HALLIBURTON LOGGING SERVICES, INC.

DUAL INDUCTION SHORT GUARD LOG

FINAL PRINT

COMPANY	ARCO OIL AND GAS COMPANY
WELL	BANANA SLUG PROSPECT C.E.R. 13-1-55
FIELD	MIST
COUNTY	COLUMBIA
STATE OR	
API NO.	N/A
LOCATION	: WWM 1522 FEET NORTH AND 289 FEET EAST FROM THE SOUTHWEST CORNER OF:
SEC.	1 TWP 5N RGE 5W
OTHER SERVICES	AVL/GR DIPMETER DSN/SDL

COMPANY ______ WELL ______ FIELD ______ COUNTY ______ ST __ 5"=100'

PERMANENT DATUM G.L. ELEV. 729.75
LOG MEASURED FROM K.B. 11.5FT. ABOVE PERM. DATUM
DRILLING MEASURED FROM KELLY BUSHING
ELEV.: K.B. 741.25 D.F. ----- G.L. 729.75

DATE	11/04/89			
RUN NO.	ONE			
DEPTH-DRILLER	1480			
DEPTH-LOGGER	1480			
BTM. LOG INTER.	1477			
TOP LOG INTER.	465			
CASING-DRILLER	9 5/8@465	@	@	@
CASING-LOGGER	465			
BIT SIZE	6 1/4			
TYPE FLUID IN HOLE	POLYMER			
DENS. : VISC	11.1 :47	--	--	--
PH : FLUID LOSS	10.0 :6.4	--	--	--
SOURCE OF SAMPLE	CIRCULATED			
RM @ MEAS. TEMP.	1.73 @75	@	@	@
RMF @ MEAS. TEMP.	1.41 @75	@	@	@
RMC @ MEAS. TEMP.	1.80 @72	@	@	@
SOURCE RMF : RMC	MEAS. :MEAS.	--	--	--
RM @ BHT	1.35 @ 98	@	@	@
TIME SINCE CIRC.	4 HOURS			
TIME ON BOTTOM	11:50 PM			
MAX. REC. TEMP.	98 @BHT	@	@	@
EQUIP. : LOCATION	2890 :WDLND	--	--	--
RECORDED BY	B.JOHNSON			
WITNESSED BY	JIM EASTES			

Fold Here

Service Ticket No.: 12312	API Serial No.: N/A	PGM Version: 1.31 PC					
Change in Mud Type or Additional Samples			RESISTIVITY SCALE CHANGES				
Date/Sample No.	11/04/89:ONE	/ / :	Type Log	Depth	Scale Up Hole	Scale Down Hole	
Depth-Driller							
Type Fluid							
" in Hole							
Dens. : Visc.	:	:					
pH. : Fluid Loss	:	:					
Source of Sample			RESISTIVITY EQUIPMENT DATA				
Rm @ Meas.Temp.	@	@	Run No	Tool Type & No	Pad Type	Tool Pos.	Other
Rmf @ Meas.Temp.	@	@	ONE	DUAL W109432	N/A	1.5"S.O.	M412
Rmc @ Meas.Temp.	@	@	ONE	SGRD W108932	N/A	1.5"S.O.	M416
Source: Rmf:Rmc	:	:					
Rm @ BHT	1.35 @98	@	ONE	DIP W28575	4-ARM	CENT	M232
Rmf @ BHT	1.10 @98	@					
Rmc @ BHT	1.35 @98	@					

EQUIPMENT DATA

GAMMA		ACOUSTIC		DENSITY		NEUTRON	
Run No.	ONE	Run No.	ONE	Run No.	ONE	Run No.	ONE
Serial No.	W108581	Serial No.	W112458	Serial No.	W109740	Serial No.	W108749
Model No.	432	Model No.	305	Model No.	465	Model No.	434
Diameter	3 5/8	No.of Cent.	FOUR	Diameter	4 1/2	Diameter	3 3/8
Detector Model No.	N/A	Spacing	1 FOOT	Log Type	SDL	Log Type	DSN
Type	SCINT.			Source Type	CS 137	Source Type	AM241BE
Length	4 IN.	LSA	YES	Serial No.	118	Serial No.	66
Distance To Source	N/A	FWDA	NO	Strength	1.5 CU	Strength	19. CU

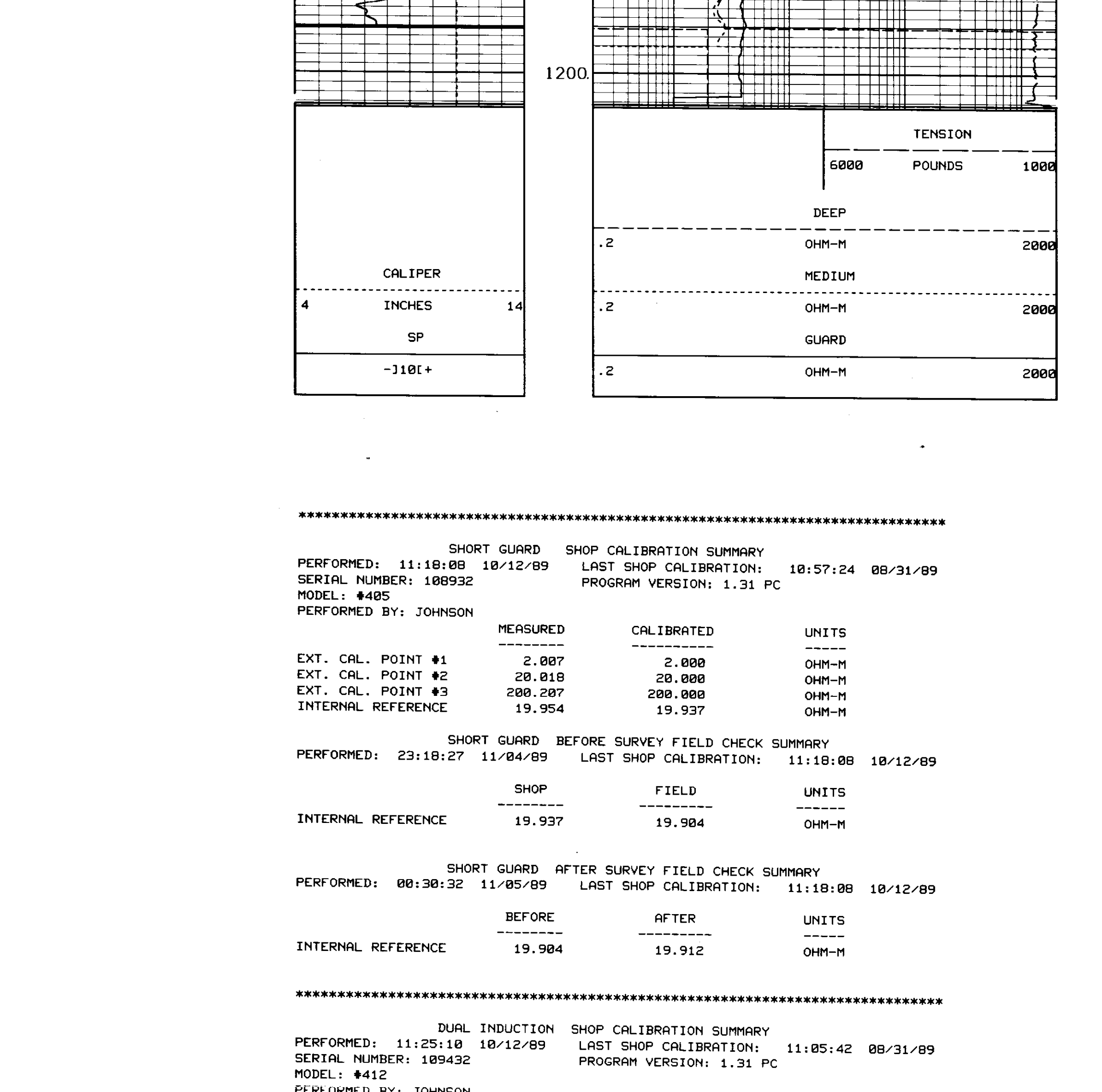
LOGGING DATA

GENERAL				GAMMA		ACOUSTIC			DENSITY			NEUTRON		
Run	Depth		Speed	Scale		Scale			Scale			Scale		
No.	From	To	Ft/Min	L	R	L	R	Matrix	L	R	Matrix	L	R	Matrix
ONE	1480	465	30	0	150	150	50	57US	1.65	2.65	2.65	60	0	SAND
					API						G/CC		PU	

Remarks: ANNULAR HOLE VOLUME CALCULATED USING 3 1/2 INCH CASING.

CREW ON LOCATION: KIBBE, ROUSSEAU
THANK YOU FOR USING HALLIBURTON LOGGING SERVICES!!

Halliburton Logging Services, Inc. does not guarantee the accuracy of any interpretation of log data, conversion of log data to physical rock parameters or recommendations which may be given by HLS personnel or which may appear on the log or in any other form. Any user of such data, interpretations, conversions or recommendations agrees that HLS is not responsible except where due to gross negligence or wilful misconduct, for any loss, damages, or expenses resulting from the use thereof.



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SHORT GUARD SHOP CALIBRATION SUMMARY
PERFORMED: 11:18:08 10/12/89 LAST SHOP CALIBRATION: 10:57:24 08/31/89
SERIAL NUMBER: 108932 PROGRAM VERSION: 1.31 PC
MODEL: #405
PERFORMED BY: JOHNSON

	MEASURED	CALIBRATED	UNITS
EXT. CAL. POINT #1	2.007	2.000	OHM-M
EXT. CAL. POINT #2	20.018	20.000	OHM-M
EXT. CAL. POINT #3	200.207	200.000	OHM-M
INTERNAL REFERENCE	19.954	19.937	OHM-M

SHORT GUARD BEFORE SURVEY FIELD CHECK SUMMARY
PERFORMED: 23:18:27 11/04/89 LAST SHOP CALIBRATION: 11:18:08 10/12/89

	SHOP	FIELD	UNITS
INTERNAL REFERENCE	19.937	19.904	OHM-M

SHORT GUARD AFTER SURVEY FIELD CHECK SUMMARY
PERFORMED: 00:30:32 11/05/89 LAST SHOP CALIBRATION: 11:18:08 10/12/89

	BEFORE	AFTER	UNITS
INTERNAL REFERENCE	19.904	19.912	OHM-M

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DUAL INDUCTION SHOP CALIBRATION SUMMARY
PERFORMED: 11:25:10 10/12/89 LAST SHOP CALIBRATION: 11:05:42 08/31/89
SERIAL NUMBER: 109432 PROGRAM VERSION: 1.31 PC
MODEL: #412
PERFORMED BY: JOHNSON

	DEEP INDUCTION		MEDIUM INDUCTION		
	MEASURED	CALIBRATED	MEASURED	CALIBRATED	UNITS
TOOL ZERO	.044	.000	.125	.000	MMHOS/M
INTERNAL REFERENCE	496.260	497.213	505.173	504.112	MMHOS/M
WHEEL	499.256	500.000	501.897	500.000	MMHOS/M
MANDREL BASE	3.683	3.922	5.771	6.411	MMHOS/M

DUAL INDUCTION BEFORE SURVEY FIELD CHECK SUMMARY
PERFORMED: 23:21:43 11/04/89 LAST SHOP CALIBRATION: 11:25:10 10/12/89

	DEEP INDUCTION		MEDIUM INDUCTION		
	SHOP	FIELD	SHOP	FIELD	UNITS
TOOL ZERO	.000	1.082	.000	-.149	MMHOS/M
INTERNAL REFERENCE	497.212	497.496	504.111	508.475	MMHOS/M
MANDREL BASE	3.922	3.922	6.411	6.411	MMHOS/M

DUAL INDUCTION AFTER SURVEY FIELD CHECK SUMMARY
PERFORMED: 00:32:02 11/05/89 LAST SHOP CALIBRATION: 11:25:10 10/12/89

	DEEP INDUCTION		MEDIUM INDUCTION		
	BEFORE	AFTER	BEFORE	AFTER	UNITS
TOOL ZERO	1.082	1.123	-.149	-.132	MMHOS/M
INTERNAL REFERENCE	497.495	489.346	508.474	508.532	MMHOS/M
MANDREL BASE	3.922	3.922	6.411	6.411	MMHOS/M

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GAMMA SHOP CALIBRATION SUMMARY
PERFORMED: 23:05:22 11/04/89 LAST SHOP CALIBRATION: 14:46:48 10/12/89
SERIAL NUMBER: 108581 PROGRAM VERSION: 1.31 PC
MODEL: #432 FIELD CALIBRATOR: #2141
PERFORMED BY: JOHNSON

	MEASURED	CALIBRATED	UNITS
BACKGROUND	25	23	API-CPS
BACKGROUND+CALIBRATOR	299	281	API-CPS
CALIBRATOR	274	258	API-CPS

GAMMA BEFORE SURVEY FIELD CHECK SUMMARY
PERFORMED: 23:13:22 11/04/89 LAST SHOP CALIBRATION: 23:05:22 11/04/89
FIELD CALIBRATOR: #2141

	SHOP	FIELD	UNITS
BACKGROUND	23	24	API-CPS
BACKGROUND+CALIBRATOR	281	280	API-CPS
CALIBRATOR	258	256	API-CPS

GAMMA AFTER SURVEY FIELD CHECK SUMMARY
PERFORMED: 00:49:50 11/05/89 LAST SHOP CALIBRATION: 23:05:22 11/04/89

	BEFORE	AFTER	UNITS
BACKGROUND	24	25	API-CPS
BACKGROUND+CALIBRATOR	280	282	API-CPS
CALIBRATOR	256	257	API-CPS

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CALIPER SHOP CALIBRATION SUMMARY
PERFORMED: 12:00:42 10/05/89 LAST SHOP CALIBRATION: 14:00:58 08/07/89
SERIAL NUMBER: TAN PROGRAM VERSION: 1.31 PC
MODEL: #202
PERFORMED BY: MCDANIEL

	MEASURED	CALIBRATED	UNITS
VALUE 1	8.590	8.000	INCHES
VALUE 2	17.414	16.000	INCHES

CALIPER BEFORE SURVEY FIELD CHECK SUMMARY
PERFORMED: 23:15:52 11/04/89 LAST SHOP CALIBRATION: 12:00:42 10/05/89

	SHOP	FIELD	UNITS
VALUE 1	8.000	8.019	INCHES

CALIPER AFTER SURVEY FIELD CHECK SUMMARY
PERFORMED: 00:39:18 11/05/89 LAST SHOP CALIBRATION: 12:00:42 10/05/89

	BEFORE	AFTER	UNITS
VALUE 1	8.019	8.085	INCHES

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TENSION SHOP CALIBRATION SUMMARY
PERFORMED: 22:37:06 11/04/89 LAST SHOP CALIBRATION: 17:45:54 10/31/89
SERIAL NUMBER: TOP PROGRAM VERSION: 1.31 PC

H L S CALIBRATION SUMMARY TABLE

SERVICE or SIGNAL	SHOP	BEFORE	AFTER	CHANGE	TOLERANCE
GUARD	19.937	19.904	19.912	-.008	+/-.80
DEEP INDUCTION	497.212	497.495	489.346	8.148	+/- 20
MEDIUM INDUCTION	504.111	508.474	508.532	-.057	+/- 20
GAMMA	258	256	257	-1	+/- 9.0
CALIPER VALUE 1	8.000	8.019	8.085	-.065	+/- 0.50

EVENTS

1	19:52:25	00000	>DATE OF LOG: MMDD	11 4
2	19:55:21	00000	>PLS SOFTWARE REVISION	1.31
3	19:55:21	00000	>CURRENT REVISION UPDATE NUMBER	PC
4	20: 4:21	00000	>CASING SIZE O.D. (INCHES)	5.500+0
5	20: 4:21	00000	>BIT SIZE? (INCHES)	7.875+0
6	20: 4:24	00000	>DT-MATRIX(40=DOL<DT<70=SHALY)	5.700+1
7	20: 4:25	00000	>DT-SHALE (100=MIN<DT<160=MAX)	1.000+2
8	20: 4:25	00000	>FOR FORMATION FACTOR(.5<A<2.5)	1.000+0
9	20: 4:25	00000	>FOR FORMATION FACTOR(1.2<M<2.5)	2.000+0
10	20: 4:31	00000	>CASING SIZE O.D. (INCHES)	3.500+0
11	20: 4:38	00000	>BIT SIZE? (INCHES)	6.250+0
12	20: 4:49	00000	>FOR FORMATION FACTOR(.5<A<2.5)	8.100-1
13	20: 4:53	00000	>>LOG PARAMETERS UPDATED HERE	
14	23:36:19	01207	>LOGGING SECTION NO.	2
15	23:44: 8	00980	>"HALTING" END OF SECTION	
16	23:44: 8	00980	>"HALTING" END OF SECTION	
17	23:52:40	01484	>LOGGING SECTION NO.	3
18	0: 0: 0	01271	>DATE OF LOG: MMDD	11 5
19	0:27:59	00458	>"HALTING" END OF SECTION	
20	0:27:59	00458	>"HALTING" END OF SECTION	