

PRODUCTIVITY AND BUILDUP TEST REPORT

On Well

PENN WEST WASKADA UNIT NO. 13 HZNTL

104/05-01-002-26W1/00

Lower Amaranth: 1042.0 – 1662.3 mKB MD

Test Date: July 20 – 30, 2011

Prepared for:

PENN WEST PETROLEUM LTD.

Prepared by:

FEKETE ASSOCIATES INC.

November 23, 2011

PENN WEST PETROLEUM LTD.

Suite 200, 207 – 9th Ave. S.W.

Calgary, Alberta

T2P 1K3

ATTENTION: TREVOR THOMPSON

Re: PRODUCTIVITY & BUILDUP TEST REPORT

PENN WEST WASKADA UNIT NO. 13 HZNTL 104/05-01-002-26W1/00

Lower Amaranth: 1042.0 – 1662.3 mKB MD

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An acoustic well sounder buildup test was conducted on the subject well to establish the current reservoir pressure, flow characteristics and productivity of the Lower Amaranth formation. The test data have been analyzed and the results are presented in this report.

The raw data, analysis and report PDF files are included in the CD attached to the original copy of this report.

If you should have any further questions or concerns, please do not hesitate to contact the undersigned or Reza Ali at 403.213-4200.

Sincerely,

FEKETE ASSOCIATES INC.

Frank Brunner, R.E.T.

Senior Technical Advisor, WellTest

FB/jf

REPORT DISTRIBUTION

Two (2) Copies of the Report to:

PENN WEST PETROLEUM LTD.
Calgary, Alberta

Attention: TREVOR THOMPSON

Summary of Results

PENN WEST WASKADA UNIT NO. 13 HZNTL 104/05-01-002-26W1/00
Lower Amaranth: 1042.0 – 1662.3 mKB MD
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TEST RESULTS

PRESSURE SUMMARY		Metric		Field	
Final Calculated Buildup Pressure (2011/07/30)	(p)	2460	kPaa	357	psia
Final Calculated Flowing Sandface Pressure (2011/07/20)	(p _{wfo})	1680	kPaa	244	psia

PRODUCTION AND DELIVERABILITY					
Final Oil Rate (2011/07/20)	(q _o)	7.8	m ³ /d	49	bbl/d
Final Water Rate (2011/07/20)	(q _w)	5.2	m ³ /d	33	bbl/d
Cumulative Oil Production (to 2011/07/20)		1429	m ³	8987	bbl
Maximum Oil Rate (based on final oil rate)	(q _{omax})	11.2	m ³ /d	70	bbl/d

Reservoir Characteristics– Hz Multi-stage Frac Model		Metric		Field	
Average Reservoir Pressure (History Match)	(p_R)	3341	kPaa	485	psia
Horizontal Permeability	(k _{xy})	0.13	mD	0.13	md
Permeability in X Direction	(k _x)	0.05	mD	0.05	md
Permeability in Y Direction	(k _y)	0.3	mD	0.3	md
Net Vertical Pay	(h)	30	m	98	ft
Effective Horizontal Wellbore Length (assumed)	(L _e)	620	m	2034	ft
Number of Effective Frac Stages (assumed)		17		17	
Effective Fracture Half Length	(x _{fy})	20	m	66	ft
Fracture Conductivity	(F _{CD})	8		8	
Reservoir Length (assumed)	(X _e)	1600	m	5250	ft
Reservoir Width (assumed)	(Y _e)	400	m	1312	ft
Location of Well From X Axis (assumed)	(X _w)	800	m	2625	ft
Location of Well From Y Axis (assumed)	(Y _w)	200	m	656	ft

Discussion/ Conclusions

PENN WEST WASKADA UNIT NO. 13 HZNTL 104/05-01-002-26W1/00
Lower Amaranth: 1042.0 – 1662.3 mKB MD
Test Date: July 20 – 30, 2011

BACKGROUND AND TEST OVERVIEW

The subject well was drilled vertically to about 658 mKB before starting to build angle. Drilling continued at a high angle until the Lower Amaranth formation was penetrated, and then, the lateral section of the wellbore was drilled out to a TD of 1681 mKB MD (909.44 mKB TVD). The 139.7 mm production casing was landed at TD and cemented in place and the drilling rig was released.

Completion operations commenced on October 22, 2010, when the frac head was installed and pressure tested. On October 25, a mud motor was RIH on coiled tubing and tagged solids at 1667 mKB MD. The tubing was reciprocated 100 meters up from the tag while circulating the well.

On November 12, a Mongoose frac tool assembly was RIH on 73 mm coiled tubing and the packer was set at 1662 mKB MD on the following day. After rigging in frac equipment, the toe of the wellbore was jet perforated across the interval 1662.0 – 1662.3 mKB MD, frac'd (placing 5 tonnes of sand into the formation) and plugged back. This procedure was repeated 16 more times along the horizontal wellbore from 1042.0 to 1638.3 mKB MD. The details of the stimulation operation were not provided at the time of this report.

Following the 17 stage fracture treatment, a retrievable WR plug was set at 390 mKB MD and successfully pressure tested. The following day, the frac head was removed and the wellhead was installed.

On November 22, the WR plug was retrieved and an N₂ assisted coiled tubing cleanout was conducted to 1680 mKB MD. On November 23, after killing the well with a total of 14 m³ of water, a 73 mm production string was RIH and landed at 922.42 mKB MD (874.66 mKB TVD). Pump and rods were installed the following day. After a successful pressure test, the well was secured.

Commercial oil production commenced on December 21, 2010. Oil production peaked on December 31, at 28.1 m³/d and fell to a daily average rate of 7.8 m³/d by July 2011.

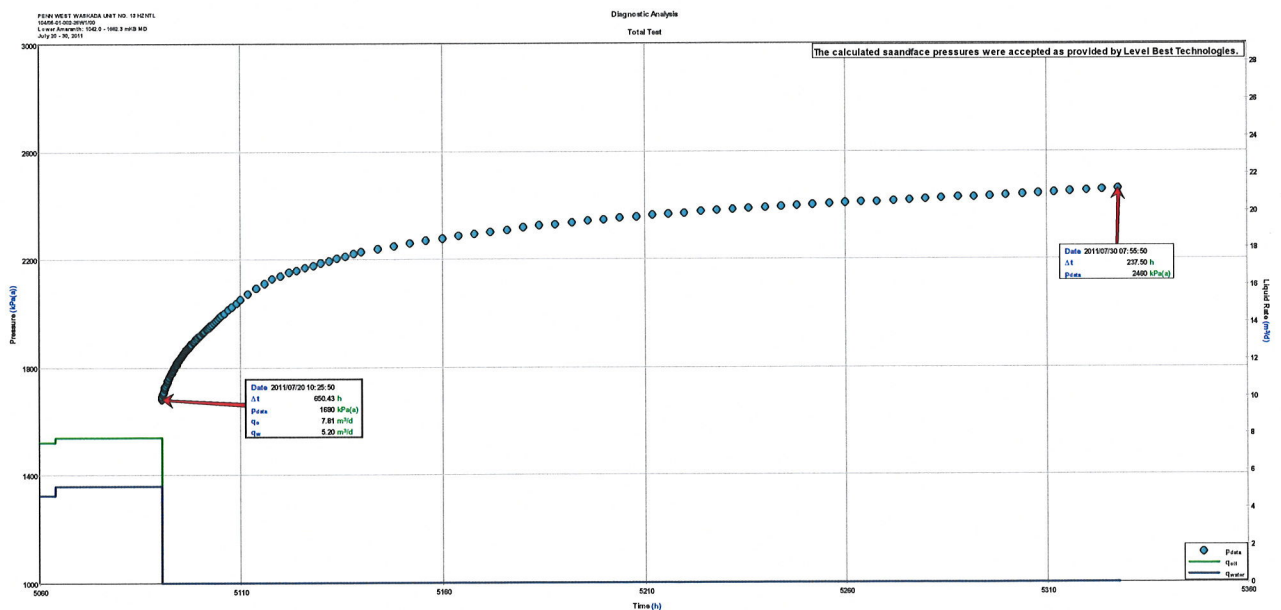
PENN WEST WASKADA UNIT NO. 13 HZNTL 104/05-01-002-26W1/00
Lower Amaranth: 1042.0 – 1662.3 mKB MD
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BACKGROUND AND TEST OVERVIEW (cont'd)

On July 20, 2011, an automated acoustic well sounder, c/w surface pressure recorder, was connected to the annulus and a fluid depression test was initiated. The well was then shut-in at an oil rate of 7.8 m³/d and a water rate of 5.2 m³/d. The subsequent automated samplings of fluid level and corresponding casing pressure were collected until July 30 ($\Delta t = 238$ hours), when the AWS equipment was rigged out. The pressure calculations to MPP (908.4 mKB TVD), were conducted by the AWS service provider and have been accepted as presented.

To the time of shut-in, the well had produced a total of 1429 m³ of oil and 2912 m³ of water. Since a gas rate is not reported it is not possible to confirm if the reservoir pressure has dropped below the saturation pressure.

The following plot illustrates the calculated bottomhole pressures and the oil and water rates measured prior to shut-in.

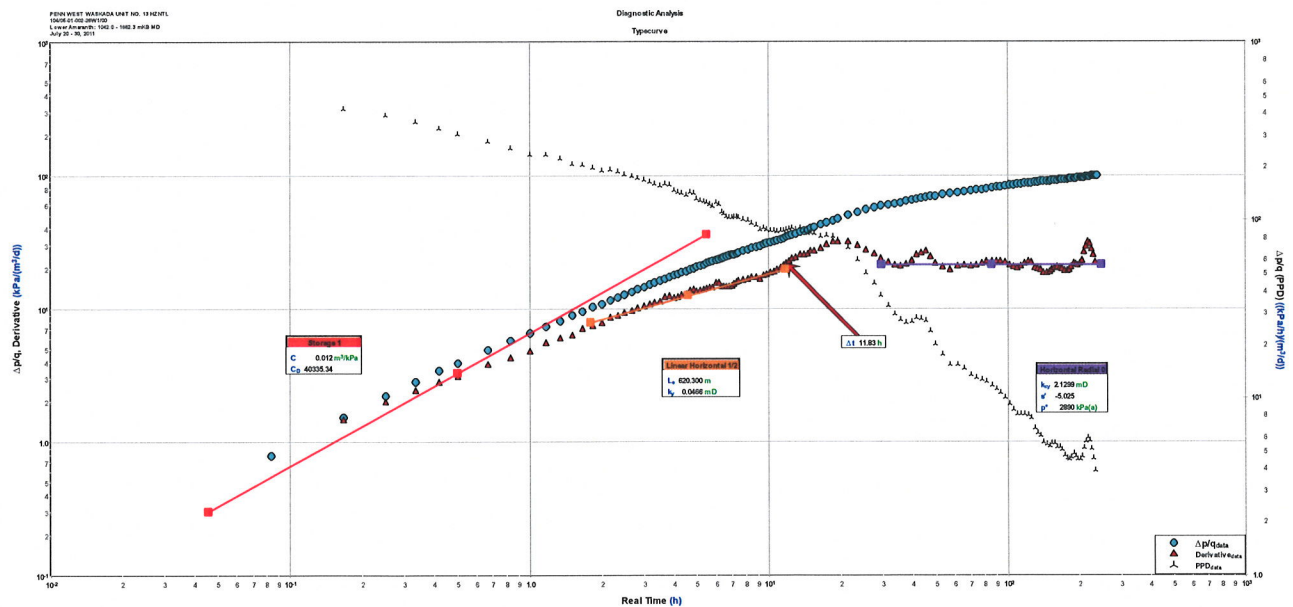


The properties of oil have been taken from the PVT data supplied by Penn West. A bubble point pressure of 4326 kPaa is reported and the solution gas-oil-ratio (GOR) is estimated to be 43.3 m³/m³.

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DIAGNOSTIC ANALYSIS

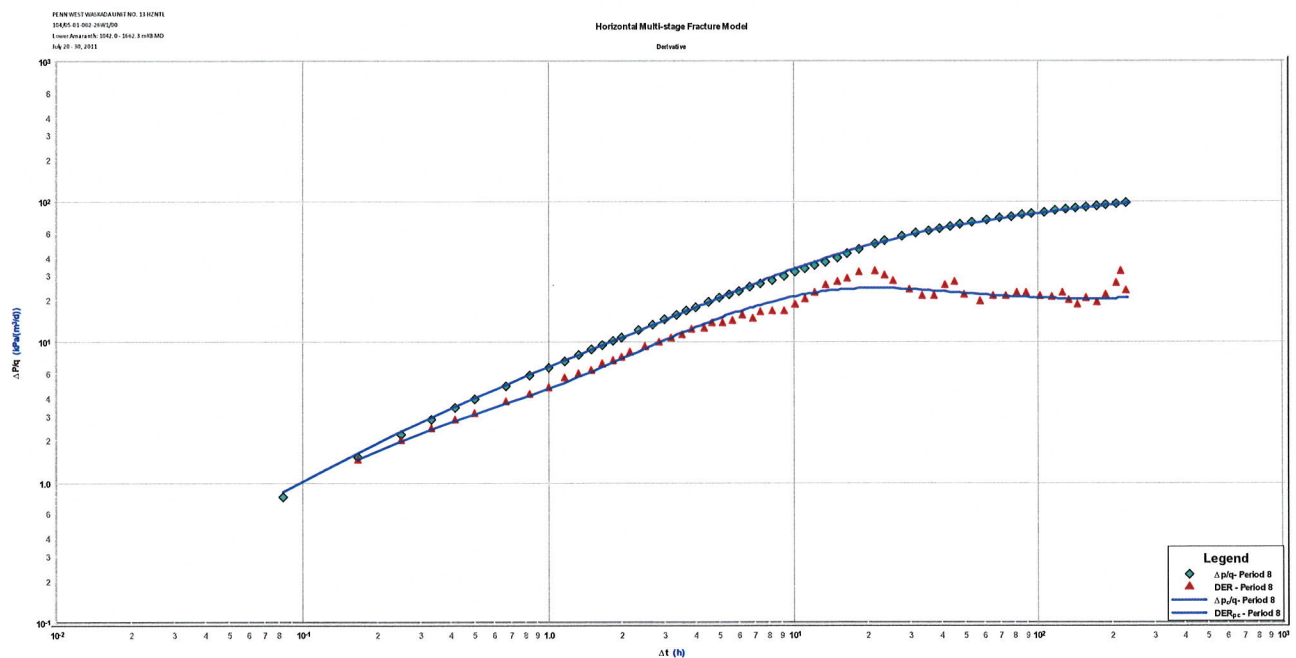
A log-log derivative plot was generated to identify the dominant flow regimes influencing the pressure buildup behavior. Although multiple fractures likely impact the flow pattern, conventional horizontal well methodology is initially applied to the buildup trends to provide preliminary permeability and skin estimates to commence subsequent history matching. Therefore, any values shown on the following plot should be viewed as qualitative. Wellbore storage followed by a $\frac{1}{2}$ slope trend (indicating linear horizontal flow) is evident within the initial 12 hours of shut-in. After that, the derivative is fairly scatter and distorted by wellbore effects and or fluid level measurement inaccuracies. Regardless, a generally horizontal trend could be identified and could be interpreted as horizontal radial flow.



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CONCLUSIONS

Considering a 17 stage fracture treatment was conducted along the 620 m horizontal wellbore, a Horizontal Multi-stage Fracture Model was utilized for history matching purposes. A reasonable match to the observed pressure data was achieved with a horizontal permeability (k_{hy}) of 0.13 mD. Assuming each frac stage generated a single transverse fracture and each is equally effective, the effective fracture half length is estimated to be 20 meters and the dimensionless fracture conductivity is estimated to be 8. A $\frac{1}{4}$ section drainage area (1600×400 m) is assumed to estimate the reservoir pressure.

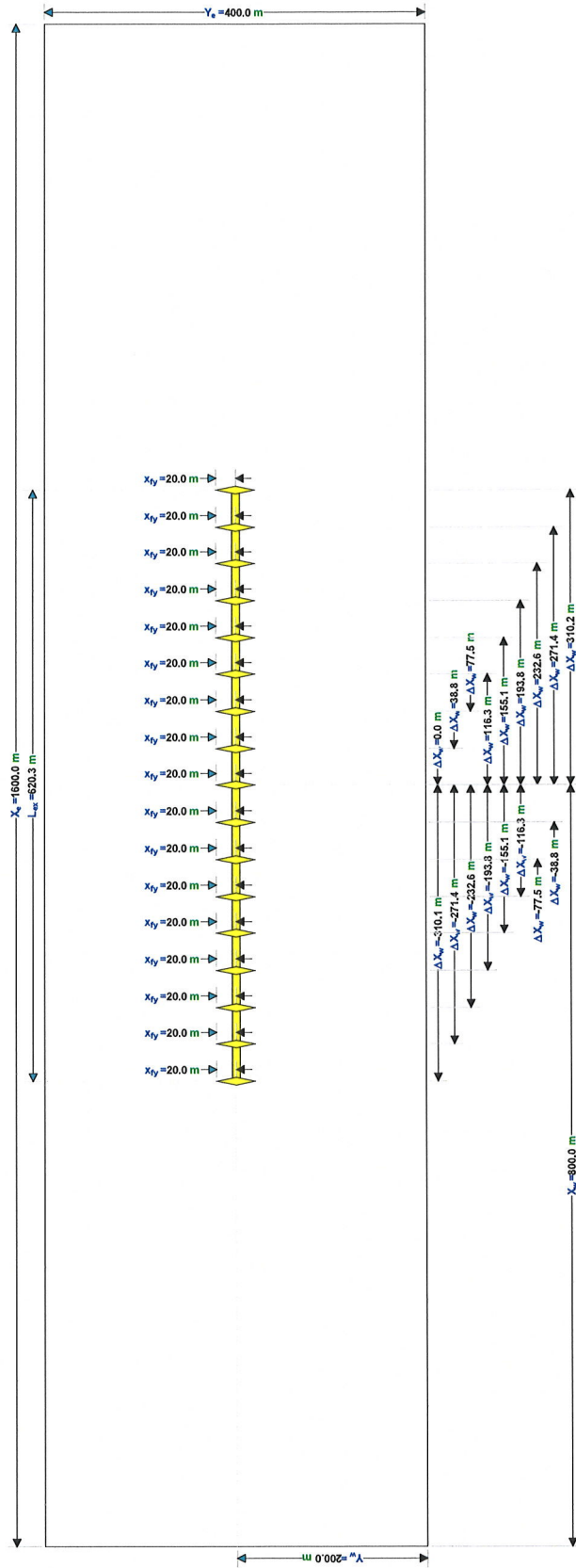


The final calculated buildup pressure on July 30, 2011 ($\Delta t = 238$ hours) was 2460 kPaa. The Horizontal Multi-stage Fracture Model estimates an average reservoir pressure of 3341 kPaa, assuming a $\frac{1}{4}$ section (1600×400 m) drainage area.

An IPR curve was generated based on the final producing conditions on July 20, 2011 ($7.8 \text{ m}^3/\text{d}$ at a bottomhole flowing pressure of 1680 kPaa) and a reservoir pressure of 3341 kPaa. The maximum oil rate is estimated to be $11.2 \text{ m}^3/\text{d}$, assuming the sandface flowing pressure could be lowered to zero.

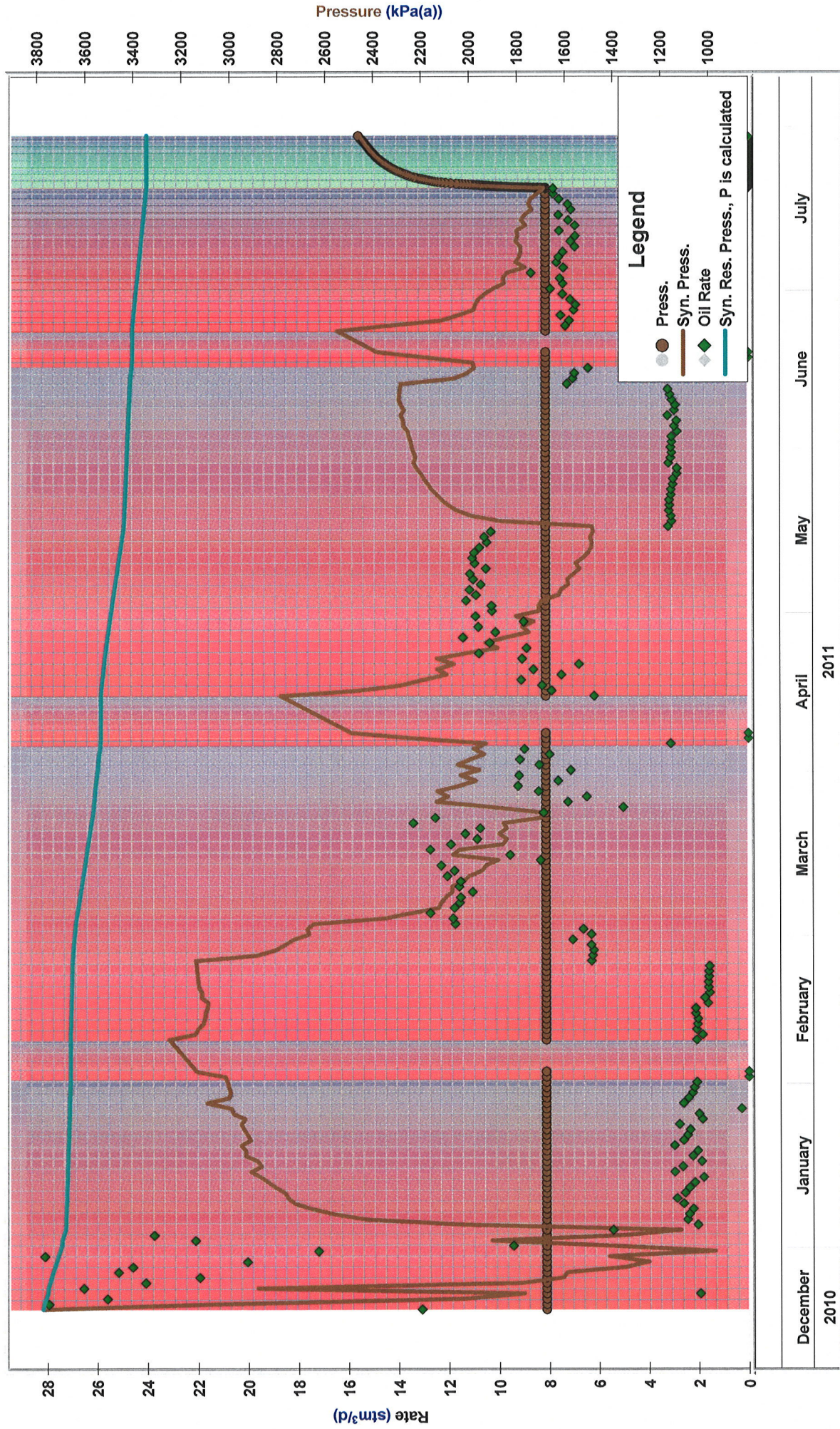
Models

Horizontal Multi-stage Fracture Model
Schematic



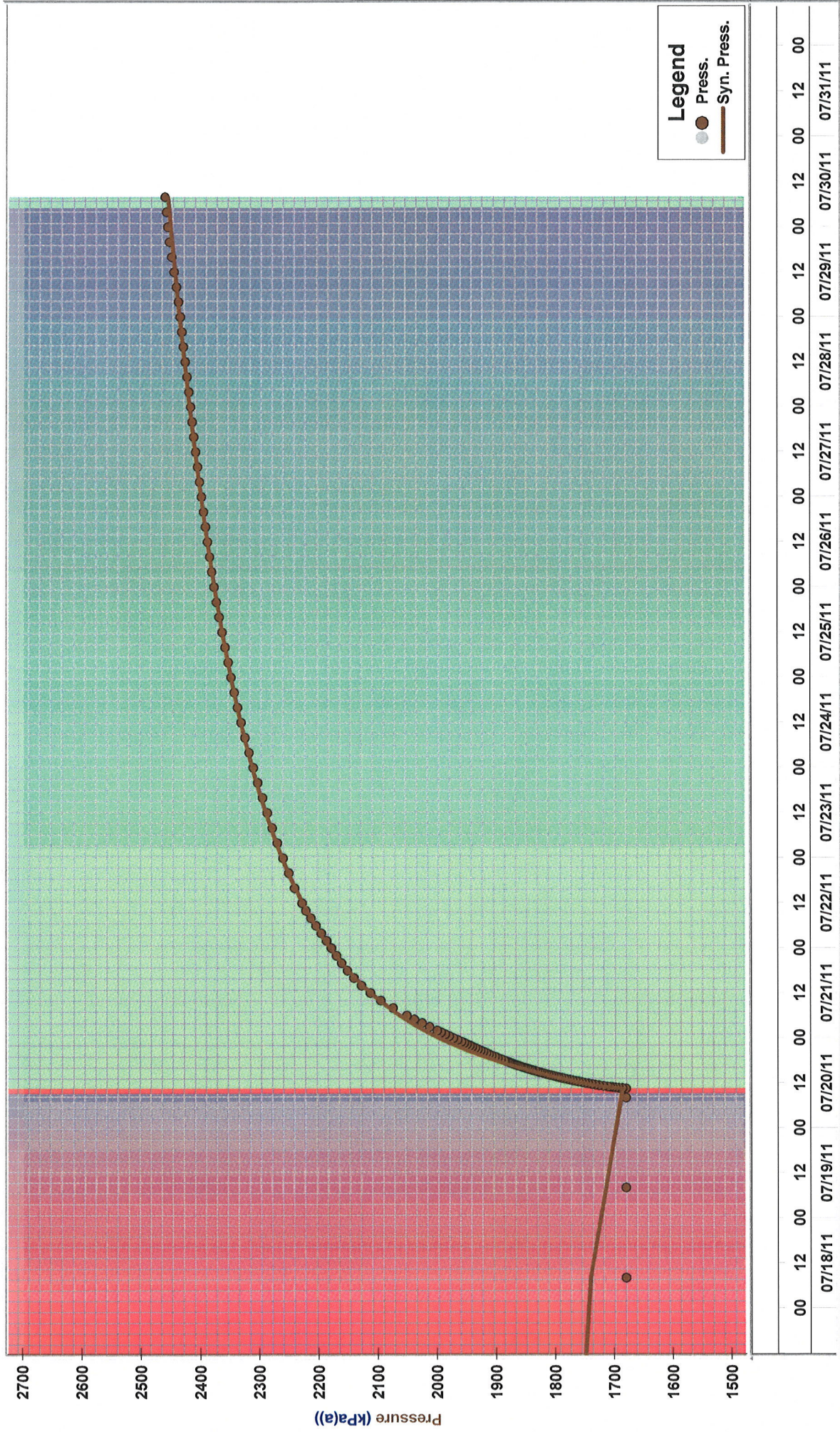
PENN WEST WASKADA UNIT NO. 13 HZNTL
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 July 20 - 30, 2011

Horizontal Multi-stage Fracture Model Welltest History



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 July 20 - 30, 2011

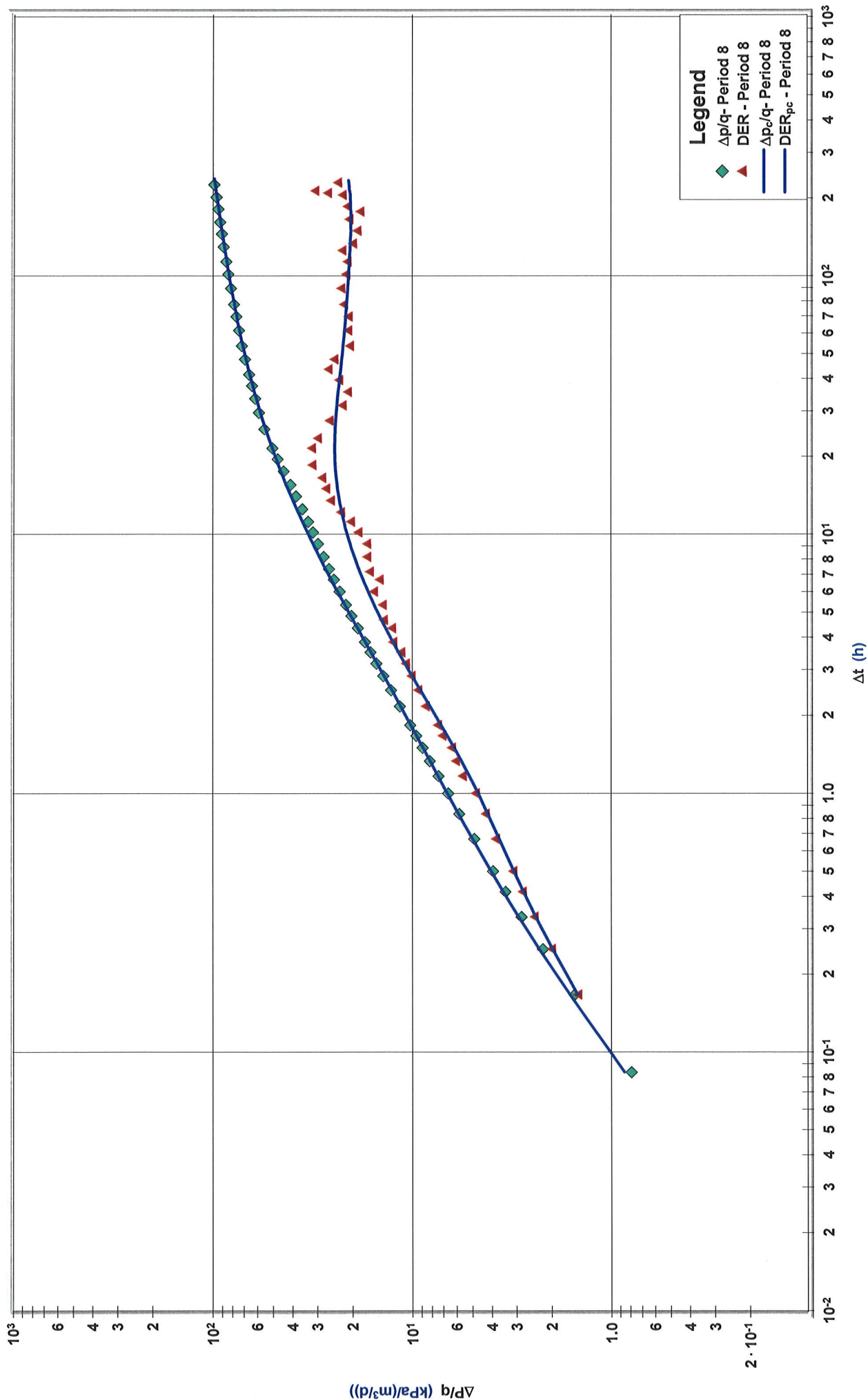
Horizontal Multi-stage Fracture Model Welltest History



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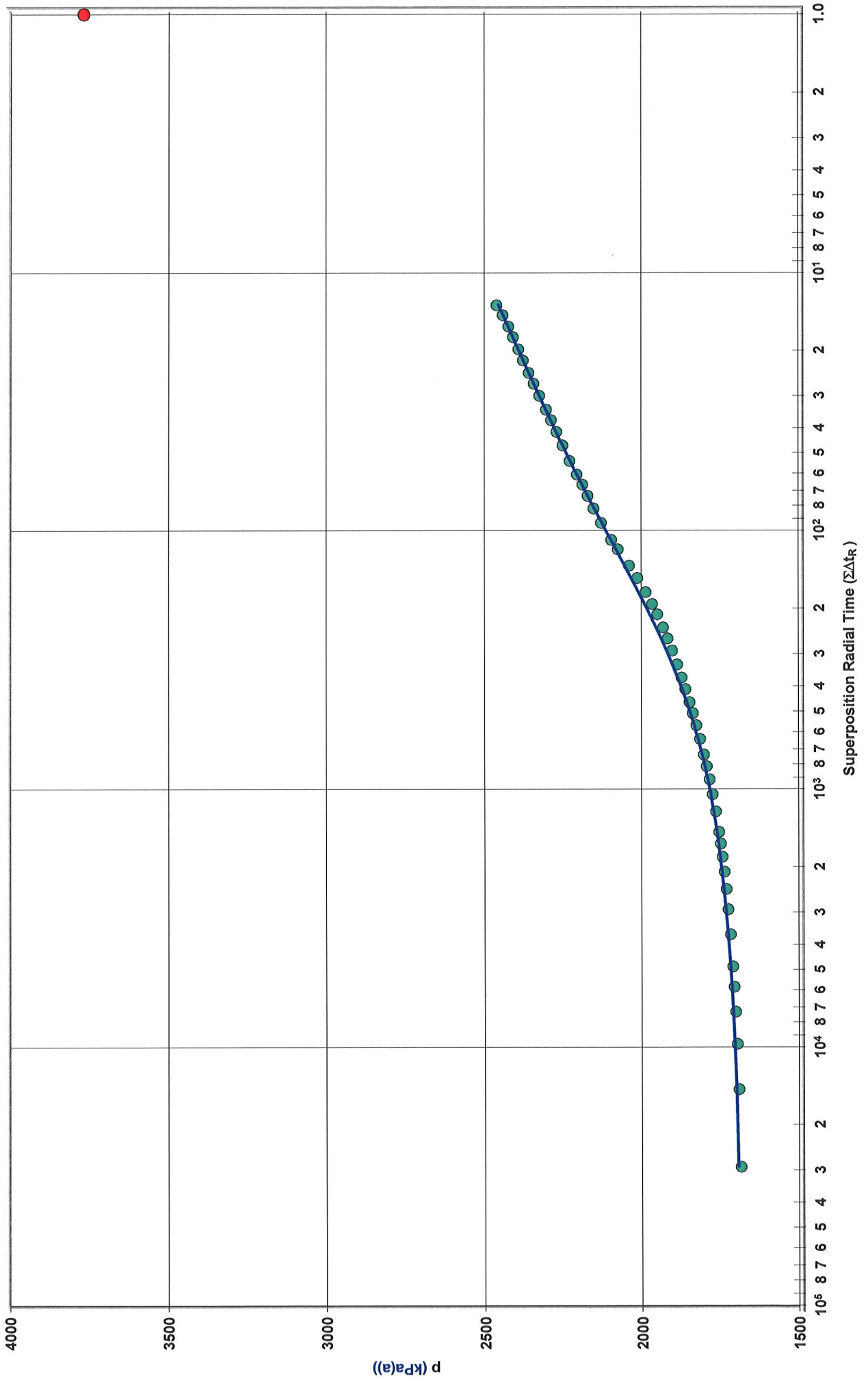
Horizontal Multi-stage Fracture Model

Derivative



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Horizontal Multi-stage Fracture Model Radial Build-Up



Oil Model - Horizontal Multifrac Model

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Model Results

Permeability x-direction (k_x) 0.0530 mD
Permeability y-direction (k_y) 0.3000 mD
Horizontal to Vertical Permeability Ratio (k_h / k_v) 1.000
Number of Fractures (#Frac) 17
Fracture Half Length (x_{fy}) 20.0 m
Dimensionless Fracture Conductivity (F_{CD}) 7.800

Reservoir Length (X_e) 1600.0 m
Reservoir Width (Y_e) 400.0 m
Well Location in X-direction (X_w) 800.0 m
Well Location in Y-direction (Y_w) 200.0 m
Effective Wellbore Length (L_e) 620.300 m

Reservoir Parameters

Reservoir Temperature (T_R) 50.0 °C

Dimensionless Storage 1 (C_{D1}) 31000.0
Dimensionless Storage 2 (C_{D2}) 14000.0
Dimensionless Storage Parameter (C_{pD}) 0.003

Total Cumulative Production Oil (Cum_{oil}) 1.430 10³m³

Net Pay (h) 30.0 m
Total Porosity (ϕ_t) 13.00 %
Wellbore Radius (r_w) 0.091 m

Drainage Area (A_D) 64.0 ha

Gas Saturation (S_g) 0.00 %
Oil Saturation (S_o) 50.00 %
Water Saturation (S_w) 50.00 %
Formation Compressibility (c_f) 6.3246e-07 1/kPa
Total Compressibility (c_t) 1.5090e-06 1/kPa
Gas Compressibility (c_g) 2.8450e-04 1/kPa
Water Compressibility (c_w) 4.5063e-07 1/kPa
Oil Compressibility (c_o) 1.3024e-06 1/kPa

Fluid Properties

Reservoir Temperature (T_{resv}) 50.0 °C
Reservoir Pressure (p_{resv}) 4500 kPa(a)
Oil Gravity (γ_o) 37.2 °API
Bubble Point Pressure (p_{bp}) 4326 kPa(a)
Oil Formation Volume Factor (B_o) 1.129
Oil Viscosity (μ_o) 1.3581 mPa.s
Oil Compressibility (c_o) 1.0911e-06 1/kPa
Solution Gas Ratio (R_s) 43.30 m³/m³
Oil Correlation Vasquez and Beggs
Oil Viscosity Correlation Beggs & Robinson

I.P.R.

Liquid IPR

Inflow Performance Relationship

PENN WEST WASKADA UNIT NO. 13 HZNTL
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Test Data

Bubble Point Pressure (p_{bp}) 4326 kPa(a)
Reservoir Pressure (p_R) 3341 kPa(a)
Test Pressure (p_{wf}) 1680 kPa(a)
Oil Test Rate (q_o) 7.8 m³/d
Water Test Rate (q_w) 5.2 m³/d

Results

Maximum Oil Rate ($q_{o(max)}$) 11.2 m³/d
Maximum Total Rate ($q_{t(max)}$) 21.7 m³/d
Maximum Water Rate ($q_{w(max)}$) 10.5 m³/d

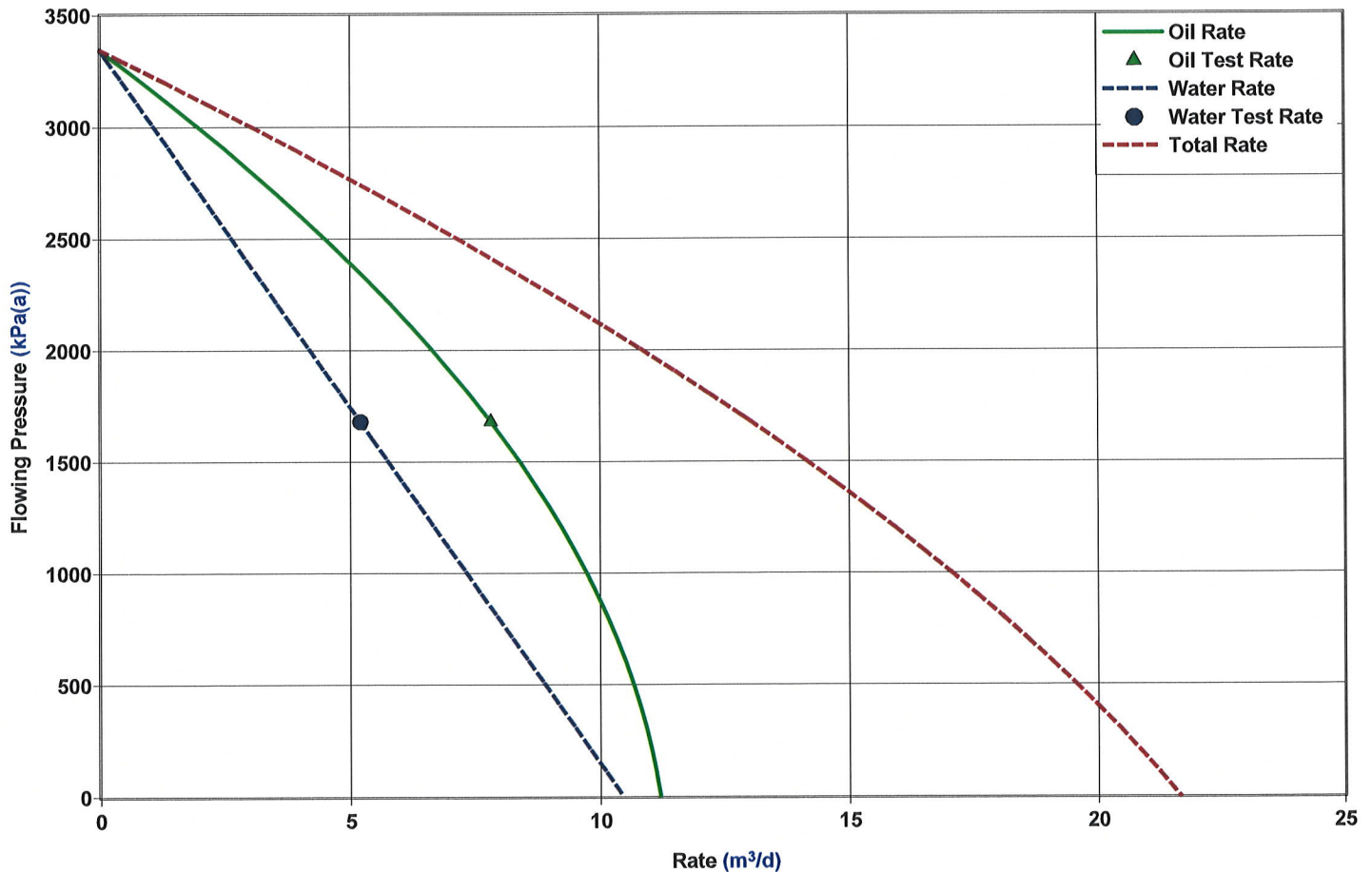
Note * Test Point

** Bubble Point

Oil IPR based on Vogel's Equation
(Quadratic Curve Factor = 0.2)

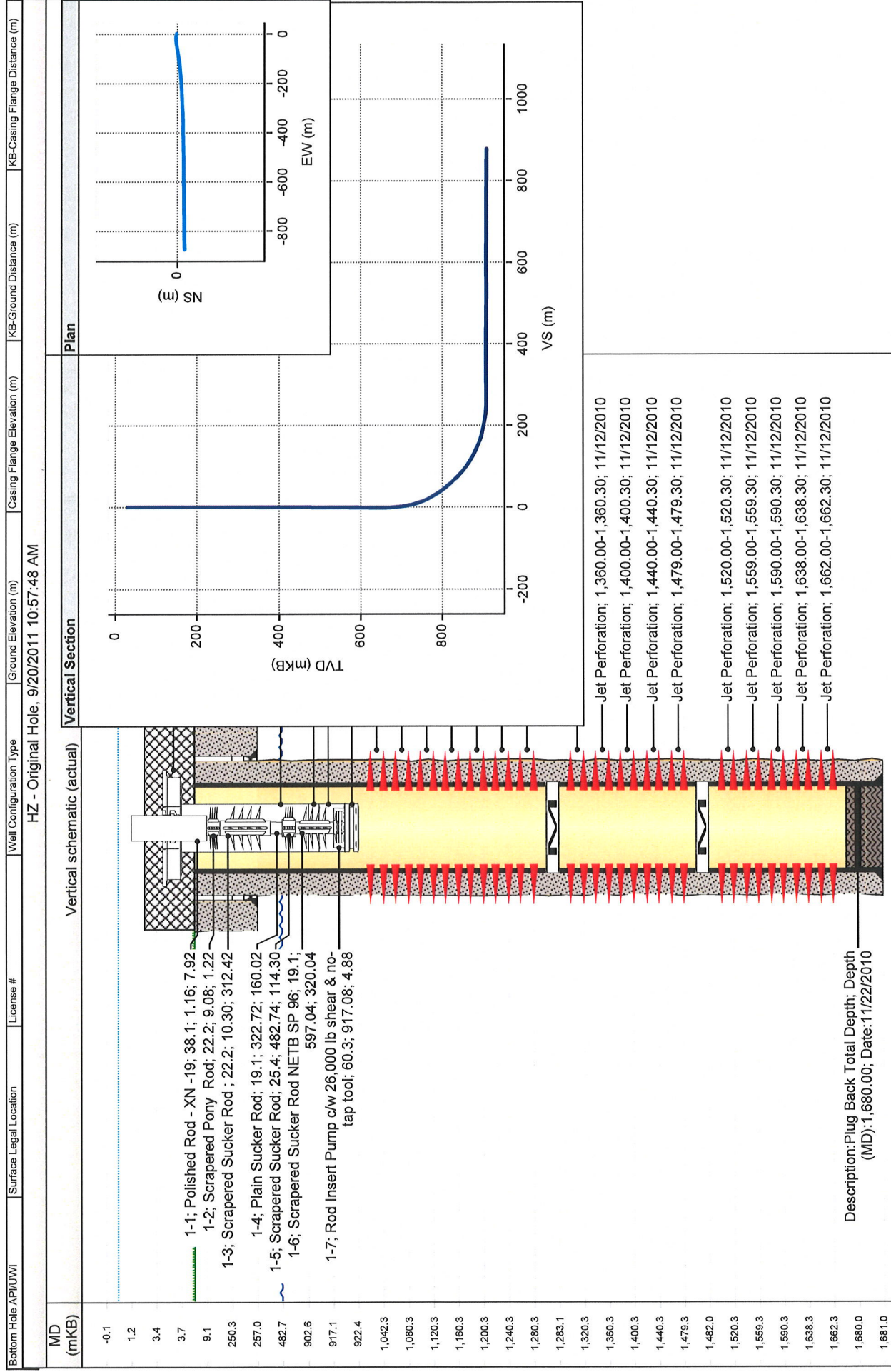
Flowing Pressure	Oil Rate	Water Rate	Total Rate
kPa(a)	m ³ /d	m ³ /d	m ³ /d
0	11.2	10.5	21.7
300	10.9	9.5	20.4
600	10.5	8.6	19.1
900	9.9	7.6	17.6
1200	9.2	6.7	15.9
1500	8.4	5.8	14.2
1680*	7.8	5.2	13.0
1800	7.4	4.8	12.2
2100	6.3	3.9	10.1
2400	5.0	2.9	7.9
2700	3.5	2.0	5.5
3000	2.0	1.1	3.0
3300	0.2	0.1	0.4
3341	0.0	0.0	0.0

IPR



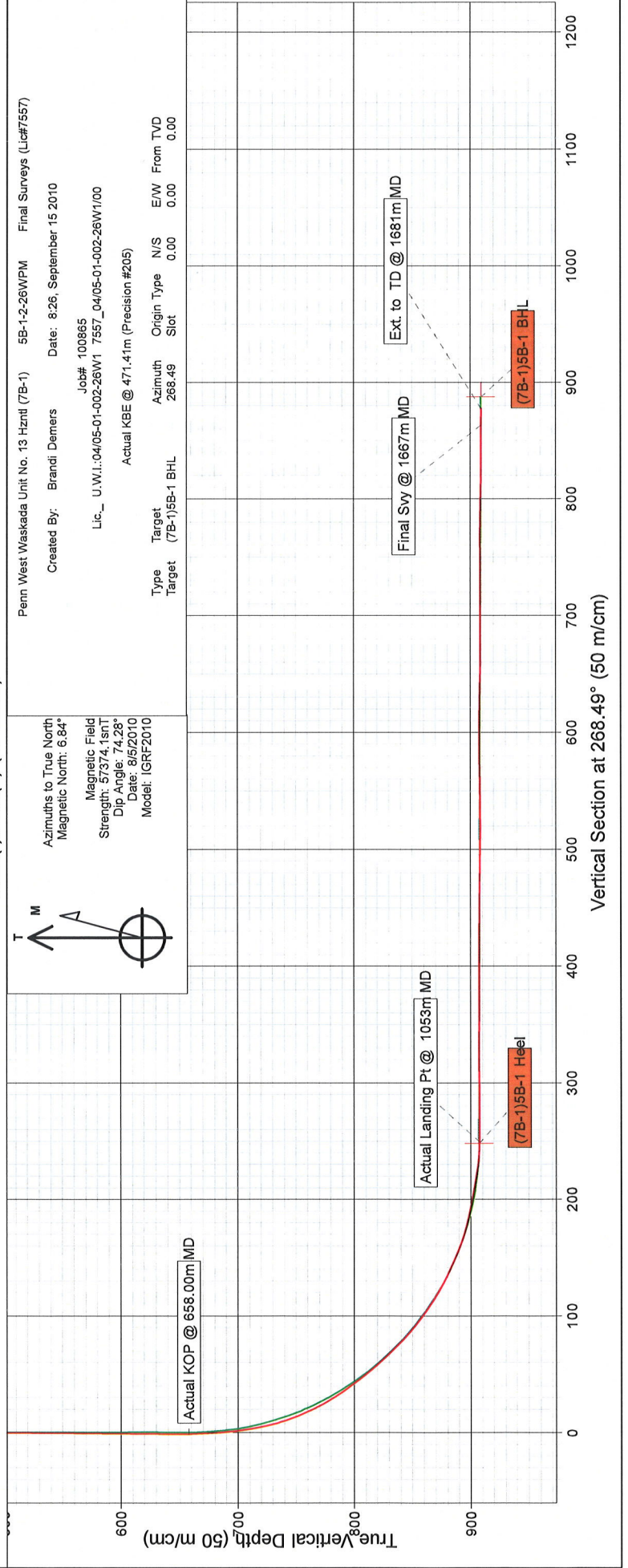
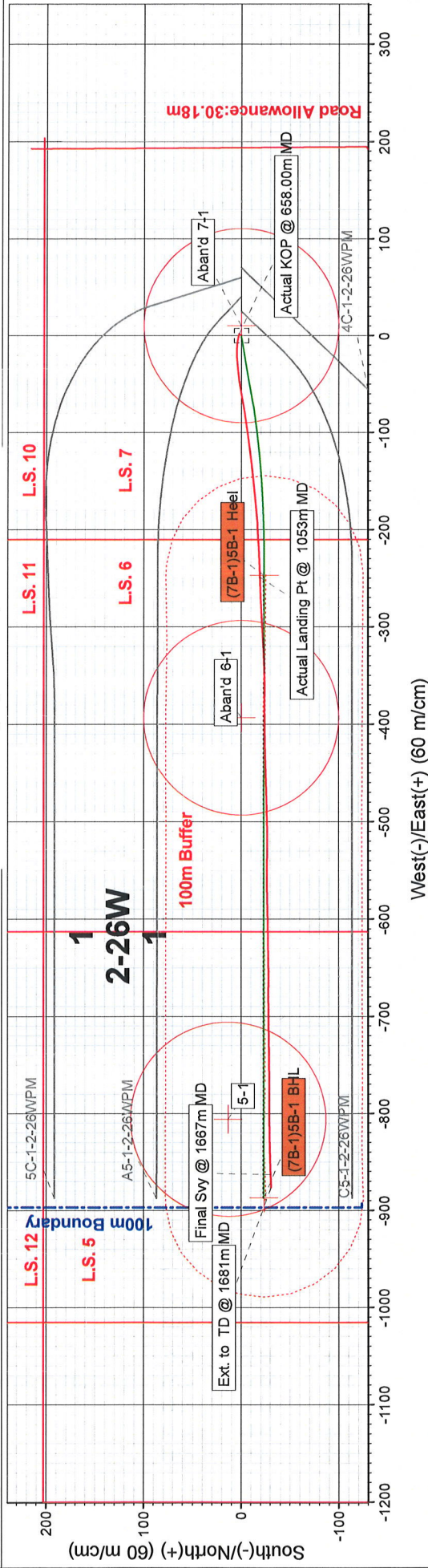
Wellbore

Well Name: Penn West Waskada Unit No. 13 HZNTL B5-1-2-26W1M

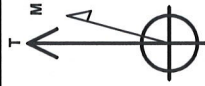




Project: Waskada
Site: Penn West Waskada Unit No. 13 Hznrl (7B-1)
Well: 5B-1-2-26WPM
Wellbore: HZ
UWI : 104/05-01-002-26W1/00
Final Surveys (Lic#7557)



Azimuths to True North
Magnetic North: 6.84°
Strength: 57374, 1stT
Dip Angle: 74.28°
Date: 8/5/2010
Model: IGRF-2010



Penn West Waskada Unit No. 13 Hznrl (7B-1) 5B-1-2-26WPM Final Surveys (Lic#7557)

Created By: Brandi Demers Date: 8/26, September 15 2010

Job# 100865
Lic_ UWI.:04/05-01-002-26W1 7557_04/05-01-002-26W1/00

Actual KBE @ 471.41m (Precision #205)

Type	Target	Target	Azimuth	Origin	Type	N/S	E/W	From	TVD
Target	(7B-1)5B-1 BHL	268.49	Slot	0.00	0.00	0.00	0.00	0.00	0.00

Cathedral Energy Services

Survey Report

Company:	Penn West Petroleum Ltd.	Local Co-ordinate Reference:	Well 5B-1-2-26WPM
Project:	Waskada	TVD Reference:	Actual KBE @ 471.41m (Precision #205)
Site:	Penn West Waskada Unit No. 13 Hzntl (7B-1)	MD Reference:	Actual KBE @ 471.41m (Precision #205)
Well:	5B-1-2-26WPM	North Reference:	True
Wellbore:	Hz	Survey Calculation Method:	Minimum Curvature
Design:	Final Surveys (Lic#7557)	Database:	EDM R5000 CATHEDRAL Multi Users

Project	Waskada		
Map System:	Universal Transverse Mercator	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Zone 14N (102 W to 96 W)		

Site	Penn West Waskada Unit No. 13 Hzntl (7B-1)		
Site Position:		Northing:	5,439,497.94 m
From:	Map	Easting:	366,185.29 m
Position Uncertainty:	0.00 m	Slot Radius:	0.00 mm
		Latitude:	49° 5' 37.58 N
		Longitude:	100° 49' 58.78 W
		Grid Convergence:	-1.39 °

Well	5B-1-2-26WPM		
Well Position	+N/-S	0.00 m	Northing: 5,439,497.94 m
	+E/-W	0.00 m	Easting: 366,185.29 m
Position Uncertainty	0.00 m	Wellhead Elevation:	471.41 m
		Latitude:	49° 5' 37.58 N
		Longitude:	100° 49' 58.78 W
		Ground Level:	467.21 m

Wellbore	Hz		
Magnetics	Model Name	Sample Date	Declination (°)
	IGRF2010	8/5/2010	6.84
			Dip Angle (°) 74.28
			Field Strength (nT) 57,374

Design	Final Surveys (Lic#7557)		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (m)	+N/-S (m)	+E/-W (m)
	0.00	0.00	0.00
			Direction (°) 268.49

Survey Program	Date 9/15/2010		
From (m)	To (m)	Survey (Wellbore)	Tool Name
257.00	1,681.00	Surveys Update (Hz)	MWD
			Description

Survey											
Measured Depth (m)	Inc. (°)	Az. (°)	Vertical Depth (m)	Sub Sea Depth (m)	+N/-S (m)	+E/-W (m)	Vertical Section (m)	Closure Distance (m)	Closure Azimuth (°)	Dogleg Rate (°/30m)	Formations / Comments
0.00	0.00	0.00	0.00	471.41	0.00	0.00	0.00	0.00	0.00	0.00	
257.00	0.00	0.00	257.00	214.41	0.00	0.00	0.00	0.00	0.00	0.00	Actual Surf CSg
272.38	0.60	14.00	272.38	199.03	0.08	0.02	-0.02	0.08	14.00	1.17	
410.08	0.40	13.90	410.07	61.34	1.24	0.31	-0.34	1.28	13.96	0.04	
547.74	0.40	37.00	547.73	-76.32	2.09	0.71	-0.77	2.21	18.82	0.03	
644.35	0.90	82.00	644.34	-172.93	2.47	1.67	-1.73	2.98	34.04	0.21	
658.00	0.99	287.41	657.98	-186.57	2.52	1.66	-1.73	3.02	33.41	4.05	Actual KOP @ 658.00m MD
658.07	1.00	287.30	658.05	-186.64	2.52	1.66	-1.73	3.02	33.39	4.36	
671.86	2.90	273.10	671.84	-200.43	2.57	1.20	-1.27	2.84	24.94	4.23	
685.75	5.10	282.10	685.69	-214.28	2.72	0.24	-0.31	2.73	5.10	4.93	

Cathedral Energy Services

Survey Report

Company:	Penn West Petroleum Ltd.	Local Co-ordinate Reference:	Well 5B-1-2-26WPM
Project:	Waskada	TVD Reference:	Actual KBE @ 471.41m (Precision #205)
Site:	Penn West Waskada Unit No. 13 Hzntrl (7B-1)	MD Reference:	Actual KBE @ 471.41m (Precision #205)
Well:	5B-1-2-26WPM	North Reference:	True
Wellbore:	Hz	Survey Calculation Method:	Minimum Curvature
Design:	Final Surveys (Lic#7557)	Database:	EDM R5000 CATHEDRAL Multi Users

Survey

Measured Depth (m)	Inc. (°)	Az. (°)	Vertical Depth (m)	Sub Sea Depth (m)	+N/-S (m)	+E/-W (m)	Vertical Section (m)	Closure Distance (m)	Closure Azimuth (°)	Dogleg Rate (°/30m)	Formations / Comments
699.53	7.20	283.20	699.39	-227.98	3.05	-1.20	1.12	3.28	338.57	4.58	
713.36	9.70	282.90	713.07	-241.66	3.51	-3.18	3.08	4.73	317.83	5.42	
727.15	13.90	281.20	726.57	-255.16	4.09	-5.94	5.83	7.21	304.56	9.17	
740.95	17.80	273.20	739.84	-268.43	4.53	-9.67	9.55	10.68	295.09	9.70	
754.67	22.10	270.50	752.73	-281.32	4.67	-14.35	14.22	15.09	288.02	9.61	
768.42	26.60	269.70	765.26	-293.85	4.67	-20.01	19.88	20.55	283.15	9.84	
782.12	30.00	266.80	777.32	-305.91	4.47	-26.50	26.38	26.88	279.57	8.03	
795.99	33.60	263.60	789.11	-317.70	3.85	-33.78	33.67	34.00	276.49	8.60	
809.65	36.90	262.50	800.26	-328.85	2.89	-41.61	41.51	41.71	273.97	7.38	
823.36	39.50	261.80	811.03	-339.62	1.73	-50.00	49.94	50.03	271.98	5.77	
837.15	42.40	260.70	821.45	-350.04	0.35	-58.93	58.90	58.94	270.34	6.50	
850.89	44.50	259.40	831.42	-360.01	-1.28	-68.24	68.25	68.25	268.92	4.98	
864.69	46.80	259.80	841.07	-369.66	-3.06	-77.95	78.00	78.01	267.75	5.04	
878.50	49.90	261.10	850.24	-378.83	-4.77	-88.12	88.22	88.25	266.90	7.06	
892.27	54.10	262.40	858.72	-387.31	-6.33	-98.86	98.99	99.06	266.34	9.42	
906.25	57.90	262.50	866.54	-395.13	-7.85	-110.34	110.51	110.62	265.93	8.16	
920.01	60.80	262.90	873.55	-402.14	-9.35	-122.09	122.29	122.44	265.62	6.37	
933.73	64.20	264.00	879.89	-408.48	-10.74	-134.17	134.41	134.60	265.42	7.73	
947.44	66.20	263.90	885.64	-414.23	-12.05	-146.55	146.82	147.04	265.30	4.38	
961.21	69.10	263.10	890.87	-419.46	-13.49	-159.20	159.50	159.77	265.16	6.52	
975.00	73.70	265.10	895.27	-423.86	-14.83	-172.20	172.53	172.84	265.08	10.82	
988.70	77.30	265.80	898.70	-427.29	-15.88	-185.42	185.77	186.10	265.10	8.02	
1,002.49	79.50	267.00	901.47	-430.06	-16.73	-198.90	199.27	199.60	265.19	5.43	
1,016.21	80.50	266.40	903.85	-432.44	-17.51	-212.39	212.78	213.11	265.29	2.54	
1,029.93	81.60	268.00	905.99	-434.58	-18.17	-225.92	226.32	226.65	265.40	4.21	
1,043.70	86.80	268.10	907.38	-435.97	-18.64	-239.61	240.02	240.33	265.55	11.33	
1,053.00	89.20	267.20	907.70	-436.29	-19.02	-248.90	249.31	249.62	265.63	8.27	Actual Landing Pt @ 1053m MD
1,071.19	89.80	267.30	907.86	-436.45	-19.89	-267.06	267.50	267.80	265.74	1.00	
1,085.07	90.30	267.30	907.85	-436.44	-20.54	-280.93	281.37	281.68	265.82	1.08	
1,098.88	90.90	267.30	907.71	-436.30	-21.19	-294.72	295.18	295.48	265.89	1.30	
1,112.59	91.20	266.60	907.46	-436.05	-21.92	-308.41	308.88	309.19	265.93	1.67	
1,126.48	91.00	267.50	907.19	-435.78	-22.64	-322.28	322.76	323.07	265.98	1.99	
1,140.35	89.20	267.30	907.16	-435.75	-23.27	-336.13	336.63	336.94	266.04	3.92	
1,154.08	89.50	268.00	907.32	-435.91	-23.83	-349.85	350.36	350.66	266.10	1.66	
1,167.77	89.60	270.30	907.43	-436.02	-24.03	-363.54	364.05	364.33	266.22	5.04	
1,181.48	90.10	270.70	907.46	-436.05	-23.91	-377.25	377.75	378.01	266.37	1.40	
1,195.25	90.10	270.20	907.44	-436.03	-23.81	-391.02	391.51	391.74	266.52	1.09	
1,208.94	89.80	268.70	907.45	-436.04	-23.94	-404.71	405.20	405.41	266.62	3.35	
1,222.75	89.30	267.60	907.56	-436.15	-24.38	-418.51	419.01	419.22	266.67	2.62	
1,236.54	89.60	268.60	907.69	-436.28	-24.84	-432.29	432.80	433.00	266.71	2.27	
1,250.24	89.50	269.50	907.80	-436.39	-25.07	-445.99	446.49	446.69	266.78	1.98	
1,263.94	89.50	269.30	907.92	-436.51	-25.21	-459.69	460.19	460.38	266.86	0.44	

Cathedral Energy Services

Survey Report

Company: Penn West Petroleum Ltd.
Project: Waskada
Site: Penn West Waskada Unit No. 13 Hzntl (7B-1)
Well: 5B-1-2-26WPM
Wellbore: Hz
Design: Final Surveys (Lic#7557)

Local Co-ordinate Reference: Well 5B-1-2-26WPM
TVD Reference: Actual KBE @ 471.41m (Precision #205)
MD Reference: Actual KBE @ 471.41m (Precision #205)
North Reference: True
Survey Calculation Method: Minimum Curvature
Database: EDM R5000 CATHEDRAL Multi Users

Survey

Measured Depth (m)	Inc. (°)	Az. (°)	Vertical Depth (m)	Sub Sea Depth (m)	+N/-S (m)	+E/-W (m)	Vertical Section (m)	Closure Distance (m)	Closure Azimuth (°)	Dogleg Rate (°/30m)	Formations / Comments
1,277.71	89.30	268.50	908.06	-436.65	-25.47	-473.45	473.96	474.14	266.92	1.80	
1,291.48	89.30	267.80	908.23	-436.82	-25.92	-487.22	487.73	487.90	266.95	1.52	
1,305.25	89.60	268.40	908.36	-436.95	-26.38	-500.98	501.50	501.67	266.99	1.46	
1,318.98	89.40	269.80	908.48	-437.07	-26.59	-514.70	515.23	515.39	267.04	3.09	
1,332.72	90.00	270.20	908.56	-437.15	-26.59	-528.44	528.96	529.11	267.12	1.57	
1,346.49	90.70	270.00	908.47	-437.06	-26.57	-542.21	542.73	542.86	267.19	1.59	
1,360.27	91.00	270.00	908.27	-436.86	-26.57	-555.99	556.50	556.63	267.26	0.65	
1,373.98	91.20	269.80	908.00	-436.59	-26.59	-569.70	570.20	570.32	267.33	0.62	
1,387.73	90.70	269.40	907.78	-436.37	-26.69	-583.45	583.95	584.06	267.38	1.40	
1,401.48	89.90	268.70	907.70	-436.29	-26.92	-597.20	597.70	597.80	267.42	2.32	
1,415.28	89.70	267.90	907.75	-436.34	-27.32	-610.99	611.50	611.60	267.44	1.79	
1,429.05	89.10	268.70	907.90	-436.49	-27.73	-624.75	625.27	625.37	267.46	2.18	
1,442.83	88.20	269.70	908.22	-436.81	-27.93	-638.53	639.04	639.14	267.50	2.93	
1,456.61	89.00	270.00	908.56	-437.15	-27.96	-652.30	652.81	652.90	267.55	1.86	
1,470.38	90.10	271.00	908.67	-437.26	-27.84	-666.07	666.57	666.65	267.61	3.24	
1,484.09	90.20	269.90	908.63	-437.22	-27.73	-679.78	680.28	680.35	267.66	2.42	
1,497.87	90.10	269.90	908.59	-437.18	-27.76	-693.56	694.05	694.12	267.71	0.22	
1,511.61	90.00	269.40	908.58	-437.17	-27.84	-707.30	707.79	707.85	267.75	1.11	
1,525.61	89.80	267.90	908.61	-437.20	-28.17	-721.30	721.79	721.85	267.76	3.24	
1,539.14	90.00	268.70	908.63	-437.22	-28.57	-734.82	735.32	735.37	267.77	1.83	
1,552.91	89.80	269.70	908.65	-437.24	-28.77	-748.59	749.09	749.14	267.80	2.22	
1,566.67	90.40	270.20	908.63	-437.22	-28.78	-762.35	762.84	762.89	267.84	1.70	
1,580.44	89.20	270.10	908.68	-437.27	-28.74	-776.12	776.61	776.65	267.88	2.62	
1,594.23	89.20	269.50	908.87	-437.46	-28.79	-789.91	790.39	790.43	267.91	1.31	
1,608.03	89.50	269.60	909.03	-437.62	-28.90	-803.70	804.19	804.22	267.94	0.69	
1,621.83	90.00	269.90	909.09	-437.68	-28.96	-817.50	817.98	818.02	267.97	1.27	
1,635.59	90.10	269.30	909.08	-437.67	-29.05	-831.26	831.74	831.77	268.00	1.33	
1,649.39	89.40	267.70	909.14	-437.73	-29.42	-845.06	845.54	845.57	268.01	3.80	
1,663.11	89.40	267.50	909.28	-437.87	-29.99	-858.77	859.26	859.29	268.00	0.44	
1,667.00	89.50	267.90	909.32	-437.91	-30.15	-862.65	863.15	863.18	268.00	3.18	Final Svy @ 1667m MD
1,681.00	89.50	267.90	909.44	-438.03	-30.66	-876.64	877.15	877.18	268.00	0.00	Ext. to TD @ 1681m MD

Cathedral Energy Services

Survey Report

Company:	Penn West Petroleum Ltd.	Local Co-ordinate Reference:	Well 5B-1-2-26WPM
Project:	Waskada	TVD Reference:	Actual KBE @ 471.41m (Precision #205)
Site:	Penn West Waskada Unit No. 13 Hzntl (7B-1)	MD Reference:	Actual KBE @ 471.41m (Precision #205)
Well:	5B-1-2-26WPM	North Reference:	True
Wellbore:	Hz	Survey Calculation Method:	Minimum Curvature
Design:	Final Surveys (Lic#7557)	Database:	EDM R5000 CATHEDRAL Multi Users

Targets

Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(m)	(m)	(m)	(m)	(m)		
- Shape									
Aban'd 7-1	0.00	0.00	-0.26	0.02	9.99	5,439,497.72	366,195.27	49° 5' 37.58 N	100° 49' 58.29 W
- survey misses target center by 9.99m at 0.00m MD (0.00 TVD, 0.00 N, 0.00 E)									
- Circle (radius 100.00)									
(7B-1)5B-1 BHL	0.00	0.00	909.41	-23.43	-887.09	5,439,495.97	365,297.89	49° 5' 36.81 N	100° 50' 42.51 W
- survey misses target center by 12.70m at 1681.00m MD (909.44 TVD, -30.66 N, -876.64 E)									
- Point									
(7B-1)5B-1 Heel	0.00	0.00	907.41	-23.85	-247.09	5,439,480.07	365,937.70	49° 5' 36.80 N	100° 50' 10.96 W
- survey misses target center by 4.92m at 1051.38m MD (907.68 TVD, -18.94 N, -247.28 E)									
- Point									
Aban'd 6-1	0.00	0.00	-0.26	-0.01	-393.46	5,439,507.44	365,791.94	49° 5' 37.57 N	100° 50' 18.18 W
- survey misses target center by 393.46m at 0.00m MD (0.00 TVD, 0.00 N, 0.00 E)									
- Circle (radius 100.00)									
5-1	0.00	0.00	-0.29	13.43	-806.20	5,439,530.86	365,379.65	49° 5' 38.01 N	100° 50' 38.52 W
- survey misses target center by 806.31m at 0.00m MD (0.00 TVD, 0.00 N, 0.00 E)									
- Circle (radius 100.00)									

Casing Points

Measured Depth	Vertical Depth	Name	Casing Diameter	Hole Diameter
(m)	(m)		(mm)	(mm)
257.00	257.00	Actual Surf CSg		

Survey Annotations

Measured Depth	Vertical Depth	Local Coordinates	Comment
(m)	(m)	+N/-S (m) +E/-W (m)	
658.00	657.98	2.52 1.66	Actual KOP @ 658.00m MD
1,053.00	907.70	-19.02 -248.90	Actual Landing Pt @ 1053m MD
1,667.00	909.32	-30.15 -862.65	Final Svy @ 1667m MD
1,681.00	909.44	-30.66 -876.64	Ext. to TD @ 1681m MD

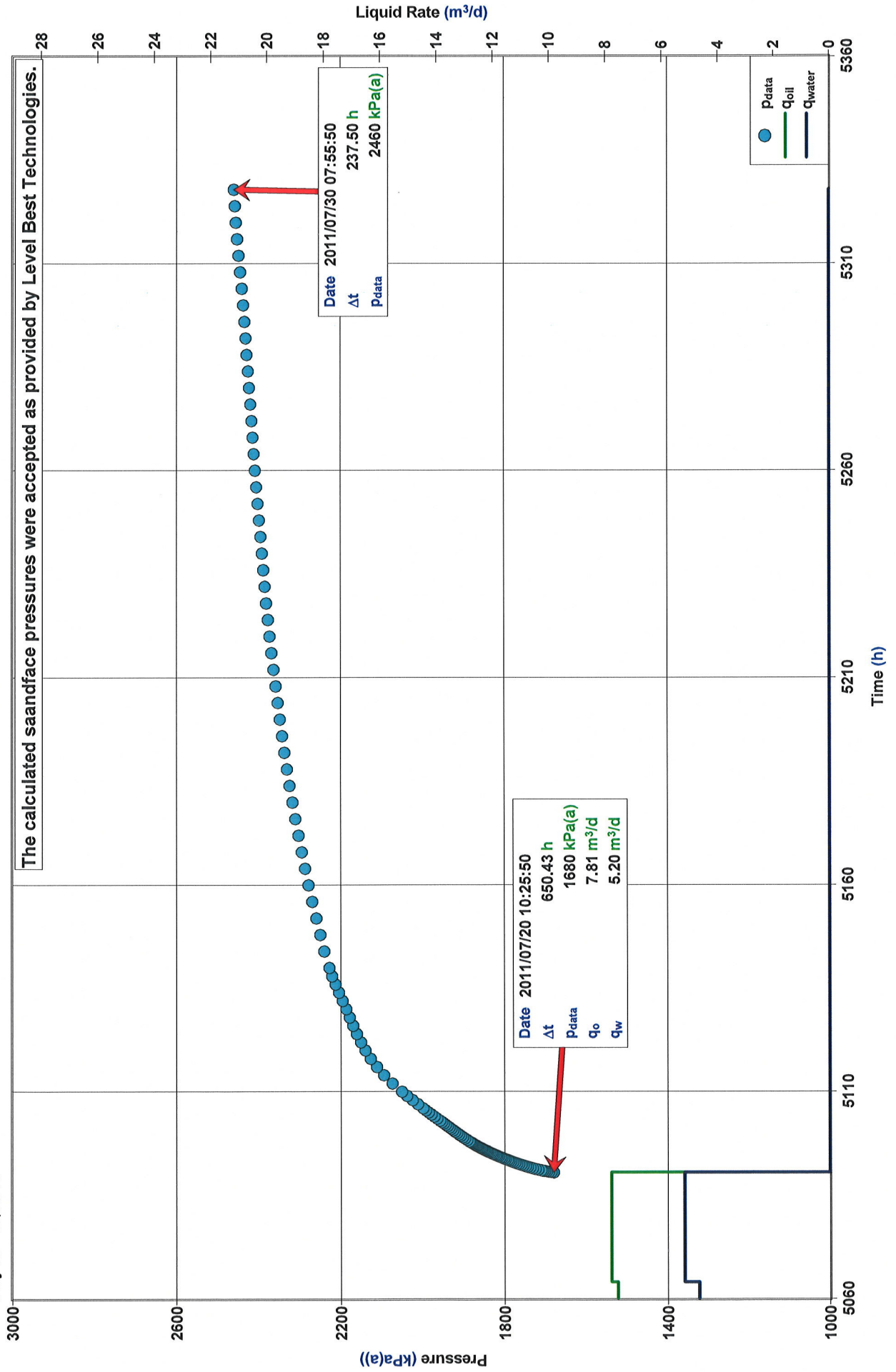
Checked By: _____ Approved By: _____ Date: _____

Diagnostics

PENN WEST WASKADA UNIT NO. 13 HZNTL
 104/05-01-002-26W1/00
 Lower Amaranth: 1042.0 - 1662.3 mKB MD
 July 20 - 30, 2011

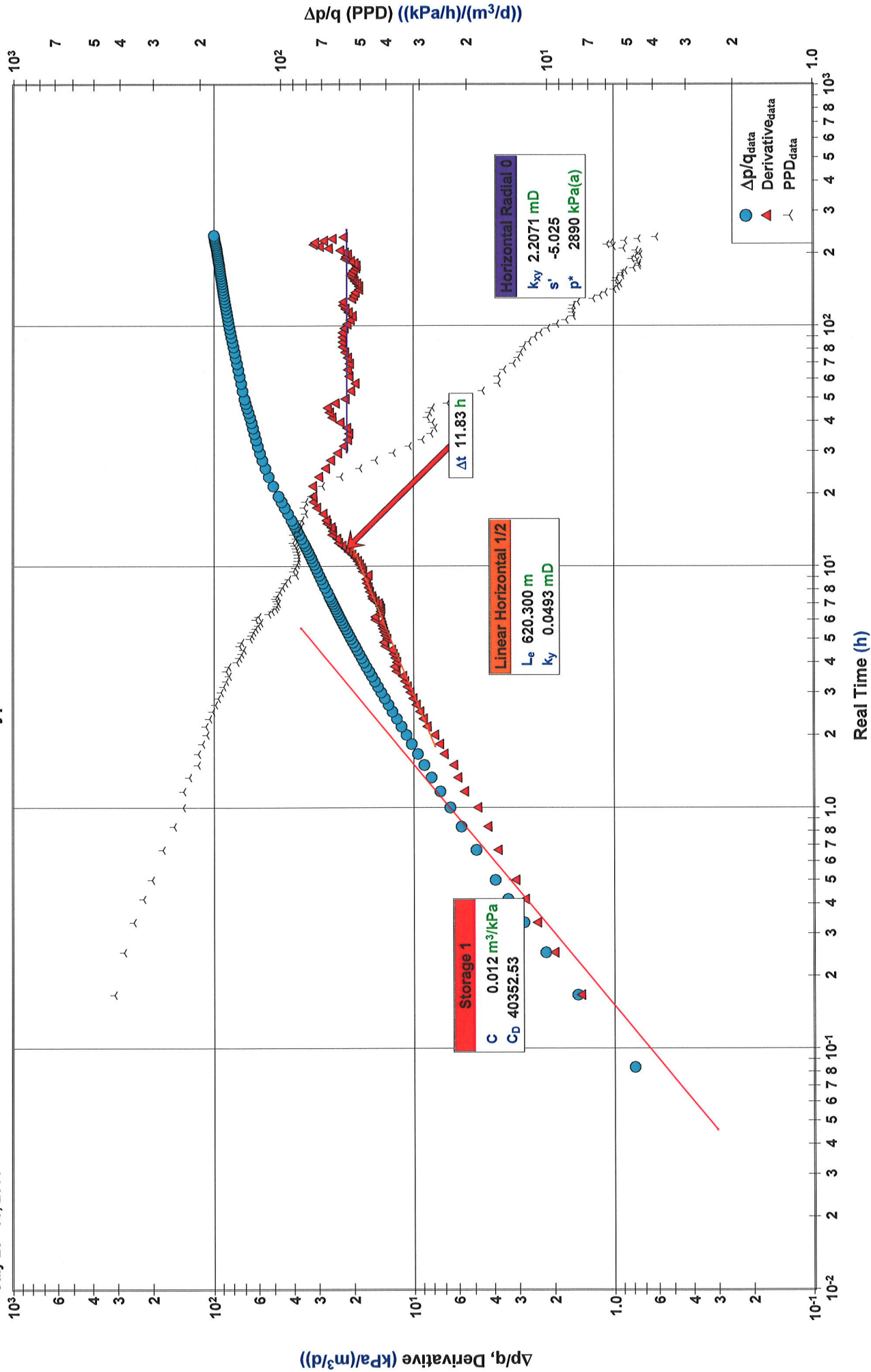
Diagnostic Analysis Total Test

The calculated saandface pressures were accepted as provided by Level Best Technologies.



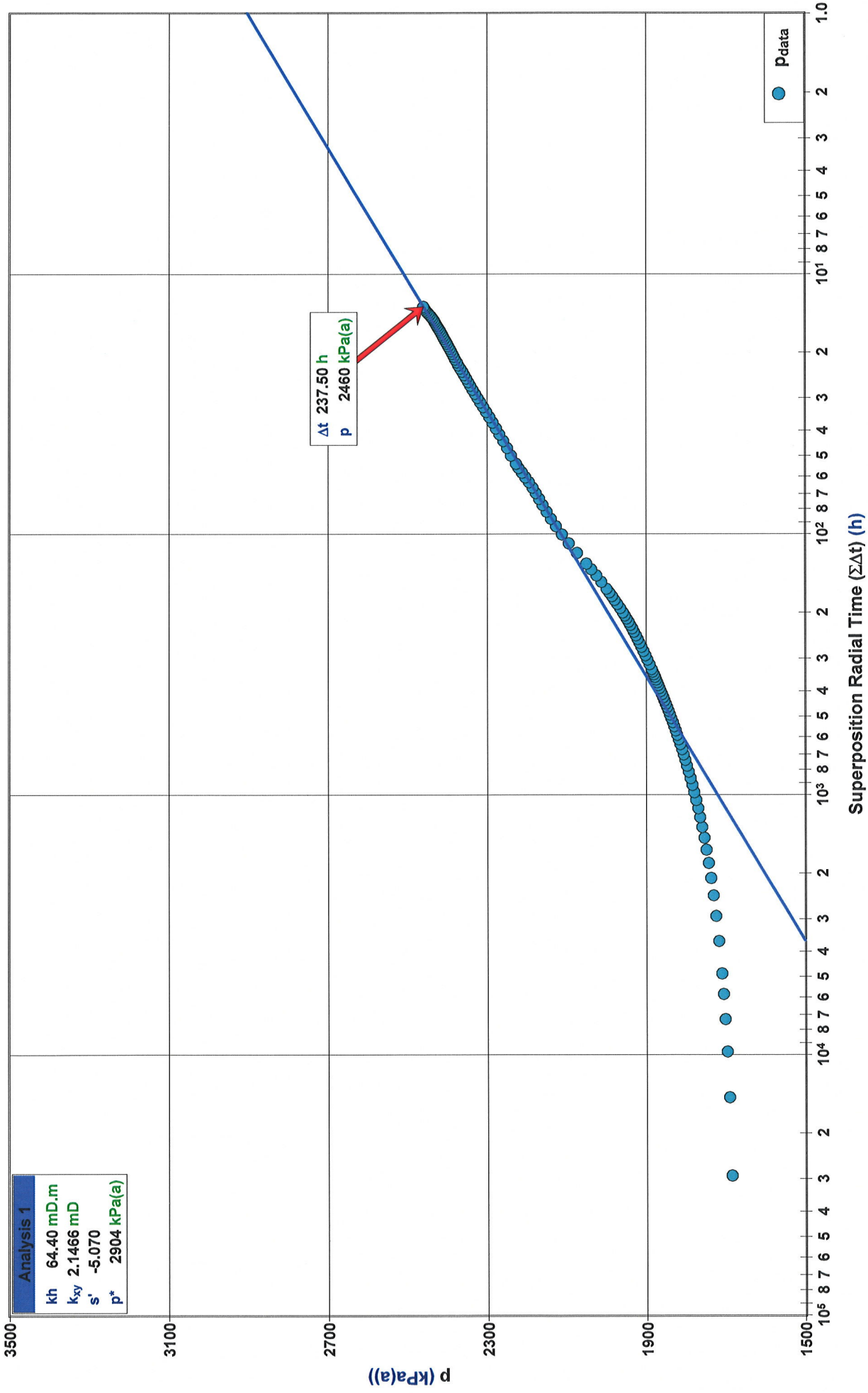
PENN WEST WASKADA UNIT NO. 13 HZNTL
 104/05-01-002-26W1/00
 Lower Amaranth: 1042.0 - 1662.3 mKB MD
 July 20 - 30, 2011

Diagnostic Analysis Typecurve



PENN WEST WASKADA UNIT NO. 13 HZNTL
104/05-01-002-26W1/00
Lower Amaranth: 1042.0 - 1662.3 mKB MD
July 20 - 30, 2011

Diagnostic Analysis Radial



PENN WEST WASKADA UNIT NO. 13 HZNT
104/05-01-002-26W1/00
Lower Amaranth: 1042.0 - 1662.3 mKB MD
July 20 - 30, 2011

Pressure/Production Summary

Item	Date Clock Time	Time	Cumulative Time	Calculated Sandface Pressure	Oil Rate	Water Rate
	YYYY/MM/DD HH:mm:ss	h	h	kPa(a)	m ³ /d	m ³ /d
1	2010/12/20 08:00:00	0.0000	0.0000		0.0	0.0
2	2010/12/21 08:00:00	24.0000	24.0000		13.1	22.9
3	2010/12/22 08:00:00	48.0000	48.0000		27.9	9.1
4	2010/12/23 08:00:00	72.0000	72.0000		25.6	9.8
5	2010/12/24 08:00:00	96.0000	96.0000		2.0	1.9
6	2010/12/25 08:00:00	120.0000	120.0000		26.6	24.7
7	2010/12/26 08:00:00	144.0000	144.0000		24.1	23.0
8	2010/12/27 08:00:00	168.0000	168.0000		21.9	24.0
9	2010/12/28 08:00:00	192.0000	192.0000		25.2	24.0
10	2010/12/29 08:00:00	216.0000	216.0000		24.6	20.2
11	2010/12/30 08:00:00	240.0000	240.0000		20.1	22.5
12	2010/12/31 08:00:00	264.0000	264.0000		28.1	23.4
13	2011/01/01 08:00:00	288.0000	288.0000		17.2	15.1
14	2011/01/02 08:00:00	312.0000	312.0000		9.4	11.1
15	2011/01/03 08:00:00	336.0000	336.0000		22.1	25.4
16	2011/01/04 08:00:00	360.0000	360.0000		23.8	19.8
17	2011/01/05 08:00:00	384.0000	384.0000		5.4	2.8
18	2011/01/06 08:00:00	408.0000	408.0000		2.0	38.6
19	2011/01/07 08:00:00	432.0000	432.0000		2.5	40.4
20	2011/01/08 08:00:00	456.0000	456.0000		2.4	32.5
21	2011/01/09 08:00:00	480.0000	480.0000		2.2	36.5
22	2011/01/10 08:00:00	504.0000	504.0000		2.6	32.4
23	2011/01/11 08:00:00	528.0000	528.0000		2.9	33.8
24	2011/01/12 08:00:00	552.0000	552.0000		2.6	45.9
25	2011/01/13 08:00:00	576.0000	576.0000		2.4	34.4
26	2011/01/14 08:00:00	600.0000	600.0000		2.2	41.3
27	2011/01/15 08:00:00	624.0000	624.0000		1.8	33.9
28	2011/01/16 08:00:00	648.0000	648.0000		3.0	30.7
29	2011/01/17 08:00:00	672.0000	672.0000		2.6	38.3
30	2011/01/18 08:00:00	696.0000	696.0000		1.9	27.8
31	2011/01/19 08:00:00	720.0000	720.0000		2.3	35.4
32	2011/01/20 08:00:00	744.0000	744.0000		2.0	33.6
33	2011/01/21 08:00:00	768.0000	768.0000		3.0	35.2
34	2011/01/22 08:00:00	792.0000	792.0000		2.6	37.3
35	2011/01/23 08:00:00	816.0000	816.0000		2.5	30.7
36	2011/01/24 08:00:00	840.0000	840.0000		2.4	34.2
37	2011/01/25 08:00:00	864.0000	864.0000		2.8	36.7
38	2011/01/26 08:00:00	888.0000	888.0000		1.9	34.2
39	2011/01/27 08:00:00	912.0000	912.0000		2.0	31.4
40	2011/01/28 08:00:00	936.0000	936.0000		0.3	5.0
41	2011/01/29 08:00:00	960.0000	960.0000		2.6	26.7
42	2011/01/30 08:00:00	984.0000	984.0000		2.4	31.2
43	2011/01/31 08:00:00	1008.0000	1008.0000		2.3	31.9
44	2011/02/01 08:00:00	1032.0000	1032.0000		2.2	30.1
45	2011/02/02 08:00:00	1056.0000	1056.0000		2.1	22.9
46	2011/02/03 08:00:00	1080.0000	1080.0000		0.0	0.0
47	2011/02/09 08:00:00	1224.0000	1224.0000		0.0	0.0
48	2011/02/10 08:00:00	1248.0000	1248.0000		2.1	32.6
49	2011/02/11 08:00:00	1272.0000	1272.0000		1.9	42.4
50	2011/02/12 08:00:00	1296.0000	1296.0000		2.1	42.5
51	2011/02/13 08:00:00	1320.0000	1320.0000		2.0	38.4
52	2011/02/14 08:00:00	1344.0000	1344.0000		2.0	39.6
53	2011/02/15 08:00:00	1368.0000	1368.0000		2.1	41.8
54	2011/02/16 08:00:00	1392.0000	1392.0000		2.1	31.0
55	2011/02/17 08:00:00	1416.0000	1416.0000		1.6	26.2
56	2011/02/18 08:00:00	1440.0000	1440.0000		1.8	27.7
57	2011/02/19 08:00:00	1464.0000	1464.0000		1.6	24.2
58	2011/02/20 08:00:00	1488.0000	1488.0000		1.6	27.9
59	2011/02/21 08:00:00	1512.0000	1512.0000		1.6	27.8
60	2011/02/22 08:00:00	1536.0000	1536.0000		1.6	36.2
61	2011/02/23 08:00:00	1560.0000	1560.0000		1.6	34.3
62	2011/02/24 08:00:00	1584.0000	1584.0000		1.6	25.9
63	2011/02/25 08:00:00	1608.0000	1608.0000		6.3	19.3
64	2011/02/26 08:00:00	1632.0000	1632.0000		6.2	26.2
65	2011/02/27 08:00:00	1656.0000	1656.0000		6.2	22.7
66	2011/02/28 08:00:00	1680.0000	1680.0000		6.3	18.4
67	2011/03/01 08:00:00	1704.0000	1704.0000		7.0	20.9
68	2011/03/02 08:00:00	1728.0000	1728.0000		6.3	20.9
69	2011/03/03 08:00:00	1752.0000	1752.0000		6.6	23.1
70	2011/03/04 08:00:00	1776.0000	1776.0000		11.7	10.9
71	2011/03/05 08:00:00	1800.0000	1800.0000		11.8	13.1
72	2011/03/06 08:00:00	1824.0000	1824.0000		12.7	13.3
73	2011/03/07 08:00:00	1848.0000	1848.0000		11.8	11.9
74	2011/03/08 08:00:00	1872.0000	1872.0000		11.6	10.4
75	2011/03/09 08:00:00	1896.0000	1896.0000		11.5	11.7
76	2011/03/10 08:00:00	1920.0000	1920.0000		11.1	12.4

Pressure/Production Summary

Item	Date Clock Time	Time	Cumulative Time	Calculated Sandface Pressure	Oil Rate	Water Rate
	YYYY/MM/DD HH:mm:ss	h	h	kPa(a)	m ³ /d	m ³ /d
77	2011/03/11 08:00:00	1944.0000	1944.0000		11.6	14.0
78	2011/03/12 08:00:00	1968.0000	1968.0000		11.5	10.2
79	2011/03/13 08:00:00	1992.0000	1992.0000		12.1	13.1
80	2011/03/14 08:00:00	2016.0000	2016.0000		11.8	11.9
81	2011/03/15 08:00:00	2040.0000	2040.0000		12.3	11.4
82	2011/03/16 08:00:00	2064.0000	2064.0000		8.3	8.1
83	2011/03/17 08:00:00	2088.0000	2088.0000		9.6	14.1
84	2011/03/18 08:00:00	2112.0000	2112.0000		12.7	12.6
85	2011/03/19 08:00:00	2136.0000	2136.0000		11.9	11.6
86	2011/03/20 08:00:00	2160.0000	2160.0000		10.9	11.0
87	2011/03/21 08:00:00	2184.0000	2184.0000		11.3	12.7
88	2011/03/22 08:00:00	2208.0000	2208.0000		10.8	10.9
89	2011/03/23 08:00:00	2232.0000	2232.0000		13.4	12.1
90	2011/03/24 08:00:00	2256.0000	2256.0000		12.5	9.8
91	2011/03/25 08:00:00	2280.0000	2280.0000		8.2	10.7
92	2011/03/26 08:00:00	2304.0000	2304.0000		5.0	9.3
93	2011/03/27 08:00:00	2328.0000	2328.0000		7.2	14.0
94	2011/03/28 08:00:00	2352.0000	2352.0000		6.5	14.3
95	2011/03/29 08:00:00	2376.0000	2376.0000		8.4	16.7
96	2011/03/30 08:00:00	2400.0000	2400.0000		9.2	7.0
97	2011/03/31 08:00:00	2424.0000	2424.0000		7.6	8.5
98	2011/04/01 08:00:00	2448.0000	2448.0000		9.2	7.7
99	2011/04/02 08:00:00	2472.0000	2472.0000		7.1	7.5
100	2011/04/03 08:00:00	2496.0000	2496.0000		8.4	9.3
101	2011/04/04 08:00:00	2520.0000	2520.0000		9.2	6.9
102	2011/04/05 08:00:00	2544.0000	2544.0000		8.0	8.5
103	2011/04/06 08:00:00	2568.0000	2568.0000		9.0	6.9
104	2011/04/07 08:00:00	2592.0000	2592.0000		3.1	0.8
105	2011/04/08 08:00:00	2616.0000	2616.0000		0.0	0.0
106	2011/04/15 08:00:00	2784.0000	2784.0000		0.0	0.0
107	2011/04/16 08:00:00	2808.0000	2808.0000		6.2	6.1
108	2011/04/17 08:00:00	2832.0000	2832.0000		7.9	7.9
109	2011/04/18 08:00:00	2856.0000	2856.0000		8.3	8.3
110	2011/04/19 08:00:00	2880.0000	2880.0000		9.1	7.3
111	2011/04/20 08:00:00	2904.0000	2904.0000		7.5	8.2
112	2011/04/21 08:00:00	2928.0000	2928.0000		8.6	7.5
113	2011/04/22 08:00:00	2952.0000	2952.0000		6.8	7.3
114	2011/04/23 08:00:00	2976.0000	2976.0000		9.1	8.6
115	2011/04/24 08:00:00	3000.0000	3000.0000		10.8	7.5
116	2011/04/25 08:00:00	3024.0000	3024.0000		8.9	8.5
117	2011/04/26 08:00:00	3048.0000	3048.0000		10.4	7.7
118	2011/04/27 08:00:00	3072.0000	3072.0000		11.4	7.9
119	2011/04/28 08:00:00	3096.0000	3096.0000		10.1	7.5
120	2011/04/29 08:00:00	3120.0000	3120.0000		10.8	8.0
121	2011/04/30 08:00:00	3144.0000	3144.0000		9.0	6.7
122	2011/05/01 08:00:00	3168.0000	3168.0000		10.9	8.1
123	2011/05/02 08:00:00	3192.0000	3192.0000		10.3	7.5
124	2011/05/03 08:00:00	3216.0000	3216.0000		10.3	8.3
125	2011/05/04 08:00:00	3240.0000	3240.0000		11.3	7.9
126	2011/05/05 08:00:00	3264.0000	3264.0000		10.9	9.8
127	2011/05/06 08:00:00	3288.0000	3288.0000		11.2	7.9
128	2011/05/07 08:00:00	3312.0000	3312.0000		10.7	8.1
129	2011/05/08 08:00:00	3336.0000	3336.0000		11.0	8.3
130	2011/05/09 08:00:00	3360.0000	3360.0000		11.1	8.4
131	2011/05/10 08:00:00	3384.0000	3384.0000		10.5	8.9
132	2011/05/11 08:00:00	3408.0000	3408.0000		11.0	8.0
133	2011/05/12 08:00:00	3432.0000	3432.0000		11.1	8.4
134	2011/05/13 08:00:00	3456.0000	3456.0000		11.0	8.0
135	2011/05/14 08:00:00	3480.0000	3480.0000		10.8	8.6
136	2011/05/15 08:00:00	3504.0000	3504.0000		10.5	8.0
137	2011/05/16 08:00:00	3528.0000	3528.0000		10.6	8.1
138	2011/05/17 08:00:00	3552.0000	3552.0000		10.3	8.7
139	2011/05/18 08:00:00	3576.0000	3576.0000		3.2	9.4
140	2011/05/19 08:00:00	3600.0000	3600.0000		3.0	8.9
141	2011/05/20 08:00:00	3624.0000	3624.0000		3.1	9.5
142	2011/05/21 08:00:00	3648.0000	3648.0000		3.2	9.3
143	2011/05/22 08:00:00	3672.0000	3672.0000		3.1	9.7
144	2011/05/23 08:00:00	3696.0000	3696.0000		3.1	10.7
145	2011/05/24 08:00:00	3720.0000	3720.0000		3.1	9.6
146	2011/05/25 08:00:00	3744.0000	3744.0000		3.1	10.0
147	2011/05/26 08:00:00	3768.0000	3768.0000		3.0	9.9
148	2011/05/27 08:00:00	3792.0000	3792.0000		3.0	9.8
149	2011/05/28 08:00:00	3816.0000	3816.0000		2.9	10.0
150	2011/05/29 08:00:00	3840.0000	3840.0000		2.8	9.6
151	2011/05/30 08:00:00	3864.0000	3864.0000		3.2	10.3
152	2011/05/31 08:00:00	3888.0000	3888.0000		3.1	8.9

Pressure/Production Summary

Item	Date Clock Time	Time	Cumulative Time	Calculated Sandface Pressure	Oil Rate	Water Rate
	YYYY/MM/DD HH:mm:ss	h	h	kPa(a)	m ³ /d	m ³ /d
153	2011/06/01 08:00:00	3912.0000	3912.0000		3.0	10.1
154	2011/06/02 08:00:00	3936.0000	3936.0000		3.1	9.2
155	2011/06/03 08:00:00	3960.0000	3960.0000		3.0	9.6
156	2011/06/04 08:00:00	3984.0000	3984.0000		3.1	10.8
157	2011/06/05 08:00:00	4008.0000	4008.0000		2.8	9.2
158	2011/06/06 08:00:00	4032.0000	4032.0000		3.0	8.5
159	2011/06/07 08:00:00	4056.0000	4056.0000		2.9	9.5
160	2011/06/08 08:00:00	4080.0000	4080.0000		3.2	9.4
161	2011/06/09 08:00:00	4104.0000	4104.0000		3.0	9.2
162	2011/06/10 08:00:00	4128.0000	4128.0000		2.9	10.2
163	2011/06/11 08:00:00	4152.0000	4152.0000		3.0	10.3
164	2011/06/12 08:00:00	4176.0000	4176.0000		3.1	10.3
165	2011/06/13 08:00:00	4200.0000	4200.0000		3.2	11.4
166	2011/06/14 08:00:00	4224.0000	4224.0000		7.3	5.0
167	2011/06/15 08:00:00	4248.0000	4248.0000		7.0	5.2
168	2011/06/16 08:00:00	4272.0000	4272.0000		7.0	4.4
169	2011/06/17 08:00:00	4296.0000	4296.0000		6.4	4.8
170	2011/06/18 08:00:00	4320.0000	4320.0000		2.7	2.2
171	2011/06/19 08:00:00	4344.0000	4344.0000		0.0	0.0
172	2011/06/23 08:00:00	4440.0000	4440.0000		0.0	0.0
173	2011/06/24 08:00:00	4464.0000	4464.0000		4.2	3.0
174	2011/06/25 08:00:00	4488.0000	4488.0000		7.3	5.0
175	2011/06/26 08:00:00	4512.0000	4512.0000		7.2	5.2
176	2011/06/27 08:00:00	4536.0000	4536.0000		7.5	5.3
177	2011/06/28 08:00:00	4560.0000	4560.0000		7.0	5.3
178	2011/06/29 08:00:00	4584.0000	4584.0000		6.9	4.6
179	2011/06/30 08:00:00	4608.0000	4608.0000		7.1	5.1
180	2011/07/01 08:00:00	4632.0000	4632.0000		7.4	5.2
181	2011/07/02 08:00:00	4656.0000	4656.0000		7.9	6.1
182	2011/07/03 08:00:00	4680.0000	4680.0000		7.4	5.7
183	2011/07/04 08:00:00	4704.0000	4704.0000		7.5	5.7
184	2011/07/05 08:00:00	4728.0000	4728.0000		8.7	7.2
185	2011/07/06 08:00:00	4752.0000	4752.0000		7.4	5.8
186	2011/07/07 08:00:00	4776.0000	4776.0000		7.7	5.7
187	2011/07/08 08:00:00	4800.0000	4800.0000		7.6	5.4
188	2011/07/09 08:00:00	4824.0000	4824.0000		7.4	5.8
189	2011/07/10 08:00:00	4848.0000	4848.0000		6.9	4.8
190	2011/07/11 08:00:00	4872.0000	4872.0000		7.1	6.0
191	2011/07/12 08:00:00	4896.0000	4896.0000		6.9	5.7
192	2011/07/13 08:00:00	4920.0000	4920.0000		7.6	5.3
193	2011/07/14 08:00:00	4944.0000	4944.0000		6.9	5.4
194	2011/07/15 08:00:00	4968.0000	4968.0000		7.2	5.2
195	2011/07/16 08:00:00	4992.0000	4992.0000		7.6	5.5
196	2011/07/17 08:00:00	5016.0000	5016.0000		7.1	4.7
197	2011/07/18 08:00:00	5040.0000	5040.0000		7.2	4.3
198	2011/07/19 08:00:00	5064.0000	5064.0000		7.6	4.7
199	2011/07/20 08:00:00	5088.0000	5088.0000		7.8	5.2
200	2011/07/20 10:25:50	5090.4306	5090.4306	1679.69	7.8	5.2
201	2011/07/20 10:30:50	5090.5139	5090.5139	1685.87	0.0	0.0
202	2011/07/20 10:35:50	5090.5972	5090.5972	1691.62		
203	2011/07/20 10:40:50	5090.6806	5090.6806	1696.93		
204	2011/07/20 10:45:50	5090.7639	5090.7639	1701.82		
205	2011/07/20 10:50:50	5090.8472	5090.8472	1706.31		
206	2011/07/20 10:55:50	5090.9306	5090.9306	1710.45		
207	2011/07/20 11:05:50	5091.0972	5091.0972	1717.93		
208	2011/07/20 11:15:50	5091.2639	5091.2639	1725.07		
209	2011/07/20 11:25:50	5091.4306	5091.4306	1731.22		
210	2011/07/20 11:35:50	5091.5972	5091.5972	1737.35		
211	2011/07/20 11:45:50	5091.7639	5091.7639	1743.46		
212	2011/07/20 11:55:50	5091.9306	5091.9306	1748.99		
213	2011/07/20 12:05:50	5092.0972	5092.0972	1754.27		
214	2011/07/20 12:15:50	5092.2639	5092.2639	1759.78		
215	2011/07/20 12:25:50	5092.4306	5092.4306	1764.68		
216	2011/07/20 12:35:50	5092.5972	5092.5972	1769.81		
217	2011/07/20 12:45:50	5092.7639	5092.7639	1774.79		
218	2011/07/20 12:55:50	5092.9306	5092.9306	1779.62		
219	2011/07/20 13:05:50	5093.0972	5093.0972	1784.32		
220	2011/07/20 13:15:50	5093.2639	5093.2639	1788.92		
221	2011/07/20 13:25:50	5093.4306	5093.4306	1793.40		
222	2011/07/20 13:35:50	5093.5972	5093.5972	1797.79		
223	2011/07/20 13:45:50	5093.7639	5093.7639	1802.07		
224	2011/07/20 13:55:50	5093.9306	5093.9306	1806.26		
225	2011/07/20 14:05:50	5094.0972	5094.0972	1810.34		
226	2011/07/20 14:15:50	5094.2639	5094.2639	1814.73		
227	2011/07/20 14:25:50	5094.4306	5094.4306	1818.64		
228	2011/07/20 14:35:50	5094.5972	5094.5972	1822.46		

Pressure/Production Summary

Item	Date Clock Time	Time	Cumulative Time	Calculated Sandface Pressure	Oil Rate	Water Rate
	YYYY/MM/DD HH:mm:ss	h	h	kPa(a)	m ³ /d	m ³ /d
229	2011/07/20 14:45:50	5094.7639	5094.7639	1826.20		
230	2011/07/20 14:55:50	5094.9306	5094.9306	1829.88		
231	2011/07/20 15:05:50	5095.0972	5095.0972	1833.49		
232	2011/07/20 15:15:50	5095.2639	5095.2639	1837.43		
233	2011/07/20 15:25:50	5095.4306	5095.4306	1840.91		
234	2011/07/20 15:35:50	5095.5972	5095.5972	1844.34		
235	2011/07/20 15:45:50	5095.7639	5095.7639	1847.72		
236	2011/07/20 15:55:50	5095.9306	5095.9306	1851.04		
237	2011/07/20 16:05:50	5096.0972	5096.0972	1854.29		
238	2011/07/20 16:15:50	5096.2639	5096.2639	1857.47		
239	2011/07/20 16:25:50	5096.4306	5096.4306	1860.60		
240	2011/07/20 16:35:50	5096.5972	5096.5972	1864.04		
241	2011/07/20 16:45:50	5096.7639	5096.7639	1867.01		
242	2011/07/20 16:55:50	5096.9306	5096.9306	1869.92		
243	2011/07/20 17:05:50	5097.0972	5097.0972	1872.72		
244	2011/07/20 17:15:50	5097.2639	5097.2639	1875.46		
245	2011/07/20 17:25:50	5097.4306	5097.4306	1878.19		
246	2011/07/20 17:35:50	5097.5972	5097.5972	1880.87		
247	2011/07/20 17:45:50	5097.7639	5097.7639	1883.94		
248	2011/07/20 17:55:50	5097.9306	5097.9306	1886.59		
249	2011/07/20 18:15:50	5098.2639	5098.2639	1891.78		
250	2011/07/20 18:35:50	5098.5972	5098.5972	1897.26		
251	2011/07/20 18:55:50	5098.9306	5098.9306	1902.21		
252	2011/07/20 19:15:50	5099.2639	5099.2639	1907.43		
253	2011/07/20 19:35:50	5099.5972	5099.5972	1912.10		
254	2011/07/20 19:55:50	5099.9306	5099.9306	1916.70		
255	2011/07/20 20:15:50	5100.2639	5100.2639	1921.60		
256	2011/07/20 20:35:50	5100.5972	5100.5972	1926.04		
257	2011/07/20 20:55:50	5100.9306	5100.9306	1930.81		
258	2011/07/20 21:15:50	5101.2639	5101.2639	1935.18		
259	2011/07/20 21:35:50	5101.5972	5101.5972	1939.93		
260	2011/07/20 21:55:50	5101.9306	5101.9306	1944.33		
261	2011/07/20 22:15:50	5102.2639	5102.2639	1949.16		
262	2011/07/20 22:35:50	5102.5972	5102.5972	1953.62		
263	2011/07/20 22:55:50	5102.9306	5102.9306	1958.54		
264	2011/07/20 23:25:50	5103.4306	5103.4306	1965.34		
265	2011/07/20 23:55:50	5103.9306	5103.9306	1972.48		
266	2011/07/21 00:25:50	5104.4306	5104.4306	1979.58		
267	2011/07/21 00:55:50	5104.9306	5104.9306	1986.12		
268	2011/07/21 01:25:50	5105.4306	5105.4306	1992.91		
269	2011/07/21 01:55:50	5105.9306	5105.9306	1999.60		
270	2011/07/21 02:55:50	5106.9306	5106.9306	2012.50		
271	2011/07/21 03:55:50	5107.9306	5107.9306	2025.25		
272	2011/07/21 04:55:50	5108.9306	5108.9306	2038.47		
273	2011/07/21 05:55:50	5109.9306	5109.9306	2050.85		
274	2011/07/21 07:55:50	5111.9306	5111.9306	2074.35		
275	2011/07/21 09:55:50	5113.9306	5113.9306	2095.14		
276	2011/07/21 11:55:50	5115.9306	5115.9306	2112.15		
277	2011/07/21 13:55:50	5117.9306	5117.9306	2127.18		
278	2011/07/21 15:55:50	5119.9306	5119.9306	2140.09		
279	2011/07/21 17:55:50	5121.9306	5121.9306	2151.14		
280	2011/07/21 19:55:50	5123.9306	5123.9306	2160.95		
281	2011/07/21 21:55:50	5125.9306	5125.9306	2169.79		
282	2011/07/21 23:55:50	5127.9306	5127.9306	2178.24		
283	2011/07/22 01:55:50	5129.9306	5129.9306	2186.50		
284	2011/07/22 03:55:50	5131.9306	5131.9306	2195.31		
285	2011/07/22 05:55:50	5133.9306	5133.9306	2204.33		
286	2011/07/22 07:55:50	5135.9306	5135.9306	2212.82		
287	2011/07/22 09:55:50	5137.9306	5137.9306	2221.42		
288	2011/07/22 11:55:50	5139.9306	5139.9306	2227.83		
289	2011/07/22 15:55:50	5143.9306	5143.9306	2240.42		
290	2011/07/22 19:55:50	5147.9306	5147.9306	2250.06		
291	2011/07/22 23:55:50	5151.9306	5151.9306	2259.79		
292	2011/07/23 03:55:50	5155.9306	5155.9306	2269.45		
293	2011/07/23 07:55:50	5159.9306	5159.9306	2278.26		
294	2011/07/23 11:55:50	5163.9306	5163.9306	2286.45		
295	2011/07/23 15:55:50	5167.9306	5167.9306	2294.60		
296	2011/07/23 19:55:50	5171.9306	5171.9306	2302.43		
297	2011/07/23 23:55:50	5175.9306	5175.9306	2310.16		
298	2011/07/24 03:55:50	5179.9306	5179.9306	2317.30		
299	2011/07/24 07:55:50	5183.9306	5183.9306	2324.30		
300	2011/07/24 11:55:50	5187.9306	5187.9306	2330.79		
301	2011/07/24 15:55:50	5191.9306	5191.9306	2336.93		
302	2011/07/24 19:55:50	5195.9306	5195.9306	2342.49		
303	2011/07/24 23:55:50	5199.9306	5199.9306	2347.72		
304	2011/07/25 03:55:50	5203.9306	5203.9306	2352.63		

PENN WEST WASKADA UNIT NO. 13 HZNT
 104/05-01-002-26W1/00
 Lower Amaranth: 1042.0 - 1662.3 mKB MD
 July 20 - 30, 2011

Pressure/Production Summary

Item	Date Clock Time	Time	Cumulative Time	Calculated Sandface Pressure	Oil Rate	Water Rate
	YYYY/MM/DD HH:mm:ss	h	h	kPa(a)	m ³ /d	m ³ /d
305	2011/07/25 07:55:50	5207.9306	5207.9306	2357.91		
306	2011/07/25 11:55:50	5211.9306	5211.9306	2362.85		
307	2011/07/25 15:55:50	5215.9306	5215.9306	2368.03		
308	2011/07/25 19:55:50	5219.9306	5219.9306	2372.60		
309	2011/07/25 23:55:50	5223.9306	5223.9306	2376.57		
310	2011/07/26 03:55:50	5227.9306	5227.9306	2380.64		
311	2011/07/26 07:55:50	5231.9306	5231.9306	2384.25		
312	2011/07/26 11:55:50	5235.9306	5235.9306	2387.77		
313	2011/07/26 15:55:50	5239.9306	5239.9306	2391.17		
314	2011/07/26 19:55:50	5243.9306	5243.9306	2394.54		
315	2011/07/26 23:55:50	5247.9306	5247.9306	2398.19		
316	2011/07/27 03:55:50	5251.9306	5251.9306	2401.51		
317	2011/07/27 07:55:50	5255.9306	5255.9306	2404.85		
318	2011/07/27 11:55:50	5259.9306	5259.9306	2408.17		
319	2011/07/27 15:55:50	5263.9306	5263.9306	2411.32		
320	2011/07/27 19:55:50	5267.9306	5267.9306	2414.05		
321	2011/07/27 23:55:50	5271.9306	5271.9306	2416.76		
322	2011/07/28 03:55:50	5275.9306	5275.9306	2419.66		
323	2011/07/28 07:55:50	5279.9306	5279.9306	2422.77		
324	2011/07/28 11:55:50	5283.9306	5283.9306	2425.71		
325	2011/07/28 15:55:50	5287.9306	5287.9306	2428.95		
326	2011/07/28 19:55:50	5291.9306	5291.9306	2431.49		
327	2011/07/28 23:55:50	5295.9306	5295.9306	2434.12		
328	2011/07/29 03:55:50	5299.9306	5299.9306	2437.16		
329	2011/07/29 07:55:50	5303.9306	5303.9306	2440.71		
330	2011/07/29 11:55:50	5307.9306	5307.9306	2444.64		
331	2011/07/29 15:55:50	5311.9306	5311.9306	2448.45		
332	2011/07/29 19:55:50	5315.9306	5315.9306	2452.28		
333	2011/07/29 23:55:50	5319.9306	5319.9306	2455.32		
334	2011/07/30 03:55:50	5323.9306	5323.9306	2457.61		
335	2011/07/30 07:55:50	5327.9306	5327.9306	2459.99		

Reservoir Information

Legend

Wells

Project Wells



From: Trevor Thompson [<mailto:Trevor.Thompson@pennwest.com>]

Sent: September-20-11 11:14 AM

To: Reza Ali

Subject: 104-05-01-002-26W1 Buildup Data

Net Pay: 30m

Sw: 50%

Porosity: 13%

Penn West Exploration
Penn West Waskada Unit No.5 Hz 102/03-03-002-26W1/00
52134-2011-0649

SUMMARY OF PVT DATA

Reported Reservoir Conditions

Reservoir Pressure	7 398	kPa(g)
Reservoir Temperature	45.0	°C

Pressure-Volume Relations

Saturation Pressure	4 233	kPa(g)
Avg. Single-Phase Compressibility	9.71	E-7 v/v/kPa (34 474 to 4 233 kPa(g))
Thermal Exp. @ 34 474 kPa(g)	1.02398	V at 45.0 °C / V at 15.0 °C

Differential Vaporization Data
(at 4 233 kPa(g) and 45.0 °C)

Solution Gas/Oil Ratio	43.3	m ³ / m ³ of residual oil at 15.0 °C
Relative Oil Volume	1.151	m ³ / m ³ of residual oil at 15.0 °C
Density of Reservoir Fluid	788.5	kg/m ³

Reservoir Fluid Viscosity

1.53 mPa·s at 4 233 kPa(g) and 45.0 °C
--

Separator Test Results

Separator Conditions		Formation Volume Factor (A)	Total Solution Gas/Oil Ratio (B)	Tank Oil Gravity (°API at 15.6 °C)
kPa(g)	°C			
1 103	2.0	1.122	37.9	37.2

(A) Cubic metres of saturated oil per cubic metre of stock tank oil at 15.0 °C.

(B) Total standard cubic metres of gas per cubic metre of stock tank oil at 15.0 °C.

Penn West Exploration
Penn West Waskada Unit No.5 Hz 102/03-03-002-26W1/00
52134-2011-0649

VOLUMETRIC DATA
(at 45.0 °C)

Saturation Pressure (Psat)	4 233 kPa(g)
Density at Psat	788.5 kg/m ³
Thermal Exp. @ 34 474 kPa(g)	1.02398 V at 45.0 °C / V at 15.0 °C

AVERAGE SINGLE-PHASE COMPRESSIBILITIES

Pressure Range kPa(g)			Single-Phase Compressibility v/v/kPa
34 474	to	27 579	8.69 E -7
27 579	to	20 684	9.15 E -7
20 684	to	13 790	9.81 E -7
13 790	to	4 233	11.35 E -7

Penn West Exploration
Penn West Waskada Unit No.5 Hz 102/03-03-002-26W1/00
52134-2011-0649

RESERVOIR FLUID VISCOSITY

(at 45 °C)

Pressure kPa(g)	Oil Viscosity mPa·s	Gas Viscosity * mPa·s	Oil/Gas Viscosity Ratio
34 474	2.19		
27 579	2.04		
20 684	1.89		
13 790	1.74		
10 342	1.66		
7 398	1.60		
5 516	1.56		
4 233	1.53		
3 806	1.52	0.0118	129
3 103	1.54	0.0115	134
2 413	1.60	0.0113	142
1 724	1.72	0.0109	157
1 062	1.91	0.0105	182
717	2.07	0.0102	202
0	3.01		

* Gas Viscosity data calculated from correlation of Lee A.L., Gonzalez M.H., and Eakin B.E., "The Viscosity of Natural Gases", Journal of Petroleum Technology, August, 1966, pp. 997-1000.

Test Data

104-05-01-002-26w1-00 Production Data.txt

Production Date	Daily Oil (m3/d)	Daily Water (m3/d)
2010-Dec-21	13.09	22.94
2010-Dec-22	27.95	9.1
2010-Dec-23	25.61	9.79
2010-Dec-24	1.95	1.94
2010-Dec-25	26.56	24.7
2010-Dec-26	24.09	23.01
2010-Dec-27	21.95	24.03
2010-Dec-28	25.17	24
2010-Dec-29	24.6	20.2
2010-Dec-30	20.05	22.49
2010-Dec-31	28.11	23.45
2011-Jan-01	17.22	15.14
2011-Jan-02	9.45	11.08
2011-Jan-03	22.12	25.35
2011-Jan-04	23.75	19.79
2011-Jan-05	5.44	2.78
2011-Jan-06	2.05	38.62
2011-Jan-07	2.46	40.4
2011-Jan-08	2.39	32.48
2011-Jan-09	2.23	36.48
2011-Jan-10	2.62	32.43
2011-Jan-11	2.88	33.79
2011-Jan-12	2.56	45.94
2011-Jan-13	2.38	34.42
2011-Jan-14	2.17	41.34
2011-Jan-15	1.81	33.9
2011-Jan-16	2.97	30.7
2011-Jan-17	2.65	38.32
2011-Jan-18	1.89	27.79
2011-Jan-19	2.25	35.37
2011-Jan-20	2.05	33.62
2011-Jan-21	2.98	35.19
2011-Jan-22	2.62	37.25
2011-Jan-23	2.45	30.66
2011-Jan-24	2.35	34.23
2011-Jan-25	2.78	36.66
2011-Jan-26	1.86	34.17
2011-Jan-27	1.99	31.45
2011-Jan-28	0.3	4.98
2011-Jan-29	2.62	26.69
2011-Jan-30	2.41	31.2
2011-Jan-31	2.25	31.9
2011-Feb-01	2.18	30.12
2011-Feb-02	2.08	22.88
2011-Feb-03	0	0
2011-Feb-04	0	0
2011-Feb-05	0	0
2011-Feb-06	0	0
2011-Feb-07	0	0
2011-Feb-08	0	0
2011-Feb-09	0	0
2011-Feb-10	2.09	32.59
2011-Feb-11	1.85	42.44
2011-Feb-12	2.09	42.54
2011-Feb-13	2.05	38.41
2011-Feb-14	2.03	39.63
2011-Feb-15	2.12	41.8
2011-Feb-16	2.12	30.99
2011-Feb-17	1.63	26.18
2011-Feb-18	1.75	27.68
2011-Feb-19	1.56	24.21
2011-Feb-20	1.6	27.88
2011-Feb-21	1.61	27.8
2011-Feb-22	1.59	36.17
2011-Feb-23	1.59	34.25

104-05-01-002-26w1-00 Production Data.txt

2011-Feb-24	1.56	25.85
2011-Feb-25	6.29	19.34
2011-Feb-26	6.24	26.24
2011-Feb-27	6.2	22.7
2011-Feb-28	6.3	18.41
2011-Mar-01	7.04	20.9
2011-Mar-02	6.3	20.92
2011-Mar-03	6.62	23.12
2011-Mar-04	11.74	10.92
2011-Mar-05	11.83	13.07
2011-Mar-06	12.74	13.29
2011-Mar-07	11.77	11.95
2011-Mar-08	11.56	10.37
2011-Mar-09	11.52	11.74
2011-Mar-10	11.05	12.38
2011-Mar-11	11.58	13.96
2011-Mar-12	11.52	10.15
2011-Mar-13	12.05	13.06
2011-Mar-14	11.77	11.92
2011-Mar-15	12.3	11.4
2011-Mar-16	8.33	8.05
2011-Mar-17	9.56	14.08
2011-Mar-18	12.74	12.65
2011-Mar-19	11.91	11.59
2011-Mar-20	10.87	11
2011-Mar-21	11.34	12.69
2011-Mar-22	10.75	10.87
2011-Mar-23	13.42	12.14
2011-Mar-24	12.54	9.78
2011-Mar-25	8.21	10.73
2011-Mar-26	5.01	9.32
2011-Mar-27	7.23	13.99
2011-Mar-28	6.47	14.34
2011-Mar-29	8.4	16.71
2011-Mar-30	9.24	6.97
2011-Mar-31	7.62	8.49
2011-Apr-01	9.19	7.66
2011-Apr-02	7.11	7.55
2011-Apr-03	8.38	9.35
2011-Apr-04	9.16	6.87
2011-Apr-05	7.97	8.49
2011-Apr-06	8.97	6.93
2011-Apr-07	3.1	0.79
2011-Apr-08	0	0
2011-Apr-09	0	0
2011-Apr-10	0	0
2011-Apr-11	0	0
2011-Apr-12	0	0
2011-Apr-13	0	0
2011-Apr-14	0	0
2011-Apr-15	0	0
2011-Apr-16	6.17	6.08
2011-Apr-17	7.88	7.92
2011-Apr-18	8.26	8.27
2011-Apr-19	9.1	7.33
2011-Apr-20	7.48	8.22
2011-Apr-21	8.61	7.48
2011-Apr-22	6.77	7.25
2011-Apr-23	9.06	8.64
2011-Apr-24	10.79	7.48
2011-Apr-25	8.88	8.49
2011-Apr-26	10.36	7.68
2011-Apr-27	11.42	7.9
2011-Apr-28	10.13	7.47
2011-Apr-29	10.81	7.96
2011-Apr-30	9	6.74

104-05-01-002-26w1-00 Production Data.txt

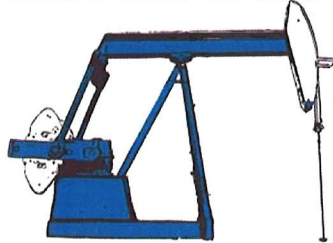
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2011-May-02	10.27	7.53
2011-May-03	10.28	8.29
2011-May-04	11.3	7.94
2011-May-05	10.91	9.82
2011-May-06	11.16	7.93
2011-May-07	10.71	8.11
2011-May-08	11.02	8.27
2011-May-09	11.14	8.39
2011-May-10	10.51	8.9
2011-May-11	10.96	8.04
2011-May-12	11.05	8.44
2011-May-13	10.98	8.03
2011-May-14	10.77	8.59
2011-May-15	10.48	8.02
2011-May-16	10.58	8.12
2011-May-17	10.31	8.73
2011-May-18	3.19	9.43
2011-May-19	3.05	8.89
2011-May-20	3.08	9.49
2011-May-21	3.16	9.25
2011-May-22	3.14	9.69
2011-May-23	3.15	10.73
2011-May-24	3.08	9.58
2011-May-25	3.08	9.96
2011-May-26	3.01	9.93
2011-May-27	3	9.82
2011-May-28	2.85	10
2011-May-29	2.84	9.64
2011-May-30	3.18	10.32
2011-May-31	3.09	8.93
2011-Jun-01	3.05	10.12
2011-Jun-02	3.09	9.15
2011-Jun-03	3.05	9.63
2011-Jun-04	3.06	10.84
2011-Jun-05	2.84	9.21
2011-Jun-06	2.95	8.52
2011-Jun-07	2.86	9.53
2011-Jun-08	3.22	9.43
2011-Jun-09	2.95	9.19
2011-Jun-10	2.91	10.16
2011-Jun-11	3.05	10.27
2011-Jun-12	3.12	10.27
2011-Jun-13	3.21	11.39
2011-Jun-14	7.26	4.96
2011-Jun-15	7.02	5.24
2011-Jun-16	6.95	4.39
2011-Jun-17	6.41	4.81
2011-Jun-18	2.69	2.2
2011-Jun-19	0	0
2011-Jun-20	0	0
2011-Jun-21	0	0
2011-Jun-22	0	0
2011-Jun-23	0	0
2011-Jun-24	4.16	3.01
2011-Jun-25	7.32	4.98
2011-Jun-26	7.16	5.24
2011-Jun-27	7.51	5.33
2011-Jun-28	6.98	5.25
2011-Jun-29	6.9	4.56
2011-Jun-30	7.12	5.1
2011-Jul-01	7.43	5.22
2011-Jul-02	7.92	6.07
2011-Jul-03	7.42	5.72
2011-Jul-04	7.54	5.74
2011-Jul-05	8.7	7.15

104-05-01-002-26w1-00 Production Data.txt

2011-Jul-06	7.4	5.77
2011-Jul-07	7.67	5.7
2011-Jul-08	7.59	5.44
2011-Jul-09	7.42	5.81
2011-Jul-10	6.94	4.75
2011-Jul-11	7.11	6
2011-Jul-12	6.92	5.68
2011-Jul-13	7.57	5.29
2011-Jul-14	6.93	5.41
2011-Jul-15	7.2	5.18
2011-Jul-16	7.59	5.46
2011-Jul-17	7.09	4.69
2011-Jul-18	7.22	4.34
2011-Jul-19	7.58	4.68
2011-Jul-20	0	0
2011-Jul-21	0	0
2011-Jul-22	0	0
2011-Jul-23	0	0
2011-Jul-24	0	0
2011-Jul-25	0	0
2011-Jul-26	0	0
2011-Jul-27	0	0
2011-Jul-28	0	0
2011-Jul-29	0	0
2011-Jul-30	0	0
2011-Jul-31	0	0
2011-Aug-01	0	5.34
2011-Aug-02	0	5.34
2011-Aug-03	0	5.3
2011-Aug-04	0	5.56
2011-Aug-05	0	5.1
2011-Aug-06	6.53	4.9
2011-Aug-07	7.45	6.56
2011-Aug-14	7.89	5.44
2011-Aug-17	7.79	5.62
2011-Aug-21	4.39	2.63
2011-Aug-22	4.25	2.55
2011-Aug-23	4.4	2.4
2011-Aug-08	7.45	5.31
2011-Aug-10	0	0
2011-Aug-13	7.91	5.65
2011-Aug-15	7.42	5.44
2011-Aug-25	4.38	2.47
2011-Aug-11	0	0
2011-Aug-16	7.54	6.8
2011-Aug-12	0	0
2011-Aug-18	7.43	6.14
2011-Aug-09	0	0
2011-Aug-19	7.63	5.5
2011-Aug-20	7.51	6.35

**ACOUSTIC PRESSURE SURVEY
BUILD-UP TEST**

LEVEL BEST



TECHNOLOGIES LTD.

WASKADA UNIT NO. 13 HZNTL B5-1-2-26 WPM

104/05-01-002-26W1/0

Surface Location: 104/07-01-002-26W1/0 (HZTL)

License: 007557

Field: WASKADA MB

Formation: AMARANTH

Pool: LOWER AMARANTH A

JULY 2011

DATA COLLECTION SERVICES

Prepared by: Sean Chakowski, C.E.T. (NR-Tec Ltd.)

Date: 2011-Aug-04

**Prepared for: BRAD CALDWELL
PENN WEST PETROLEUM**

NR-Tec Ltd.

P.O. Box 36028 Lakeview RPO, Calgary, Alberta, Canada T3E 7C6

Tel: (403) 283-1416 Fax: (403) 206-7783

<http://www.nr-tec.com>

PENN WEST PETROLEUM

ACOUSTIC PRESSURE SURVEY (BUILD-UP)
WASKADA UNIT NO. 13 HZNTL B5-1-2-26 WPM
104/05-01-002-26W1/0
WASKADA MB
POOL: LOWER AMARANTH A
2011-JUL-20 TO 2011-JUL-30

TEST SUMMARY:

- An acoustic well sounder instrument was installed into the casing on 2011-07-20 at 10:25 hours. The fluid level was at 96.2 joints.
- The well was shut-in on 2011-07-20 at 10:25 hours to start the build-up.
- The build-up test was concluded on 2011-07-30 at 07:55 hours.
- A final bottomhole pressure of 2,460 kPa (absolute) was calculated at the mid-point of the producing interval after 9.9 days of shut-in.
- The rate of change in pressure during the last 8.0 hours of shut-in is 0.58 kPa/hr.

PRESSURE DATA CALCULATIONS:

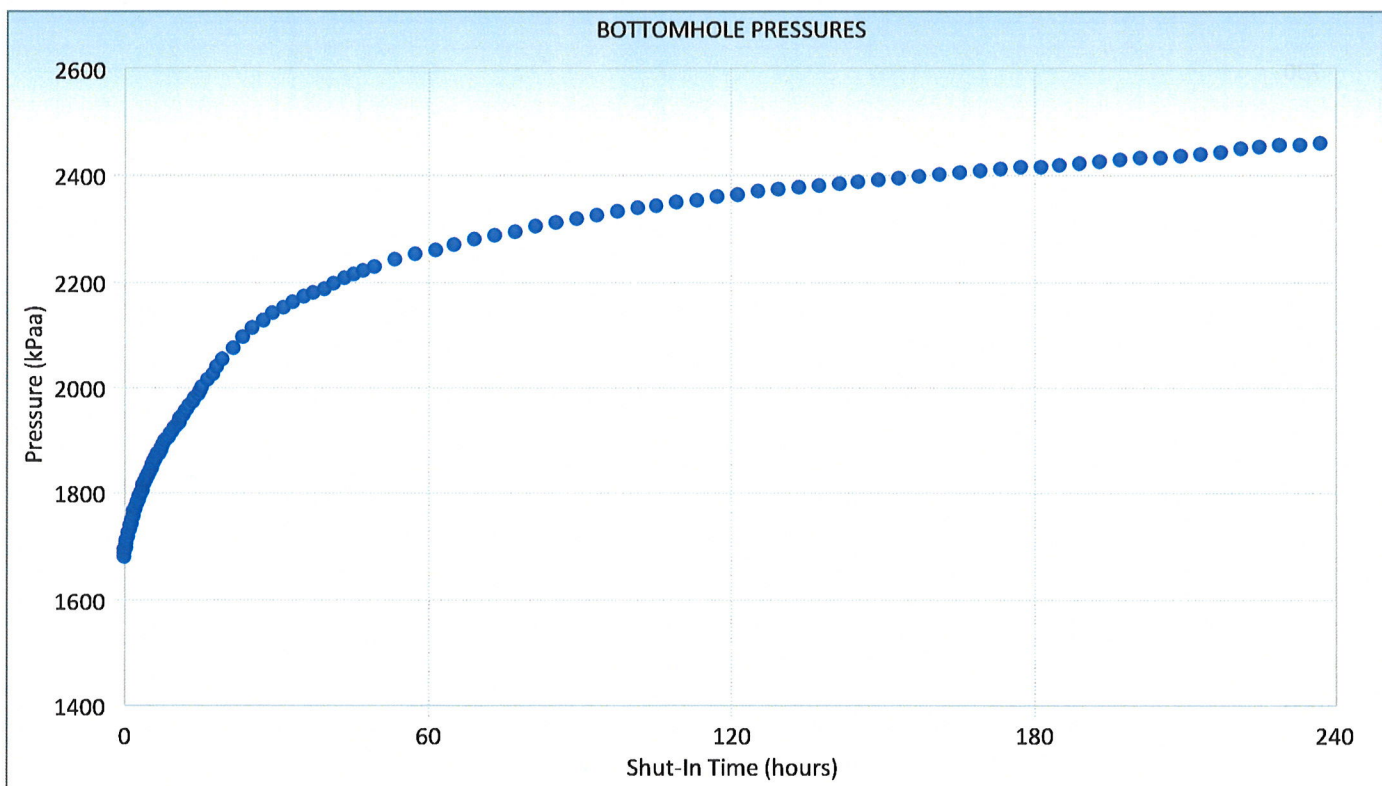
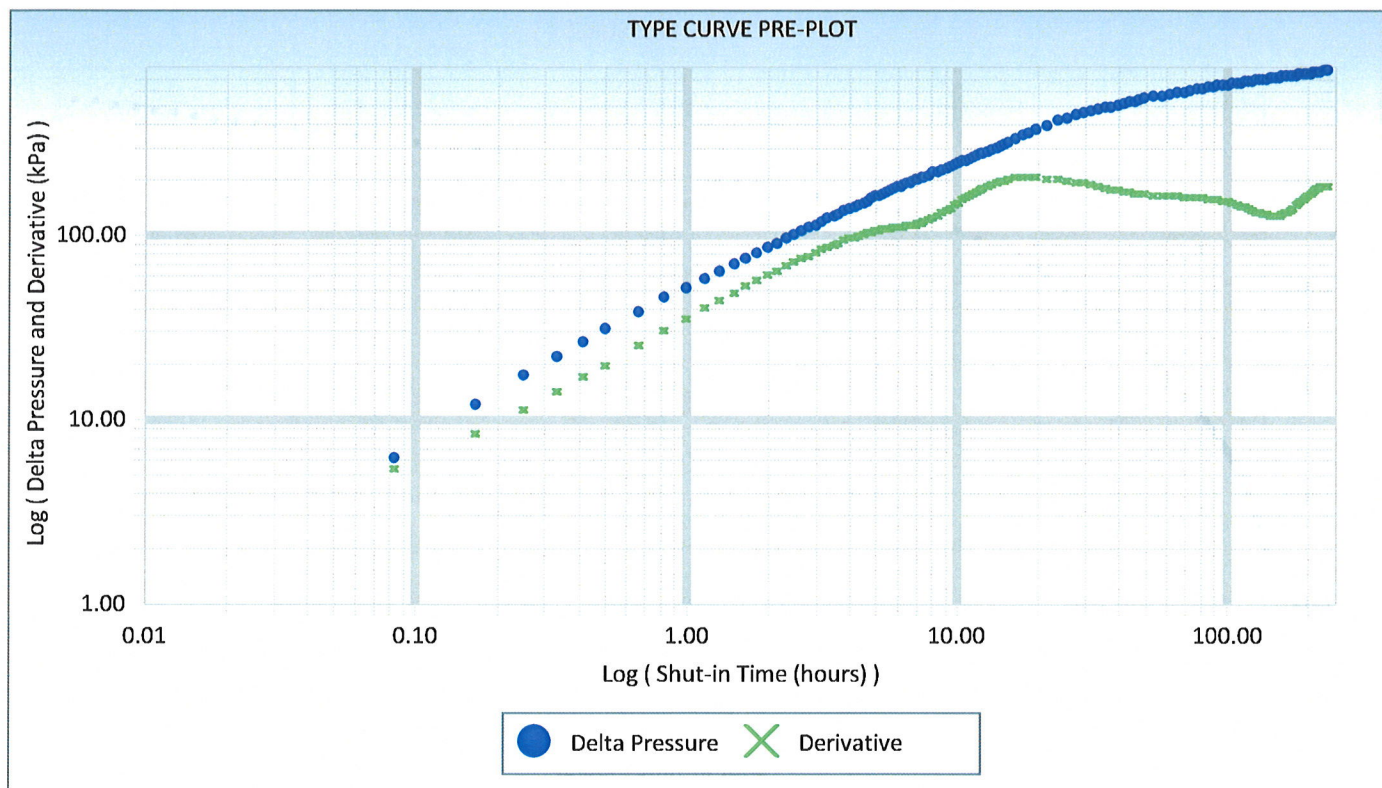
- The bottomhole pressures were calculated using the following information:

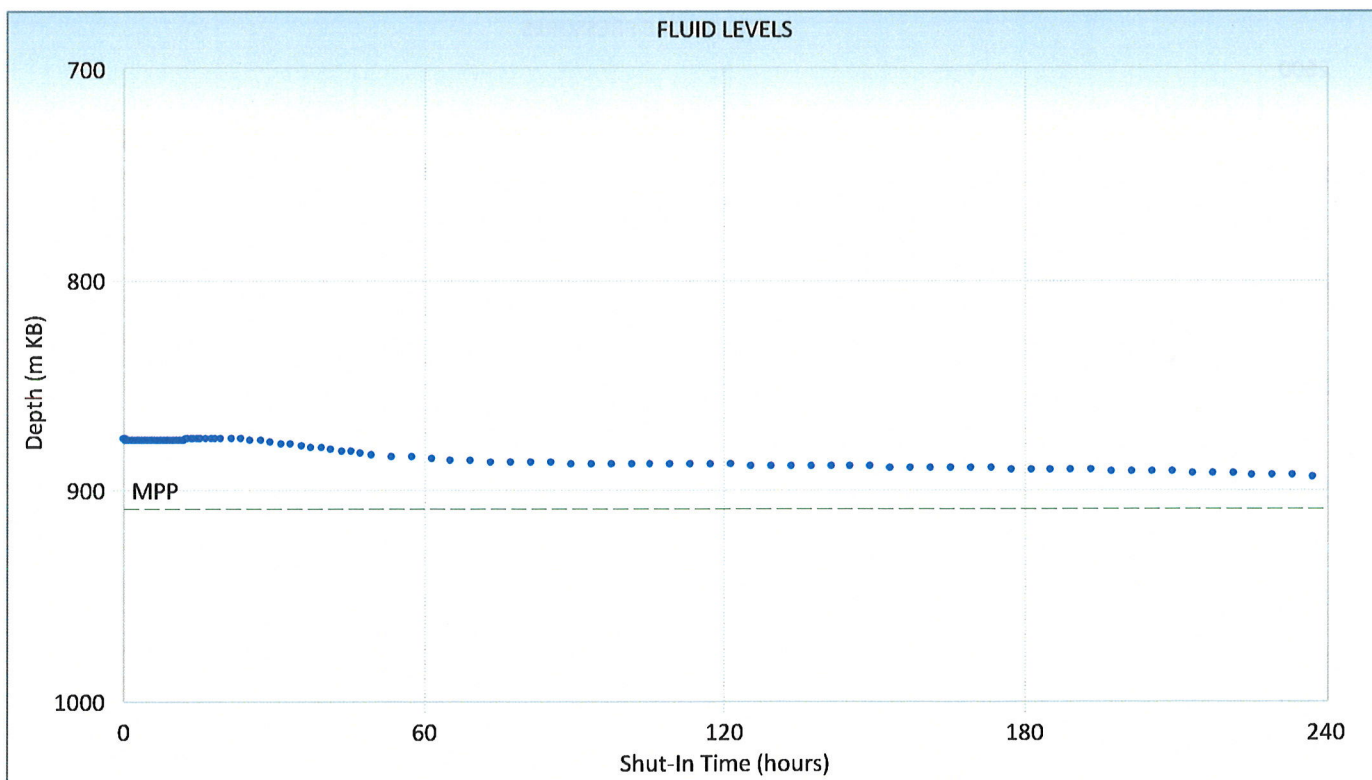
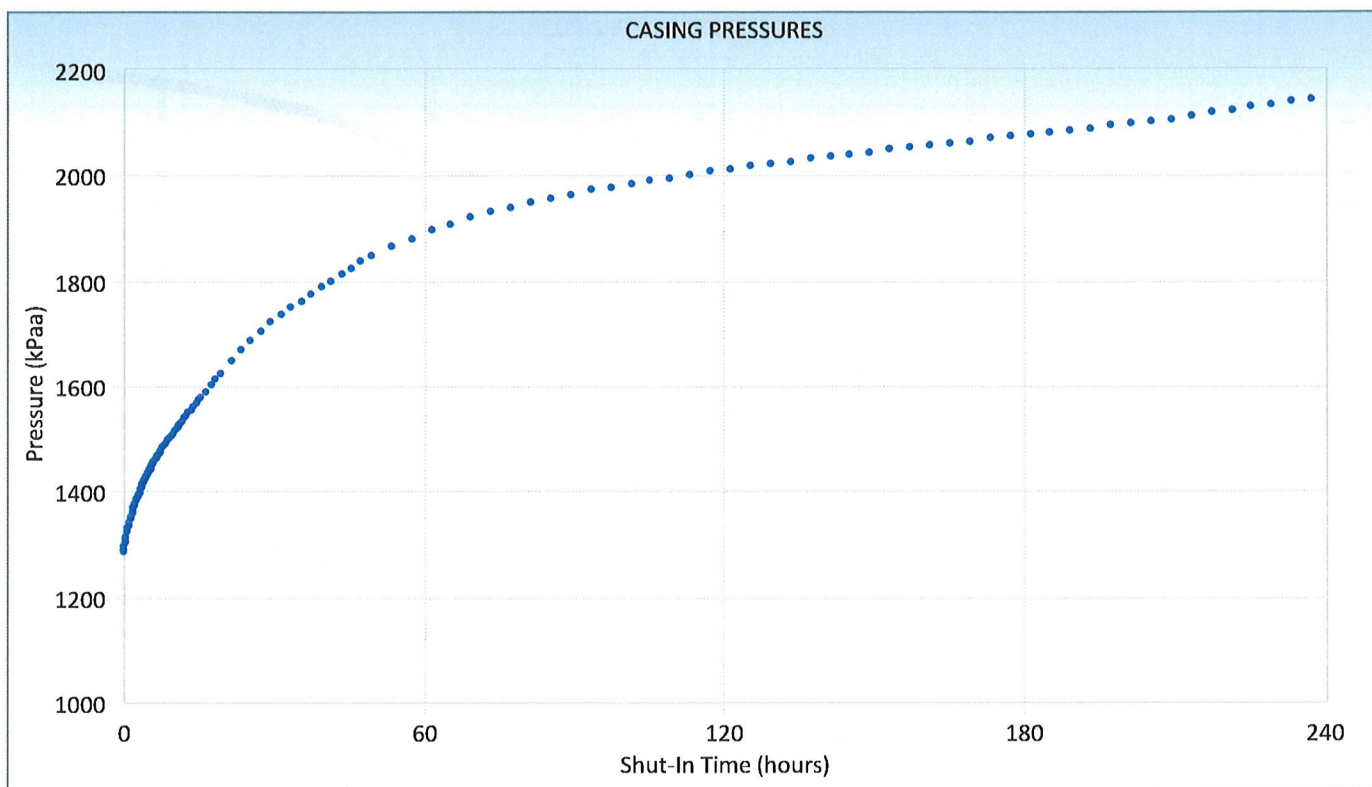
Atmospheric Pressure	93.0 kPa
Formation Depth	908.40 m KB (TVD) / 1,352.15 m KB
Oil Gravity	37.79 °API
Water Gravity	1.067
Gas Gravity	0.750
Oil Production	7.81 m ³ /d
Water Production	5.20 m ³ /d
Gas Production	0.11 E ³ m ³ /d
Bottomhole Temperature	50.00 °C

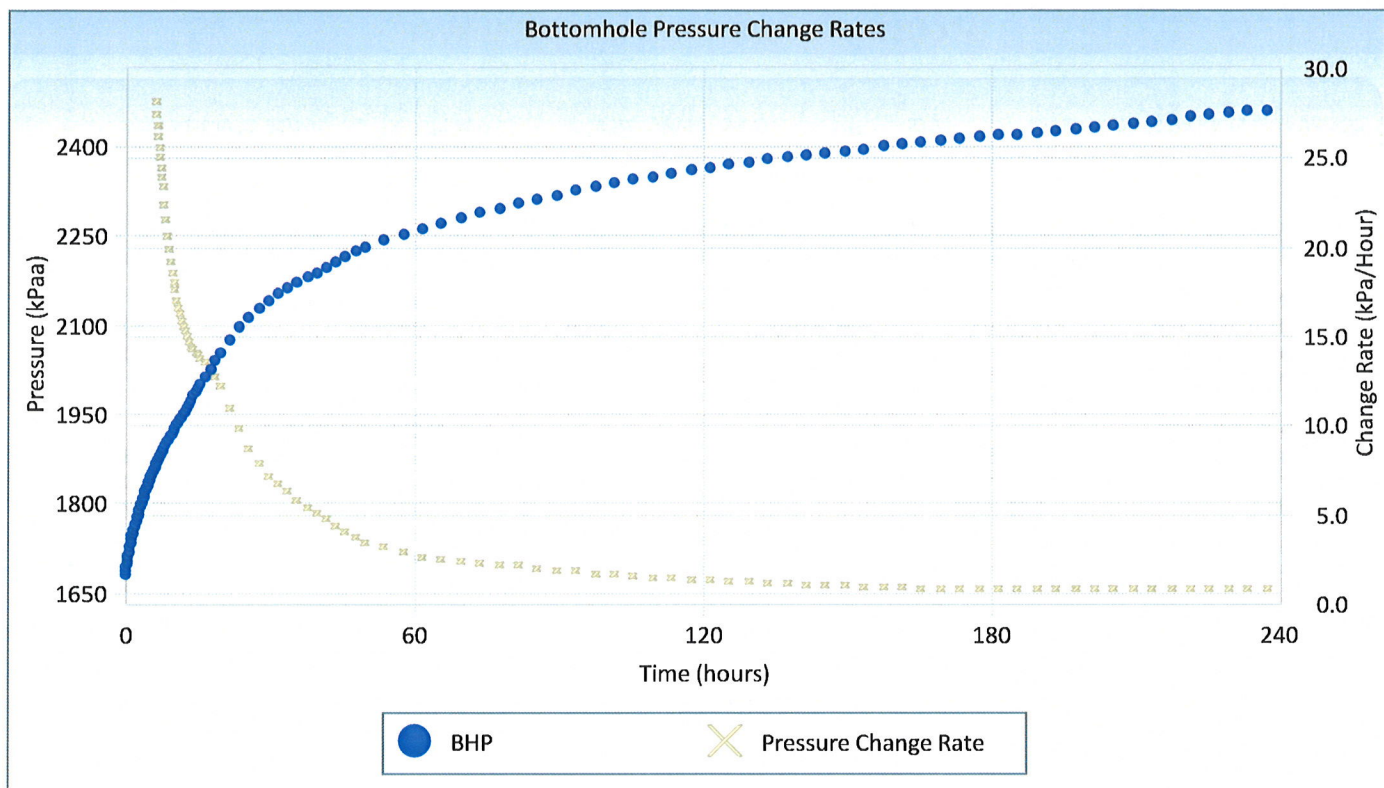
ATTACHMENTS:

ACOUSTIC WELLSOUNDER PRESSURE SURVEY DATA
TYPE CURVE PRE-PLOT
BOTTOMHOLE PRESSURE VERSUS TIME
CASING PRESSURE VERSUS TIME
FLUID LEVEL VERSUS TIME









ACOUSTIC WELLSOUNDER PRESSURE SURVEY

COMPANY: PENN WEST PETROLEUM	POOL: LOWER AMARANTH A	U.W.I.: 104/05-01-002-26W1/0
FIELD: WASKADA MB	WELL STATUS: OIL	WELL NAME: WASKADA UNIT NO. 13 HZNTL B5-1-2-26 WPM
SHUT-IN: 2011-Jul-20 @ 10:25:50	LICENSE: 007557	SURFACE LCN.: 104/07-01-002-26W1/0 (HZTL)

ELEVATIONS:	FLUID PROPERTIES:	TEMPERATURES:
Kelly Bushing (KB): 471.50 m	Gas Gravity: 0.750	Surface: 2.50 °C
Ground Level (GL): 467.50 m	Oil Gravity: 37.790 °API	Reservoir: 50.00 °C
KB to GL: 4.00 m	Water Gravity: 1.067	

PRODUCTION RATES:	PRODUCING INTERVAL:
Gas: 0.11 E ³ m ³ /d	Top: 907.28 m KB (TVD)
Oil: 7.81 m ³ /d	1,042.00 m KB (MD)
Water: 5.20 m ³ /d	Bottom: 909.27 m KB (TVD)
	1,662.30 m KB (MD)
	Mid-Point: 908.40 m KB (TVD)
	1,352.15 m KB (MD)

NOTES:

All calculated depths have been corrected to True Vertical Depth.

NO.	TEST			JOINTS TO LIQUID	SURFACE PRESSURE (kPaa)	GAS COLUMN			OIL COLUMN			EMULSION COLUMN			PRESSURE @ MPP (kPaa)
	TIME (hours)	DATE	TIME			HEIGHT (m)	GRADIENT (kPa/m)	PRESSURE (kPa)	HEIGHT (m)	GRADIENT (kPa/m)	PRESSURE (kPa)	HEIGHT (m)	GRADIENT (kPa/m)	PRESSURE (kPa)	
1	0.000	2011-Jul-20	10:25:50	96.21	1284.8	871.5	0.120	104.8	--	--	--	32.9	8.820	290.1	1679.7
2	0.083	2011-Jul-20	10:30:50	96.22	1290.8	871.5	0.121	105.3	--	--	--	32.8	8.819	289.7	1685.9
3	0.167	2011-Jul-20	10:35:50	96.23	1296.5	871.6	0.121	105.8	--	--	--	32.8	8.819	289.3	1691.6
4	0.250	2011-Jul-20	10:40:50	96.24	1301.8	871.6	0.122	106.3	--	--	--	32.8	8.819	288.9	1696.9
5	0.333	2011-Jul-20	10:45:50	96.25	1306.7	871.7	0.122	106.7	--	--	--	32.7	8.819	288.5	1701.8
6	0.417	2011-Jul-20	10:50:50	96.26	1311.2	871.7	0.123	107.1	--	--	--	32.7	8.819	288.1	1706.3
7	0.500	2011-Jul-20	10:55:50	96.27	1315.3	871.8	0.123	107.4	--	--	--	32.6	8.818	287.7	1710.4
8	0.667	2011-Jul-20	11:05:50	96.29	1322.9	871.9	0.124	108.1	--	--	--	32.5	8.818	286.9	1717.9
9	0.833	2011-Jul-20	11:15:50	96.30	1329.9	871.9	0.125	108.7	--	--	--	32.5	8.818	286.5	1725.1
10	1.000	2011-Jul-20	11:25:50	96.32	1336.3	872.0	0.125	109.3	--	--	--	32.4	8.817	285.7	1731.2
11	1.167	2011-Jul-20	11:35:50	96.33	1342.3	872.0	0.126	109.8	--	--	--	32.4	8.817	285.3	1737.3
12	1.333	2011-Jul-20	11:45:50	96.33	1347.9	872.0	0.126	110.3	--	--	--	32.4	8.817	285.2	1743.5
13	1.500	2011-Jul-20	11:55:50	96.34	1353.4	872.1	0.127	110.7	--	--	--	32.3	8.817	284.8	1749.0
14	1.667	2011-Jul-20	12:05:50	96.35	1358.6	872.1	0.128	111.2	--	--	--	32.3	8.816	284.4	1754.3
15	1.833	2011-Jul-20	12:15:50	96.35	1363.7	872.1	0.128	111.6	--	--	--	32.3	8.816	284.4	1759.8
16	2.000	2011-Jul-20	12:25:50	96.36	1368.6	872.2	0.128	112.1	--	--	--	32.2	8.816	284.0	1764.7
17	2.167	2011-Jul-20	12:35:50	96.36	1373.3	872.2	0.129	112.5	--	--	--	32.2	8.816	284.0	1769.8
18	2.333	2011-Jul-20	12:45:50	96.36	1377.9	872.2	0.129	112.9	--	--	--	32.2	8.815	284.0	1774.8
19	2.500	2011-Jul-20	12:55:50	96.36	1382.3	872.2	0.130	113.3	--	--	--	32.2	8.815	284.0	1779.6
20	2.667	2011-Jul-20	13:05:50	96.36	1386.7	872.2	0.130	113.6	--	--	--	32.2	8.815	284.0	1784.3
21	2.833	2011-Jul-20	13:15:50	96.36	1390.9	872.2	0.131	114.0	--	--	--	32.2	8.815	284.0	1788.9
22	3.000	2011-Jul-20	13:25:50	96.36	1395.1	872.2	0.131	114.3	--	--	--	32.2	8.815	284.0	1793.4
23	3.167	2011-Jul-20	13:35:50	96.36	1399.1	872.2	0.132	114.7	--	--	--	32.2	8.814	284.0	1797.8
24	3.333	2011-Jul-20	13:45:50	96.36	1403.1	872.2	0.132	115.0	--	--	--	32.2	8.814	284.0	1802.1
25	3.500	2011-Jul-20	13:55:50	96.36	1406.9	872.2	0.132	115.4	--	--	--	32.2	8.814	284.0	1806.3
26	3.667	2011-Jul-20	14:05:50	96.36	1410.7	872.2	0.133	115.7	--	--	--	32.2	8.814	284.0	1810.3
27	3.833	2011-Jul-20	14:15:50	96.35	1414.4	872.1	0.133	116.0	--	--	--	32.3	8.814	284.4	1814.7
28	4.000	2011-Jul-20	14:25:50	96.35	1418.0	872.1	0.133	116.3	--	--	--	32.3	8.814	284.4	1818.6



NO.	TEST TIME (hours)	DATE	TIME	JOINTS TO LIQUID	SURFACE PRESSURE (kPa)	GAS COLUMN			OIL COLUMN			EMULSION COLUMN			PRESSURE @ MPP (kPa)
						HEIGHT (m)	GRADIENT (kPa/m)	PRESSURE (kPa)	HEIGHT (m)	GRADIENT (kPa/m)	PRESSURE (kPa)	HEIGHT (m)	GRADIENT (kPa/m)	PRESSURE (kPa)	
29	4.167	2011-Jul-20	14:35:50	96.35	1421.5	872.1	0.134	116.6	--	--	--	32.3	8.813	284.4	1822.5
30	4.333	2011-Jul-20	14:45:50	96.35	1424.9	872.1	0.134	116.9	--	--	--	32.3	8.813	284.3	1826.2
31	4.500	2011-Jul-20	14:55:50	96.35	1428.3	872.1	0.134	117.2	--	--	--	32.3	8.813	284.3	1829.9
32	4.667	2011-Jul-20	15:05:50	96.35	1431.7	872.1	0.135	117.5	--	--	--	32.3	8.813	284.3	1833.5
33	4.833	2011-Jul-20	15:15:50	96.34	1434.9	872.1	0.135	117.8	--	--	--	32.3	8.813	284.7	1837.4
34	5.000	2011-Jul-20	15:25:50	96.34	1438.1	872.1	0.135	118.1	--	--	--	32.3	8.813	284.7	1840.9
35	5.167	2011-Jul-20	15:35:50	96.34	1441.3	872.1	0.136	118.3	--	--	--	32.3	8.813	284.7	1844.3
36	5.333	2011-Jul-20	15:45:50	96.34	1444.4	872.1	0.136	118.6	--	--	--	32.3	8.812	284.7	1847.7
37	5.500	2011-Jul-20	15:55:50	96.34	1447.5	872.1	0.136	118.9	--	--	--	32.3	8.812	284.7	1851.0
38	5.667	2011-Jul-20	16:05:50	96.34	1450.5	872.1	0.137	119.1	--	--	--	32.3	8.812	284.7	1854.3
39	5.833	2011-Jul-20	16:15:50	96.34	1453.4	872.1	0.137	119.4	--	--	--	32.3	8.812	284.7	1857.5
40	6.000	2011-Jul-20	16:25:50	96.34	1456.3	872.1	0.137	119.6	--	--	--	32.3	8.812	284.7	1860.6
41	6.167	2011-Jul-20	16:35:50	96.33	1459.1	872.0	0.137	119.9	--	--	--	32.4	8.812	285.1	1864.0
42	6.333	2011-Jul-20	16:45:50	96.33	1461.8	872.0	0.138	120.1	--	--	--	32.4	8.812	285.1	1867.0
43	6.500	2011-Jul-20	16:55:50	96.33	1464.5	872.0	0.138	120.3	--	--	--	32.4	8.811	285.1	1869.9
44	6.667	2011-Jul-20	17:05:50	96.33	1467.1	872.0	0.138	120.6	--	--	--	32.4	8.811	285.1	1872.7
45	6.833	2011-Jul-20	17:15:50	96.33	1469.6	872.0	0.139	120.8	--	--	--	32.4	8.811	285.1	1875.5
46	7.000	2011-Jul-20	17:25:50	96.33	1472.1	872.0	0.139	121.0	--	--	--	32.4	8.811	285.1	1878.2
47	7.167	2011-Jul-20	17:35:50	96.33	1474.6	872.0	0.139	121.2	--	--	--	32.4	8.811	285.1	1880.9
48	7.333	2011-Jul-20	17:45:50	96.32	1477.1	872.0	0.139	121.4	--	--	--	32.4	8.811	285.5	1883.9
49	7.500	2011-Jul-20	17:55:50	96.32	1479.5	872.0	0.139	121.6	--	--	--	32.4	8.811	285.4	1886.6
50	7.833	2011-Jul-20	18:15:50	96.32	1484.3	872.0	0.140	122.1	--	--	--	32.4	8.811	285.4	1891.8
51	8.167	2011-Jul-20	18:35:50	96.31	1489.0	872.0	0.140	122.5	--	--	--	32.4	8.810	285.8	1897.3
52	8.500	2011-Jul-20	18:55:50	96.31	1493.5	872.0	0.141	122.9	--	--	--	32.4	8.810	285.8	1902.2
53	8.833	2011-Jul-20	19:15:50	96.30	1498.0	871.9	0.141	123.2	--	--	--	32.5	8.810	286.2	1907.4
54	9.167	2011-Jul-20	19:35:50	96.30	1502.3	871.9	0.142	123.6	--	--	--	32.5	8.810	286.2	1912.1
55	9.500	2011-Jul-20	19:55:50	96.30	1506.5	871.9	0.142	124.0	--	--	--	32.5	8.810	286.2	1916.7
56	9.833	2011-Jul-20	20:15:50	96.29	1510.7	871.9	0.143	124.3	--	--	--	32.5	8.809	286.6	1921.6
57	10.167	2011-Jul-20	20:35:50	96.29	1514.8	871.9	0.143	124.7	--	--	--	32.5	8.809	286.6	1926.0
58	10.500	2011-Jul-20	20:55:50	96.28	1518.8	871.8	0.143	125.0	--	--	--	32.6	8.809	287.0	1930.8
59	10.833	2011-Jul-20	21:15:50	96.28	1522.8	871.8	0.144	125.4	--	--	--	32.6	8.809	287.0	1935.2
60	11.167	2011-Jul-20	21:35:50	96.27	1526.8	871.8	0.144	125.7	--	--	--	32.6	8.809	287.4	1939.9
61	11.500	2011-Jul-20	21:55:50	96.27	1530.9	871.8	0.145	126.1	--	--	--	32.6	8.808	287.3	1944.3
62	11.833	2011-Jul-20	22:15:50	96.26	1535.0	871.7	0.145	126.4	--	--	--	32.7	8.808	287.7	1949.2
63	12.167	2011-Jul-20	22:35:50	96.26	1539.1	871.7	0.145	126.8	--	--	--	32.7	8.808	287.7	1953.6
64	12.500	2011-Jul-20	22:55:50	96.25	1543.3	871.7	0.146	127.1	--	--	--	32.7	8.808	288.1	1958.5
65	13.000	2011-Jul-20	23:25:50	96.25	1549.5	871.7	0.146	127.7	--	--	--	32.7	8.808	288.1	1965.3
66	13.500	2011-Jul-20	23:55:50	96.24	1555.8	871.6	0.147	128.2	--	--	--	32.8	8.807	288.5	1972.5
67	14.000	2011-Jul-21	00:25:50	96.23	1561.9	871.6	0.148	128.8	--	--	--	32.8	8.807	288.9	1979.6
68	14.500	2011-Jul-21	00:55:50	96.23	1567.9	871.6	0.148	129.3	--	--	--	32.8	8.807	288.9	1986.1
69	15.000	2011-Jul-21	01:25:50	96.22	1573.8	871.5	0.149	129.8	--	--	--	32.8	8.806	289.3	1992.9
70	15.500	2011-Jul-21	01:55:50	96.21	1579.6	871.5	0.150	130.3	--	--	--	32.9	8.806	289.7	1999.6
71	16.500	2011-Jul-21	02:55:50	96.20	1591.2	871.5	0.151	131.3	--	--	--	32.9	8.806	290.0	2012.5
72	17.500	2011-Jul-21	03:55:50	96.19	1602.5	871.4	0.152	132.3	--	--	--	33.0	8.805	290.4	2025.3
73	18.500	2011-Jul-21	04:55:50	96.17	1614.0	871.3	0.153	133.3	--	--	--	33.1	8.804	291.2	2038.5
74	19.500	2011-Jul-21	05:55:50	96.17	1625.4	871.3	0.154	134.3	--	--	--	33.1	8.804	291.2	2050.9
75	21.500	2011-Jul-21	07:55:50	96.18	1647.4	871.4	0.156	136.2	--	--	--	33.0	8.803	290.7	2074.4
76	23.500	2011-Jul-21	09:55:50	96.23	1668.3	871.6	0.158	138.1	--	--	--	32.8	8.802	288.7	2095.1
77	25.500	2011-Jul-21	11:55:50	96.32	1687.2	872.0	0.160	139.8	--	--	--	32.4	8.801	285.1	2112.1
78	27.500	2011-Jul-21	13:55:50	96.43	1704.9	872.5	0.162	141.5	--	--	--	31.9	8.800	280.8	2127.2
79	29.500	2011-Jul-21	15:55:50	96.54	1720.7	873.0	0.164	142.9	--	--	--	31.4	8.799	276.5	2140.1
80	31.500	2011-Jul-21	17:55:50	96.67	1735.4	873.5	0.165	144.3	--	--	--	30.8	8.799	271.4	2151.1
81	33.500	2011-Jul-21	19:55:50	96.80	1748.9	874.1	0.167	145.6	--	--	--	30.3	8.798	266.5	2160.9
82	35.500	2011-Jul-21	21:55:50	96.94	1761.8	874.7	0.168	146.9	--	--	--	29.7	8.798	261.2	2169.8
83	37.500	2011-Jul-21	23:55:50	97.08	1774.3	875.3	0.169	148.1	--	--	--	29.1	8.797	255.9	2178.2
84	39.500	2011-Jul-22	01:55:50	97.23	1786.8	875.9	0.170	149.3	--	--	--	28.5	8.796	250.4	2186.5
85	41.500	2011-Jul-22	03:55:50	97.37	1799.5	876.5	0.172	150.5	--	--	--	27.9	8.796	245.3	2195.3

NO.	TEST		TIME	TO	SURFACE PRESSURE (kPaa)	GAS COLUMN			OIL COLUMN			EMULSION COLUMN			PRESSURE @ MPP (kPaa)
	(hours)	DATE				HEIGHT (m)	GRADIENT (kPa/m)	PRESSURE (kPa)	HEIGHT (m)	GRADIENT (kPa/m)	PRESSURE (kPa)	HEIGHT (m)	GRADIENT (kPa/m)	PRESSURE (kPa)	
86	43.500	2011-Jul-22	05:55:50	97.51	1812.4	877.1	0.173	151.8	--	--	--	27.3	8.795	240.2	2204.3
87	45.500	2011-Jul-22	07:55:50	97.65	1824.7	877.7	0.174	153.0	--	--	--	28.7	8.795	235.1	2212.8
88	47.500	2011-Jul-22	09:55:50	97.78	1836.8	878.2	0.176	154.1	--	--	--	26.2	8.794	230.5	2221.4
89	49.500	2011-Jul-22	11:55:50	97.92	1847.2	878.8	0.177	155.2	--	--	--	25.6	8.794	225.5	2227.8
90	53.500	2011-Jul-22	15:55:50	98.14	1865.7	879.6	0.178	157.0	--	--	--	24.8	8.793	217.8	2240.4
91	57.500	2011-Jul-22	19:55:50	98.34	1880.8	880.4	0.180	158.5	--	--	--	24.0	8.792	210.8	2250.1
92	61.500	2011-Jul-22	23:55:50	98.51	1895.0	881.1	0.181	159.9	--	--	--	23.3	8.791	204.9	2259.8
93	65.500	2011-Jul-23	03:55:50	98.64	1907.8	881.6	0.183	161.1	--	--	--	22.8	8.791	200.5	2269.5
94	69.500	2011-Jul-23	07:55:50	98.75	1919.2	882.0	0.184	162.2	--	--	--	22.4	8.790	196.8	2278.3
95	73.500	2011-Jul-23	11:55:50	98.85	1929.8	882.4	0.185	163.3	--	--	--	22.0	8.790	193.4	2286.5
96	77.500	2011-Jul-23	15:55:50	98.92	1939.3	882.7	0.186	164.2	--	--	--	21.7	8.789	191.1	2294.6
97	81.500	2011-Jul-23	19:55:50	98.98	1948.3	882.9	0.187	165.0	--	--	--	21.5	8.789	189.1	2302.4
98	85.500	2011-Jul-23	23:55:50	99.02	1956.6	883.0	0.188	165.8	--	--	--	21.4	8.788	187.7	2310.2
99	89.500	2011-Jul-24	03:55:50	99.06	1964.3	883.2	0.189	166.6	--	--	--	21.2	8.788	186.4	2317.3
100	93.500	2011-Jul-24	07:55:50	99.09	1971.6	883.3	0.189	167.2	--	--	--	21.1	8.788	185.4	2324.3
101	97.500	2011-Jul-24	11:55:50	99.12	1978.4	883.4	0.190	167.9	--	--	--	21.0	8.787	184.5	2330.8
102	101.500	2011-Jul-24	15:55:50	99.14	1984.7	883.5	0.191	168.5	--	--	--	20.9	8.787	183.8	2336.9
103	105.500	2011-Jul-24	19:55:50	99.16	1990.3	883.6	0.191	169.0	--	--	--	20.8	8.787	183.1	2342.5
104	109.500	2011-Jul-24	23:55:50	99.18	1995.7	883.6	0.192	169.5	--	--	--	20.8	8.787	182.5	2347.7
105	113.500	2011-Jul-25	03:55:50	99.21	2001.1	883.7	0.192	170.0	--	--	--	20.7	8.786	181.5	2352.6
106	117.500	2011-Jul-25	07:55:50	99.23	2006.5	883.8	0.193	170.5	--	--	--	20.6	8.786	180.9	2357.9
107	121.500	2011-Jul-25	11:55:50	99.26	2011.9	883.9	0.194	171.1	--	--	--	20.5	8.786	179.9	2362.9
108	125.500	2011-Jul-25	15:55:50	99.28	2017.2	884.0	0.194	171.6	--	--	--	20.4	8.785	179.2	2368.0
109	129.500	2011-Jul-25	19:55:50	99.31	2022.3	884.1	0.195	172.0	--	--	--	20.3	8.785	178.3	2372.6
110	133.500	2011-Jul-25	23:55:50	99.35	2027.1	884.3	0.195	172.5	--	--	--	20.1	8.785	177.0	2376.6
111	137.500	2011-Jul-26	03:55:50	99.38	2031.7	884.4	0.196	172.9	--	--	--	20.0	8.785	176.0	2380.6
112	141.500	2011-Jul-26	07:55:50	99.42	2036.1	884.5	0.196	173.4	--	--	--	19.9	8.785	174.7	2384.3
113	145.500	2011-Jul-26	11:55:50	99.46	2040.5	884.6	0.196	173.8	--	--	--	19.7	8.784	173.5	2387.8
114	149.500	2011-Jul-26	15:55:50	99.50	2044.7	884.8	0.197	174.2	--	--	--	19.6	8.784	172.2	2391.2
115	153.500	2011-Jul-26	19:55:50	99.54	2049.0	884.9	0.197	174.6	--	--	--	19.5	8.784	170.9	2394.5
116	157.500	2011-Jul-26	23:55:50	99.57	2053.1	885.0	0.198	175.1	--	--	--	19.4	8.784	170.0	2398.2
117	161.500	2011-Jul-27	03:55:50	99.61	2057.3	885.2	0.198	175.5	--	--	--	19.2	8.784	168.7	2401.5
118	165.500	2011-Jul-27	07:55:50	99.65	2061.5	885.3	0.199	175.9	--	--	--	19.1	8.783	167.5	2404.9
119	169.500	2011-Jul-27	11:55:50	99.69	2065.6	885.5	0.199	176.3	--	--	--	18.9	8.783	166.2	2408.2
120	173.500	2011-Jul-27	15:55:50	99.73	2069.6	885.6	0.200	176.7	--	--	--	18.8	8.783	165.0	2411.3
121	177.500	2011-Jul-27	19:55:50	99.78	2073.5	885.8	0.200	177.1	--	--	--	18.6	8.783	163.4	2414.1
122	181.500	2011-Jul-27	23:55:50	99.83	2077.4	886.0	0.200	177.5	--	--	--	18.4	8.783	161.9	2416.8
123	185.500	2011-Jul-28	03:55:50	99.88	2081.4	886.1	0.201	177.9	--	--	--	18.3	8.782	160.4	2419.7
124	189.500	2011-Jul-28	07:55:50	99.93	2085.6	886.3	0.201	178.3	--	--	--	18.1	8.782	158.8	2422.8
125	193.500	2011-Jul-28	11:55:50	99.99	2090.0	886.5	0.202	178.7	--	--	--	17.9	8.782	157.0	2425.7
126	197.500	2011-Jul-28	15:55:50	100.04	2094.3	886.7	0.202	179.2	--	--	--	17.7	8.782	155.5	2429.0
127	201.500	2011-Jul-28	19:55:50	100.11	2098.5	886.9	0.202	179.6	--	--	--	17.5	8.782	153.4	2431.5
128	205.500	2011-Jul-28	23:55:50	100.18	2102.8	887.2	0.203	180.0	--	--	--	17.2	8.781	151.3	2434.1
129	209.500	2011-Jul-29	03:55:50	100.25	2107.4	887.4	0.203	180.5	--	--	--	17.0	8.781	149.3	2437.2
130	213.500	2011-Jul-29	07:55:50	100.32	2112.5	887.6	0.204	181.0	--	--	--	16.8	8.781	147.2	2440.7
131	217.500	2011-Jul-29	11:55:50	100.40	2118.1	887.9	0.205	181.6	--	--	--	16.5	8.781	144.9	2444.6
132	221.500	2011-Jul-29	15:55:50	100.49	2123.9	888.2	0.205	182.2	--	--	--	16.2	8.780	142.3	2448.5
133	225.500	2011-Jul-29	19:55:50	100.57	2129.4	888.4	0.206	182.8	--	--	--	16.0	8.780	140.1	2452.3
134	229.500	2011-Jul-29	23:55:50	100.66	2134.4	888.7	0.206	183.3	--	--	--	15.7	8.780	137.6	2455.3
135	233.500	2011-Jul-30	03:55:50	100.76	2139.0	889.0	0.207	183.8	--	--	--	15.4	8.780	134.9	2457.6
136	237.500	2011-Jul-30	07:55:50	100.85	2143.3	889.3	0.207	184.2	--	--	--	15.1	8.779	132.4	2460.0