



Northern States Completions

Williston, ND 701-572-5720

LINER SPECIFICATIONS

4 1/2" 11.6# LTC HCP-110 GRADE
TUBE ID = 4.000" DRIFT = 3.875"

7" Casing Collars near planned Liner Top

DP Pipe Depths

5690.00

5735.00

NOT TO SCALE

Drill Pipe Depths

SWELLING PACKER LINER-----for isolated section frac

with Frac Port Sub sections

Float Equipment

10822.00

10832'

Lateral TD

Shifting Ball (1 1/8" OD) for Bottom Frac Sub (item 34) is in the 4 1/2" Liner
When on depth with liner, and displacing the Reactive Fluid to the lateral, the 1 1/8" OD Ball was dropped & 72 Bbls of displacement SW was pumped down DP & Liner behind the ball. The ball was pumped to within a calculated 60 Bbls of the Lowermost Frac Sub. Since balls typically run ahead of the fluid, the ball may be 25 Bbls of volume closer to the Bottom Frac Sub. Ball is estimated to be between 6,828.05' & 7,758.25'

Northern States Completions									
Date: 11/12/2011		Carrizo Oil and Gas				Field:			
Well Name: Speaker 1-27-31-8-61						Rig Name & #: Extreme Coil Drlg #19			
County: Weld						NSC Rep: Kyle Dillard			
State: CO						Company Rep: Tom Harris			
4 1/2" LINER-----"AS RUN" DETAIL									
KB = 17'						DRILL PIPE DEPTHS			
ITEM	Centralized Entry Guide on PBR Top	DESCRIPTION	13.94' of 5 1/4" Seal Bore Length	OD	ID	LENGTH	TOP	BOTTOM	
1	5 1/4" ID x 15' Polished Bore Receptacle			5.920"	5.250"	14.94	5758.91	5773.85	
2	4 1/2" x 7" PPK Liner Hanger Packer w/ 1' Extension			6.000"	4.000"	3.42	5773.85	5777.27	
	Centralizer (4 1/2" Buttress Box x LTC Pin)			6.000"	4.000"	0.60	5777.27	5777.87	
31	Jts 4 1/2" 11.6# LTC Blank Liner			5.000"	4.000"	1286.38	5777.87	7064.25	
3	TAM FreeCap1 Swelling Packer	Water Reactive Elastomer (5 FT)	5.875' Centralizer (Top & Bottom)	5.750"	4.000"	15.75	7064.25	7080.00	
	3 Jts 4 1/2" 11.6# LTC Blank Liner			5.000"	4.000"	125.16	7080.00	7205.16	
4	Divert-A-Frac Port Sub II	Shifting Ball Size	3.625"	5.420"	3.520"	3.30	7205.16	7208.46	
	2 Jts 4 1/2" 11.6# LTC Blank Liner			5.000"	4.000"	83.46	7208.46	7291.92	
5	TAM FreeCap1 Swelling Packer	Water Reactive Elastomer (5 FT)	5.875' Centralizer (Top & Bottom)	5.750"	4.000"	15.75	7291.92	7307.67	
	3 Jts 4 1/2" 11.6# LTC Blank Liner			5.000"	4.000"	124.57	7307.67	7432.24	
6	Divert-A-Frac Port Sub II	Shifting Ball Size	3.500"	5.420"	3.390"	3.30	7432.24	7435.54	
	2 Jts 4 1/2" 11.6# LTC Blank Liner			5.000"	4.000"	82.98	7435.54	7518.52	
7	TAM FreeCap1 Swelling Packer	Water Reactive Elastomer (5 FT)	5.875' Centralizer (Top & Bottom)	5.750"	4.000"	15.75	7518.52	7534.27	
	3 Jts 4 1/2" 11.6# LTC Blank Liner			5.000"	4.000"	124.13	7534.27	7658.40	
8	Divert-A-Frac Port Sub II	Shifting Ball Size	3.375"	5.420"	3.270"	3.30	7658.40	7661.70	
	3 Jts 4 1/2" 11.6# LTC Blank Liner			5.000"	4.000"	124.24	7661.70	7785.94	
9	TAM FreeCap1 Swelling Packer	Water Reactive Elastomer (5 FT)	5.875' Centralizer (Top & Bottom)	5.750"	4.000"	15.75	7785.94	7801.69	
	2 Jts 4 1/2" 11.6# LTC Blank Liner			5.000"	4.000"	83.34	7801.69	7885.03	
10	Divert-A-Frac Port Sub II	Shifting Ball Size	3.250"	5.420"	3.142"	3.30	7885.03	7888.33	
	3 Jts 4 1/2" 11.6# LTC Blank Liner			5.000"	4.000"	125.18	7888.33	8013.51	
11	TAM FreeCap1 Swelling Packer	Water Reactive Elastomer (5 FT)	5.875' Centralizer (Top & Bottom)	5.750"	4.000"	15.75	8013.51	8029.26	
	2 Jts 4 1/2" 11.6# LTC Blank Liner			5.000"	4.000"	83.32	8029.26	8112.58	
12	Divert-A-Frac Port Sub II	Shifting Ball Size	3.125"	5.420"	3.020"	3.30	8112.58	8115.88	
	3 Jts 4 1/2" 11.6# LTC Blank Liner			5.000"	4.000"	124.73	8115.88	8240.61	
13	TAM FreeCap1 Swelling Packer	Water Reactive Elastomer (5 FT)	5.875' Centralizer (Top & Bottom)	5.750"	4.000"	15.75	8240.61	8256.36	
	2 Jts 4 1/2" 11.6# LTC Blank Liner			5.000"	4.000"	82.20	8256.36	8338.56	
14	Divert-A-Frac Port Sub II	Shifting Ball Size	3.000"	5.420"	2.895"	3.30	8338.56	8341.86	
	3 Jts 4 1/2" 11.6# LTC Blank Liner			5.000"	4.000"	123.09	8341.86	8464.95	
15	TAM FreeCap1 Swelling Packer	Water Reactive Elastomer (5 FT)	5.875' Centralizer (Top & Bottom)	5.750"	4.000"	15.75	8464.95	8480.70	
	2 Jts 4 1/2" 11.6# LTC Blank Liner			5.000"	4.000"	83.00	8480.70	8563.70	
16	Divert-A-Frac Port Sub II	Shifting Ball Size	2.875"	5.420"	2.770"	3.30	8563.70	8567.00	
	3 Jts 4 1/2" 11.6# LTC Blank Liner			5.000"	4.000"	125.17	8567.00	8692.17	
17	TAM FreeCap1 Swelling Packer	Water Reactive Elastomer (5 FT)	5.875' Centralizer (Top & Bottom)	5.750"	4.000"	15.75	8692.17	8707.92	
	3 Jts 4 1/2" 11.6# LTC Blank Liner			5.000"	4.000"	125.15	8707.92	8833.07	
18	Divert-A-Frac Port Sub II	Shifting Ball Size	2.750"	5.420"	2.646"	3.30	8833.07	8836.37	
	3 Jts 4 1/2" 11.6# LTC Blank Liner			5.000"	4.000"	124.71	8836.37	8961.08	
19	TAM FreeCap1 Swelling Packer	Water Reactive Elastomer (5 FT)	5.875' Centralizer (Top & Bottom)	5.750"	4.000"	15.75	8961.08	8976.83	
	2 Jts 4 1/2" 11.6# LTC Blank Liner			5.000"	4.000"	83.44	8976.83	9060.27	
20	Divert-A-Frac Port Sub II	Shifting Ball Size	2.625"	5.420"	2.515"	3.30	9060.27	9063.57	
	3 Jts 4 1/2" 11.6# LTC Blank Liner			5.000"	4.000"	122.40	9063.57	9185.97	
21	TAM FreeCap1 Swelling Packer	Water Reactive Elastomer (5 FT)	5.875' Centralizer (Top & Bottom)	5.750"	4.000"	15.75	9185.97	9201.72	
	2 Jts 4 1/2" 11.6# LTC Blank Liner			5.000"	4.000"	83.42	9201.72	9285.14	
22	Divert-A-Frac Port Sub II	Shifting Ball Size	2.500"	5.420"	2.393"	3.30	9285.14	9288.44	
	3 Jts 4 1/2" 11.6# LTC Blank Liner			5.000"	4.000"	124.74	9288.44	9413.18	
23	TAM FreeCap1 Swelling Packer	Water Reactive Elastomer (5 FT)	5.875' Centralizer (Top & Bottom)	5.750"	4.000"	15.75	9413.18	9428.93	
	2 Jts 4 1/2" 11.6# LTC Blank Liner			5.000"	4.000"	83.46	9428.93	9512.39	
24	Divert-A-Frac Port Sub II	Shifting Ball Size	2.375"	5.420"	2.270"	3.30	9512.39	9515.69	
	3 Jts 4 1/2" 11.6# LTC Blank Liner			5.000"	4.000"	124.50	9515.69	9640.19	
25	TAM FreeCap1 Swelling Packer	Water Reactive Elastomer (5 FT)	5.875' Centralizer (Top & Bottom)	5.750"	4.000"	15.75	9640.19	9655.94	
	2 Jts 4 1/2" 11.6# LTC Blank Liner			5.000"	4.000"	83.48	9655.94	9739.42	
26	Divert-A-Frac Port Sub II	Shifting Ball Size	2.250"	5.420"	2.142"	3.30	9739.42	9742.72	
	3 Jts 4 1/2" 11.6# LTC Blank Liner			5.000"	4.000"	124.61	9742.72	9867.33	
27	TAM FreeCap1 Swelling Packer	Water Reactive Elastomer (5 FT)	5.875' Centralizer (Top & Bottom)	5.750"	4.000"	15.75	9867.33	9883.08	
	3 Jts 4 1/2" 11.6# LTC Blank Liner			5.000"	4.000"	125.16	9883.08	10008.24	
28	Divert-A-Frac Port Sub II	Shifting Ball Size	2.125"	5.420"	2.018"	3.30	10008.24	10011.54	
	3 Jts 4 1/2" 11.6# LTC Blank Liner			5.000"	4.000"	124.73	10011.54	10136.27	
29	TAM FreeCap1 Swelling Packer	Water Reactive Elastomer (5 FT)	5.875' Centralizer (Top & Bottom)	5.750"	4.000"	15.75	10136.27	10152.02	
	2 Jts 4 1/2" 11.6# LTC Blank Liner			5.000"	4.000"	82.02	10152.02	10234.04	
30	Divert-A-Frac Port Sub II	Shifting Ball Size	2.000"	5.420"	1.895"	3.30	10234.04	10237.34	
	3 Jts 4 1/2" 11.6# LTC Blank Liner			5.000"	4.000"	124.63	10237.34	10361.97	
31	TAM FreeCap1 Swelling Packer	Water Reactive Elastomer (5 FT)	5.875' Centralizer (Top & Bottom)	5.750"	4.000"	15.75	10361.97	10377.72	
	2 Jts 4 1/2" 11.6# LTC Blank Liner			5.000"	4.000"	83.48	10377.72	10461.20	
32	Divert-A-Frac Port Sub II	Shifting Ball Size	1.875"	5.420"	1.768"	3.30	10461.20	10464.50	
	3 Jts 4 1/2" 11.6# LTC Blank Liner			5.000"	4.000"	124.72	10464.50	10589.22	
33	TAM FreeCap1 Swelling Packer	Water Reactive Elastomer (5 FT)	5.875' Centralizer (Top & Bottom)	5.750"	4.000"	15.75	10589.22	10604.97	
	2 Jts 4 1/2" 11.6# LTC Blank Liner			5.000"	4.000"	83.48	10604.97	10688.45	
34	Divert-A-Frac Port Sub II	Shifting Ball Size	1.125"	5.420"	.750"	3.30	10688.45	10691.75	
	2 Jts 4 1/2" 11.6# LTC Blank Liner			5.000"	4.000"	83.01	10691.75	10774.76	
35	4 1/2" Float Collar			5.000"	---	1.00	10774.76	10775.76	
	1 Jt 4 1/2" 11.6# LTC Blank Liner			5.000"	4.000"	41.74	10775.76	10817.50	
36	4 1/2" Float Collar			5.000"	---	1.00	10817.50	10818.50	
37	4 1/2" Guide Shoe w/ Aluminum Nose & Side Ports			5.000"	.750"	3.50	10818.50	10822.00	
						Lateral TD	10,832'		

Operator	Carrizo Oil & Gas
Well Name	Speaker 1-27-31-8-61H
Rig Name	Extreme Coil Drilling #19
Run Date	11/12/11

"AS RUN" LINER TALLY

KOP	5825'
7" Shoe	6950'

Total Joints Tallied	116
Liner Size	4 1/2"
Thread Description	LTC
Lateral TD	10832.00

Original Tally Jt #	Wt	Grade	Actual Run Jt #	Item Description	Length			Shoe--Off Bottom		Cumulative Length
								Item Top Depth	Item Bottom Depth	
Shoe			Shoe	Guide Shoe w/ Side Ports	3.50			10818.50	10822.00	3.50
Float			Float	Float Collar	1.00			10817.50	10818.50	4.50
1	11.6	P-110	1	4 1/2" LTC Liner	41.74	1	41.74	10775.76	10817.50	46.24
Float			Float	Float Collar	1.00			10774.76	10775.76	47.24
2	11.6	P-110	2	4 1/2" LTC Liner	41.73	2	83.01	10733.03	10774.76	88.97
3	11.6	P-110	3	4 1/2" LTC Liner	41.28			10691.75	10733.03	130.25
Frac Sub		P110	Frac Sub	Frac Sub 1	3.30			10688.45	10691.75	133.55
	11.6	P-110	4	4 1/2" LTC Liner	41.74	2	83.48	10646.71	10688.45	175.29
	11.6	P-110	5	4 1/2" LTC Liner	41.74			10604.97	10646.71	217.03
Pkr	11.6	P110	Pkr	Swelling Packer 1	15.75			10589.22	10604.97	232.78
	11.6	P-110	6	4 1/2" LTC Liner	41.26	3	Joints	10547.96	10589.22	274.04
	11.6	P-110	7	4 1/2" LTC Liner	41.72		Block Total	10506.24	10547.96	315.76
	11.6	P-110	8	4 1/2" LTC Liner	41.74		124.72	10464.50	10506.24	357.50
Frac Sub		P110	Frac Sub	Frac Sub 2	3.30			10461.20	10464.50	360.80
	11.6	P-110	9	4 1/2" LTC Liner	41.74	2	83.48	10419.46	10461.20	402.54
	11.6	P-110	10	4 1/2" LTC Liner	41.74			10377.72	10419.46	444.28
Pkr	11.6	P110	Pkr	Swelling Packer 2	15.75			10361.97	10377.72	460.03
	11.6	P-110	11	4 1/2" LTC Liner	41.72	3	Joints	10320.25	10361.97	501.75
	11.6	P-110	12	4 1/2" LTC Liner	41.72		Block Total	10278.53	10320.25	543.47
	11.6	P-110	13	4 1/2" LTC Liner	41.19		124.63	10237.34	10278.53	584.66
Frac Sub		P110	Frac Sub	Frac Sub 3	3.30			10234.04	10237.34	587.96
	11.6	P-110	14	4 1/2" LTC Liner	41.12	2	82.02	10192.92	10234.04	629.08
	11.6	P-110	15	4 1/2" LTC Liner	40.90			10152.02	10192.92	669.98
Pkr	11.6	P110	Pkr	Swelling Packer 3	15.75			10136.27	10152.02	685.73
	11.6	P-110	16	4 1/2" LTC Liner	41.73	3	Joints	10094.54	10136.27	727.46
	11.6	P-110	17	4 1/2" LTC Liner	41.27		Block Total	10053.27	10094.54	768.73
	11.6	P-110	18	4 1/2" LTC Liner	41.73		124.73	10011.54	10053.27	810.46
Frac Sub		P110	Frac Sub	Frac Sub 4	3.30			10008.24	10011.54	813.76
	11.6	P-110	19	4 1/2" LTC Liner	41.74	3	Joints	9966.50	10008.24	855.50
	11.6	P-110	20	4 1/2" LTC Liner	41.70		Block Total	9924.80	9966.50	897.20
	11.6	P-110	21	4 1/2" LTC Liner	41.72		125.16	9883.08	9924.80	938.92
Pkr	11.6	P110	Pkr	Swelling Packer 4	15.75			9867.33	9883.08	954.67
	11.6	P-110	22	4 1/2" LTC Liner	41.73	3	Joints	9825.60	9867.33	996.40
	11.6	P-110	23	4 1/2" LTC Liner	41.15		Block Total	9784.45	9825.60	1037.55
	11.6	P-110	24	4 1/2" LTC Liner	41.73		124.61	9742.72	9784.45	1079.28
Frac Sub		P110	Frac Sub	Frac Sub 5	3.30			9739.42	9742.72	1082.58
	11.6	P-110	25	4 1/2" LTC Liner	41.74	2	83.48	9697.68	9739.42	1124.32
	11.6	P-110	26	4 1/2" LTC Liner	41.74			9655.94	9697.68	1166.06
Pkr	11.6	P110	Pkr	Swelling Packer 5	15.75			9640.19	9655.94	1181.81
	11.6	P-110	27	4 1/2" LTC Liner	41.26	3	Joints	9598.93	9640.19	1223.07
	11.6	P-110	28	4 1/2" LTC Liner	41.73		Block Total	9557.20	9598.93	1264.80
	11.6	P-110	29	4 1/2" LTC Liner	41.51		124.50	9515.69	9557.20	1306.31
Frac Sub		P110	Frac Sub	Frac Sub 6	3.30			9512.39	9515.69	1309.61
	11.6	P-110	30	4 1/2" LTC Liner	41.73	2	83.46	9470.66	9512.39	1351.34
	11.6	P-110	31	4 1/2" LTC Liner	41.73			9428.93	9470.66	1393.07
Pkr	11.6	P110	Pkr	Swelling Packer 6	15.75			9413.18	9428.93	1408.82
	11.6	P-110	32	4 1/2" LTC Liner	41.27	3	Joints	9371.91	9413.18	1450.09
	11.6	P-110	33	4 1/2" LTC Liner	41.73		Block Total	9330.18	9371.91	1491.82
	11.6	P-110	34	4 1/2" LTC Liner	41.74		124.74	9288.44	9330.18	1533.56
Frac Sub		P110	Frac Sub	Frac Sub 7	3.30			9285.14	9288.44	1536.86
	11.6	P-110	35	4 1/2" LTC Liner	41.71	2	83.42	9243.43	9285.14	1578.57
	11.6	P-110	36	4 1/2" LTC Liner	41.71			9201.72	9243.43	1620.28
Pkr	11.6	P110	Pkr	Swelling Packer 7	15.75			9185.97	9201.72	1636.03

	11.6	P-110	37	4 1/2" LTC Liner	41.74	3	Joints	9144.23	9185.97	1677.77
	11.6	P-110	38	4 1/2" LTC Liner	39.41		Block Total	9104.82	9144.23	1717.18
	11.6	P-110	39	4 1/2" LTC Liner	41.25		122.40	9063.57	9104.82	1758.43
Frac Sub		P110	Frac Sub	Frac Sub 8	3.30			9060.27	9063.57	1761.73
	11.6	P-110	40	4 1/2" LTC Liner	41.72	2	83.44	9018.55	9060.27	1803.45
	11.6	P-110	41	4 1/2" LTC Liner	41.72			8976.83	9018.55	1845.17
Pkr	11.6	P110	Pkr	Swelling Packer 8	15.75			8961.08	8976.83	1860.92
	11.6	P-110	42	4 1/2" LTC Liner	41.73	3	Joints	8919.35	8961.08	1902.65
	11.6	P-110	43	4 1/2" LTC Liner	41.26		Block Total	8878.09	8919.35	1943.91
	11.6	P-110	44	4 1/2" LTC Liner	41.72		124.71	8836.37	8878.09	1985.63
Frac Sub		P110	Frac Sub	Frac Sub 9	3.30			8833.07	8836.37	1988.93
	11.6	P-110	45	4 1/2" LTC Liner	41.71	3	Joints	8791.36	8833.07	2030.64
	11.6	P-110	46	4 1/2" LTC Liner	41.72		Block Total	8749.64	8791.36	2072.36
	11.6	P-110	47	4 1/2" LTC Liner	41.72		125.15	8707.92	8749.64	2114.08
Pkr	11.6	P110	Pkr	Swelling Packer 9	15.75			8692.17	8707.92	2129.83
	11.6	P-110	48	4 1/2" LTC Liner	41.73	3	Joints	8650.44	8692.17	2171.56
	11.6	P-110	49	4 1/2" LTC Liner	41.72		Block Total	8608.72	8650.44	2213.28
	11.6	P-110	50	4 1/2" LTC Liner	41.72		125.17	8567.00	8608.72	2255.00
Frac Sub		P110	Frac Sub	Frac Sub 10	3.30			8563.70	8567.00	2258.30
	11.6	P-110	51	4 1/2" LTC Liner	41.28	2	83.00	8522.42	8563.70	2299.58
	11.6	P-110	52	4 1/2" LTC Liner	41.72			8480.70	8522.42	2341.30
Pkr	11.6	P110	Pkr	Swelling Packer 10	15.75			8464.95	8480.70	2357.05
	11.6	P-110	53	4 1/2" LTC Liner	41.26	3	Joints	8423.69	8464.95	2398.31
	11.6	P-110	54	4 1/2" LTC Liner	40.56		Block Total	8383.13	8423.69	2438.87
	11.6	P-110	55	4 1/2" LTC Liner	41.27		123.09	8341.86	8383.13	2480.14
Frac Sub		P110	Frac Sub	Frac Sub 11	3.30			8338.56	8341.86	2483.44
	11.6	P-110	56	4 1/2" LTC Liner	41.27	2	82.20	8297.29	8338.56	2524.71
	11.6	P-110	57	4 1/2" LTC Liner	40.93			8256.36	8297.29	2565.64
Pkr	11.6	P110	Pkr	Swelling Packer 11	15.75			8240.61	8256.36	2581.39
	11.6	P-110	58	4 1/2" LTC Liner	41.29	3	Joints	8199.32	8240.61	2622.68
	11.6	P-110	59	4 1/2" LTC Liner	41.73		Block Total	8157.59	8199.32	2664.41
	11.6	P-110	60	4 1/2" LTC Liner	41.71		124.73	8115.88	8157.59	2706.12
Frac Sub		P110	Frac Sub	Frac Sub 12	3.30			8112.58	8115.88	2709.42
	11.6	P-110	61	4 1/2" LTC Liner	41.72	2	83.32	8070.86	8112.58	2751.14
	11.6	P-110	62	4 1/2" LTC Liner	41.60			8029.26	8070.86	2792.74
Pkr	11.6	P110	Pkr	Swelling Packer 12	15.75			8013.51	8029.26	2808.49
	11.6	P-110	63	4 1/2" LTC Liner	41.72	3	Joints	7971.79	8013.51	2850.21
	11.6	P-110	64	4 1/2" LTC Liner	41.73		Block Total	7930.06	7971.79	2891.94
	11.6	P-110	65	4 1/2" LTC Liner	41.73		125.18	7888.33	7930.06	2933.67
Frac Sub		P110	Frac Sub	Frac Sub 13	3.30			7885.03	7888.33	2936.97
	11.6	P-110	66	4 1/2" LTC Liner	41.60	2	83.34	7843.43	7885.03	2978.57
	11.6	P-110	67	4 1/2" LTC Liner	41.74			7801.69	7843.43	3020.31
Pkr	11.6	P110	Pkr	Swelling Packer 13	15.75			7785.94	7801.69	3036.06
	11.6	P-110	68	4 1/2" LTC Liner	41.26	3	Joints	7744.68	7785.94	3077.32
	11.6	P-110	69	4 1/2" LTC Liner	41.72		Block Total	7702.96	7744.68	3119.04
	11.6	P-110	70	4 1/2" LTC Liner	41.26		124.24	7661.70	7702.96	3160.30
Frac Sub		P110	Frac Sub	Frac Sub 14	3.30			7658.40	7661.70	3163.60
	11.6	P-110	71	4 1/2" LTC Liner	40.70	3	Joints	7617.70	7658.40	3204.30
	11.6	P-110	72	4 1/2" LTC Liner	41.72		Block Total	7575.98	7617.70	3246.02
	11.6	P-110	73	4 1/2" LTC Liner	41.71		124.13	7534.27	7575.98	3287.73
Pkr	11.6	P110	Pkr	Swelling Packer 14	15.75			7518.52	7534.27	3303.48
	11.6	P-110	74	4 1/2" LTC Liner	41.72	2	82.98	7476.80	7518.52	3345.20
	11.6	P-110	75	4 1/2" LTC Liner	41.26			7435.54	7476.80	3386.46
Frac Sub		P110	Frac Sub	Frac Sub 15	3.30			7432.24	7435.54	3389.76
	11.6	P-110	76	4 1/2" LTC Liner	41.72	3	Joints	7390.52	7432.24	3431.48
	11.6	P-110	77	4 1/2" LTC Liner	41.72		Block Total	7348.80	7390.52	3473.20
	11.6	P-110	78	4 1/2" LTC Liner	41.13		124.57	7307.67	7348.80	3514.33
Pkr	11.6	P110	Pkr	Swelling Packer 15	15.75			7291.92	7307.67	3530.08
	11.6	P-110	79	4 1/2" LTC Liner	41.74	2	83.46	7250.18	7291.92	3571.82
	11.6	P-110	80	4 1/2" LTC Liner	41.72			7208.46	7250.18	3613.54
Frac Sub		P110	Frac Sub	Frac Sub 16	3.30			7205.16	7208.46	3616.84

	11.6	P-110	81	4 1/2" LTC Liner	41.72	3	Joints	7163.44	7205.16	3658.56
	11.6	P-110	82	4 1/2" LTC Liner	41.72		Block Total	7121.72	7163.44	3700.28
	11.6	P-110	83	4 1/2" LTC Liner	41.72		125.16	7080.00	7121.72	3742.00
Pkr	11.6	P110	Pkr	Swelling Packer 16	15.75			7064.25	7080.00	3757.75
	11.6	P-110	84	TD of 8 3/4" Open Hole @ 7060'	41.72			7022.53	7064.25	3799.47
	11.6	P-110	85	4 1/2" LTC Liner	41.72			6980.81	7022.53	3841.19
	11.6	P-110	86	4 1/2" LTC Liner	41.25	6950'	7" Shoe	6939.56	6980.81	3882.44
	11.6	P-110	87	4 1/2" LTC Liner	41.28			6898.28	6939.56	3923.72
	11.6	P-110	88	4 1/2" LTC Liner	41.25			6857.03	6898.28	3964.97
	11.6	P-110	89	4 1/2" LTC Liner	41.72			6815.31	6857.03	4006.69
	11.6	P-110	90	4 1/2" LTC Liner	41.27			6774.04	6815.31	4047.96
	11.6	P-110	91	4 1/2" LTC Liner	41.73			6732.31	6774.04	4089.69
	11.6	P-110	92	4 1/2" LTC Liner	41.27			6691.04	6732.31	4130.96
	11.6	P-110	93	4 1/2" LTC Liner	41.72			6649.32	6691.04	4172.68
	11.6	P-110	94	4 1/2" LTC Liner	41.74			6607.58	6649.32	4214.42
	11.6	P-110	95	4 1/2" LTC Liner	41.74			6565.84	6607.58	4256.16
	11.6	P-110	96	4 1/2" LTC Liner	41.72			6524.12	6565.84	4297.88
	11.6	P-110	97	4 1/2" LTC Liner	39.60			6484.52	6524.12	4337.48
	11.6	P-110	98	4 1/2" LTC Liner	41.73			6442.79	6484.52	4379.21
	11.6	P-110	99	4 1/2" LTC Liner	41.73	31	Joints	6401.06	6442.79	4420.94
	11.6	P-110	100	4 1/2" LTC Liner	41.25		Block Total	6359.81	6401.06	4462.19
	11.6	P-110	101	4 1/2" LTC Liner	41.72		1286.38	6318.09	6359.81	4503.91
	11.6	P-110	102	4 1/2" LTC Liner	41.73			6276.36	6318.09	4545.64
	11.6	P-110	103	4 1/2" LTC Liner	41.72			6234.64	6276.36	4587.36
	11.6	P-110	104	4 1/2" LTC Liner	41.74			6192.90	6234.64	4629.10
	11.6	P-110	105	4 1/2" LTC Liner	41.74			6151.16	6192.90	4670.84
	11.6	P-110	106	4 1/2" LTC Liner	41.76			6109.40	6151.16	4712.60
	11.6	P-110	107	4 1/2" LTC Liner	41.72			6067.68	6109.40	4754.32
	11.6	P-110	108	4 1/2" LTC Liner	41.24			6026.44	6067.68	4795.56
	11.6	P-110	109	4 1/2" LTC Liner	41.70			5984.74	6026.44	4837.26
	11.6	P-110	110	4 1/2" LTC Liner	40.88			5943.86	5984.74	4878.14
	11.6	P-110	111	4 1/2" LTC Liner	41.72			5902.14	5943.86	4919.86
	11.6	P-110	112	4 1/2" LTC Liner	41.74			5860.40	5902.14	4961.60
	11.6	P-110	113	4 1/2" LTC Liner	41.26	5825'	KOP	5819.14	5860.40	5002.86
	11.6	P-110	114	4 1/2" LTC Liner	41.27			5777.87	5819.14	5044.13
Ctrlzr	11.6	P110	Ctrlzr	Centralizer	0.60			5777.27	5777.87	5044.73
Packer			Packer	PPK Hanger / Packer	3.42			5773.85	5777.27	5048.15
PBR		P110	PBR	PBR	14.94		LINER TOP	5758.91	5773.85	5063.09
	11.6	P-110	115	4 1/2" LTC Liner	41.72	OUT				
	11.6	P-110	116	4 1/2" LTC Liner	41.74	OUT				

DATE CASING TALLIED 11/9/2011

			Wt	Thread	Grade	Description
JTS.	1 thru	116	11.6#	LTC	P-110	Blank

No.	Length of Jt.	No.	Length of Jt.	No.	Length of Jt.	No.	Length of Jt.	No.	Length of Jt.	No.	Length of Jt.	No.	Length of Jt.
1	41.74	51	41.28	101	41.72								
2	41.73	52	41.72	102	41.73								
3	41.28	53	41.26	103	41.72								
4	41.74	54	40.56	104	41.74								
5	41.74	55	41.27	105	41.74								
6	41.26	56	41.27	106	41.76								
7	41.72	57	40.93	107	41.72								
8	41.74	58	41.29	108	41.24								
9	41.74	59	41.73	109	41.70								
10	41.74	60	41.71	110	40.88								
11	41.72	61	41.72	111	41.72								
12	41.72	62	41.60	112	41.74								
13	41.19	63	41.72	113	41.26								
14	41.12	64	41.73	114	41.27								
15	40.90	65	41.73	115	41.72	OUT							
16	41.73	66	41.60	116	41.74	OUT							
17	41.27	67	41.74	117									
18	41.73	68	41.26	118									
19	41.74	69	41.72	119									
20	41.70	70	41.26	120									
21	41.72	71	40.70	121									
22	41.73	72	41.72	122									
23	41.15	73	41.71	123									
24	41.73	74	41.72	124									
25	41.74	75	41.26	125									
26	41.74	76	41.72	126									
27	41.26	77	41.72	127									
28	41.73	78	41.13	128									
29	41.51	79	41.74	129									
30	41.73	80	41.72	130									
31	41.73	81	41.72	131									
32	41.27	82	41.72	132									
33	41.73	83	41.72	133									
34	41.74	84	41.72	134									
35	41.71	85	41.72	135									
36	41.71	86	41.25	136									
37	41.74	87	41.28	137									
38	39.41	88	41.25	138									
39	41.25	89	41.72	139									
40	41.72	90	41.27	140									
41	41.72	91	41.73	141									
42	41.73	92	41.27	142									
43	41.26	93	41.72	143									
44	41.72	94	41.74	144									
45	41.71	95	41.74	145									
46	41.72	96	41.72	146									
47	41.72	97	39.60	147									
48	41.73	98	41.73	148									
49	41.72	99	41.73	149									
50	41.72	100	41.25	150									

Total	<u>2078.05</u>	<u>2073.84</u>	<u>665.40</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>	<u>0.00</u>	GRAND TOTAL	4817.29
-------	----------------	----------------	---------------	-------------	-------------	-------------	-------------	--------------------	----------------

Northern States Completions

Date:		Oil Company:		Field:	
Well Name:				Rig Name & #:	
County:				NSC Rep:	
State:				Company Rep:	

Ball & Seat Chart for 16 DAFPS-II Frac Sub System

Actual measured ID NSC Shop	Actual measured ID (Field)	NSC Initials (Field)	Frac Sub #	Requested Ball Seat ID Reference Only	Ball OD	Ball OD over Ball Seat ID	Clearance of ball thru previous ball seat		
3.520"	"		16	3.518	3.625	0.107	.250" less than 4 1/2" 11.6# Liner Drift		Longer Cast Iron Seat
3.390"	"		15	3.393	3.500	0.107	-0.018		Longer Cast Iron Seat
3.270"	"		14	3.268	3.375	0.107	-0.018		Longer Cast Iron Seat
3.142"	"		13	3.143	3.250	0.107	-0.018		
3.020"	"		12	3.018	3.125	0.107	-0.018		
2.895"	"		11	2.893	3.000	0.107	-0.018		
2.770"	"		10	2.768	2.875	0.107	-0.018		
2.646"	"		9	2.643	2.750	0.107	-0.018		
2.515"	"		8	2.518	2.625	0.107	-0.018		
2.393"	"		7	2.393	2.500	0.107	-0.018		
2.270"	"		6	2.268	2.375	0.107	-0.018		
2.142"	"		5	2.143	2.250	0.107	-0.018		
2.018"	"		4	2.018	2.125	0.107	-0.018		
1.895"	"		3	1.893	2.000	0.107	-0.018		
1.768"	"		2	1.768	1.875	0.107	-0.018		
.750"	"		1	0.893	1.125	0.232	-0.643		

The NSC shop ID's were taken in a controlled situation with precise measuring devices.
 A variance of up to .005" could be expected with the field measurements.
 For accuracy, NSC will report the shop-measured ID's.

Rates are based on the DAFPS-II being pinned for 1876 PSI

Max Rate thru this seat = 90 Bbl/min	
Max Rate thru this seat = 78 Bbl/min	
Won't frac thru seat.....pump out frac-ports	

Frac Stage 2 @ less than 90 Bbls/min (because of the allowable rate thru Frac Sub #3)

Frac Stage 1 @ less than 78 Bbls/min (because of the allowable rate thru Frac Sub #2)

We, the undersigned have verified that the Frac Sub Ball Seat ID's are as shown above.
 We have also verified that Frac Subs were installed in the proper run order in the liner string.

NSC Representative: _____

Oil Company Rep: _____
 Date: _____