

API Well No.	State	County	Well	S/T	Date <u>6-1</u> 19 <u>93</u>	Depth <u>366</u>
Operator <u>GRAND MESA OPER. CO.</u>					Spud Date <u>6-1</u>	Present Activity <u>WOC</u>
Report for <u>LARRY FRIEND</u>					Contractor <u>DUKE ORLB</u>	Rig No. <u>4</u>
Well Name and No. <u>ELMORE #3</u>					Report For <u>JAY SCHNEIDER</u>	Section Township Range <u>17-17S-24W</u>
Field or Block No.				County, Parish or Offshore Area <u>NEB</u>	State <u>NEB</u>	

Drilling Assembly			Casing	Mud Volume (BBL)	Circulation Data			
Bit Size <u>77/16</u>	Type	Jet Size	<u>25/16</u> Surface @ <u>360</u> Ft.	Hole	Pits <u>350</u>	Pump Size x In <u>6</u> x <u>14</u>	Annular Vel (Ft/Min) DP <u>179</u> DC <u>321</u>	
Drill Pipe Size	Type	Length	Intermediate @ Ft.	Total Circulating Volume		Pump Make, Model <u>D-300</u>	Assumed Eff. %	Circulation Pressure (PSI) <u>800</u>
Drill Pipe Size	Type	Length	Intermediate @ Ft.	In Storage	Weight	Bbl/Stk <u>152</u>	Stk/Min <u>53</u>	Bottoms Up (Min)
Drill Collar Size	Type	Length	Production or Liner @ Ft.	Mud Type <u>WATER</u>	Bbl/Min <u>7.1</u>	Gal/Min <u>299</u>	Total Circ Time (Min)	

Mud Properties				Mud Property Specifications			
Sample From	<input type="checkbox"/> F.L.	<input type="checkbox"/> Pit	<input type="checkbox"/> F.L.	<input type="checkbox"/> Pit	Weight <u>9.0-9.4</u>	Viscosity <u>26-32</u>	Filtrate <u>n/c</u>
Time Sample Taken	<u>8:20 A</u>			Recommended Tour Treatment			
Flowline Temperature °F				<u>(1) TO 3600' DRILL WITH WATER FLUSH HOLE AS NEEDED</u>			
Depth (ft) TVD <input checked="" type="checkbox"/> MD <input type="checkbox"/>	<u>366</u>			<u>(2) WATER TO CONTROL WT.</u>			
Weight <input type="checkbox"/> (ppg) <input type="checkbox"/> (lb/cu ft) <input type="checkbox"/> SpG				<u>(3) LCM AS NEEDED</u>			
Funnel Viscosity (sec/qt) API @ °F				<u>(4) TO FILL FRAC - IN 80 BBL WATER MIX 1/2 SODA ASH 1R GEL 1 CALSOL 2 L36</u>			
Plastic Viscosity cp @ °F	<u>W</u>			<u>(5) DISPLACE AT 3600'</u>			
Yield Point (lb/100 cu ft)	<u>A</u>						
Gel Strength (lb/100 ft ²) 10 sec/10 min.	<u>T</u>						
Filtrate API (cm ³ /30 min.)	<u>E</u>						
API HTHP Filtrate (cm ³ /30 min.) °F	<u>R</u>						
Cake Thickness (32nd in API/HTHP)							
Solids Content (% by Vol) <input type="checkbox"/> calculated <input type="checkbox"/> retort							
Liquid Content (% by Vol) Oil/Water							
Sand Content (% by Vol)							
Methylene Blue Capacity <input type="checkbox"/> lb/bbl equiv. <input type="checkbox"/> cm ³ /cm ³ mud							
pH <input type="checkbox"/> Strip <input type="checkbox"/> Meter @ °F							
Alkalinity Mud (PM) cm ³ N/50 Acid							
Alkalinity Filtrate (P _f /M _f) cm ³ cm ³ N/50 Acid							
Chloride (mg/L)				DAILY COST		CUMULATIVE COST	
Total Hardness as Calcium (mg/L)				<u>\$110.27</u>		<u>\$110.27</u>	

Product Inventory	GEL	MULL	SA	CS	L36	DRUM	L36										
Starting Inventory	210	64	10	10	15	6	4										
Received																	
Used Last 24 Hr.	15						2										
Closing Inventory	195	64	10	10	15	6	2										
Cost Last 24 Hr.																	

Engineer DUSTY RHOADES Phone: 913-743-5419 For Mud, Call: 913-462-6114

Any opinion and/or recommendation, expressed orally or written herein, has been prepared carefully and may be used if the user so elects, however, no representation or warranty is made by ourselves or our agents as to its correctness or completeness, and no liability is assumed for any damages resulting from the use of same.

DRILLING MUD REPORT NO. 2

State _____ County _____ Well _____ S/T _____
Operator GRAND MECA OPER. CO.
Report for LARRY FRIENDS
Well Name and No. ELMORE #3

Date 6-5 1993 Depth 3755
Present Activity DRILL
Spud Date 6-1
Contractor DUKE DRIB Rig No. 4
Report For RICH WHEELER Section Township Range 17-17S-24W
Field or Block No. _____ County, Parish or Offshore Area NESS State KC

Drilling Assembly			Casing		Mud Volume (BBL)		Circulation Data			
Bit Size <u>7 7/8</u>	Type <u>S1PF</u>	Jet Size <u>3/16</u>	<u>RS1/2</u>	Surface @ <u>360 Ft.</u>	Hole <u>276</u>	Pits <u>350</u>	Pump Size x In. <u>6 x 14</u>	Annular Vel (Ft/Min) DP <u>179 DC 321</u>		
Drill Pipe Size <u>4 1/2</u>	Type <u>XA</u>	Length _____	Intermediate @ _____ Ft.	Total Circulating Volume <u>626</u>	Pump Make, Model <u>0-300</u>		Assumed Eff. % _____	Circulation Pressure (PSI) <u>900</u>		
Drill Pipe Size _____	Type _____	Length _____	Intermediate @ _____ Ft.	In Storage _____	Weight _____	Bbl/Stk <u>.152</u>	Stk/Min <u>58</u>	Bottoms Up (Min) <u>39 t</u>		
Drill Collar Size <u>6 1/4</u>	Type _____	Length <u>560'</u>	Production or Liner @ _____ Ft.	Mud Type <u>CHEM</u>	Bbl/Min <u>7.1</u>	Gal/Min <u>298</u>	Total Circ Time (Min) <u>88 t</u>			

Mud Properties		Mud Property Specifications	
Sample From <input checked="" type="checkbox"/> F.L. <input type="checkbox"/> Pit	<input type="checkbox"/> F.L. <input type="checkbox"/> Pit	Weight <u>9.0-9.3</u>	Viscosity <u>38-40 ORFV</u>
Time Sample Taken <u>9:45 AA</u>			Filtrate <u>10-12</u>
Flowline Temperature °F _____		Recommended Tour Treatment	
Depth (ft) TVD <input checked="" type="checkbox"/> MD <input type="checkbox"/> <u>3755</u>		<u>(1) DAILY - 1 CASEINIC</u>	
Weight <input checked="" type="checkbox"/> (ppg) <input type="checkbox"/> (lb/cu ft) <input type="checkbox"/> SpG <u>8.8</u>		<u>(2) GEL FOR 38-40 TO DRILL</u>	
Funnel Viscosity (sec/qt) API @ _____ °F <u>36</u>		<u>45-50 BY 4200</u>	
Plastic Viscosity cp @ _____ °F <u>10</u>		<u>(3) WATER TO CONTROL WT.</u>	
Yield Point (lb/100 cu ft) <u>4</u>		<u>(4) LCM AS NEEDED</u>	
Gel Strength (lb/100 ft²) 10 sec/10 min. <u>4/10</u>		<u>(5) KEEP HOLE FULL</u>	
Filtrate API (cm³/30 min.) <u>10.6</u>		<u>DISPLACED - 3630</u>	
API HTHP Filtrate (cm³/30 min.) °F _____			
Cake Thickness (32nd in API/HTHP) <u>1/32</u>			
Solids Content (% by Vol) <input checked="" type="checkbox"/> calculated <input type="checkbox"/> retort <u>3.3</u>			
Liquid Content (% by Vol) Oil/Water <u>96.7</u>			
Sand Content (% by Vol) _____			
Methylene Blue Capacity <input type="checkbox"/> lb/bbl equiv. <input type="checkbox"/> cm³/cm³ mud _____			
pH <input checked="" type="checkbox"/> Strip <input type="checkbox"/> Meter @ _____ °F <u>11.5</u>			
Alkalinity Mud (PM) cm³ N/50 Acid _____			
Alkalinity Filtrate (P/M) cm³ cm³ N/50 Acid _____			
Chloride (mg/L) <u>2000</u>		DAILY COST <u>\$ 1640.78</u>	CUMULATIVE COST <u>\$ 1751.05</u>
Total Hardness as Calcium (mg/L) <u>40</u>			
<u>LCM #189L</u> <u>0</u>			

Product Inventory	GEL	HALES	SA	S	LAG	ORASIN	LCM										
Starting Inventory	195	64	10	10	15	6	2										
Received	220			10													
Used Last 24 Hr.	167	1	5	6	12		1										
Closing Inventory	248	63	5	14	3	6	1										
Cost Last 24 Hr.																	

Engineer DUSTY RHOADES Phone: 913-743-5419 For Mud, Call: 316-793-8417

DRILLING MUD REPORT NO. 3

County: 13533865
 Well: GRAND MESA OPER. CO.
 S/T: LARRY FRIEND

Date: 6-6 19 93
 Depth: 4230
 Present Activity: DRILG
 Spud Date: 6-1
 Contractor: DUKE DRILG
 Rig No.: 4
 Report For: RSCH WHEELER
 Section Township Range: 17-17S-24W

Name and No.: ELMORE 43
 Field or Block No.:
 County, Parish or Offshore Area: NESS
 State: KS

Drilling Assembly		Casing		Mud Volume (BBL)		Circulation Data	
Type: 31 PF	Jet Size: 3/16	Surface: 360	Hole: 304	Pits: 350	Pump Size: 6 x 14	Annular Vel (Ft/Min) DP: 1779	DC: 321
Type: XH	Length:	Intermediate: @	Total Circulating Volume: 654	In Storage:	Pump Make, Model: D-300	Assumed Eff. %:	Circulation Pressure (PSI): 900
Type:	Length:	Intermediate: @	Weight:	Bbl/Stk: .152	Stk/Min: 58	Bottoms Up (Min):	43 L
Bar Size: 6 1/4	Type:	Production or Liner: @	Mud Type: CHEM	Bbl/Min: 11	Gal/Min: 298	Total Circ Time (Min):	92 L

Mud Properties		Mud Property Specifications	
Sample From: 9:14 AM	Weight: 9.2-9.6	Viscosity: 45-50	Filtrate: 10-12
Temperature: 94 F	Recommended Tour Treatment:		
TVD: 4230	(1) DAILY - 1 CAUSTIC		
ppg: 9.47	(2) GEL FOR 45-50 UVI		
Viscosity (sec/qt) API @ 300 RPM: 49	USE 1/2 WATER - 1/2 AST MUD		
Viscosity cp @ 300 RPM: 20	(3) WATER TO CONTROL UVI		
Point (lb/100 cu ft): 16	(4) LCM AS NEEDED		
Length (lb/100 ft) 10 sec/10 min.: 12/26	(5) KEEP HOLE FULL		
API (cm³/30 min.): 10.4			
THP Filtrate (cm³/30 min.):			
Thickness (32nd in API/HTHP): 2/32			
Content (% by Vol) calculated: 8			
Content (% by Vol) Oil/Water: 92			
Content (% by Vol): TR			
Blue Capacity:			
Strip: 11.0			
PM: 1700	DAILY COST: PROD - 656.93		
Hardness as Calcium (mg/L): 160	CUMULATIVE COST: PROD - 2407.98		
LCM #1 BBL: 0	TRM - 0		
	TOTAL - 2940.52		

Day	GEL	HUM	SA	LS	LSB	DRYSPAL	LIMS
6/3	6	16	7	6	1		
6/7	6	16	7	6	1		
6/11	6	16	7	6	1		

Operator: DUSTY RHOADES Phone: 913-743-5419 For Mud, Call: 316-793-8417

Opinion and/or recommendation, expressed orally or written herein, has been prepared carefully and may be used if the user so elects, however, no representation or warranty is made by ourselves or our agents as to its correctness or completeness, and no liability is assumed for any damages resulting from the use of same.

DRILLING MUD REPORT NO. 4



County _____ Well _____ S/T _____

Date 6-7 19 93 Depth 4380
 Spud Date 6-1 Present Activity DRIL

GRAND MESA OPER CO.

Contractor DUKE DRIL Rig No. 4

Report for LARRY FRIEND

Report For RICH WHEELER Section Township Range 17-175-24W

Well Name and No. ELMORE #3

Field or Block No. _____ County, Parish or Offshore Area NESS State _____

Drilling Assembly			Casing		Mud Volume (BBL)		Circulation Data			
Size 77/8	Type SIF	Jet Size 3/14	Surface 2 5/8 @ 360 Ft.	Hole 314	Pits 350	Pump Size 6 x 14	Annular Vel (Ft/Min) DP 179 DC 321			
Pipe 4 1/2	Type XH	Length _____	Intermediate @ Ft.	Total Circulating Volume 864		Pump Make, Model D-300	Assumed Eff. %	Circulation Pressure (PSI) 900		
Pipe _____	Type _____	Length _____	Intermediate @ Ft.	In Storage _____	Weight _____	Bbl/Stk .152	Stk/Min 58	Bottoms Up (Min) 44 L		
Collar Size 6 1/4	Type _____	Length 560	Production or Liner @ Ft.	Mud Type CHEM		Bbl/Min 1.1	Gal/Min 298	Total Circ Time (Min) 94 L		

Mud Properties		Mud Property Specifications	
Sample From _____	<input checked="" type="checkbox"/> F.L. <input type="checkbox"/> Pit <input type="checkbox"/> F.L. <input type="checkbox"/> Pit	Weight 9.2-9.6	Viscosity 48-50
Time Sample Taken 9:05 AM			Filtrate 10-12
Wellbore Temperature °F _____		Recommended Tour Treatment	
Depth (ft) TVD <input checked="" type="checkbox"/> MD <input type="checkbox"/> 4380		(1) DAILY - 1 CAUSTIC	
Weight <input checked="" type="checkbox"/> (ppg) <input type="checkbox"/> (lb/cu ft) <input type="checkbox"/> SpG 9.5		(2) GEL FOR 48-50 LBS	
Apparent Viscosity (sec/qt) API @ °F 50		(3) WATER TO CONTROL WL.	
Intrinsic Viscosity cp @ °F 20		(4) LCM AS NEEDED	
Yield Point (lb/100 cu ft) 18		(5) KEEP HOLE FULL	
Strength (lb/100 ft²) 10 sec/10 min. 14/32		DST #1- 4261-4360	
Plastic Viscosity (lb/100 ft²) 10.0		DAILY COST	
HTHP Filtrate (cm³/30 min.) °F _____		PROD. 33.21	
Filter Cake Thickness (32nd in API/HTHP) 2/32		MAY 0	
Solids Content (% by Vol) <input checked="" type="checkbox"/> Calculated <input type="checkbox"/> retort 8.4		CUMULATIVE COST	
Oil Content (% by Vol) Oil/Water 9/16		PROD. 2443.19	
Water Content (% by Vol) 1R		MAY 532.54	
Methylene Blue Capacity <input type="checkbox"/> lb/bbl equiv. <input type="checkbox"/> cm³/cm³ mud		TOTAL 2975.73	
<input checked="" type="checkbox"/> Strip <input type="checkbox"/> Meter @ °F 9.5			
Fluidity Mud (PM) cm³ N/50 Acid _____			
Fluidity Filtrate (P/M) cm³ cm³ N/50 Acid _____			
Rheology (mg/L) 2000			
Hardness as Calcium (mg/L) 100			
LCM #1 BBL 0			

Category	GEL	HYD	SA	CS	LOW	DRUM	W-1E										
1st	175	63	6	16	7	6	1										
2nd																	
3rd																	
4th																	
5th																	
6th																	
7th																	
8th																	
9th																	
10th																	

Operator: DUSTY RHOADES Phone: 913-743-5419 For Mud, Call: 913-462-6114

Opinion and/or recommendation, expressed orally or written herein, has been prepared carefully and may be used if the user so elects, however, no representation or warranty is made by ourselves or our agents as to its correctness or completeness, and no liability is assumed for any damages resulting from the use of same.

INTERVAL: 0 - 350'

1. Spud with Bentonite & Lime slurry of 36-38 sec/qt viscosity.
2. Mix 2-3 sacks of Cottonseed Hulls to assure full returns initially.
3. Run water and jet often to control mud weight as low as possible.
4. Have viscosity 36-38 sec/qt at pipe point for good hole cleaning prior to running casing.
5. Be certain to circulate hole clean prior to pulling out to run casing.

INTERVAL: 350' - 3000'

1. Drill out from under surface with water & native viscosity from drilled solids.
2. Jet often & run ample water to control mud weight as low as possible. Do not mix LCM unless severe mud loss should occur. For seepage loss, increase water additions to maintain volume.

INTERVAL: 3000' - 3800'

1. At approximately 3500' & at the discretion of the toolpusher, company representative, & the mud engineer, the fluid in the hole should be displaced with a clean premixed bentonite system.
2. The displacement will increase the Bentonite concentration & at the same time lower the mud weight, solids content, chloride content & the fluid loss.
3. Make additions of water at the flowline only as needed to control the mud weight in the recommended range.
4. Add LCM only if needed.

Suggested Mud Properties:

Mud Weight: 9.4-9.0 #/gal
Viscosity: 30-38 sec/qt
Fluid Loss: 15-20cc
Lost Circ. Matl.: As needed

Additives:

Premixed Bentonite, Soda Ash,
Lignite, Caustic Soda, Desco

INTERVAL: ⁴²⁰⁰~~3800~~' - 4500' (PTD)

1. Maintain fluid with hourly treatments as per field engineers' recommendations.
2. Run minimum amount of fresh water to control mud weight in recommended range.
3. Add LCM only as needed.
4. Be certain to circulate hole clean prior to tripping out for DST or logs.

Suggested Mud Properties:

Mud Weight: 9.9-9.2 #/gal
Viscosity: 42-48 sec/qt
Fluid Loss: 10-12cc
Lost Circ. Matl.: Only as needed

Additives:

Premixed Bentonite, Caustic
Soda, Lignite, Soda Ash,
Driscopac, Desco, Cottonseed
Hulls if needed

KEEP HOLE FULL AT ALL TIMES.

The above treatments and procedures will be monitored at the wellsite by the MSI Engineer and recommendations made based on hole conditions at that time.

COMPANY: Grand Mesa Operating Co.

WELL NAME: #3 Elmore

LOCATION: 17-175-24W

COUNTY/STATE: Ness Co., KS

SUGGESTED CASING PROGRAM:

8 5/8" at approximately 350'

Mud Type: Displacement (Low Solids)

SUGGESTED MUD PROPERTIES:

Depth	Weight	Viscosity	Fluid Loss	Treatment/Remarks
0' - 350'	9.4-9.8	36-38	No control	Spud with Bentonite & Lime slurry.
350' - 3000'	9.2-9.4	27-30	No control	Drill from under surface with water and native viscosity.
3000' - 3800'	9.4-9.0	30-38	15-20cc	Displace the hole with Prehydrated Bentonite & Chemicals to lower the mud weight & fluid loss by the Heebner.
3800' 4280' - 4500' (PTD)	8.9-9.2	42- 38 ⁴	10-12cc	Maintain fluid with tourly treatments per field engineer's recommendations. First zone of interest is the Heebner. <i>FT SCOTT</i>

NOTE: Mud engineer should stay in close communications with wellsite personnel for possible change in mud up depth.

MUD SYSTEMS, INC.'S PERSONNEL

<u>PERSONNEL</u>	<u>ADDRESS</u>	<u>PHONE</u>
Rick Hughes, Sales Engineer	Great Bend, Kansas	316-793-8417
Steve Yaden, Sales Engineer	Pratt, Kansas	316-672-3106
Mike Whitefield, Sales Engineer	Liberal, Kansas	316-624-6525
Dusty Rhoades, Sales Engineer	Wakeeney, Kansas	913-743-5419
Ed Kope, Sales Consultant	Wichita, Kansas	316-267-2811
Doyle Lyon, Sales Manager	Wichita, Kansas	316-267-2811
Chuck Latham, Operations Manager	Wichita, Kansas	316-267-2811

STOCK POINTS

<u>WAREHOUSE MANAGERS</u>	<u>ADDRESS</u>	<u>PHONE</u>
Tab Stupka, Whse. Mgr.	Colby, Kansas	913-462-6114
Stan Billinger, Whse. Mgr.	Great Bend, Kansas	316-793-8417
David Blanton, Whse. Mgr.	Liberal, Kansas	316-624-7131

JUN. 28 1993

4

File TRK V File

Operator GRAND MESA OPER. CO.	Legal Location 17-175-24W	Elevation/Water Depth	Warehouse GREAT BEND, KY
Well Name and No. ELMORE #3	Field/Offshore Area/Block	Spud Date 6-1-93	Total Mud Cost \$3222.96
Contractor DUKE DRILL	Rig No. 4	County/Parish NESS	T.D. Date 6-7-93
TSR DUSH, RHOADES	State KANSAS	Days to TD 6	Total Depth 4460
			MSI Well No. 15-135-38865

DATE (1993)	TIME	OPERATION	DEPTH (ft)	WT (ppg)	FUNNEL VISCOSITY (sec/qt)		PLASTIC VISCOSITY		YIELD POINT (lb/100ft ²)	GELS (lb/100ft ²) 0/10	FILTRATE (ml/30 min)			Cake (32nd in)	Solids (% by Vol.)	Oil (% by Vol.)	Water (% by Vol.)	Sand (% by Vol.)	Methy. Blue (me/ml mud)	pH	Alkalinity			Chloride mg/l	Calcium mg/l	LCM #/BBL	SR min	Circ. Volume (bbl)	Flow Rate GPM	REMARKS				
					API@	°F	cp@	°F			API	HT-HP	°F								P _m	P _f	M _f											
6-1	8:20 P	SPUD	366						SPUD	MUD																								
2	9:00 A	DRILL	700						WATER																									
3		DRILL	2400						WATER																									
4		DRILL	3100						WATER																									
5	9:15 A	DRILL	3755	8.8	36		10	4	4/10	10.6		1	3.3	-	96.7	-				11.5		2000	40	0		58	626	298						
6	9:40 A	DRILL	4230	9.1	49		20	16	12/26	10.4		2	8	-	92	NR				11		1700	160	0		58	654	298						
7	9:05 A	DRILL	4380	9.5	50		20	18	14/32	10		2	8.4	-	91.6	NR				9.5		2000	100	0		58	664	298						
8	9:20 A	ID	4460																															LOGGED D.A.