



LWD MEMORY LOG

Multiple Propagation Resistivity Gamma Ray

Scale: **Company: CCRP Operating Inc.**

Well: Salt Ranch Fee 201-1015H

Measured Depth	Field:	Weld County (NAD 83/TN)
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Depth Reference:	Country: Weld	Country: United States
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Driller's Depth | State: Colorado

Status:	Surface Location:	Other Services
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Latitude: $40^{\circ} 41' 11''$ N

API No:	05-123-46644	Directional
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Job ID: 109730687

SEC:	10	TWN:	11N	RGE:	64W
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Permanent Datum (P.D.):	Ground Level	Elevation:	5434.00 ft	Elev. KB:	N/A
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Log Measured From:	Rig Floor	Above P.D.	22.00 ft	Elev. G.I.	5434.00 ft
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Dates	Interval Drilled	Magnetic Field Reference
1998-01-01	0-1000	0.0000
1998-01-02	1000-2000	0.0001
1998-01-03	2000-3000	0.0002
1998-01-04	3000-4000	0.0003
1998-01-05	4000-5000	0.0004
1998-01-06	5000-6000	0.0005
1998-01-07	6000-7000	0.0006
1998-01-08	7000-8000	0.0007
1998-01-09	8000-9000	0.0008
1998-01-10	9000-10000	0.0009
1998-01-11	10000-11000	0.0010
1998-01-12	11000-12000	0.0011
1998-01-13	12000-13000	0.0012
1998-01-14	13000-14000	0.0013
1998-01-15	14000-15000	0.0014
1998-01-16	15000-16000	0.0015
1998-01-17	16000-17000	0.0016
1998-01-18	17000-18000	0.0017
1998-01-19	18000-19000	0.0018
1998-01-20	19000-20000	0.0019
1998-01-21	20000-21000	0.0020
1998-01-22	21000-22000	0.0021
1998-01-23	22000-23000	0.0022
1998-01-24	23000-24000	0.0023
1998-01-25	24000-25000	0.0024
1998-01-26	25000-26000	0.0025
1998-01-27	26000-27000	0.0026
1998-01-28	27000-28000	0.0027
1998-01-29	28000-29000	0.0028
1998-01-30	29000-30000	0.0029
1998-01-31	30000-31000	0.0030
1998-02-01	31000-32000	0.0031
1998-02-02	32000-33000	0.0032
1998-02-03	33000-34000	0.0033
1998-02-04	34000-35000	0.0034
1998-02-05	35000-36000	0.0035
1998-02-06	36000-37000	0.0036
1998-02-07	37000-38000	0.0037
1998-02-08	38000-39000	0.0038
1998-02-09	39000-40000	0.0039
1998-02-10	40000-41000	0.0040
1998-02-11	41000-42000	0.0041
1998-02-12	42000-43000	0.0042
1998-02-13	43000-44000	0.0043
1998-02-14	44000-45000	0.0044
1998-02-15	45000-46000	0.0045
1998-02-16	46000-47000	0.0046
1998-02-17	47000-48000	0.0047
1998-02-18	48000-49000	0.0048
1998-02-19	49000-50000	0.0049
1998-02-20	50000-51000	0.0050
1998-02-21	51000-52000	0.0051
1998-02-22	52000-53000	0.0052
1998-02-23	53000-54000	0.0053
1998-02-24	54000-55000	0.0054
1998-02-25	55000-56000	0.0055
1998-02-26	56000-57000	0.0056
1998-02-27	57000-58000	0.0057
1998-02-28	58000-59000	0.0058
1998-02-29	59000-60000	0.0059
1998-03-01	60000-61000	0.0060
1998-03-02	61000-62000	0.0061
1998-03-03	62000-63000	0.0062
1998-03-04	63000-64000	0.0063
1998-03-05	64000-65000	0.0064
1998-03-06	65000-66000	0.0065
1998-03-07	66000-67000	0.0066
1998-03-08	67000-68000	0.0067
1998-03-09	68000-69000	0.0068
1998-03-10	69000-70000	0.0069
1998-03-11	70000-71000	0.0070
1998-03-12	71000-72000	0.0071
1998-03-13	72000-73000	0.0072
1998-03-14	73000-74000	0.0073
1998-03-15	74000-75000	0.0074
1998-03-16	75000-76000	0.0075
1998-03-17	76000-77000	0.0076
1998-03-18	77000-78000	0.0077
1998-03-1		

Date From: 2019-04-12 Top: (ft) 100.00 Azi Reference North: True Dip Angle: (deg) 67.25

Date To:	2019-04-17	Bottom: (ft)	18383.00	Total Magnetic Field Strength: (nT)	52561
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Spud Date:	2019-04-12	Mag to Reference North Correction: (deg)	8.11
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Borehole Record Casing Record

Hole Size (in)	From (ft)	To (ft)	Size (in)	Weight (lb/ft)	From (ft)	To (ft)
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12.500	22.00	2222.00	9.625	36.00	22.00	2208.00
22.00						

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Mud Record Deviation Record

Type	From (ft)	To (ft)	Hole Size (in)	Interval (ft)	Inc Az (Start)	Inc Az (End)
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Fresh Water	100.00	2222.00	13.500	2222.00	0.21 289.81	15.32 10.04
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Oil Based Mud	2222.00	10303.00	0.300	10101.00	13.32	10.04	09.03	100.0
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Acquisition System	Software Version	Other
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Baker Hughes Cadence	RT 5.0	Rig:	Unit 406
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Plot Studio 5.0.8260.3 Contractor: Unit

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Log Run Summary

Run No	Bit Run No.	Bit Size (in)	Bit Type	Bit Gauge Length (in)	Assembly Type	Logged Interval		Bit Depth Interval		Date / Time		Circ. Hours
						Top	Bottom	From	To	Start Logging	End Logging	
						(ft)	(ft)	(ft)	(ft)			
1	1	13.500	PDC	4.75	Steerable	0.00	0.00	100.00	2222.00	N/A	N/A	8.95
2	1	8.500	PDC	3.00	AutoTrak Curve	2222.00	18370.00	2222.00	18383.00	2019-04-14 02:45	2019-04-17 09:03	74.27

Crew

Name	Arrive Wellsite	Depart Wellsite	Name	Arrive Wellsite	Depart Wellsite	Name	Arrive Wellsite	Depart Wellsite
Zac Williams	2019-04-12	2019-04-18	Ryan Marshall	2019-04-14	2019-04-18			

Mud Properties Record

Date / Time	Run No.	Measured Depth (ft)	Mud Type	Density (ppg)	Viscosity (cP)	pH	Fluid Loss (cm3)	Oil / Water	Source	Total Chlorides (ppm)	K+ (%)
2019-04-12 10:00	1	100.00	Fresh Water	8.5	28	8.5	2.0	0/100	Active Pit	1000	0.00
2019-04-13 16:50	2	2222.00	Oil Based Mud	9.2	8	N/A	2.0	74/17	Active Pit	41905	0.00
2019-04-14 13:31	2	5401.00	Oil Based Mud	9.3	10	N/A	17.4	72/16.5	Active Pit	43000	0.00
2019-04-15 14:00	2	10541.00	Oil Based Mud	9.7	10	N/A	17.6	70/18	Active Pit	42000	0.00
2019-04-16 14:00	2	14401.00	Oil Based Mud	9.7	12	N/A	16.0	70/16	Active Pit	44000	0.00

Mud Resistivity Record

Date / Time	Run No.	Measured Depth (ft)	Surface Temp (degF)	Surface			BHCT (degF)	Downhole		
				Rm (ohm.m)	Rmf (ohm.m)	Rmc (ohm.m)		Rm @ BHCT (ohm.m)	Rmf @ BHCT (ohm.m)	Rmc @ BHCT (ohm.m)
2019-04-15 19:30	2	11290.00	150.0	100.000	N/A	N/A	226.0	100.000	N/A	N/A
2019-04-16 16:50	2	15035.00	165.0	100.000	N/A	N/A	247.0	100.000	N/A	N/A
2019-04-17 07:00	2	18000.00	170.0	100.000	N/A	N/A	264.0	100.000	N/A	N/A

Equipment and Service Data

Run No.	Tool	Serial Number	Measurement	Sensor Offset (ft)	Bit Offset (ft)	Max O.D. (in)	Min I.D. (in)
1	NaviTrak	10350729	VSS	16.47	52.64	8.063	0.000
1	NaviTrak	10350729	Directional (mag)	16.47	52.64	8.063	0.000
2	AutoTrak Curve Steering Unit	14262246	Near Bit Inclination	5.93	6.76	7.000	4.330
2	AutoTrak Curve Steering Unit	14262246	Near Bit VSS	5.93	6.76	7.000	4.330
2	AutoTrak Curve MWD	12599902	Gamma (single)	2.76	12.93	7.000	3.250
2	AutoTrak Curve MWD	12599902	Directional (mag)	12.28	22.45	7.000	3.250
2	OnTrak	11779203	Pressure	1.08	11203.48	6.750	0.000
2	OnTrak	11779203	Gamma (double)	1.97	11204.37	6.750	0.000
2	OnTrak	11779203	Resistivity (4tx)	6.01	11208.41	6.750	0.000
2	OnTrak	11779203	Directional (mag)	11.80	11214.20	6.750	0.000

Service and Tool Mnemonics

Mnemonic	Name	Description
NTK	NaviTrak	Probe Based Directional Module, NaviTrak Platform
ATC SU	AutoTrak Curve SU	Auto Trak Curve Steering Unit
ATC MWD	AutoTrak Curve MWD	Auto Trak Curve MWD
ATC LCPM	AutoTrak Curve LCPM	Auto Trak Curve LCPM
OTK	OnTrak	Sensor Sub (Inc, Azi, Temp, Azimuthal GR, Res, AP, VSS), OnTrak Platform
BCPM	BCPM	Bi-Directional Communication and Power Module, OnTrak Platform

Comments

1	Depth measurements were obtained from a depth control system not supplied or operated by Baker Hughes. Due to lack of control by Baker Hughes logging engineers, depth calibrations and measurements could not be independently verified.
2	Baker Hughes LWD run 1 utilized a 8 inch NaviTrak services (Directional) behind a 12.5 inch bit and steerable assembly from 100 to 2222 feet MD (100 to 2178 feet TVD).
3	On 4/16/19, a MAD (measurement after drilling) Pass from 2222 to 7175 feet MD (2178 to 7075 feet TVD). The Data collected during this run was ream logged up to 61.4 hours after being drilled and presented independent of the drilled log.

Remarks

Number	Measured Depth (ft)	Hole Section (in)	Run No.	Remark
1	7175.00	8.500	2	The interval from 7175 to 18383 feet MD (7075 to 7730 feet TVD) was not logged due to sensor offset from bit.

Curve Mnemonics

Presented Curves	Description	Units
CACLM	Conductivity Attenuation - Corrected - 400kHz	mmho/m
RACHM	Resistivity Attenuation - Corrected - 2MHz	ohm.m
RACLM	Resistivity Attenuation - Corrected - 400kHz	ohm.m
RPCHM	Resistivity Phase - Corrected - 2MHz	ohm.m
RPCLM	Resistivity Phase - Corrected - 400kHz	ohm.m
RPTHM	Resistivity Time Since Drilled	min
ROPA	Depth Averaged ROP 3 ft Average	ft/h
TVD	True Vertical Depth	ft
GRAM	Gamma Ray - Apparent - Memory 3 ft Average	API
GRIM	Gamma Ray - Data Point Indicator - Memory	unitless



Company	CCRP Operating Inc.		
Well	Salt Ranch Fee 201-1015H		
Interval	Date From:	2019-04-12 10:28	Top: 100.00 ft
	Date To:	2019-04-17 18:00	Bottom: 18383.00 ft
Created	2019-04-17 21:46:50		



























































