.3	1844.8	13.375	61	12.515	12.614	54.5	TRUE	61
48	1844.8	1885.8	13.375	61	12.515	12.587	54.5	TRUE	61
49	1885.8	1928.2	13.375	61	12.515	12.614	54.5	TRUE	61
50	1928.2	1964.3	13.375	61	12.515	12.596	54.5	TRUE	61

West Hackberry 009A (continued)

			Nominal Values			Measured Values			
Casing Number	Begin Casing Depth	End Casing Depth	Outside Diameter	Casing Weight	Nominal Internal Diameter	Measured Internal Diameter	Closest Casing Weight	Within Threshold?	Calculated Casing Weight
-	*ft*	*ft*	*in*	*kg/ft*	*in*	*in*	*kg/ft*	-	*kg/ft*
51	1964.3	2005.1	13.375	61	12.515	12.598	54.5	TRUE	61
52	2005.1	2043.7	13.375	61	12.515	12.628	54.5	FALSE	54.5
53	2043.7	2084.3	13.375	61	12.515	12.591	54.5	TRUE	61
54	2084.3	2126.0	13.375	61	12.515	12.538	61	TRUE	61
55	2126.0	2164.7	13.375	61	12.515	12.578	54.5	TRUE	61
56	2164.7	2199.8	13.375	61	12.515	12.579	54.5	TRUE	61
57	2199.8	2239.0	13.375	61	12.515	12.533	61	TRUE	61
58	2239.0	2280.6	13.375	61	12.515	12.630	54.5	FALSE	54.5
59	2280.6	2322.3	13.375	61	12.515	12.583	54.5	TRUE	61
60	2322.3	2362.1	13.375	61	12.515	12.611	54.5	TRUE	61
61	2362.1	2404.8	13.375	61	12.515	12.614	54.5	TRUE	61
62	2404.8	2445.1	13.375	61	12.515	12.606	54.5	TRUE	61
63	2445.1	2486.4	13.375	61	12.515	12.551	61	TRUE	61
64	2486.4	2527.1	13.375	61	12.515	12.526	61	TRUE	61

West Hackberry 009B

			Nominal Values			Measured Values			
Casing Number	Begin Casing Depth	End Casing Depth	Outside Diameter	Casing Weight	Nominal Internal Diameter	Measured Internal Diameter	Closest Casing Weight	Within Threshold?	Calculated Casing Weight
-	*ft*	*ft*	*in*	*kg/ft*	*in*	*in*	*kg/ft*	-	*kg/ft*
1	0.0	11.4	13.375	61	12.515	12.538	61	TRUE	61
2	11.4	53.9	13.375	61	12.515	12.563	61	TRUE	61
3	53.9	96.7	13.375	61	12.515	12.550	61	TRUE	61
4	96.7	138.2	13.375	61	12.515	12.571	54.5	TRUE	61
5	138.2	180.4	13.375	61	12.515	12.531	61	TRUE	61
6	180.4	213.6	13.375	61	12.515	12.533	61	TRUE	61
7	213.6	256.2	13.375	61	12.515	12.562	61	TRUE	61
8	256.2	297.6	13.375	61	12.515	12.543	61	TRUE	61
9	297.6	336.7	13.375	61	12.515	12.547	61	TRUE	61
10	336.7	370.8	13.375	61	12.515	12.551	61	TRUE	61
11	370.8	404.8	13.375	61	12.515	12.546	61	TRUE	61
12	404.8	443.9	13.375	61	12.515	12.530	61	TRUE	61
13	443.9	486.3	13.375	61	12.515	12.527	61	TRUE	61
14	486.3	527.9	13.375	61	12.515	12.530	61	TRUE	61
15	527.9	570.5	13.375	61	12.515	12.536	61	TRUE	61
16	570.5	612.7	13.375	61	12.515	12.553	61	TRUE	61
17	612.7	655.8	13.375	61	12.515	12.545	61	TRUE	61
18	655.8	697.4	13.375	61	12.515	12.534	61	TRUE	61
19	697.4	737.2	13.375	61	12.515	12.532	61	TRUE	61
20	737.2	771.3	13.375	61	12.515	12.545	61	TRUE	61
21	771.3	801.0	13.375	61	12.515	12.542	61	TRUE	61
22	801.0	833.4	13.375	61	12.515	12.577	54.5	TRUE	61
23	833.4	872.7	13.375	61	12.515	12.549	61	TRUE	61
24	872.7	915.0	13.375	61	12.515	12.559	61	TRUE	61
25	915.0	959.4	13.375	61	12.515	12.575	54.5	TRUE	61
26	959.4	999.8	13.375	61	12.515	12.537	61	TRUE	61
27	999.8	1043.0	13.375	61	12.515	12.558	61	TRUE	61
28	1043.0	1084.3	13.375	61	12.515	12.536	61	TRUE	61
29	1084.3	1115.4	13.375	61	12.515	12.582	54.5	TRUE	61
30	1115.4	1141.6	13.375	61	12.515	12.556	61	TRUE	61
31	1141.6	1173.6	13.375	61	12.515	12.591	54.5	TRUE	61
32	1173.6	1200.1	13.375	61	12.515	12.582	54.5	TRUE	61
33	1200.1	1231.8	13.375	61	12.515	12.561	61	TRUE	61
34	1231.8	1270.3	13.375	61	12.515	12.546	61	TRUE	61
35	1270.3	1299.3	13.375	61	12.515	12.559	61	TRUE	61
36	1299.3	1335.6	13.375	61	12.515	12.583	54.5	TRUE	61
37	1335.6	1374.8	13.375	61	12.515	12.555	61	TRUE	61
38	1374.8	1405.4	13.375	61	12.515	12.679	48	FALSE	48
39	1405.4	1435.6	13.375	61	12.515	12.550	61	TRUE	61
40	1435.6	1466.1	13.375	61	12.515	12.553	61	TRUE	61
41	1466.1	1499.0	13.375	61	12.515	12.547	61	TRUE	61
42	1499.0	1532.1	13.375	61	12.515	12.566	54.5	TRUE	61
43	1532.1	1563.5	13.375	61	12.515	12.549	61	TRUE	61
44	1563.5	1597.7	13.375	61	12.515	12.541	61	TRUE	61
45	1597.7	1632.3	13.375	61	12.515	12.586	54.5	TRUE	61
46	1632.3	1672.7	13.375	61	12.515	12.575	54.5	TRUE	61
47	1672.7	1708.1	13.375	61	12.515	12.511	61	TRUE	61
48	1708.1	1746.3	13.375	61	12.515	12.561	61	TRUE	61
49	1746.3	1785.7	13.375	61	12.515	12.576	54.5	TRUE	61
50	1785.7	1827.5	13.375	61	12.515	12.555	61	TRUE	61

West Hackberry 009B (continued)

			Nominal Values			Measured Values			
Casing Number	Begin Casing Depth	End Casing Depth	Outside Diameter	Casing Weight	Nominal Internal Diameter	Measured Internal Diameter	Closest Casing Weight	Within Threshold?	Calculated Casing Weight
-	*ft*	*ft*	*in*	*kg/ft*	*in*	*in*	*kg/ft*	-	*kg/ft*
51	1827.5	1868.4	13.375	61	12.515	12.561	61	TRUE	61
52	1868.4	1903.3	13.375	61	12.515	12.569	54.5	TRUE	61
53	1903.3	1944.8	13.375	61	12.515	12.623	54.5	FALSE	54.5
54	1944.8	1986.2	13.375	61	12.515	12.562	61	TRUE	61
55	1986.2	2024.9	13.375	61	12.515	12.555	61	TRUE	61
56	2024.9	2066.0	13.375	61	12.515	12.575	54.5	TRUE	61
57	2066.0	2108.9	13.375	61	12.515	12.553	61	TRUE	61
58	2108.9	2151.3	13.375	61	12.515	12.553	61	TRUE	61
59	2151.3	2195.9	13.375	61	12.515	12.589	54.5	TRUE	61
60	2195.9	2239.0	13.375	61	12.515	12.556	61	TRUE	61
61	2239.0	2282.7	13.375	61	12.515	12.594	54.5	TRUE	61
62	2282.7	2319.3	13.375	61	12.515	12.576	54.5	TRUE	61
63	2319.3	2358.1	13.375	61	12.515	12.556	61	TRUE	61
64	2358.1	2384.7	13.375	61	12.515	12.570	54.5	TRUE	61
65	2384.7	2410.3	13.375	61	12.515	12.581	54.5	TRUE	61
66	2410.3	2438.0	13.375	61	12.515	12.687	48	FALSE	48
67	2438.0	2482.8	13.375	61	12.515	12.609	54.5	TRUE	61
68	2482.8	2525.0	13.375	61	12.515	12.608	54.5	TRUE	61

West Hackberry 011

			Nominal Values			Measured Values			
Casing Number	Begin Casing Depth	End Casing Depth	Outside Diameter	Casing Weight	Nominal Internal Diameter	Measured Internal Diameter	Closest Casing Weight	Within Threshold?	Calculated Casing Weight
-	*ft*	*ft*	*in*	*kg/ft*	*in*	*in*	*kg/ft*	-	*kg/ft*
1	5.8	43.1	9.625	36	8.921	9.026	32.3	FALSE	32.3
2	43.1	83.7	9.625	36	8.921	9.015	32.3	FALSE	32.3
3	83.7	125.5	9.625	36	8.921	9.016	32.3	FALSE	32.3
4	125.5	167.6	9.625	36	8.921	9.028	32.3	FALSE	32.3
5	167.6	208.3	9.625	36	8.921	9.029	32.3	FALSE	32.3
6	208.3	250.4	9.625	36	8.921	9.018	32.3	FALSE	32.3
7	250.4	292.3	9.625	36	8.921	9.020	32.3	FALSE	32.3
8	292.3	333.4	9.625	36	8.921	9.015	32.3	FALSE	32.3
9	333.4	375.9	9.625	36	8.921	9.056	29.3	FALSE	29.3
10	375.9	417.3	9.625	36	8.921	9.018	32.3	FALSE	32.3
11	417.3	459.3	9.625	36	8.921	9.026	32.3	FALSE	32.3
12	459.3	501.7	9.625	36	8.921	9.036	29.3	FALSE	29.3
13	501.7	543.0	9.625	36	8.921	9.019	32.3	FALSE	32.3
14	543.0	584.8	9.625	36	8.921	9.020	32.3	FALSE	32.3
15	584.8	626.8	9.625	36	8.921	9.028	32.3	FALSE	32.3
16	626.8	668.9	9.625	36	8.921	9.022	32.3	FALSE	32.3
17	668.9	709.3	9.625	36	8.921	9.010	32.3	FALSE	32.3
18	709.3	750.1	9.625	36	8.921	9.019	32.3	FALSE	32.3
19	750.1	792.1	9.625	36	8.921	9.032	29.3	FALSE	29.3
20	792.1	834.2	9.625	36	8.921	9.029	32.3	FALSE	32.3
21	834.2	875.7	9.625	36	8.921	9.036	29.3	FALSE	29.3
22	875.7	917.8	9.625	36	8.921	9.031	32.3	FALSE	32.3
23	917.8	956.4	9.625	36	8.921	9.036	29.3	FALSE	29.3
24	956.4	998.0	9.625	36	8.921	9.023	32.3	FALSE	32.3
25	998.0	1040.9	9.625	36	8.921	9.039	29.3	FALSE	29.3
26	1040.9	1083.7	9.625	36	8.921	9.028	32.3	FALSE	32.3
27	1083.7	1125.8	9.625	36	8.921	9.031	32.3	FALSE	32.3
28	1125.8	1167.6	9.625	36	8.921	9.014	32.3	FALSE	32.3
29	1167.6	1208.7	9.625	36	8.921	9.023	32.3	FALSE	32.3
30	1208.7	1250.8	9.625	36	8.921	9.027	32.3	FALSE	32.3
31	1250.8	1293.1	9.625	36	8.921	9.031	32.3	FALSE	32.3
32	1293.1	1335.2	9.625	36	8.921	9.030	32.3	FALSE	32.3
33	1335.2	1378.3	9.625	36	8.921	9.035	29.3	FALSE	29.3
34	1378.3	1420.6	9.625	36	8.921	9.037	29.3	FALSE	29.3
35	1420.6	1462.9	9.625	36	8.921	9.025	32.3	FALSE	32.3
36	1462.9	1505.5	9.625	36	8.921	9.031	32.3	FALSE	32.3
37	1505.5	1548.1	9.625	36	8.921	9.036	29.3	FALSE	29.3
38	1548.1	1590.0	9.625	36	8.921	9.036	29.3	FALSE	29.3
39	1590.0	1632.3	9.625	36	8.921	9.015	32.3	FALSE	32.3
40	1632.3	1672.4	9.625	36	8.921	9.026	32.3	FALSE	32.3
41	1672.4	1714.5	9.625	36	8.921	9.005	32.3	TRUE	36
42	1714.5	1756.5	9.625	36	8.921	9.033	29.3	FALSE	29.3
43	1756.5	1798.5	9.625	36	8.921	9.029	32.3	FALSE	32.3
44	1798.5	1841.2	9.625	36	8.921	9.040	29.3	FALSE	29.3
45	1841.2	1882.8	9.625	36	8.921	9.029	32.3	FALSE	32.3
46	1882.8	1923.6	9.625	36	8.921	9.014	32.3	FALSE	32.3
47	1923.6	1965.0	9.625	36	8.921	9.020	32.3	FALSE	32.3
48	1965.0	2006.0	9.625	36	8.921	9.030	32.3	FALSE	32.3
49	2006.0	2037.2	9.625	36	8.921	9.018	32.3	FALSE	32.3
50	2037.2	2067.2	9.625	36	8.921	9.038	29.3	FALSE	29.3

West Hackberry 011 (continued)

			Nominal Values			Measured Values			
Casing Number	Begin Casing Depth	End Casing Depth	Outside Diameter	Casing Weight	Nominal Internal Diameter	Measured Internal Diameter	Closest Casing Weight	Within Threshold?	Calculated Casing Weight
-	*ft*	*ft*	*in*	*kg/ft*	*in*	*in*	*kg/ft*	-	*kg/ft*
51	2067.2	2098.6	9.625	36	8.921	9.017	32.3	FALSE	32.3
52	2098.6	2131.5	9.625	36	8.921	9.026	32.3	FALSE	32.3
53	2131.5	2162.3	9.625	36	8.921	8.977	32.3	TRUE	36
54	2162.3	2192.8	9.625	36	8.921	9.008	32.3	TRUE	36
55	2192.8	2224.8	9.625	36	8.921	8.990	32.3	TRUE	36
56	2224.8	2255.2	9.625	36	8.921	9.011	32.3	FALSE	32.3
57	2255.2	2284.0	9.625	36	8.921	9.002	32.3	TRUE	36
58	2284.0	2315.3	9.625	36	8.921	8.987	32.3	TRUE	36
59	2315.3	2344.6	9.625	36	8.921	9.033	29.3	FALSE	29.3
60	2344.6	2372.8	9.625	36	8.921	8.963	32.3	TRUE	36
61	2372.8	2403.9	9.625	36	8.921	8.985	32.3	TRUE	36
62	2403.9	2435.9	9.625	36	8.921	9.016	32.3	FALSE	32.3
63	2435.9	2462.0	9.625	36	8.921	9.005	32.3	TRUE	36
64	2462.0	2489.8	9.625	36	8.921	9.036	29.3	FALSE	29.3
65	2489.8	2521.8	9.625	36	8.921	9.017	32.3	FALSE	32.3
66	2521.8	2548.2	9.625	36	8.921	9.032	32.3	FALSE	32.3
67	2548.2	2576.7	9.625	36	8.921	9.007	32.3	TRUE	36
68	2576.7	2607.6	9.625	36	8.921	8.992	32.3	TRUE	36
69	2607.6	2637.3	9.625	36	8.921	9.019	32.3	FALSE	32.3
70	2637.3	2666.1	9.625	36	8.921	8.996	32.3	TRUE	36
71	2666.1	2698.7	9.625	36	8.921	9.009	32.3	TRUE	36
72	2698.7	2730.3	9.625	36	8.921	9.026	32.3	FALSE	32.3
73	2730.3	2762.8	9.625	36	8.921	9.009	32.3	FALSE	32.3
74	2762.8	2794.8	9.625	36	8.921	9.024	32.3	FALSE	32.3

West Hackberry 011A

			Nominal Values			Measured Values			
Casing Number	Begin Casing Depth	End Casing Depth	Outside Diameter	Casing Weight	Nominal Internal Diameter	Measured Internal Diameter	Closest Casing Weight	Within Threshold?	Calculated Casing Weight
-	*ft*	*ft*	*in*	*kg/ft*	*in*	*in*	*kg/ft*	-	*kg/ft*
1	27.8	72.3	13.375	61	12.515	12.526	61	TRUE	61
2	72.3	117.1	13.375	61	12.515	12.535	61	TRUE	61
3	117.1	161.7	13.375	61	12.515	12.532	61	TRUE	61
4	161.7	205.7	13.375	61	12.515	12.528	61	TRUE	61
5	205.7	250.6	13.375	61	12.515	12.529	61	TRUE	61
6	250.6	295.3	13.375	61	12.515	12.534	61	TRUE	61
7	295.3	337.6	13.375	61	12.515	12.532	61	TRUE	61
8	337.6	382.4	13.375	61	12.515	12.560	61	TRUE	61
9	382.4	427.1	13.375	61	12.515	12.556	61	TRUE	61
10	427.1	472.6	13.375	61	12.515	12.572	54.5	TRUE	61
11	472.6	517.2	13.375	61	12.515	12.583	54.5	TRUE	61
12	517.2	562.4	13.375	61	12.515	12.567	54.5	TRUE	61
13	562.4	607.8	13.375	61	12.515	12.574	54.5	TRUE	61
14	607.8	652.8	13.375	61	12.515	12.559	61	TRUE	61
15	652.8	697.9	13.375	61	12.515	12.586	54.5	TRUE	61
16	697.9	742.8	13.375	61	12.515	12.571	54.5	TRUE	61
17	742.8	787.2	13.375	61	12.515	12.555	61	TRUE	61
18	787.2	831.7	13.375	61	12.515	12.547	61	TRUE	61
19	831.7	878.0	13.375	61	12.515	12.526	61	TRUE	61
20	878.0	922.0	13.375	61	12.515	12.561	61	TRUE	61
21	922.0	967.1	13.375	61	12.515	12.532	61	TRUE	61
22	967.1	1010.1	13.375	61	12.515	12.534	61	TRUE	61
23	1010.1	1054.5	13.375	61	12.515	12.532	61	TRUE	61
24	1054.5	1097.6	13.375	61	12.515	12.521	61	TRUE	61
25	1097.6	1142.4	13.375	61	12.515	12.564	61	TRUE	61
26	1142.4	1186.0	13.375	61	12.515	12.551	61	TRUE	61
27	1186.0	1231.2	13.375	61	12.515	12.577	54.5	TRUE	61
28	1231.2	1276.0	13.375	61	12.515	12.574	54.5	TRUE	61
29	1276.0	1320.9	13.375	61	12.515	12.565	61	TRUE	61
30	1320.9	1365.3	13.375	61	12.515	12.556	61	TRUE	61
31	1365.3	1410.0	13.375	61	12.515	12.583	54.5	TRUE	61
32	1410.0	1455.0	13.375	61	12.515	12.616	54.5	TRUE	61
33	1455.0	1489.5	13.375	61	12.515	12.580	54.5	TRUE	61
34	1489.5	1525.1	13.375	61	12.515	12.577	54.5	TRUE	61
35	1525.1	1569.8	13.375	61	12.515	12.573	54.5	TRUE	61
36	1569.8	1614.9	13.375	61	12.515	12.570	54.5	TRUE	61
37	1614.9	1657.2	13.375	61	12.515	12.573	54.5	TRUE	61
38	1657.2	1702.4	13.375	61	12.515	12.573	54.5	TRUE	61
39	1702.4	1747.4	13.375	61	12.515	12.587	54.5	TRUE	61
40	1747.4	1792.5	13.375	61	12.515	12.575	54.5	TRUE	61
41	1792.5	1837.6	13.375	61	12.515	12.580	54.5	TRUE	61
42	1837.6	1882.7	13.375	61	12.515	12.549	61	TRUE	61
43	1882.7	1927.1	13.375	61	12.515	12.549	61	TRUE	61
44	1927.1	1970.5	13.375	61	12.515	12.561	61	TRUE	61
45	1970.5	2015.9	13.375	61	12.515	12.580	54.5	TRUE	61
46	2015.9	2060.6	13.375	61	12.515	12.445	68	TRUE	61
47	2060.6	2100.9	13.375	61	12.515	12.546	61	TRUE	61
48	2100.9	2150.9	13.375	61	12.515	12.546	61	TRUE	61
49	2150.9	2189.6	13.375	61	12.515	12.552	61	TRUE	61
50	2189.6	2233.2	13.375	61	12.515	12.543	61	TRUE	61

West Hackberry 011A (continued)

			Nominal Values			Measured Values			
Casing Number	Begin Casing Depth	End Casing Depth	Outside Diameter	Casing Weight	Nominal Internal Diameter	Measured Internal Diameter	Closest Casing Weight	Within Threshold?	Calculated Casing Weight
-	*ft*	*ft*	*in*	*kg/ft*	*in*	*in*	*kg/ft*	-	*kg/ft*
51	2233.2	2276.0	13.375	61	12.515	12.571	54.5	TRUE	61
52	2276.0	2320.6	13.375	61	12.515	12.556	61	TRUE	61
53	2320.6	2365.7	13.375	61	12.515	12.541	61	TRUE	61
54	2365.7	2405.6	13.375	61	12.515	12.576	54.5	TRUE	61
55	2405.6	2450.5	13.375	61	12.515	12.588	54.5	TRUE	61
56	2450.5	2495.4	13.375	61	12.515	12.574	54.5	TRUE	61
57	2495.4	2538.7	13.375	61	12.515	12.595	54.5	TRUE	61
58	2538.7	2583.5	13.375	61	12.515	12.591	54.5	TRUE	61
59	2583.5	2628.7	13.375	61	12.515	12.587	54.5	TRUE	61
60	2628.7	2673.3	13.375	61	12.515	12.537	61	TRUE	61
61	2673.3	2715.8	13.375	61	12.515	12.532	61	TRUE	61
62	2715.8	2759.2	13.375	61	12.515	12.536	61	TRUE	61
63	2759.2	2804.1	13.375	61	12.515	12.528	61	TRUE	61
64	2804.1	2849.9	13.375	61	12.515	12.502	61	TRUE	61

West Hackberry 011B – August 2010

			Nominal Values			Measured Values			
Casing Number	Begin Casing Depth	End Casing Depth	Outside Diameter	Casing Weight	Nominal Internal Diameter	Measured Internal Diameter	Closest Casing Weight	Within Threshold?	Calculated Casing Weight
-	*ft*	*ft*	*in*	*kg/ft*	*in*	*in*	*kg/ft*	-	*kg/ft*
1	26.8	69.1	13.375	61	12.515	12.779	48	FALSE	48
2	69.1	107.9	13.375	61	12.515	12.738	48	FALSE	48
3	107.9	148.1	13.375	61	12.515	12.796	48	FALSE	48
4	148.1	188.4	13.375	61	12.515	12.797	48	FALSE	48
5	188.4	229.1	13.375	61	12.515	12.771	48	FALSE	48
6	229.1	272.4	13.375	61	12.515	12.759	48	FALSE	48
7	272.4	308.2	13.375	61	12.515	12.737	48	FALSE	48
8	308.2	346.2	13.375	61	12.515	12.772	48	FALSE	48
9	346.2	387.6	13.375	61	12.515	12.740	48	FALSE	48
10	387.6	428.0	13.375	61	12.515	12.789	48	FALSE	48
11	428.0	469.4	13.375	61	12.515	12.761	48	FALSE	48
12	469.4	511.2	13.375	61	12.515	12.735	48	FALSE	48
13	511.2	551.8	13.375	61	12.515	12.740	48	FALSE	48
14	551.8	593.7	13.375	61	12.515	12.752	48	FALSE	48
15	593.7	633.8	13.375	61	12.515	12.763	48	FALSE	48
16	633.8	669.8	13.375	61	12.515	12.664	54.5	FALSE	54.5
17	669.8	710.8	13.375	61	12.515	12.734	48	FALSE	48
18	710.8	749.8	13.375	61	12.515	12.723	48	FALSE	48
19	749.8	791.3	13.375	61	12.515	12.758	48	FALSE	48
20	791.3	832.7	13.375	61	12.515	12.772	48	FALSE	48
21	832.7	872.7	13.375	61	12.515	12.804	48	FALSE	48
22	872.7	914.6	13.375	61	12.515	12.768	48	FALSE	48
23	914.6	956.5	13.375	61	12.515	12.768	48	FALSE	48
24	956.5	997.8	13.375	61	12.515	12.764	48	FALSE	48
25	997.8	1039.9	13.375	61	12.515	12.816	48	FALSE	48
26	1039.9	1081.9	13.375	61	12.515	12.796	48	FALSE	48
27	1081.9	1118.2	13.375	61	12.515	12.793	48	FALSE	48
28	1118.2	1156.6	13.375	61	12.515	12.742	48	FALSE	48
29	1156.6	1196.3	13.375	61	12.515	12.786	48	FALSE	48
30	1196.3	1233.4	13.375	61	12.515	12.781	48	FALSE	48
31	1233.4	1268.8	13.375	61	12.515	12.793	48	FALSE	48
32	1268.8	1303.4	13.375	61	12.515	12.805	48	FALSE	48
33	1303.4	1343.1	13.375	61	12.515	12.794	48	FALSE	48
34	1343.1	1382.8	13.375	61	12.515	12.778	48	FALSE	48
35	1382.8	1427.4	13.375	54.5	12.615	12.674	48	TRUE	54.5
36	1427.4	1469.8	13.375	54.5	12.615	12.675	48	TRUE	54.5
37	1469.8	1514.2	13.375	54.5	12.615	12.669	48	TRUE	54.5
38	1514.2	1556.0	13.375	54.5	12.615	12.690	48	TRUE	54.5
39	1556.0	1600.8	13.375	54.5	12.615	12.665	54.5	TRUE	54.5
40	1600.8	1645.4	13.375	54.5	12.615	12.681	48	TRUE	54.5
41	1645.4	1690.0	13.375	54.5	12.615	12.664	54.5	TRUE	54.5
42	1690.0	1734.7	13.375	54.5	12.615	12.665	54.5	TRUE	54.5
43	1734.7	1779.8	13.375	54.5	12.615	12.670	48	TRUE	54.5
44	1779.8	1824.5	13.375	54.5	12.615	12.661	54.5	TRUE	54.5
45	1824.5	1868.8	13.375	54.5	12.615	12.672	48	TRUE	54.5
46	1868.8	1913.9	13.375	54.5	12.615	12.658	54.5	TRUE	54.5
47	1913.9	1958.6	13.375	54.5	12.615	12.664	54.5	TRUE	54.5
48	1958.6	2003.2	13.375	54.5	12.615	12.662	54.5	TRUE	54.5
49	2003.2	2048.0	13.375	54.5	12.615	12.661	54.5	TRUE	54.5
50	2048.0	2083.3	13.375	54.5	12.615	12.683	48	TRUE	54.5

West Hackberry 011B – August 2010 (continued)

			Nominal Values			Measured Values			
Casing Number	Begin Casing Depth	End Casing Depth	Outside Diameter	Casing Weight	Nominal Internal Diameter	Measured Internal Diameter	Closest Casing Weight	Within Threshold?	Calculated Casing Weight
-	*ft*	*ft*	*in*	*kg/ft*	*in*	*in*	*kg/ft*	-	*kg/ft*
51	2083.3	2128.3	13.375	54.5	12.615	12.661	54.5	TRUE	54.5
52	2128.3	2172.5	13.375	54.5	12.615	12.649	54.5	TRUE	54.5
53	2172.5	2215.8	13.375	54.5	12.615	12.659	54.5	TRUE	54.5
54	2215.8	2260.6	13.375	54.5	12.615	12.701	48	TRUE	54.5
55	2260.6	2300.3	13.375	54.5	12.615	12.647	54.5	TRUE	54.5
56	2300.3	2334.2	13.375	54.5	12.615	12.672	48	TRUE	54.5
57	2334.2	2378.8	13.375	54.5	12.615	12.653	54.5	TRUE	54.5
58	2378.8	2423.6	13.375	54.5	12.615	12.651	54.5	TRUE	54.5
59	2423.6	2468.3	13.375	54.5	12.615	12.650	54.5	TRUE	54.5
60	2468.3	2512.4	13.375	54.5	12.615	12.682	48	TRUE	54.5
61	2512.4	2554.7	13.375	54.5	12.615	12.655	54.5	TRUE	54.5
62	2554.7	2599.2	13.375	54.5	12.615	12.653	54.5	TRUE	54.5
63	2599.2	2644.1	13.375	54.5	12.615	12.643	54.5	TRUE	54.5
64	2644.1	2687.8	13.375	54.5	12.615	12.658	54.5	TRUE	54.5
65	2687.8	2732.8	13.375	54.5	12.615	12.644	54.5	TRUE	54.5
66	2732.8	2774.9	13.375	54.5	12.615	12.655	54.5	TRUE	54.5
67	2774.9	2820.0	13.375	54.5	12.615	12.622	54.5	TRUE	54.5
68	2820.0	2861.3	13.375	54.5	12.615	12.588	54.5	TRUE	54.5

West Hackberry 011B – September 2015

			Nominal Values			Measured Values			
Casing Number	Begin Casing Depth	End Casing Depth	Outside Diameter	Casing Weight	Nominal Internal Diameter	Measured Internal Diameter	Closest Casing Weight	Within Threshold?	Calculated Casing Weight
-	*ft*	*ft*	*in*	*kg/ft*	*in*	*in*	*kg/ft*	-	*kg/ft*
1	18.3	59.6	13.375	61	12.515	12.692	48	FALSE	48
2	59.6	98.4	13.375	61	12.515	12.653	54.5	FALSE	54.5
3	98.4	138.8	13.375	61	12.515	12.696	48	FALSE	48
4	138.8	179.4	13.375	61	12.515	12.705	48	FALSE	48
5	179.4	220.1	13.375	61	12.515	12.681	48	FALSE	48
6	220.1	263.4	13.375	61	12.515	12.670	48	FALSE	48
7	263.4	299.5	13.375	61	12.515	12.649	54.5	FALSE	54.5
8	299.5	337.7	13.375	61	12.515	12.679	48	FALSE	48
9	337.7	379.1	13.375	61	12.515	12.654	54.5	FALSE	54.5
10	379.1	419.6	13.375	61	12.515	12.697	48	FALSE	48
11	419.6	461.3	13.375	61	12.515	12.666	48	FALSE	48
12	461.3	502.9	13.375	61	12.515	12.648	54.5	FALSE	54.5
13	502.9	543.7	13.375	61	12.515	12.647	54.5	FALSE	54.5
14	543.7	585.9	13.375	61	12.515	12.667	48	FALSE	48
15	585.9	626.0	13.375	61	12.515	12.668	48	FALSE	48
16	626.0	662.0	13.375	61	12.515	12.586	54.5	TRUE	61
17	662.0	703.2	13.375	61	12.515	12.646	54.5	FALSE	54.5
18	703.2	742.5	13.375	61	12.515	12.636	54.5	FALSE	54.5
19	742.5	784.1	13.375	61	12.515	12.667	48	FALSE	48
20	784.1	825.5	13.375	61	12.515	12.673	48	FALSE	48
21	825.5	865.8	13.375	61	12.515	12.696	48	FALSE	48
22	865.8	907.9	13.375	61	12.515	12.673	48	FALSE	48
23	907.9	949.9	13.375	61	12.515	12.676	48	FALSE	48
24	949.9	991.3	13.375	61	12.515	12.670	48	FALSE	48
25	991.3	1033.6	13.375	61	12.515	12.706	48	FALSE	48
26	1033.6	1075.7	13.375	61	12.515	12.693	48	FALSE	48
27	1075.7	1112.0	13.375	61	12.515	12.689	48	FALSE	48
28	1112.0	1150.6	13.375	61	12.515	12.650	54.5	FALSE	54.5
29	1150.6	1190.5	13.375	61	12.515	12.685	48	FALSE	48
30	1190.5	1227.6	13.375	61	12.515	12.681	48	FALSE	48
31	1227.6	1264.0	13.375	61	12.515	12.692	48	FALSE	48
32	1264.0	1297.9	13.375	61	12.515	12.702	48	FALSE	48
33	1297.9	1337.4	13.375	61	12.515	12.689	48	FALSE	48
34	1337.4	1377.4	13.375	61	12.515	12.678	48	FALSE	48
35	1377.4	1422.3	13.375	54.5	12.615	12.591	54.5	TRUE	54.5
36	1422.3	1464.7	13.375	54.5	12.615	12.598	54.5	TRUE	54.5
37	1464.7	1509.0	13.375	54.5	12.615	12.586	54.5	TRUE	54.5
38	1509.0	1551.0	13.375	54.5	12.615	12.603	54.5	TRUE	54.5
39	1551.0	1596.0	13.375	54.5	12.615	12.587	54.5	TRUE	54.5
40	1596.0	1640.7	13.375	54.5	12.615	12.595	54.5	TRUE	54.5
41	1640.7	1685.5	13.375	54.5	12.615	12.585	54.5	TRUE	54.5
42	1685.5	1730.3	13.375	54.5	12.615	12.584	54.5	TRUE	54.5
43	1730.3	1775.5	13.375	54.5	12.615	12.590	54.5	TRUE	54.5
44	1775.5	1820.3	13.375	54.5	12.615	12.582	54.5	TRUE	54.5
45	1820.3	1864.7	13.375	54.5	12.615	12.590	54.5	TRUE	54.5
46	1864.7	1910.0	13.375	54.5	12.615	12.577	54.5	TRUE	54.5
47	1910.0	1954.8	13.375	54.5	12.615	12.582	54.5	TRUE	54.5
48	1954.8	1999.7	13.375	54.5	12.615	12.585	54.5	TRUE	54.5
49	1999.7	2044.5	13.375	54.5	12.615	12.583	54.5	TRUE	54.5
50	2044.5	2079.9	13.375	54.5	12.615	12.603	54.5	TRUE	54.5

West Hackberry 011B – September 2015 (continued)

			Nominal Values			Measured Values			
Casing Number	Begin Casing Depth	End Casing Depth	Outside Diameter	Casing Weight	Nominal Internal Diameter	Measured Internal Diameter	Closest Casing Weight	Within Threshold?	Calculated Casing Weight
-	*ft*	*ft*	*in*	*kg/ft*	*in*	*in*	*kg/ft*	-	*kg/ft*
51	2079.9	2125.1	13.375	54.5	12.615	12.583	54.5	TRUE	54.5
52	2125.1	2169.3	13.375	54.5	12.615	12.576	54.5	TRUE	54.5
53	2169.3	2213.0	13.375	54.5	12.615	12.583	54.5	TRUE	54.5
54	2213.0	2257.7	13.375	54.5	12.615	12.613	54.5	TRUE	54.5
55	2257.7	2297.6	13.375	54.5	12.615	12.573	54.5	TRUE	54.5
56	2297.6	2331.5	13.375	54.5	12.615	12.596	54.5	TRUE	54.5
57	2331.5	2376.3	13.375	54.5	12.615	12.578	54.5	TRUE	54.5
58	2376.3	2421.3	13.375	54.5	12.615	12.576	54.5	TRUE	54.5
59	2421.3	2466.3	13.375	54.5	12.615	12.573	54.5	TRUE	54.5
60	2466.3	2510.6	13.375	54.5	12.615	12.605	54.5	TRUE	54.5
61	2510.6	2560.6	13.375	54.5	12.615	12.579	54.5	TRUE	54.5
62	2560.6	2597.5	13.375	54.5	12.615	12.578	54.5	TRUE	54.5
63	2597.5	2642.4	13.375	54.5	12.615	12.568	54.5	TRUE	54.5
64	2642.4	2686.4	13.375	54.5	12.615	12.584	54.5	TRUE	54.5
65	2686.4	2731.5	13.375	54.5	12.615	12.574	54.5	TRUE	54.5
66	2731.5	2773.4	13.375	54.5	12.615	12.577	54.5	TRUE	54.5
67	2773.4	2820.2	13.375	54.5	12.615	12.550	61	TRUE	54.5
68	2820.2	2866.0	13.375	54.5	12.615	12.522	61	TRUE	54.5

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			Nominal Values			Measured Values			
Casing Number	Begin Casing Depth	End Casing Depth	Outside Diameter	Casing Weight	Nominal Internal Diameter	Measured Internal Diameter	Closest Casing Weight	Within Threshold?	Calculated Casing Weight
-	*ft*	*ft*	*in*	*kg/ft*	*in*	*in*	*kg/ft*	-	*kg/ft*
1	39.0	77.9	20	94	19.124	19.160	94	TRUE	94
2	77.9	118.9	20	94	19.124	19.165	94	TRUE	94
3	118.9	154.1	20	94	19.124	19.181	94	TRUE	94
4	154.1	195.1	20	94	19.124	19.138	94	TRUE	94
5	195.1	231.9	20	94	19.124	19.140	94	TRUE	94
6	231.9	271.6	20	94	19.124	19.157	94	TRUE	94
7	271.6	313.5	20	94	19.124	19.192	94	TRUE	94
8	313.5	355.3	20	94	19.124	19.182	94	TRUE	94
9	355.3	397.5	20	94	19.124	19.154	94	TRUE	94
10	397.5	439.4	20	94	19.124	19.153	94	TRUE	94
11	439.4	481.3	20	94	19.124	19.151	94	TRUE	94
12	481.3	521.4	20	94	19.124	19.112	94	TRUE	94
13	521.4	561.2	20	94	19.124	19.160	94	TRUE	94
14	561.2	603.6	20	94	19.124	19.181	94	TRUE	94
15	603.6	644.5	20	94	19.124	19.166	94	TRUE	94
16	644.5	685.1	20	94	19.124	19.148	94	TRUE	94
17	685.1	726.1	20	94	19.124	19.160	94	TRUE	94
18	726.1	767.4	20	94	19.124	19.138	94	TRUE	94
19	767.4	808.3	20	94	19.124	19.135	94	TRUE	94
20	808.3	849.0	20	94	19.124	19.034	106.5	TRUE	94
21	849.0	890.0	20	94	19.124	19.021	106.5	TRUE	94
22	890.0	929.4	20	106.5	19	19.054	106.5	TRUE	106.5
23	929.4	969.5	20	106.5	19	19.014	106.5	TRUE	106.5
24	969.5	1008.9	20	106.5	19	19.037	106.5	TRUE	106.5
25	1008.9	1051.1	20	106.5	19	19.053	106.5	TRUE	106.5
26	1051.1	1088.4	20	106.5	19	19.033	106.5	TRUE	106.5
27	1088.4	1128.7	20	106.5	19	19.011	106.5	TRUE	106.5
28	1128.7	1165.1	20	106.5	19	19.090	94	TRUE	106.5
29	1165.1	1207.6	20	106.5	19	19.041	106.5	TRUE	106.5
30	1207.6	1248.7	20	106.5	19	19.062	94	TRUE	106.5
31	1248.7	1290.8	20	106.5	19	19.042	106.5	TRUE	106.5
32	1290.8	1330.8	20	106.5	19	19.087	94	TRUE	106.5
33	1330.8	1369.1	20	106.5	19	18.754	133	FALSE	133
34	1369.1	1406.5	20	133	18.73	18.808	133	TRUE	133
35	1406.5	1447.5	20	133	18.73	18.780	133	TRUE	133
36	1447.5	1490.3	20	133	18.73	18.768	133	TRUE	133
37	1490.3	1532.6	20	133	18.73	18.798	133	TRUE	133
38	1532.6	1574.2	20	133	18.73	18.777	133	TRUE	133
39	1574.2	1613.4	20	133	18.73	18.774	133	TRUE	133
40	1613.4	1653.6	20	133	18.73	18.784	133	TRUE	133
41	1653.6	1696.0	20	133	18.73	18.811	133	TRUE	133
42	1696.0	1738.3	20	133	18.73	18.808	133	TRUE	133
43	1738.3	1780.6	20	133	18.73	18.795	133	TRUE	133
44	1780.6	1819.1	20	133	18.73	18.746	133	TRUE	133
45	1819.1	1859.7	20	133	18.73	18.789	133	TRUE	133
46	1859.7	1899.6	20	133	18.73	18.786	133	TRUE	133
47	1899.6	1939.5	20	133	18.73	18.793	133	TRUE	133
48	1939.5	1979.8	20	133	18.73	18.801	133	TRUE	133
49	1979.8	2020.2	20	133	18.73	18.814	133	TRUE	133
50	2020.2	2061.8	20	133	18.73	18.802	133	TRUE	133

West Hackberry 101 (continued)

			Nominal Values			Measured Values			
Casing Number	Begin Casing Depth	End Casing Depth	Outside Diameter	Casing Weight	Nominal Internal Diameter	Measured Internal Diameter	Closest Casing Weight	Within Threshold?	Calculated Casing Weight
-	*ft*	*ft*	*in*	*kg/ft*	*in*	*in*	*kg/ft*	-	*kg/ft*
51	2061.8	2098.4	20	133	18.73	18.777	133	TRUE	133
52	2098.4	2138.1	20	133	18.73	18.796	133	TRUE	133
53	2138.1	2177.3	20	133	18.73	18.780	133	TRUE	133
54	2177.3	2219.0	20	133	18.73	18.782	133	TRUE	133
55	2219.0	2259.2	20	133	18.73	18.771	133	TRUE	133
56	2259.2	2301.5	20	133	18.73	18.791	133	TRUE	133
57	2301.5	2341.2	20	133	18.73	18.790	133	TRUE	133
58	2341.2	2379.6	20	133	18.73	18.795	133	TRUE	133
59	2379.6	2424.1	20	133	18.73	18.763	133	TRUE	133

West Hackberry 102

			Nominal Values			Measured Values			
Casing Number	Begin Casing Depth	End Casing Depth	Outside Diameter	Casing Weight	Nominal Internal Diameter	Measured Internal Diameter	Closest Casing Weight	Within Threshold?	Calculated Casing Weight
-	*ft*	*ft*	*in*	*kg/ft*	*in*	*in*	*kg/ft*	-	*kg/ft*
1	40.4	81.8	20	94	19.124	19.199	94	TRUE	94
2	81.8	122.8	20	94	19.124	19.147	94	TRUE	94
3	122.8	163.4	20	94	19.124	19.145	94	TRUE	94
4	163.4	205.6	20	94	19.124	19.165	94	TRUE	94
5	205.6	248.6	20	94	19.124	19.178	94	TRUE	94
6	248.6	290.0	20	94	19.124	19.168	94	TRUE	94
7	290.0	331.4	20	94	19.124	19.150	94	TRUE	94
8	331.4	370.9	20	94	19.124	19.158	94	TRUE	94
9	370.9	412.0	20	94	19.124	19.170	94	TRUE	94
10	412.0	453.5	20	94	19.124	19.175	94	TRUE	94
11	453.5	494.6	20	94	19.124	19.174	94	TRUE	94
12	494.6	536.3	20	94	19.124	19.186	94	TRUE	94
13	536.3	576.4	20	106.5	19	19.046	106.5	TRUE	106.5
14	576.4	616.8	20	106.5	19	19.045	106.5	TRUE	106.5
15	616.8	658.6	20	106.5	19	19.080	94	TRUE	106.5
16	658.6	693.9	20	106.5	19	19.037	106.5	TRUE	106.5
17	693.9	728.5	20	106.5	19	19.063	94	TRUE	106.5
18	728.5	764.7	20	106.5	19	19.006	106.5	TRUE	106.5
19	764.7	805.6	20	106.5	19	18.991	106.5	TRUE	106.5
20	805.6	845.2	20	106.5	19	18.980	106.5	TRUE	106.5
21	845.2	883.9	20	106.5	19	19.069	94	TRUE	106.5
22	883.9	926.1	20	106.5	19	19.047	106.5	TRUE	106.5
23	926.1	967.7	20	106.5	19	18.995	106.5	TRUE	106.5
24	967.7	1007.6	20	106.5	19	19.007	106.5	TRUE	106.5
25	1007.6	1043.5	20	106.5	19	19.010	106.5	TRUE	106.5
26	1043.5	1086.1	20	106.5	19	19.048	106.5	TRUE	106.5
27	1086.1	1126.4	20	106.5	19	19.074	94	TRUE	106.5
28	1126.4	1168.7	20	133	18.73	18.753	133	TRUE	133
29	1168.7	1210.5	20	133	18.73	18.779	133	TRUE	133
30	1210.5	1251.2	20	133	18.73	18.709	133	TRUE	133
31	1251.2	1291.0	20	133	18.73	18.766	133	TRUE	133
32	1291.0	1333.3	20	133	18.73	18.747	133	TRUE	133
33	1333.3	1373.9	20	133	18.73	18.732	133	TRUE	133
34	1373.9	1416.5	20	133	18.73	18.801	133	TRUE	133
35	1416.5	1457.9	20	133	18.73	18.764	133	TRUE	133
36	1457.9	1497.9	20	133	18.73	18.750	133	TRUE	133
37	1497.9	1537.1	20	133	18.73	18.732	133	TRUE	133
38	1537.1	1578.5	20	133	18.73	18.783	133	TRUE	133
39	1578.5	1618.8	20	133	18.73	18.753	133	TRUE	133
40	1618.8	1660.6	20	133	18.73	18.803	133	TRUE	133
41	1660.6	1700.5	20	133	18.73	18.687	133	TRUE	133
42	1700.5	1742.1	20	133	18.73	18.782	133	TRUE	133
43	1742.1	1782.6	20	133	18.73	18.775	133	TRUE	133
44	1782.6	1824.8	20	133	18.73	18.793	133	TRUE	133
45	1824.8	1863.1	20	133	18.73	18.757	133	TRUE	133
46	1863.1	1905.2	20	133	18.73	18.762	133	TRUE	133
47	1905.2	1946.3	20	133	18.73	18.779	133	TRUE	133
48	1946.3	1988.8	20	133	18.73	18.763	133	TRUE	133
49	1988.8	2025.2	20	133	18.73	18.727	133	TRUE	133
50	2025.2	2066.2	20	133	18.73	18.754	133	TRUE	133

West Hackberry 102 (continued)

			Nominal Values			Measured Values			
Casing Number	Begin Casing Depth	End Casing Depth	Outside Diameter	Casing Weight	Nominal Internal Diameter	Measured Internal Diameter	Closest Casing Weight	Within Threshold?	Calculated Casing Weight
-	*ft*	*ft*	*in*	*kg/ft*	*in*	*in*	*kg/ft*	-	*kg/ft*
51	2066.2	2107.1	20	133	18.73	18.740	133	TRUE	133
52	2107.1	2148.2	20	133	18.73	18.770	133	TRUE	133
53	2148.2	2187.5	20	133	18.73	18.787	133	TRUE	133
54	2187.5	2227.5	20	133	18.73	18.763	133	TRUE	133
55	2227.5	2269.1	20	133	18.73	18.782	133	TRUE	133
56	2269.1	2311.1	20	133	18.73	18.733	133	TRUE	133
57	2311.1	2353.5	20	133	18.73	18.780	133	TRUE	133
58	2353.5	2398.1	20	133	18.73	18.808	133	TRUE	133
59	2398.1	2439.1	20	133	18.73	18.731	133	TRUE	133

West Hackberry 103

			Nominal Values			Measured Values			
Casing Number	Begin Casing Depth	End Casing Depth	Outside Diameter	Casing Weight	Nominal Internal Diameter	Measured Internal Diameter	Closest Casing Weight	Within Threshold?	Calculated Casing Weight
-	*ft*	*ft*	*in*	*kg/ft*	*in*	*in*	*kg/ft*	-	*kg/ft*
1	22.8	62.2	20	129	18.75	19.006	106.5	FALSE	106.5
2	62.2	102.6	20	129	18.75	18.968	106.5	FALSE	106.5
3	102.6	142.9	20	129	18.75	18.974	106.5	FALSE	106.5
4	142.9	181.7	20	129	18.75	18.984	106.5	FALSE	106.5
5	181.7	223.1	20	129	18.75	18.978	106.5	FALSE	106.5
6	223.1	263.1	20	129	18.75	18.982	106.5	FALSE	106.5
7	263.1	303.2	20	129	18.75	18.993	106.5	FALSE	106.5
8	303.2	343.8	20	129	18.75	18.996	106.5	FALSE	106.5
9	343.8	383.6	20	129	18.75	18.989	106.5	FALSE	106.5
10	383.6	423.1	20	129	18.75	18.997	106.5	FALSE	106.5
11	423.1	464.2	20	129	18.75	18.969	106.5	FALSE	106.5
12	464.2	504.6	20	129	18.75	18.994	106.5	FALSE	106.5
13	504.6	544.7	20	129	18.75	18.980	106.5	FALSE	106.5
14	544.7	585.1	20	129	18.75	18.994	106.5	FALSE	106.5
15	585.1	627.2	20	129	18.75	18.995	106.5	FALSE	106.5
16	627.2	665.7	20	129	18.75	18.970	106.5	FALSE	106.5
17	665.7	705.7	20	129	18.75	18.998	106.5	FALSE	106.5
18	705.7	745.1	20	129	18.75	18.969	106.5	FALSE	106.5
19	745.1	785.6	20	129	18.75	18.955	106.5	FALSE	106.5
20	785.6	828.3	20	129	18.75	19.005	106.5	FALSE	106.5
21	828.3	866.7	20	129	18.75	18.971	106.5	FALSE	106.5
22	866.7	907.3	20	129	18.75	18.986	106.5	FALSE	106.5
23	907.3	947.3	20	129	18.75	18.977	106.5	FALSE	106.5
24	947.3	987.7	20	129	18.75	18.965	106.5	FALSE	106.5
25	987.7	1027.7	20	129	18.75	18.982	106.5	FALSE	106.5
26	1027.7	1067.4	20	129	18.75	18.963	106.5	FALSE	106.5
27	1067.4	1108.3	20	129	18.75	18.986	106.5	FALSE	106.5
28	1108.3	1148.4	20	129	18.75	18.970	106.5	FALSE	106.5
29	1148.4	1188.6	20	129	18.75	18.977	106.5	FALSE	106.5
30	1188.6	1228.9	20	129	18.75	18.973	106.5	FALSE	106.5
31	1228.9	1267.9	20	129	18.75	18.972	106.5	FALSE	106.5
32	1267.9	1309.0	20	129	18.75	18.989	106.5	FALSE	106.5
33	1309.0	1349.3	20	129	18.75	18.970	106.5	FALSE	106.5
34	1349.3	1389.7	20	129	18.75	18.997	106.5	FALSE	106.5
35	1389.7	1431.1	20	129	18.75	18.973	106.5	FALSE	106.5
36	1431.1	1470.0	20	129	18.75	18.965	106.5	FALSE	106.5
37	1470.0	1510.5	20	129	18.75	18.988	106.5	FALSE	106.5
38	1510.5	1551.2	20	129	18.75	18.994	106.5	FALSE	106.5
39	1551.2	1591.3	20	129	18.75	18.779	133	TRUE	129
40	1591.3	1630.5	20	129	18.75	18.763	133	TRUE	129
41	1630.5	1669.9	20	129	18.75	18.770	133	TRUE	129
42	1669.9	1710.0	20	129	18.75	18.766	133	TRUE	129
43	1710.0	1750.2	20	104	19	18.752	133	FALSE	133
44	1750.2	1791.3	20	104	19	18.774	133	FALSE	133
45	1791.3	1832.3	20	104	19	18.743	133	FALSE	133
46	1832.3	1872.5	20	104	19	18.773	133	FALSE	133
47	1872.5	1910.8	20	104	19	18.733	133	FALSE	133
48	1910.8	1950.8	20	104	19	18.757	133	FALSE	133
49	1950.8	1992.3	20	104	19	18.747	133	FALSE	133
50	1992.3	2031.2	20	104	19	18.778	133	FALSE	133

West Hackberry 103 (continued)

			Nominal Values			Measured Values			
Casing Number	Begin Casing Depth	End Casing Depth	Outside Diameter	Casing Weight	Nominal Internal Diameter	Measured Internal Diameter	Closest Casing Weight	Within Threshold?	Calculated Casing Weight
-	*ft*	*ft*	*in*	*kg/ft*	*in*	*in*	*kg/ft*	-	*kg/ft*
51	2031.2	2071.3	20	104	19	18.740	133	FALSE	133
52	2071.3	2112.8	20	104	19	18.767	133	FALSE	133
53	2112.8	2153.0	20	104	19	18.793	133	FALSE	133
54	2153.0	2192.8	20	104	19	18.781	133	FALSE	133
55	2192.8	2232.0	20	104	19	18.772	133	FALSE	133
56	2232.0	2273.2	20	104	19	18.722	133	FALSE	133
57	2273.2	2314.7	20	104	19	18.726	133	FALSE	133
58	2314.7	2346.5	20	104	19	18.739	133	FALSE	133
59	2346.5	2387.7	20	104	19	18.750	133	FALSE	133
60	2387.7	2429.3	20	104	19	18.753	133	FALSE	133

West Hackberry 106A

			Nominal Values			Measured Values			
Casing Number	Begin Casing Depth	End Casing Depth	Outside Diameter	Casing Weight	Nominal Internal Diameter	Measured Internal Diameter	Closest Casing Weight	Within Threshold?	Calculated Casing Weight
-	*ft*	*ft*	*in*	*kg/ft*	*in*	*in*	*kg/ft*	-	*kg/ft*
1	2.8	8.3	16	109	14.688	14.725	84	TRUE	109
2	8.3	32.8	16	109	14.688	15.143	75	FALSE	75
3	32.8	66.0	16	109	14.688	15.118	75	FALSE	75
4	66.0	98.9	16	75	15.124	15.145	75	TRUE	75
5	98.9	127.2	16	75	15.124	15.163	75	TRUE	75
6	127.2	154.0	16	75	15.124	15.188	65	TRUE	75
7	154.0	186.3	16	75	15.124	15.180	75	TRUE	75
8	186.3	218.8	16	75	15.124	15.157	75	TRUE	75
9	218.8	249.0	16	75	15.124	15.192	65	TRUE	75
10	249.0	281.8	16	75	15.124	15.079	75	TRUE	75
11	281.8	314.8	16	75	15.124	15.176	75	TRUE	75
12	314.8	352.9	16	75	15.124	15.107	75	TRUE	75
13	352.9	383.8	16	75	15.124	15.109	75	TRUE	75
14	383.8	415.5	16	75	15.124	15.104	75	TRUE	75
15	415.5	449.4	16	75	15.124	15.102	75	TRUE	75
16	449.4	486.8	16	75	15.124	15.103	75	TRUE	75
17	486.8	524.5	16	75	15.124	15.142	75	TRUE	75
18	524.5	558.1	16	75	15.124	15.142	75	TRUE	75
19	558.1	593.8	16	75	15.124	15.137	75	TRUE	75
20	593.8	630.7	16	75	15.124	15.176	75	TRUE	75
21	630.7	665.3	16	75	15.124	15.084	75	TRUE	75
22	665.3	703.3	16	75	15.124	15.140	75	TRUE	75
23	703.3	740.3	16	75	15.124	15.232	65	TRUE	75
24	740.3	775.8	16	75	15.124	15.142	75	TRUE	75
25	775.8	810.9	16	75	15.124	15.140	75	TRUE	75
26	810.9	845.3	16	75	15.124	15.215	65	TRUE	75
27	845.3	882.3	16	75	15.124	15.121	75	TRUE	75
28	882.3	920.0	16	75	15.124	15.100	75	TRUE	75
29	920.0	963.7	16	75	15.124	15.114	75	TRUE	75
30	963.7	1005.6	16	75	15.124	15.101	75	TRUE	75
31	1005.6	1048.6	16	84	15.01	15.106	75	TRUE	84
32	1048.6	1082.3	16	84	15.01	14.689	84	FALSE	84
33	1082.3	1126.0	16	84	15.01	15.105	75	TRUE	84
34	1126.0	1169.7	16	84	15.01	15.089	75	TRUE	84
35	1169.7	1213.2	16	84	15.01	15.109	75	TRUE	84
36	1213.2	1245.2	16	84	15.01	15.040	84	TRUE	84
37	1245.2	1277.8	16	84	15.01	14.851	84	FALSE	84
38	1277.8	1308.8	16	84	15.01	15.099	75	TRUE	84
39	1308.8	1339.2	16	84	15.01	15.103	75	TRUE	84
40	1339.2	1368.2	16	84	15.01	15.146	75	FALSE	75
41	1368.2	1397.1	16	84	15.01	15.089	75	TRUE	84
42	1397.1	1426.1	16	84	15.01	14.806	84	FALSE	84
43	1426.1	1458.4	16	84	15.01	14.793	84	FALSE	84
44	1458.4	1490.3	16	84	15.01	14.846	84	FALSE	84
45	1490.3	1519.9	16	84	15.01	15.067	84	TRUE	84
46	1519.9	1557.2	16	84	15.01	14.796	84	FALSE	84
47	1557.2	1588.9	16	84	15.01	14.755	84	FALSE	84
48	1588.9	1620.4	16	109	14.688	14.726	84	TRUE	109
49	1620.4	1651.3	16	109	14.688	14.668	84	TRUE	109
50	1651.3	1683.8	16	109	14.688	14.715	84	TRUE	109

West Hackberry 106A (continued)

			Nominal Values			Measured Values			
Casing Number	Begin Casing Depth	End Casing Depth	Outside Diameter	Casing Weight	Nominal Internal Diameter	Measured Internal Diameter	Closest Casing Weight	Within Threshold?	Calculated Casing Weight
-	*ft*	*ft*	*in*	*kg/ft*	*in*	*in*	*kg/ft*	-	*kg/ft*
51	1683.8	1713.9	16	109	14.688	14.790	84	TRUE	109
52	1713.9	1745.4	16	109	14.688	14.771	84	TRUE	109
53	1745.4	1776.0	16	109	14.688	14.760	84	TRUE	109
54	1776.0	1807.0	16	109	14.688	14.807	84	TRUE	109
55	1807.0	1840.2	16	109	14.688	14.750	84	TRUE	109
56	1840.2	1873.2	16	109	14.688	14.799	84	TRUE	109
57	1873.2	1907.6	16	109	14.688	14.870	84	FALSE	84
58	1907.6	1943.1	16	109	14.688	14.727	84	TRUE	109
59	1943.1	1980.8	16	109	14.688	14.793	84	TRUE	109
60	1980.8	2016.1	16	109	14.688	14.823	84	TRUE	109
61	2016.1	2051.1	16	109	14.688	14.816	84	TRUE	109
62	2051.1	2086.7	16	109	14.688	14.834	84	TRUE	109
63	2086.7	2120.5	16	109	14.688	14.673	84	TRUE	109
64	2120.5	2152.7	16	109	14.688	14.916	84	FALSE	84
65	2152.7	2178.3	20	133	18.73	18.775	133	TRUE	133
66	2178.3	2214.2	20	133	18.73	17.217	169	FALSE	169
67	2214.2	2256.1	20	133	18.73	18.823	133	TRUE	133
68	2256.1	2294.6	20	133	18.73	18.848	133	TRUE	133
69	2294.6	2336.0	20	133	18.73	18.778	133	TRUE	133
70	2336.0	2379.3	20	133	18.73	18.802	133	TRUE	133

West Hackberry 107A

			Nominal Values			Measured Values			
Casing Number	Begin Casing Depth	End Casing Depth	Outside Diameter	Casing Weight	Nominal Internal Diameter	Measured Internal Diameter	Closest Casing Weight	Within Threshold?	Calculated Casing Weight
-	*ft*	*ft*	*in*	*kg/ft*	*in*	*in*	*kg/ft*	-	*kg/ft*
1	33.5	73.8	16	75	15.124	15.147	75	TRUE	75
2	73.8	111.5	16	75	15.124	15.110	75	TRUE	75
3	111.5	152.3	16	75	15.124	15.094	75	TRUE	75
4	152.3	194.5	16	75	15.124	15.187	75	TRUE	75
5	194.5	230.3	16	75	15.124	15.198	65	TRUE	75
6	230.3	266.3	16	75	15.124	15.172	75	TRUE	75
7	266.3	302.0	16	75	15.124	15.185	75	TRUE	75
8	302.0	336.0	16	75	15.124	15.177	75	TRUE	75
9	336.0	370.8	16	75	15.124	15.186	75	TRUE	75
10	370.8	406.0	16	75	15.124	15.185	75	TRUE	75
11	406.0	441.8	16	75	15.124	15.171	75	TRUE	75
12	441.8	479.8	16	75	15.124	15.176	75	TRUE	75
13	479.8	512.5	16	75	15.124	15.091	75	TRUE	75
14	512.5	548.5	16	75	15.124	15.083	75	TRUE	75
15	548.5	584.8	16	75	15.124	15.175	75	TRUE	75
16	584.8	620.5	16	75	15.124	15.197	65	TRUE	75
17	620.5	655.3	16	75	15.124	15.193	65	TRUE	75
18	655.3	691.5	16	75	15.124	15.170	75	TRUE	75
19	691.5	729.3	16	75	15.124	15.175	75	TRUE	75
20	729.3	763.3	16	75	15.124	15.170	75	TRUE	75
21	763.3	797.3	16	75	15.124	15.064	84	TRUE	75
22	797.3	832.3	16	75	15.124	15.200	65	TRUE	75
23	832.3	870.3	16	75	15.124	15.186	75	TRUE	75
24	870.3	903.3	16	75	15.124	15.198	65	TRUE	75
25	903.3	940.8	16	75	15.124	15.191	65	TRUE	75
26	940.8	977.3	16	75	15.124	15.197	65	TRUE	75
27	977.3	1012.3	16	75	15.124	15.202	65	TRUE	75
28	1012.3	1048.8	16	75	15.124	15.197	65	TRUE	75
29	1048.8	1085.3	16	75	15.124	15.183	75	TRUE	75
30	1085.3	1120.8	16	75	15.124	15.177	75	TRUE	75
31	1120.8	1158.3	16	75	15.124	15.200	65	TRUE	75
32	1158.3	1193.0	16	75	15.124	15.162	75	TRUE	75
33	1193.0	1235.0	16	84	15.01	15.061	84	TRUE	84
34	1235.0	1276.0	16	84	15.01	15.012	84	TRUE	84
35	1276.0	1316.5	16	84	15.01	15.043	84	TRUE	84
36	1316.5	1354.0	16	84	15.01	15.017	84	TRUE	84
37	1354.0	1397.5	16	84	15.01	15.052	84	TRUE	84
38	1397.5	1433.8	16	84	15.01	15.029	84	TRUE	84
39	1433.8	1475.8	16	84	15.01	15.032	84	TRUE	84
40	1475.8	1517.8	16	84	15.01	15.050	84	TRUE	84
41	1517.8	1562.5	16	84	15.01	15.055	84	TRUE	84
42	1562.5	1605.0	16	84	15.01	15.069	75	TRUE	84
43	1605.0	1644.5	16	84	15.01	15.070	75	TRUE	84
44	1644.5	1681.3	16	84	15.01	15.057	84	TRUE	84
45	1681.3	1721.8	16	84	15.01	15.018	84	TRUE	84
46	1721.8	1763.3	16	84	15.01	15.041	84	TRUE	84
47	1763.3	1798.5	16	84	15.01	14.718	84	FALSE	84
48	1798.5	1830.5	16	84	15.01	15.019	84	TRUE	84
49	1830.5	1874.0	16	84	15.01	15.066	84	TRUE	84
50	1874.0	1917.5	16	84	15.01	15.054	84	TRUE	84

West Hackberry 107A (continued)

			Nominal Values			Measured Values			
Casing Number	Begin Casing Depth	End Casing Depth	Outside Diameter	Casing Weight	Nominal Internal Diameter	Measured Internal Diameter	Closest Casing Weight	Within Threshold?	Calculated Casing Weight
-	*ft*	*ft*	*in*	*kg/ft*	*in*	*in*	*kg/ft*	-	*kg/ft*
51	1917.5	1946.5	16	84	15.01	15.053	84	TRUE	84
52	1946.5	1989.3	16	84	15.01	15.039	84	TRUE	84
53	1989.3	2030.5	16	84	15.01	15.045	84	TRUE	84
54	2030.5	2071.5	16	84	15.01	15.034	84	TRUE	84
55	2071.5	2107.3	16	84	15.01	14.809	84	FALSE	84
56	2107.3	2137.8	16	84	15.01	15.027	84	TRUE	84
57	2137.8	2180.8	16	84	15.01	15.054	84	TRUE	84
58	2180.8	2219.8	16	84	15.01	15.048	84	TRUE	84
59	2219.8	2267.5	16	84	15.01	15.061	84	TRUE	84
60	2267.5	2304.8	16	84	15.01	15.059	84	TRUE	84
61	2304.8	2342.3	16	84	15.01	15.049	84	TRUE	84
62	2342.3	2377.3	16	84	15.01	15.017	84	TRUE	84

West Hackberry 108

			Nominal Values			Measured Values			
Casing Number	Begin Casing Depth	End Casing Depth	Outside Diameter	Casing Weight	Nominal Internal Diameter	Measured Internal Diameter	Closest Casing Weight	Within Threshold?	Calculated Casing Weight
-	*ft*	*ft*	*in*	*kg/ft*	*in*	*in*	*kg/ft*	-	*kg/ft*
1	40.3	80.5	20	94	19.124	18.741	133	FALSE	133
2	80.5	120.9	20	94	19.124	18.790	133	FALSE	133
3	120.9	162.0	20	94	19.124	18.804	133	FALSE	133
4	162.0	196.8	20	94	19.124	19.210	94	TRUE	94
5	196.8	237.9	20	94	19.124	19.170	94	TRUE	94
6	237.9	280.3	20	94	19.124	19.223	94	TRUE	94
7	280.3	319.7	20	94	19.124	19.252	94	FALSE	94
8	319.7	362.3	20	94	19.124	19.231	94	TRUE	94
9	362.3	399.1	20	94	19.124	19.241	94	FALSE	94
10	399.1	440.6	20	94	19.124	19.234	94	FALSE	94
11	440.6	483.5	20	94	19.124	19.214	94	TRUE	94
12	483.5	520.3	20	94	19.124	19.163	94	TRUE	94
13	520.3	557.6	20	94	19.124	19.178	94	TRUE	94
14	557.6	599.9	20	94	19.124	19.251	94	FALSE	94
15	599.9	642.2	20	94	19.124	19.241	94	FALSE	94
16	642.2	681.5	20	94	19.124	19.207	94	TRUE	94
17	681.5	722.2	20	94	19.124	19.221	94	TRUE	94
18	722.2	764.7	20	94	19.124	19.228	94	TRUE	94
19	764.7	807.5	20	94	19.124	19.274	94	FALSE	94
20	807.5	847.0	20	94	19.124	19.202	94	TRUE	94
21	847.0	888.4	20	133	18.73	19.169	94	FALSE	94
22	888.4	930.1	20	133	18.73	19.198	94	FALSE	94
23	930.1	973.2	20	133	18.73	19.238	94	FALSE	94
24	973.2	1014.2	20	133	18.73	19.152	94	FALSE	94
25	1014.2	1052.9	20	106.5	19	19.056	106.5	TRUE	106.5
26	1052.9	1093.5	20	106.5	19	19.046	106.5	TRUE	106.5
27	1093.5	1132.3	20	106.5	19	18.992	106.5	TRUE	106.5
28	1132.3	1173.7	20	106.5	19	19.087	94	TRUE	106.5
29	1173.7	1214.6	20	106.5	19	19.024	106.5	TRUE	106.5
30	1214.6	1255.2	20	106.5	19	19.041	106.5	TRUE	106.5
31	1255.2	1293.7	20	106.5	19	19.066	94	TRUE	106.5
32	1293.7	1331.8	20	106.5	19	19.024	106.5	TRUE	106.5
33	1331.8	1371.5	20	133	18.73	19.026	106.5	FALSE	106.5
34	1371.5	1412.6	20	133	18.73	18.779	133	TRUE	133
35	1412.6	1453.7	20	133	18.73	18.797	133	TRUE	133
36	1453.7	1494.7	20	133	18.73	18.775	133	TRUE	133
37	1494.7	1535.3	20	133	18.73	18.815	133	TRUE	133
38	1535.3	1575.8	20	133	18.73	18.722	133	TRUE	133
39	1575.8	1614.5	20	133	18.73	18.681	133	TRUE	133
40	1614.5	1654.3	20	133	18.73	18.764	133	TRUE	133
41	1654.3	1696.7	20	133	18.73	18.826	133	TRUE	133
42	1696.7	1737.8	20	133	18.73	18.751	133	TRUE	133
43	1737.8	1779.3	20	133	18.73	18.803	133	TRUE	133
44	1779.3	1815.7	20	133	18.73	18.729	133	TRUE	133
45	1815.7	1854.6	20	133	18.73	18.777	133	TRUE	133
46	1854.6	1895.1	20	133	18.73	18.791	133	TRUE	133
47	1895.1	1934.8	20	133	18.73	18.741	133	TRUE	133
48	1934.8	1974.4	20	133	18.73	18.744	133	TRUE	133
49	1974.4	2013.1	20	133	18.73	18.784	133	TRUE	133
50	2013.1	2054.6	20	133	18.73	18.803	133	TRUE	133

West Hackberry 108 (continued)

			Nominal Values			Measured Values			
Casing Number	Begin Casing Depth	End Casing Depth	Outside Diameter	Casing Weight	Nominal Internal Diameter	Measured Internal Diameter	Closest Casing Weight	Within Threshold?	Calculated Casing Weight
-	*ft*	*ft*	*in*	*kg/ft*	*in*	*in*	*kg/ft*	-	*kg/ft*
51	2054.6	2092.9	20	133	18.73	18.769	133	TRUE	133
52	2092.9	2133.5	20	133	18.73	18.717	133	TRUE	133
53	2133.5	2175.8	20	133	18.73	18.780	133	TRUE	133
54	2175.8	2215.4	20	133	18.73	18.761	133	TRUE	133
55	2215.4	2258.2	20	133	18.73	18.829	133	TRUE	133
56	2258.2	2299.6	20	133	18.73	18.805	133	TRUE	133
57	2299.6	2338.1	20	133	18.73	18.789	133	TRUE	133
58	2338.1	2376.7	20	133	18.73	18.765	133	TRUE	133
59	2376.7	2419.2	20	133	18.73	18.743	133	TRUE	133

West Hackberry 109

			Nominal Values			Measured Values			
Casing Number	Begin Casing Depth	End Casing Depth	Outside Diameter	Casing Weight	Nominal Internal Diameter	Measured Internal Diameter	Closest Casing Weight	Within Threshold?	Calculated Casing Weight
-	*ft*	*ft*	*in*	*kg/ft*	*in*	*in*	*kg/ft*	-	*kg/ft*
1	35.2	77.1	20	94	19.124	19.248	94	FALSE	94
2	77.1	118.4	20	94	19.124	19.237	94	FALSE	94
3	118.4	158.7	20	94	19.124	19.294	94	FALSE	94
4	158.7	199.8	20	94	19.124	19.229	94	TRUE	94
5	199.8	239.0	20	94	19.124	19.220	94	TRUE	94
6	239.0	279.5	20	94	19.124	19.250	94	FALSE	94
7	279.5	323.4	20	94	19.124	19.262	94	FALSE	94
8	323.4	363.8	20	94	19.124	19.181	94	TRUE	94
9	363.8	405.0	20	94	19.124	19.202	94	TRUE	94
10	405.0	445.1	20	94	19.124	19.169	94	TRUE	94
11	445.1	484.4	20	94	19.124	19.172	94	TRUE	94
12	484.4	524.4	20	94	19.124	19.174	94	TRUE	94
13	524.4	563.8	20	94	19.124	19.142	94	TRUE	94
14	563.8	605.2	20	94	19.124	19.186	94	TRUE	94
15	605.2	646.9	20	94	19.124	19.147	94	TRUE	94
16	646.9	689.8	20	94	19.124	19.198	94	TRUE	94
17	689.8	731.8	20	94	19.124	19.236	94	FALSE	94
18	731.8	772.7	20	94	19.124	19.184	94	TRUE	94
19	772.7	814.1	20	94	19.124	19.183	94	TRUE	94
20	814.1	847.7	20	106.5	19	19.011	106.5	TRUE	106.5
21	847.7	882.2	20	106.5	19	19.072	94	TRUE	106.5
22	882.2	922.4	20	106.5	19	19.062	106.5	TRUE	106.5
23	922.4	963.8	20	106.5	19	19.021	106.5	TRUE	106.5
24	963.8	1003.9	20	106.5	19	19.115	94	TRUE	106.5
25	1003.9	1044.3	20	106.5	19	19.102	94	TRUE	106.5
26	1044.3	1086.4	20	106.5	19	19.080	94	TRUE	106.5
27	1086.4	1124.8	20	106.5	19	19.059	106.5	TRUE	106.5
28	1124.8	1164.1	20	106.5	19	19.049	106.5	TRUE	106.5
29	1164.1	1205.1	20	106.5	19	19.048	106.5	TRUE	106.5
30	1205.1	1242.8	20	106.5	19	19.127	94	FALSE	94
31	1242.8	1282.4	20	106.5	19	19.099	94	TRUE	106.5
32	1282.4	1321.5	20	106.5	19	19.011	106.5	TRUE	106.5
33	1321.5	1362.4	20	133	18.73	18.793	133	TRUE	133
34	1362.4	1403.6	20	133	18.73	18.799	133	TRUE	133
35	1403.6	1441.9	20	133	18.73	18.771	133	TRUE	133
36	1441.9	1482.3	20	133	18.73	18.772	133	TRUE	133
37	1482.3	1517.2	20	133	18.73	18.768	133	TRUE	133
38	1517.2	1554.4	20	133	18.73	18.834	133	TRUE	133
39	1554.4	1596.9	20	133	18.73	18.816	133	TRUE	133
40	1596.9	1633.1	20	133	18.73	18.784	133	TRUE	133
41	1633.1	1672.1	20	133	18.73	18.744	133	TRUE	133
42	1672.1	1711.3	20	133	18.73	18.781	133	TRUE	133
43	1711.3	1749.1	20	133	18.73	18.785	133	TRUE	133
44	1749.1	1788.1	20	133	18.73	18.734	133	TRUE	133
45	1788.1	1830.0	20	133	18.73	18.741	133	TRUE	133
46	1830.0	1868.7	20	133	18.73	19.061	106.5	FALSE	106.5
47	1868.7	1910.3	20	133	18.73	18.778	133	TRUE	133
48	1910.3	1951.3	20	133	18.73	18.766	133	TRUE	133
49	1951.3	1989.6	20	133	18.73	18.785	133	TRUE	133
50	1989.6	2030.4	20	133	18.73	18.759	133	TRUE	133

West Hackberry 109 (continued)

			Nominal Values			Measured Values			
Casing Number	Begin Casing Depth	End Casing Depth	Outside Diameter	Casing Weight	Nominal Internal Diameter	Measured Internal Diameter	Closest Casing Weight	Within Threshold?	Calculated Casing Weight
-	*ft*	*ft*	*in*	*kg/ft*	*in*	*in*	*kg/ft*	-	*kg/ft*
51	2030.4	2070.9	20	133	18.73	18.757	133	TRUE	133
52	2070.9	2109.7	20	133	18.73	18.748	133	TRUE	133
53	2109.7	2150.9	20	133	18.73	18.757	133	TRUE	133
54	2150.9	2189.7	20	133	18.73	18.724	133	TRUE	133
55	2189.7	2230.9	20	133	18.73	18.773	133	TRUE	133
56	2230.9	2269.9	20	133	18.73	18.774	133	TRUE	133
57	2269.9	2310.4	20	133	18.73	18.745	133	TRUE	133
58	2310.4	2348.7	20	133	18.73	18.712	133	TRUE	133
59	2348.7	2387.3	20	133	18.73	18.730	133	TRUE	133
60	2387.3	2427.4	20	133	18.73	18.763	133	TRUE	133

West Hackberry 111

			Nominal Values			Measured Values			
Casing Number	Begin Casing Depth	End Casing Depth	Outside Diameter	Casing Weight	Nominal Internal Diameter	Measured Internal Diameter	Closest Casing Weight	Within Threshold?	Calculated Casing Weight
-	*ft*	*ft*	*in*	*kg/ft*	*in*	*in*	*kg/ft*	-	*kg/ft*
1	36.9	79.8	20	94	19.124	19.210	94	TRUE	94
2	79.8	123.0	20	94	19.124	19.187	94	TRUE	94
3	123.0	165.2	20	94	19.124	19.180	94	TRUE	94
4	165.2	205.4	20	94	19.124	19.141	94	TRUE	94
5	205.4	244.0	20	94	19.124	19.166	94	TRUE	94
6	244.0	284.0	20	94	19.124	19.178	94	TRUE	94
7	284.0	324.5	20	94	19.124	19.120	94	TRUE	94
8	324.5	364.6	20	94	19.124	19.148	94	TRUE	94
9	364.6	406.8	20	94	19.124	19.187	94	TRUE	94
10	406.8	444.3	20	94	19.124	19.165	94	TRUE	94
11	444.3	486.9	20	94	19.124	19.181	94	TRUE	94
12	486.9	521.2	20	94	19.124	19.174	94	TRUE	94
13	521.2	560.2	20	94	19.124	19.165	94	TRUE	94
14	560.2	601.3	20	94	19.124	19.162	94	TRUE	94
15	601.3	641.4	20	94	19.124	19.130	94	TRUE	94
16	641.4	682.4	20	94	19.124	19.158	94	TRUE	94
17	682.4	724.0	20	94	19.124	19.178	94	TRUE	94
18	724.0	765.1	20	94	19.124	19.133	94	TRUE	94
19	765.1	807.1	20	94	19.124	19.208	94	TRUE	94
20	807.1	845.9	20	106.5	19	19.141	94	FALSE	94
21	845.9	886.0	20	106.5	19	18.998	106.5	TRUE	106.5
22	886.0	925.9	20	106.5	19	19.106	94	TRUE	106.5
23	925.9	966.3	20	106.5	19	19.040	106.5	TRUE	106.5
24	966.3	1004.3	20	106.5	19	19.073	94	TRUE	106.5
25	1004.3	1043.7	20	106.5	19	19.058	106.5	TRUE	106.5
26	1043.7	1080.7	20	106.5	19	19.063	94	TRUE	106.5
27	1080.7	1120.0	20	106.5	19	19.035	106.5	TRUE	106.5
28	1120.0	1159.3	20	106.5	19	18.996	106.5	TRUE	106.5
29	1159.3	1198.4	20	106.5	19	18.998	106.5	TRUE	106.5
30	1198.4	1240.9	20	133	18.73	18.761	133	TRUE	133
31	1240.9	1281.9	20	133	18.73	18.768	133	TRUE	133
32	1281.9	1322.3	20	133	18.73	18.744	133	TRUE	133
33	1322.3	1360.8	20	133	18.73	18.765	133	TRUE	133
34	1360.8	1399.7	20	133	18.73	18.720	133	TRUE	133
35	1399.7	1440.8	20	133	18.73	18.704	133	TRUE	133
36	1440.8	1484.0	20	133	18.73	18.767	133	TRUE	133
37	1484.0	1526.2	20	133	18.73	18.741	133	TRUE	133
38	1526.2	1565.7	20	133	18.73	18.869	106.5	TRUE	133
39	1565.7	1605.2	20	133	18.73	18.777	133	TRUE	133
40	1605.2	1643.8	20	133	18.73	18.778	133	TRUE	133
41	1643.8	1685.6	20	133	18.73	18.752	133	TRUE	133
42	1685.6	1725.4	20	133	18.73	18.727	133	TRUE	133
43	1725.4	1764.2	20	133	18.73	18.740	133	TRUE	133
44	1764.2	1804.9	20	133	18.73	18.777	133	TRUE	133
45	1804.9	1846.5	20	133	18.73	18.758	133	TRUE	133
46	1846.5	1884.5	20	133	18.73	18.793	133	TRUE	133
47	1884.5	1925.1	20	133	18.73	18.768	133	TRUE	133
48	1925.1	1968.6	20	133	18.73	18.757	133	TRUE	133
49	1968.6	2010.0	20	133	18.73	18.764	133	TRUE	133
50	2010.0	2049.1	20	133	18.73	18.730	133	TRUE	133

West Hackberry 111 (continued)

			Nominal Values			Measured Values			
Casing Number	Begin Casing Depth	End Casing Depth	Outside Diameter	Casing Weight	Nominal Internal Diameter	Measured Internal Diameter	Closest Casing Weight	Within Threshold?	Calculated Casing Weight
-	*ft*	*ft*	*in*	*kg/ft*	*in*	*in*	*kg/ft*	-	*kg/ft*
51	2049.1	2089.9	20	133	18.73	18.832	133	TRUE	133
52	2089.9	2131.5	20	133	18.73	18.754	133	TRUE	133
53	2131.5	2172.6	20	133	18.73	18.793	133	TRUE	133
54	2172.6	2214.0	20	133	18.73	18.791	133	TRUE	133
55	2214.0	2251.0	20	133	18.73	18.761	133	TRUE	133
56	2251.0	2290.8	20	133	18.73	18.765	133	TRUE	133
57	2290.8	2329.5	20	133	18.73	18.702	133	TRUE	133
58	2329.5	2368.1	20	133	18.73	18.747	133	TRUE	133
59	2368.1	2409.5	20	133	18.73	18.795	133	TRUE	133
60	2409.5	2450.4	20	133	18.73	18.798	133	TRUE	133
61	2450.4	2493.5	20	133	18.73	18.789	133	TRUE	133
62	2493.5	2533.9	20	133	18.73	18.786	133	TRUE	133

West Hackberry 112

			Nominal Values			Measured Values			
Casing Number	Begin Casing Depth	End Casing Depth	Outside Diameter	Casing Weight	Nominal Internal Diameter	Measured Internal Diameter	Closest Casing Weight	Within Threshold?	Calculated Casing Weight
-	*ft*	*ft*	*in*	*kg/ft*	*in*	*in*	*kg/ft*	-	*kg/ft*
1	12.6	41.6	20	94	19.124	19.133	94	TRUE	94
2	41.6	83.3	20	94	19.124	19.098	94	TRUE	94
3	83.3	124.3	20	94	19.124	19.119	94	TRUE	94
4	124.3	163.1	20	94	19.124	19.126	94	TRUE	94
5	163.1	205.3	20	94	19.124	19.163	94	TRUE	94
6	205.3	245.3	20	94	19.124	19.098	94	TRUE	94
7	245.3	287.4	20	94	19.124	19.109	94	TRUE	94
8	287.4	328.7	20	94	19.124	19.136	94	TRUE	94
9	328.7	370.9	20	94	19.124	19.127	94	TRUE	94
10	370.9	411.9	20	94	19.124	19.136	94	TRUE	94
11	411.9	453.9	20	94	19.124	19.123	94	TRUE	94
12	453.9	493.9	20	94	19.124	19.116	94	TRUE	94
13	493.9	535.6	20	94	19.124	19.121	94	TRUE	94
14	535.6	575.5	20	94	19.124	19.127	94	TRUE	94
15	575.5	617.0	20	94	19.124	19.110	94	TRUE	94
16	617.0	656.4	20	94	19.124	19.132	94	TRUE	94
17	656.4	697.4	20	94	19.124	19.113	94	TRUE	94
18	697.4	737.6	20	106.5	19	19.003	106.5	TRUE	106.5
19	737.6	778.8	20	106.5	19	18.728	133	FALSE	133
20	778.8	820.2	20	106.5	19	18.986	106.5	TRUE	106.5
21	820.2	858.7	20	106.5	19	19.002	106.5	TRUE	106.5
22	858.7	899.4	20	106.5	19	18.955	106.5	TRUE	106.5
23	899.4	940.3	20	106.5	19	19.009	106.5	TRUE	106.5
24	940.3	982.5	20	106.5	19	19.060	106.5	TRUE	106.5
25	982.5	1021.5	20	106.5	19	19.000	106.5	TRUE	106.5
26	1021.5	1060.7	20	106.5	19	18.974	106.5	TRUE	106.5
27	1060.7	1101.0	20	106.5	19	19.010	106.5	TRUE	106.5
28	1101.0	1143.2	20	106.5	19	19.010	106.5	TRUE	106.5
29	1143.2	1176.5	20	106.5	19	18.980	106.5	TRUE	106.5
30	1176.5	1218.5	20	106.5	19	18.991	106.5	TRUE	106.5
31	1218.5	1260.1	20	106.5	19	18.993	106.5	TRUE	106.5
32	1260.1	1296.7	20	106.5	19	19.050	106.5	TRUE	106.5
33	1296.7	1334.7	20	133	18.73	18.974	106.5	FALSE	106.5
34	1334.7	1373.4	20	133	18.73	18.683	133	TRUE	133
35	1373.4	1413.8	20	133	18.73	18.693	133	TRUE	133
36	1413.8	1448.4	20	133	18.73	18.671	133	TRUE	133
37	1448.4	1489.9	20	133	18.73	18.729	133	TRUE	133
38	1489.9	1530.9	20	133	18.73	18.683	133	TRUE	133
39	1530.9	1571.0	20	133	18.73	18.637	133	TRUE	133
40	1571.0	1610.4	20	133	18.73	18.690	133	TRUE	133
41	1610.4	1649.2	20	133	18.73	18.723	133	TRUE	133
42	1649.2	1688.5	20	133	18.73	18.689	133	TRUE	133
43	1688.5	1730.0	20	133	18.73	18.696	133	TRUE	133
44	1730.0	1770.8	20	133	18.73	18.710	133	TRUE	133
45	1770.8	1812.4	20	133	18.73	18.707	133	TRUE	133
46	1812.4	1854.3	20	133	18.73	18.746	133	TRUE	133
47	1854.3	1896.1	20	133	18.73	18.739	133	TRUE	133
48	1896.1	1937.0	20	133	18.73	18.735	133	TRUE	133
49	1937.0	1978.0	20	133	18.73	18.714	133	TRUE	133
50	1978.0	2019.2	20	133	18.73	18.751	133	TRUE	133

West Hackberry 112 (continued)

			Nominal Values			Measured Values			
Casing Number	Begin Casing Depth	End Casing Depth	Outside Diameter	Casing Weight	Nominal Internal Diameter	Measured Internal Diameter	Closest Casing Weight	Within Threshold?	Calculated Casing Weight
-	*ft*	*ft*	*in*	*kg/ft*	*in*	*in*	*kg/ft*	-	*kg/ft*
51	2019.2	2057.6	20	133	18.73	18.727	133	TRUE	133
52	2057.6	2099.6	20	133	18.73	18.753	133	TRUE	133
53	2099.6	2141.4	20	133	18.73	18.790	133	TRUE	133
54	2141.4	2183.8	20	133	18.73	18.765	133	TRUE	133
55	2183.8	2225.9	20	133	18.73	18.774	133	TRUE	133
56	2225.9	2266.7	20	133	18.73	18.756	133	TRUE	133
57	2266.7	2307.2	20	133	18.73	18.772	133	TRUE	133
58	2307.2	2348.1	20	133	18.73	18.816	133	TRUE	133
59	2348.1	2392.3	20	133	18.73	18.770	133	TRUE	133
60	2392.3	2426.2	20	133	18.73	18.767	133	TRUE	133

West Hackberry 113

			Nominal Values			Measured Values			
Casing Number	Begin Casing Depth	End Casing Depth	Outside Diameter	Casing Weight	Nominal Internal Diameter	Measured Internal Diameter	Closest Casing Weight	Within Threshold?	Calculated Casing Weight
-	*ft*	*ft*	*in*	*kg/ft*	*in*	*in*	*kg/ft*	-	*kg/ft*
1	18.8	45.0	16	109	14.688	14.711	84	TRUE	109
2	45.0	80.0	16	109	14.688	14.691	84	TRUE	109
3	80.0	117.5	16	109	14.688	15.061	84	FALSE	84
4	117.5	156.9	16	84	15.01	15.108	75	TRUE	84
5	156.9	193.0	16	84	15.01	15.125	75	TRUE	84
6	193.0	227.8	16	84	15.01	15.192	65	FALSE	65
7	227.8	263.3	16	84	15.01	15.093	75	TRUE	84
8	263.3	300.4	16	84	15.01	15.159	75	FALSE	75
9	300.4	337.6	16	84	15.01	15.086	75	TRUE	84
10	337.6	375.7	16	84	15.01	15.151	75	FALSE	75
11	375.7	415.6	16	84	15.01	15.075	75	TRUE	84
12	415.6	453.3	16	84	15.01	15.089	75	TRUE	84
13	453.3	490.0	16	84	15.01	15.135	75	FALSE	75
14	490.0	525.9	16	84	15.01	15.114	75	TRUE	84
15	525.9	569.9	16	84	15.01	15.049	84	TRUE	84
16	569.9	608.7	16	84	15.01	15.051	84	TRUE	84
17	608.7	642.9	16	84	15.01	15.082	75	TRUE	84
18	642.9	681.2	16	84	15.01	15.132	75	TRUE	84
19	681.2	716.5	16	84	15.01	15.104	75	TRUE	84
20	716.5	751.0	16	84	15.01	15.083	75	TRUE	84
21	751.0	780.9	16	84	15.01	15.047	84	TRUE	84
22	780.9	815.6	16	84	15.01	14.739	84	FALSE	84
23	815.6	845.3	16	84	15.01	15.068	75	TRUE	84
24	845.3	883.3	16	84	15.01	14.704	84	FALSE	84
25	883.3	918.7	16	84	15.01	14.795	84	FALSE	84
26	918.7	956.5	16	84	15.01	14.754	84	FALSE	84
27	956.5	993.5	16	84	15.01	15.048	84	TRUE	84
28	993.5	1037.8	16	84	15.01	15.058	84	TRUE	84
29	1037.8	1072.4	16	84	15.01	15.037	84	TRUE	84
30	1072.4	1107.7	16	84	15.01	14.749	84	FALSE	84
31	1107.7	1143.2	16	84	15.01	14.720	84	FALSE	84
32	1143.2	1184.4	16	84	15.01	15.060	84	TRUE	84
33	1184.4	1226.8	16	84	15.01	15.039	84	TRUE	84
34	1226.8	1267.9	16	84	15.01	15.039	84	TRUE	84
35	1267.9	1309.2	16	84	15.01	15.040	84	TRUE	84
36	1309.2	1343.1	16	84	15.01	15.050	84	TRUE	84
37	1343.1	1382.0	16	84	15.01	15.065	84	TRUE	84
38	1382.0	1423.9	16	84	15.01	15.051	84	TRUE	84
39	1423.9	1466.1	16	84	15.01	15.040	84	TRUE	84
40	1466.1	1508.9	16	84	15.01	15.063	84	TRUE	84
41	1508.9	1551.6	16	84	15.01	15.058	84	TRUE	84
42	1551.6	1593.1	16	84	15.01	15.048	84	TRUE	84
43	1593.1	1634.5	16	84	15.01	15.044	84	TRUE	84
44	1634.5	1678.3	16	84	15.01	15.073	75	TRUE	84
45	1678.3	1722.1	16	84	15.01	15.057	84	TRUE	84
46	1722.1	1755.8	16	84	15.01	15.046	84	TRUE	84
47	1755.8	1798.3	16	84	15.01	15.046	84	TRUE	84
48	1798.3	1840.5	16	84	15.01	15.056	84	TRUE	84
49	1840.5	1883.0	16	84	15.01	15.065	84	TRUE	84
50	1883.0	1925.2	16	84	15.01	15.054	84	TRUE	84

West Hackberry 113 (continued)

			Nominal Values			Measured Values			
Casing Number	Begin Casing Depth	End Casing Depth	Outside Diameter	Casing Weight	Nominal Internal Diameter	Measured Internal Diameter	Closest Casing Weight	Within Threshold?	Calculated Casing Weight
-	*ft*	*ft*	*in*	*kg/ft*	*in*	*in*	*kg/ft*	-	*kg/ft*
51	1925.2	1963.2	16	84	15.01	15.019	84	TRUE	84
52	1963.2	2006.0	16	75	15.124	15.077	75	TRUE	75
53	2006.0	2042.4	16	75	15.124	15.054	84	TRUE	75
54	2042.4	2078.6	16	75	15.124	14.806	84	FALSE	84
55	2078.6	2116.8	16	75	15.124	15.053	84	TRUE	75
56	2116.8	2151.8	16	75	15.124	15.065	84	TRUE	75
57	2151.8	2196.8	16	75	15.124	15.078	75	TRUE	75
58	2196.8	2231.5	16	75	15.124	15.121	75	TRUE	75
59	2231.5	2275.6	16	75	15.124	15.063	84	TRUE	75
60	2275.6	2315.9	16	75	15.124	15.061	84	TRUE	75
61	2315.9	2356.6	16	75	15.124	15.043	84	TRUE	75
62	2356.6	2397.4	16	75	15.124	15.058	84	TRUE	75
63	2397.4	2436.6	16	75	15.124	15.071	75	TRUE	75
64	2436.6	2479.8	16	75	15.124	15.082	75	TRUE	75
65	2479.8	2524.4	16	75	15.124	15.066	84	TRUE	75
66	2524.4	2567.2	16	75	15.124	15.063	84	TRUE	75
67	2567.2	2599.2	16	75	15.124	14.696	84	FALSE	84
68	2599.2	2634.9	16	75	15.124	14.737	84	FALSE	84
69	2634.9	2673.0	16	109	14.688	14.712	84	TRUE	109
70	2673.0	2714.5	16	109	14.688	18.855	65	FALSE	65
71	2714.5	2752.4	16	109	14.688	18.742	65	FALSE	65

West Hackberry 114

			Nominal Values			Measured Values			
Casing Number	Begin Casing Depth	End Casing Depth	Outside Diameter	Casing Weight	Nominal Internal Diameter	Measured Internal Diameter	Closest Casing Weight	Within Threshold?	Calculated Casing Weight
-	*ft*	*ft*	*in*	*kg/ft*	*in*	*in*	*kg/ft*	-	*kg/ft*
1	38.8	77.4	16	84	15.01	15.041	84	TRUE	84
2	77.4	116.1	16	84	15.01	15.090	75	TRUE	84
3	116.1	153.1	16	84	15.01	15.108	75	TRUE	84
4	153.1	189.6	16	84	15.01	15.040	84	TRUE	84
5	189.6	228.8	16	84	15.01	15.066	84	TRUE	84
6	228.8	268.4	16	84	15.01	15.072	75	TRUE	84
7	268.4	306.8	16	84	15.01	15.052	84	TRUE	84
8	306.8	347.2	16	84	15.01	15.088	75	TRUE	84
9	347.2	385.4	16	84	15.01	15.089	75	TRUE	84
10	385.4	426.4	16	84	15.01	15.100	75	TRUE	84
11	426.4	465.7	16	84	15.01	15.076	75	TRUE	84
12	465.7	504.3	16	84	15.01	15.095	75	TRUE	84
13	504.3	537.4	16	84	15.01	14.999	84	TRUE	84
14	537.4	569.3	16	84	15.01	15.129	75	TRUE	84
15	569.3	597.8	16	84	15.01	15.024	84	TRUE	84
16	597.8	630.4	16	84	15.01	14.984	84	TRUE	84
17	630.4	666.9	16	84	15.01	15.052	84	TRUE	84
18	666.9	695.9	16	84	15.01	15.085	75	TRUE	84
19	695.9	731.7	16	84	15.01	15.104	75	TRUE	84
20	731.7	764.3	16	84	15.01	15.076	75	TRUE	84
21	764.3	796.6	16	84	15.01	15.091	75	TRUE	84
22	796.6	830.1	16	84	15.01	15.080	75	TRUE	84
23	830.1	870.0	16	84	15.01	15.096	75	TRUE	84
24	870.0	906.7	16	84	15.01	15.033	84	TRUE	84
25	906.7	946.0	16	84	15.01	15.100	75	TRUE	84
26	946.0	983.4	16	84	15.01	15.047	84	TRUE	84
27	983.4	1021.9	16	84	15.01	15.105	75	TRUE	84
28	1021.9	1060.8	16	84	15.01	15.058	84	TRUE	84
29	1060.8	1100.0	16	84	15.01	15.079	75	TRUE	84
30	1100.0	1139.9	16	84	15.01	15.093	75	TRUE	84
31	1139.9	1174.2	16	84	15.01	15.117	75	TRUE	84
32	1174.2	1207.7	16	84	15.01	15.146	75	FALSE	75
33	1207.7	1246.6	16	84	15.01	15.099	75	TRUE	84
34	1246.6	1286.6	16	84	15.01	15.082	75	TRUE	84
35	1286.6	1321.4	16	84	15.01	15.099	75	TRUE	84
36	1321.4	1359.1	16	109	14.688	14.750	84	TRUE	109
37	1359.1	1398.6	16	109	14.688	14.748	84	TRUE	109
38	1398.6	1436.4	16	109	14.688	14.661	84	TRUE	109
39	1436.4	1469.3	16	109	14.688	14.724	84	TRUE	109
40	1469.3	1508.8	16	109	14.688	14.750	84	TRUE	109
41	1508.8	1547.7	16	109	14.688	14.742	84	TRUE	109
42	1547.7	1585.3	16	109	14.688	14.710	84	TRUE	109
43	1585.3	1622.0	16	109	14.688	14.684	84	TRUE	109
44	1622.0	1660.9	16	109	14.688	14.772	84	TRUE	109
45	1660.9	1699.7	16	109	14.688	14.742	84	TRUE	109
46	1699.7	1738.2	16	109	14.688	14.715	84	TRUE	109
47	1738.2	1774.2	16	109	14.688	14.710	84	TRUE	109
48	1774.2	1810.1	16	109	14.688	14.758	84	TRUE	109
49	1810.1	1848.8	16	109	14.688	14.774	84	TRUE	109
50	1848.8	1880.9	16	109	14.688	14.761	84	TRUE	109

West Hackberry 114 (continued)

			Nominal Values			Measured Values			
Casing Number	Begin Casing Depth	End Casing Depth	Outside Diameter	Casing Weight	Nominal Internal Diameter	Measured Internal Diameter	Closest Casing Weight	Within Threshold?	Calculated Casing Weight
-	*ft*	*ft*	*in*	*kg/ft*	*in*	*in*	*kg/ft*	-	*kg/ft*
51	1880.9	1919.2	16	109	14.688	14.788	84	TRUE	109
52	1919.2	1956.3	16	109	14.688	14.710	84	TRUE	109
53	1956.3	1994.5	16	109	14.688	14.823	84	TRUE	109
54	1994.5	2030.6	16	109	14.688	14.735	84	TRUE	109
55	2030.6	2065.5	16	109	14.688	14.772	84	TRUE	109
56	2065.5	2104.6	16	109	14.688	14.781	84	TRUE	109
57	2104.6	2143.7	16	109	14.688	14.770	84	TRUE	109
58	2143.7	2181.2	16	109	14.688	14.770	84	TRUE	109
59	2181.2	2220.9	16	109	14.688	14.732	84	TRUE	109
60	2220.9	2256.6	16	109	14.688	14.701	84	TRUE	109
61	2256.6	2295.2	16	109	14.688	14.747	84	TRUE	109
62	2295.2	2335.5	16	109	14.688	14.803	84	TRUE	109
63	2335.5	2375.4	16	109	14.688	14.737	84	TRUE	109

West Hackberry 115

			Nominal Values			Measured Values			
Casing Number	Begin Casing Depth	End Casing Depth	Outside Diameter	Casing Weight	Nominal Internal Diameter	Measured Internal Diameter	Closest Casing Weight	Within Threshold?	Calculated Casing Weight
-	*ft*	*ft*	*in*	*kg/ft*	*in*	*in*	*kg/ft*	-	*kg/ft*
1	3.3	44.8	20	94	19.124	18.943	106.5	FALSE	106.5
2	44.8	86.6	20	94	19.124	18.970	106.5	FALSE	106.5
3	86.6	127.8	20	94	19.124	18.990	106.5	FALSE	106.5
4	127.8	167.1	20	94	19.124	18.957	106.5	FALSE	106.5
5	167.1	210.2	20	94	19.124	18.983	106.5	FALSE	106.5
6	210.2	253.0	20	94	19.124	18.947	106.5	FALSE	106.5
7	253.0	292.9	20	94	19.124	18.957	106.5	FALSE	106.5
8	292.9	330.1	20	94	19.124	18.960	106.5	FALSE	106.5
9	330.1	372.8	20	94	19.124	18.988	106.5	FALSE	106.5
10	372.8	415.0	20	94	19.124	18.922	106.5	FALSE	106.5
11	415.0	456.1	20	94	19.124	18.965	106.5	FALSE	106.5
12	456.1	497.3	20	94	19.124	18.973	106.5	FALSE	106.5
13	497.3	537.4	20	94	19.124	18.975	106.5	FALSE	106.5
14	537.4	579.6	20	94	19.124	18.956	106.5	FALSE	106.5
15	579.6	620.1	20	94	19.124	18.934	106.5	FALSE	106.5
16	620.1	654.8	20	94	19.124	18.908	106.5	FALSE	106.5
17	654.8	696.7	20	94	19.124	18.962	106.5	FALSE	106.5
18	696.7	738.4	20	94	19.124	18.925	106.5	FALSE	106.5
19	738.4	779.5	20	94	19.124	18.961	106.5	FALSE	106.5
20	779.5	821.7	20	94	19.124	18.983	106.5	FALSE	106.5
21	821.7	863.4	20	106.5	19	18.821	133	FALSE	133
22	863.4	903.5	20	106.5	19	18.803	133	FALSE	133
23	903.5	945.0	20	106.5	19	18.850	133	FALSE	133
24	945.0	986.4	20	106.5	19	18.847	133	FALSE	133
25	986.4	1027.7	20	106.5	19	18.849	133	FALSE	133
26	1027.7	1066.1	20	106.5	19	18.788	133	FALSE	133
27	1066.1	1107.0	20	106.5	19	18.847	133	FALSE	133
28	1107.0	1147.1	20	106.5	19	18.837	133	FALSE	133
29	1147.1	1187.8	20	106.5	19	18.825	133	FALSE	133
30	1187.8	1227.8	20	106.5	19	18.814	133	FALSE	133
31	1227.8	1265.6	20	106.5	19	18.841	133	FALSE	133
32	1265.6	1304.8	20	106.5	19	18.851	133	FALSE	133
33	1304.8	1344.5	20	133	18.73	18.828	133	TRUE	133
34	1344.5	1383.9	20	133	18.73	18.817	133	TRUE	133
35	1383.9	1422.1	20	133	18.73	18.840	133	TRUE	133
36	1422.1	1465.2	20	133	18.73	18.606	133	TRUE	133
37	1465.2	1505.3	20	133	18.73	18.796	133	TRUE	133
38	1505.3	1545.6	20	133	18.73	18.836	133	TRUE	133
39	1545.6	1585.4	20	133	18.73	18.535	169	FALSE	169
40	1585.4	1626.1	20	133	18.73	18.528	169	FALSE	169
41	1626.1	1664.2	20	133	18.73	18.962	106.5	FALSE	106.5
42	1664.2	1705.6	20	133	18.73	18.572	133	TRUE	133
43	1705.6	1746.1	20	133	18.73	18.608	133	TRUE	133
44	1746.1	1788.1	20	133	18.73	18.571	133	FALSE	133
45	1788.1	1829.6	20	133	18.73	18.831	133	TRUE	133
46	1829.6	1870.1	20	133	18.73	18.815	133	TRUE	133
47	1870.1	1910.2	20	133	18.73	18.836	133	TRUE	133
48	1910.2	1948.4	20	133	18.73	18.617	133	TRUE	133
49	1948.4	1990.1	20	133	18.73	18.566	133	FALSE	133
50	1990.1	2031.8	20	133	18.73	18.581	133	TRUE	133

West Hackberry 115 (continued)

			Nominal Values			Measured Values			
Casing Number	Begin Casing Depth	End Casing Depth	Outside Diameter	Casing Weight	Nominal Internal Diameter	Measured Internal Diameter	Closest Casing Weight	Within Threshold?	Calculated Casing Weight
-	*ft*	*ft*	*in*	*kg/ft*	*in*	*in*	*kg/ft*	-	*kg/ft*
51	2031.8	2073.3	20	133	18.73	18.860	133	TRUE	133
52	2073.3	2114.6	20	133	18.73	18.574	133	TRUE	133
53	2114.6	2156.6	20	133	18.73	18.600	133	TRUE	133
54	2156.6	2199.2	20	133	18.73	18.612	133	TRUE	133
55	2199.2	2241.3	20	133	18.73	18.601	133	TRUE	133
56	2241.3	2280.4	20	133	18.73	18.529	169	FALSE	169
57	2280.4	2322.5	20	133	18.73	18.597	133	TRUE	133
58	2322.5	2364.7	20	133	18.73	18.613	133	TRUE	133
59	2364.7	2406.8	20	133	18.73	18.589	133	TRUE	133
60	2406.8	2448.2	20	133	18.73	18.617	133	TRUE	133

West Hackberry 117A

			Nominal Values			Measured Values			
Casing Number	Begin Casing Depth	End Casing Depth	Outside Diameter	Casing Weight	Nominal Internal Diameter	Measured Internal Diameter	Closest Casing Weight	Within Threshold?	Calculated Casing Weight
-	*ft*	*ft*	*in*	*kg/ft*	*in*	*in*	*kg/ft*	-	*kg/ft*
1	35.2	75.6	13.375	68	12.415	12.445	68	TRUE	68
2	75.6	115.8	13.375	54.5	12.615	12.715	48	FALSE	48
3	115.8	156.0	13.375	54.5	12.615	12.709	48	TRUE	54.5
4	156.0	196.3	13.375	54.5	12.615	12.706	48	TRUE	54.5
5	196.3	236.4	13.375	54.5	12.615	12.713	48	FALSE	48
6	236.4	276.7	13.375	54.5	12.615	12.711	48	FALSE	48
7	276.7	316.5	13.375	54.5	12.615	12.724	48	FALSE	48
8	316.5	356.8	13.375	54.5	12.615	12.720	48	FALSE	48
9	356.8	397.1	13.375	54.5	12.615	12.714	48	FALSE	48
10	397.1	437.3	13.375	54.5	12.615	12.717	48	FALSE	48
11	437.3	477.7	13.375	54.5	12.615	12.720	48	FALSE	48
12	477.7	518.0	13.375	54.5	12.615	12.734	48	FALSE	48
13	518.0	558.2	13.375	54.5	12.615	12.716	48	FALSE	48
14	558.2	598.3	13.375	54.5	12.615	12.723	48	FALSE	48
15	598.3	638.8	13.375	54.5	12.615	12.720	48	FALSE	48
16	638.8	679.0	13.375	54.5	12.615	12.721	48	FALSE	48
17	679.0	719.3	13.375	54.5	12.615	12.716	48	FALSE	48
18	719.3	759.6	13.375	54.5	12.615	12.720	48	FALSE	48
19	759.6	799.1	13.375	54.5	12.615	12.717	48	FALSE	48
20	799.1	839.0	13.375	54.5	12.615	12.724	48	FALSE	48
21	839.0	878.8	13.375	54.5	12.615	12.719	48	FALSE	48
22	878.8	919.2	13.375	54.5	12.615	12.722	48	FALSE	48
23	919.2	958.7	13.375	54.5	12.615	12.724	48	FALSE	48
24	958.7	998.4	13.375	54.5	12.615	12.721	48	FALSE	48
25	998.4	1038.3	13.375	54.5	12.615	12.723	48	FALSE	48
26	1038.3	1078.5	13.375	54.5	12.615	12.718	48	FALSE	48
27	1078.5	1118.9	13.375	54.5	12.615	12.722	48	FALSE	48
28	1118.9	1159.1	13.375	54.5	12.615	12.723	48	FALSE	48
29	1159.1	1195.5	13.375	54.5	12.615	12.613	54.5	TRUE	54.5
30	1195.5	1235.7	13.375	54.5	12.615	12.726	48	FALSE	48
31	1235.7	1275.9	13.375	54.5	12.615	12.727	48	FALSE	48
32	1275.9	1317.8	13.375	54.5	12.615	12.725	48	FALSE	48
33	1317.8	1356.9	13.375	61	12.515	12.588	54.5	TRUE	61
34	1356.9	1397.5	13.375	61	12.515	12.603	54.5	TRUE	61
35	1397.5	1437.1	13.375	61	12.515	12.542	61	TRUE	61
36	1437.1	1478.5	13.375	61	12.515	12.605	54.5	TRUE	61
37	1478.5	1519.5	13.375	61	12.515	12.598	54.5	TRUE	61
38	1519.5	1558.9	13.375	61	12.515	12.579	54.5	TRUE	61
39	1558.9	1600.0	13.375	61	12.515	12.601	54.5	TRUE	61
40	1600.0	1640.5	13.375	61	12.515	12.589	54.5	TRUE	61
41	1640.5	1680.4	13.375	61	12.515	12.602	54.5	TRUE	61
42	1680.4	1721.2	13.375	61	12.515	12.597	54.5	TRUE	61
43	1721.2	1762.1	13.375	61	12.515	12.589	54.5	TRUE	61
44	1762.1	1802.9	13.375	61	12.515	12.595	54.5	TRUE	61
45	1802.9	1843.1	13.375	61	12.515	12.581	54.5	TRUE	61
46	1843.1	1884.9	13.375	61	12.515	12.590	54.5	TRUE	61
47	1884.9	1927.8	13.375	68	12.415	12.486	61	TRUE	68
48	1927.8	1969.0	13.375	68	12.415	12.466	61	TRUE	68
49	1969.0	2010.5	13.375	68	12.415	12.487	61	TRUE	68
50	2010.5	2046.8	13.375	68	12.415	12.485	61	TRUE	68

West Hackberry 117A (continued)

			Nominal Values			Measured Values			
Casing Number	Begin Casing Depth	End Casing Depth	Outside Diameter	Casing Weight	Nominal Internal Diameter	Measured Internal Diameter	Closest Casing Weight	Within Threshold?	Calculated Casing Weight
-	*ft*	*ft*	*in*	*kg/ft*	*in*	*in*	*kg/ft*	-	*kg/ft*
51	2046.8	2085.2	13.375	68	12.415	12.460	68	TRUE	68
52	2085.2	2126.5	13.375	68	12.415	12.468	61	TRUE	68
53	2126.5	2169.2	13.375	68	12.415	12.480	61	TRUE	68
54	2169.2	2209.7	13.375	68	12.415	12.476	61	TRUE	68
55	2209.7	2247.6	13.375	68	12.415	12.502	61	TRUE	68
56	2247.6	2288.9	13.375	68	12.415	12.446	68	TRUE	68
57	2288.9	2330.1	13.375	68	12.415	12.456	68	TRUE	68
58	2330.1	2370.4	13.375	68	12.415	12.459	68	TRUE	68
59	2370.4	2402.4	13.375	68	12.415	12.444	68	TRUE	68

West Hackberry 117B

			Nominal Values			Measured Values			
Casing Number	Begin Casing Depth	End Casing Depth	Outside Diameter	Casing Weight	Nominal Internal Diameter	Measured Internal Diameter	Closest Casing Weight	Within Threshold?	Calculated Casing Weight
-	*ft*	*ft*	*in*	*kg/ft*	*in*	*in*	*kg/ft*	-	*kg/ft*
1	41.5	82.0	13.375	68	12.415	12.423	68	TRUE	68
2	82.0	122.1	13.375	54.5	12.615	12.671	48	TRUE	54.5
3	122.1	162.3	13.375	54.5	12.615	12.715	48	FALSE	48
4	162.3	202.4	13.375	54.5	12.615	12.674	48	TRUE	54.5
5	202.4	242.5	13.375	54.5	12.615	12.685	48	TRUE	54.5
6	242.5	282.7	13.375	54.5	12.615	12.678	48	TRUE	54.5
7	282.7	322.9	13.375	54.5	12.615	12.686	48	TRUE	54.5
8	322.9	363.0	13.375	54.5	12.615	12.715	48	FALSE	48
9	363.0	403.2	13.375	54.5	12.615	12.731	48	FALSE	48
10	403.2	443.5	13.375	54.5	12.615	12.730	48	FALSE	48
11	443.5	483.7	13.375	54.5	12.615	12.692	48	TRUE	54.5
12	483.7	524.0	13.375	54.5	12.615	12.692	48	TRUE	54.5
13	524.0	564.2	13.375	54.5	12.615	12.691	48	TRUE	54.5
14	564.2	604.4	13.375	54.5	12.615	12.693	48	TRUE	54.5
15	604.4	644.7	13.375	54.5	12.615	12.690	48	TRUE	54.5
16	644.7	685.0	13.375	54.5	12.615	12.686	48	TRUE	54.5
17	685.0	725.2	13.375	54.5	12.615	12.702	48	TRUE	54.5
18	725.2	765.0	13.375	54.5	12.615	12.696	48	TRUE	54.5
19	765.0	804.5	13.375	54.5	12.615	12.716	48	FALSE	48
20	804.5	844.4	13.375	54.5	12.615	12.693	48	TRUE	54.5
21	844.4	884.6	13.375	54.5	12.615	12.733	48	FALSE	48
22	884.6	924.9	13.375	54.5	12.615	12.691	48	TRUE	54.5
23	924.9	965.0	13.375	54.5	12.615	12.688	48	TRUE	54.5
24	965.0	1005.1	13.375	54.5	12.615	12.694	48	TRUE	54.5
25	1005.1	1045.3	13.375	54.5	12.615	12.706	48	TRUE	54.5
26	1045.3	1085.4	13.375	54.5	12.615	12.696	48	TRUE	54.5
27	1085.4	1125.5	13.375	54.5	12.615	12.702	48	TRUE	54.5
28	1125.5	1165.7	13.375	54.5	12.615	12.704	48	TRUE	54.5
29	1165.7	1205.8	13.375	54.5	12.615	12.707	48	TRUE	54.5
30	1205.8	1246.0	13.375	54.5	12.615	12.710	48	TRUE	54.5
31	1246.0	1286.2	13.375	54.5	12.615	12.707	48	TRUE	54.5
32	1286.2	1326.4	13.375	54.5	12.615	12.703	48	TRUE	54.5
33	1326.4	1366.5	13.375	54.5	12.615	12.743	48	FALSE	48
34	1366.5	1405.3	13.375	61	12.515	12.553	61	TRUE	61
35	1405.3	1441.6	13.375	61	12.515	12.538	61	TRUE	61
36	1441.6	1482.1	13.375	61	12.515	12.540	61	TRUE	61
37	1482.1	1521.2	13.375	61	12.515	12.542	61	TRUE	61
38	1521.2	1561.5	13.375	61	12.515	12.557	61	TRUE	61
39	1561.5	1600.8	13.375	61	12.515	12.557	61	TRUE	61
40	1600.8	1641.2	13.375	61	12.515	12.555	61	TRUE	61
41	1641.2	1679.8	13.375	61	12.515	12.550	61	TRUE	61
42	1679.8	1718.0	13.375	61	12.515	12.543	61	TRUE	61
43	1718.0	1758.4	13.375	61	12.515	12.578	54.5	TRUE	61
44	1758.4	1794.9	13.375	61	12.515	12.559	61	TRUE	61
45	1794.9	1832.5	13.375	61	12.515	12.563	61	TRUE	61
46	1832.5	1873.5	13.375	61	12.515	12.551	61	TRUE	61
47	1873.5	1913.7	13.375	61	12.515	12.565	61	TRUE	61
48	1913.7	1955.2	13.375	68	12.415	12.432	68	TRUE	68
49	1955.2	1995.4	13.375	68	12.415	12.425	68	TRUE	68
50	1995.4	2035.9	13.375	68	12.415	12.420	68	TRUE	68

West Hackberry 117B (continued)

			Nominal Values			Measured Values			
Casing Number	Begin Casing Depth	End Casing Depth	Outside Diameter	Casing Weight	Nominal Internal Diameter	Measured Internal Diameter	Closest Casing Weight	Within Threshold?	Calculated Casing Weight
-	*ft*	*ft*	*in*	*kg/ft*	*in*	*in*	*kg/ft*	-	*kg/ft*
51	2035.9	2078.5	13.375	68	12.415	12.421	68	TRUE	68
52	2078.5	2121.7	13.375	68	12.415	12.433	68	TRUE	68
53	2121.7	2159.7	13.375	68	12.415	12.434	68	TRUE	68
54	2159.7	2201.4	13.375	68	12.415	12.440	68	TRUE	68
55	2201.4	2243.3	13.375	68	12.415	12.412	68	TRUE	68
56	2243.3	2284.4	13.375	68	12.415	12.423	68	TRUE	68
57	2284.4	2325.8	13.375	68	12.415	12.408	68	TRUE	68
58	2325.8	2370.2	13.375	68	12.415	12.419	68	TRUE	68
59	2370.2	2411.5	13.375	68	12.415	12.405	68	TRUE	68

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