

HALLIBURTON
HR/BSCS/DLSN
TRUE VERTICAL DEPTH
2"=100'

QUAD COMBO

COMPANY: NORTHWEST NATURAL GAS
WELL: IW 23ACH-3-65
FIELD: MIST (FLORA POOL STORAGE)
COUNTY: COLUMBIA STATE: OR
OCCUPY: COLUMBIA STATE: OR

APN No: 36-009-00366
Location: 36-009-00366
OWNER: NORTHWEST NATURAL GAS
OPERATOR: NORTHWEST NATURAL GAS
DATE: 05/21/2007

Log measured from: K.B. 14.0' above perm. datum
Casing measured from: K.B. 14.0' above perm. datum
Datum: 3616.0'
Elev: 1033.3'
Elev: 1033.3'
Elev: 1033.3'

Log measured from: K.B. 14.0' above perm. datum
Casing measured from: K.B. 14.0' above perm. datum
Datum: 3616.0'
Elev: 1033.3'
Elev: 1033.3'

Service Ticket No	5" 6244	API Serial No	36-009-00366	PGM Version	RESISTIVITY SCALE CHANGES
Date / Sample No					
Depth - Driller		Type Log		Depth	Scale Up Hole
Type Fluid					Scale Down Hole
Dens / Visc					
Phi / Fluid Loss					
Source of Sample					
Rm @ Meas Temp	2.820 @ 84 F			Run No	Tool Type & R
Rmf @ Meas Temp	2.220 @ 82 F			ONE	HRIT #21' 132
Rmc @ Meas Temp	1.250 @ 59 F				NA
Source Rm / Rmf	MEAS @ MEAS				
Rm @ BHT	1.903 @ 88 F				
Rmf @ BHT	1.457 @ 88 F				
Rmc @ BHT	0.785 @ 88 F				

GAMMA		ACOUSTIC		DENSITY		NEUTRON	
Run No	ONE	Run No	ONE	Run No	ONE	Run No	ONE
Serial No	A-180	Serial No	4501 264	Serial No	1714M741	Serial No	05
Model No	NGRT	Model No	305B BCS	Model No	SDLT-DA	Model No	DSNT-X
Diameter	3.932	No. of Carls	TWC	Diameter	5.500	Log Type	3.688
Detector Model No	432	Spacing	2 FEET	Log Type	GAM-GAM	Log Type	NEU-NEU
Type	SCINT	Source Type	CS-137	Source Type	CS-137	Source Type	AMP41BE
Length	4.00'	LSA [Y/N]	NO	Serial No	2894GW	Serial No	DSN-307
Distance to Source	11.0'	FWDA [Y/N]	NO	Strength	1.5 CI	Strength	15.0 CI

GENERAL		SCALE		ACOUSTIC		DENSITY		NEUTRON	
Run	Depth	Scale	Scale	L	R	L	R	L	R
ONE	35' to 6' 5.633	15	15	0	150	150	55.5	1.65	2.65
		API	API	USEC	USEC	USEC	GMCC	GMCC	GMCC

Maximum Deviation: 92.0 deg @ 35' 9" KOP 103'

DIRECTIONAL INFORMATION: 03'

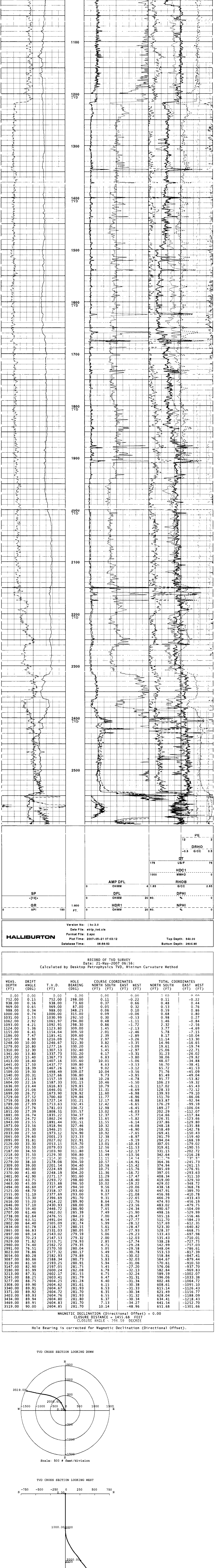
Remarks: MAGNETIC DECLINATION 19.1 DEGREES.
HRID-BCSD-EMIT-SDLT-DSNT-NGRT-OTD RUN IN COMBINATION.
SPLICE AT 2940'.

CREW: D. ROSENSTEEL, M. GAONA, S. SYROCK. RIG: TO DRILLING NO. 101.

HALLIBURTON DOES NOT GUARANTEE THE ACCURACY OF ANY INTERPRETATION OF THE LOG DATA. CONVERSION OF LOG DATA TO PHYSICAL ROCK PARAMETERS OR RESISTIVITY RATIOS WILL BE DONE BY HALLIBURTON PERSONNEL OR WHO APPEAR ON THE LOG OR IN ANY OTHER FORM. ANY USER OF SUCH DATA INTERPRETATIONS, CONVERSIONS, OR RECOMMENDATIONS AGREES THAT HALLIBURTON IS NOT RESPONSIBLE EXCEPT WHERE DUE TO GROSS NEGLIGENCE OR WILLFUL MISCONDUCT FOR ANY LOSS, DAMAGE, OR EXPENSES RESULTING FROM THE USE THEREOF.

Version No: |hc3.0
Data File: strip_tvd.cla
Format File: 2.spc
Plot Time: 2007-05-21 07:03:18
Database Time: 06:56:53

Top Depth: 540.00
Bottom Depth: 2604.85



Version No: |hc3.0
Data File: strip_tvd.cla
Format File: 2.spc
Plot Time: 2007-05-21 07:03:18
Database Time: 06:56:53

Top Depth: 540.00
Bottom Depth: 2604.85

RECORD OF TVD SURVEY
Date: 21-May-2007 06:56
Calculated by Desktop Petrophysics TVD, Minimum Curvature Method

MEAS. DEPTH (FT)	DRIFT ANGLE (DEG)	T.V.D. (FT)	HOLE BEARING (DEG)	COURSE COORDINATES (FT)			NORTH COORDINATES (FT)		
				NORTH	SOUTH	EAST WEST	NORTH	SOUTH	EAST WEST
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
752.00	0.15	752.00	298.00	0.11	-0.22	0.00	0.11	-0.22	0.00
938.00	0.56	938.00	73.60	0.37	0.66	0.00	0.48	0.44	0.00
969.00	0.65	969.00	87.00	0.50	0.32	0.00	0.53	0.36	0.00
988.00	0.34	988.00	348.25	0.06	0.10	0.00	0.59	0.86	0.00
1000.00	0.74	1000.00	315.00	0.09	-0.06	0.00	0.68	0.80	0.00
1031.00	1.55	1030.93	293.50	0.30	-0.53	0.00	0.68	0.27	0.00
1062.00	2.92	1061.97	294.00	0.48	-1.11	0.00	1.46	-0.84	0.00
1093.00	4.21	1092.91	298.30	0.86	-1.72	0.00	2.32	-2.56	0.00
1124.00	5.36	1123.80	309.00	1.45	-2.13	0.00	3.77	-4.69	0.00
1155.00	6.41	1154.94	309.60	2.01	-2.46	0.00	4.81	-7.15	0.00
1186.00	7.47	1185.41	309.60	2.39	-2.89	0.00	8.17	-10.04	0.00
1217.00	8.90	1216.09	314.70	2.97	-3.26	0.00	11.14	-13.30	0.00
1248.00	10.00	1246.67	322.30	3.82	-3.35	0.00	14.96	-16.65	0.00
1279.00	11.80	1277.05	320.20	4.65	-3.09	0.00	19.04	-18.74	0.00
1310.00	13.80	1307.53	322.40	5.45	-2.97	0.00	25.06	-22.71	0.00
1341.00	13.80	1337.73	331.20	6.17	-3.11	0.00	31.23	-26.02	0.00
1372.00	15.40	1367.75	335.60	6.84	-3.80	0.00	38.05	-29.82	0.00
1403.00	16.40	1400.93	335.60	10.01	-5.06	0.00	48.05	-34.88	0.00
1445.00	17.50	1437.77	339.80	8.63	-3.53	0.00	56.70	-38.41	0.00
1476.00	18.39	1467.26	341.97	9.02	-3.12	0.00	65.72	-41.53	0.00
1507.00	23.56	1498.94	339.07	10.04	-3.56	0.00	74.76	-45.09	0.00
1540.00	20.31	1527.66	336.80	9.73	-3.95	0.00	85.49	-49.04	0.00
1572.00	21.19	1557.59	333.38	10.28	-4.78	0.00	95.77	-53.82	0.00
1604.00	22.16	1587.33	331.15	10.48	-5.50	0.00	106.23	-59.32	0.00
1636.00	27.30	1620.93	325.50	13.02	-5.06	0.00	117.02	-65.43	0.00
1668.00	25.06	1646.01	329.02	11.31	-6.69	0.00	128.33	-72.12	0.00
1699.00	26.72	1673.90	328.92	11.60	-6.98	0.00	139.93	-79.10	0.00
1730.00	27.52	1700.60	329.86	11.77	-6.35	0.00	151.70	-86.06	0.00
1762.00	28.03	1727.02	333.00	12.17	-6.96	0.00	164.66	-92.94	0.00
1795.00	27.99	1753.63	332.45	12.42	-6.65	0.00	176.29	-99.59	0.00
1820.00	27.76	1781.03	334.72	12.98	-6.45	0.00	189.27	-106.04	0.00
1851.00	27.39	1808.93	335.60	13.02	-6.03	0.00	202.02	-112.07	0.00
1881.00	26.74	1835.22	334.37	12.77	-5.77	0.00	214.66	-117.84	0.00
1911.00	24.72	1862.24	332.49	11.65	-5.82	0.00	226.31	-123.66	0.00
1943.00	23.55	1891.44	331.51	11.55	-6.14	0.00	237.86	-129.80	0.00
1975.00	23.56	1918.94	327.46	10.32	-5.08	0.00	248.78	-135.88	0.00
2005.00	25.30	1946.25	325.06	10.31	-6.90	0.00	258.49	-142.78	0.00
2033.00	27.50	1973.12	324.90	10.92	-7.65	0.00	269.41	-150.43	0.00
2065.00	29.60	2001.23	323.33	12.38	-8.97	0.00	281.79	-159.40	0.00
2095.00	31.80	2029.03	319.70	13.01	-10.43	0.00	307.05	-179.02	0.00
2125.00	33.50	2057.00	315.20	12.56	-11.53	0.00	331.61	-190.55	0.00
2157.00	34.50	2079.72	315.80	11.74	-12.17	0.00	359.15	-202.72	0.00
2187.00	35.50	2099.00	311.80	10.79	-13.66	0.00	384.64	-216.28	0.00
2219.00	37.00	2115.30	306.29	11.15	-14.54	0.00	409.04	-230.87	0.00
2249.00	38.10	2128.08	304.50	10.57	-14.91	0.00	434.36	-245.73	0.00
2279.00	39.00	2148.34	287.30	10.32	-15.77	0.00	459.59	-260.87	0.00
2309.00	40.00	2172.69	304.20	10.75	-15.76	0.00	484.66	-276.91	0.00
2339.00	41.40	2200.19	304.20	11.36	-16.72	0.00	509.65	-293.70	0.00
2401.00	42.90	2271.17	301.60	11.29	-17.47	0.00	534.52	-311.10	0.00
2432.00	43.75	2293.72	298.60	10.66	-18.40	0.00	559.39	-329.53	0.00
2465.00	45.00	2315.88	296.50	10.02	-19.22	0.00	584.04	-348.72	0.00
2494.00	46.60	2337.49	294.50	9.56	-20.06	0.00	608.58	-368.78	0.00
2525.00	48.70	2358.37	289.60	9.33	-20.92	0.00	632.93	-389.70	0.00
2555.00	51.10	2377.69	287.90	9.07	-21.88	0.00	657.14	-410.74	0.00
2586.00	53.30	2396.69	291.70	9.31	-22.65	0.00	681.29	-433.43	0.00
2616.00	55.20	2414.22	289.90	8.64	-22.76	0.00	705.29	-456.19	0.00
2646.00	57.10	2430.93	288.00	8.09	-23.56	0.00	729.04	-479.77	0.00
2677.00	59.40	2466.02	286.90	7.65	-24.34	0.00	752.64	-504.09	0.00
2708.00	61.46	2492.72	285.39	7.49	-25.90	0.00	776.16	-529.99	0.00
2738.00	62.64	2476.55	284.23	7.00	-26.47	0.00	800.56	-556.46	0.00
2770.00	63.51	2491.04	287.30	6.54	-27.77	0.00	824.76	-584.23	0.00
2802.00	64.40	2505.09	281.74	5.99	-28.12	0.00	848.87	-612.35	0.00
2834.00	65.78	2518.57	280.55	5.61	-28.47	0.00	872.83	-640.82	0.00
2865.00	66.83	2531.03	280.05	5.07	-29.93	0.00	896.66	-669.75	0.00
2895.00	69.14	2543.02	279.59	4.65	-29.23	0.00	920.33	-699.98	0.00
2920.00	70.23	2547.53	279.32	2.80	-12.03	0.00	943.84	-730.38	0.00
2929.00	71.82	2553.71	278.93	2.05	-17.74	0.00	967.28	-771.75	0.00
2939.00	73.40	2560.72	278.80	1.74	-12.28	0.00	990.56	-814.07	0.00
2949.00	75.11	2569.50	280.04	1.25	-15.76	0.00	1013.69	-857.33	0.00
2959.00	78.86	2577.32	280.17	5.49	-30.78	0.00	1036.58	-901.59	0.00
3004.00	80.28	2582.93	279.89	5.31	-30.02	0.00	1059.24	-946.84	0.00
3039.00	80.86	2588.34	280.73	5.83	-32.03	0.00	1081.67	-993.14	0.00
3119.00	81.50	2593.25	280.91	5.94	-31.06	0.00	1103.87	-1040.50	0.00
3147.00	82.90	2597.05	281.75	5.45	-27.20	0.00	1125.84	-1088.97	0.00
3180.00	85.99	2600.24	282.08	6.78	-32.13	0.00	1147.58	-1138.53	0.00
3213.00	87.31	2602.17	281.55	6.15	-30.34	0.00	1169.01	-1189.19	0.00
3245.00	88.25	2603.41	281.79	6.47	-31.31	0.00	1190.14	-1240.00	0.00
3277.00	88.75	2604.25	281.28	6.40	-31.34	0.00	1210.96	-1291.06	0.00
3308.00	89.90	2604.62	281.61	6.15	-30.38	0.00	1231.47	-1342.38	0.00
3340.00	89.91	2604.67	281.93	6.53	-31.33	0.00	1251.66	-1393.88	0.00
3371.00	89.92	2604.72	281.70	6.35	-30.34	0.00	1271.53	-1445.57	0.00
3403.00	89.93	2604.76	281.93	6.55	-31.32	0.00	1291.08	-1497.46	0.00
3435.00	89.94	2604.80	281.70	6.37					