

30-015-35350

KAISER-FRANCIS OIL COMPANY

P. O. BOX 21468

TULSA, OKLAHOMA 74121-1468

6733 South Yale Avenue, 74136  
(918) 494-0000

January 8, 2007

Mr. Bryan Arrant  
State of New Mexico  
Oil Conservation Division  
1301 W. Grand Ave.  
Artesia, NM 88210



Re: Mud Program and  
H2S Contingency Plan  
Mesa 11 Grande #4  
Sec. 11-22S-26E  
Eddy Co., NM

Dear Sir:

Please find a copy of the mud program and H2S contingency plan attached for the subject well we are attempting to permit to drill. All other input was entered online.

Should anything further be required, feel free to contact me at 918-491-4314 or email @ [Charlotv@KFOC.net](mailto:Charlotv@KFOC.net).

Sincerely,

  
Charlotte Van Valkenburg  
Technical Coordinator

Attachments

**KAISER-FRANCIS OIL COMPANY  
HYDROGEN SULFIDE (H<sub>2</sub>S) CONTINGENCY PLAN  
FOR DRILLING/COMPLETION WORKOVER/FACILITY**



**MESA 11 GRANDE # 4  
SECTION 11-T22S-R26E  
EDDY COUNTY, NM**

This well/facility is not expected to have H<sub>2</sub>S, but due to the sensitive location, the following is submitted as requested.

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## **EMERGENCY RESPONSE ACTIVATION AND GENERAL RESPONSIBILITIES**

### **Activation of the Emergency Action Plan**

In the event of any emergency situation, all personnel on location should first ensure that the following items are initiated. After that, they should refer to the appropriate Specific Emergency Guidance sections below for further responsibilities:

1. Notify the senior ranking contract representative on site.
2. Notify Kaiser-Francis representative in charge.
3. Notify civil authorities if the Kaiser-Francis Representative cannot be contacted and the situation dictates.
4. Perform rescue and first aid as required (without jeopardizing additional personnel).

### **General Responsibilities**

In the event of an H<sub>2</sub>S emergency, the following plan will be initiated.

- 1) All personnel will immediately evacuate to an up-wind and if possible up-hill "safe area".
- 2) If for any reason a person must enter the hazardous area, they must wear a SCBA (Self contained breathing apparatus).
- 3) Always use the "buddy system".
- 4) Isolate the well/problem if possible.
- 5) Account for all personnel
- 6) Display the proper colors warning all unsuspecting personnel of the danger at hand
- 7) Contact the Company personnel as soon as possible if not at the location. (use the enclosed call list as instructed)

At this point the company representative will evaluate the situation and coordinate the necessary duties to bring the situation under control, and if necessary, the notification of emergency response agencies and residents.

## **INDIVIDUAL RESPONSIBILITIES DURING AN H<sub>2</sub>S RELEASE**

The following procedures and responsibilities will be implemented on activation of the H<sub>2</sub>S siren and lights.

### **All Personnel:**

1. On alarm, don escape unit (if available) and report to upwind briefing area.

### **Rig Manager/Tool Pusher:**

1. Check that all personnel are accounted for and their condition.
2. Administer or arrange for first aid treatment, and/or call EMTs as needed.
3. Identify two people best suited to secure well and perform rescue, and instruct them to don SCBA.
4. Notify Contract management and Kaiser-Francis Representative.
5. Remain at the briefing area, assess and monitor personnel and overall situation for hazards or conditions that might warrant a change in the action plan.

### **Two People Responsible for Shut-in and Rescue:**

1. Don SCBA and acquire tools to secure well and perform rescue, i.e., wrenches, retrieval ropes, etc.
2. Utilize the buddy system to secure well and perform rescue(s).
3. Return to the briefing area and stand by for further instructions.

### **All Other Personnel:**

1. Isolate the area and prevent entry by other persons into the 100 ppm ROE. Additionally the first responder(s) must evacuate any public places encompassed by the 100 ppm ROE. First responder(s) must take care not to injure themselves during this operation. Company and/or local officials must be contacted to aid in this operation. Evacuation of the public should be beyond the 100 ppm ROE.

### **Kaiser-Francis Oil Company Representative:**

1. Remain at the briefing area, assess and monitor personnel and overall situation for hazards or conditions that might warrant a change in the action plan.
2. Notify company management or Local Incident Commander, and Police, Fire Department, or other local emergency services as required.

#### **PROCEDURE FOR IGNITING AN UNCONTROLLABLE CONDITION:**

Should control of the well be considered lost and ignition considered, take care to protect against exposure to Sulfur Dioxide (SO<sub>2</sub>). Intentional ignition must be coordinated with the NMOCD and local officials. Additionally the NM State Police shall be the Incident Command of any major release.

The decision to ignite a well should be a last resort and one if not both of the following pertain.

- 1) Human life and/or property are in danger.
- 2) There is no hope of bringing the situation under control with the prevailing conditions at the site.

#### **INSTRUCTIONS FOR IGNITION:**

- 1) Two people are required. They must be equipped with positive pressure; self contained breathing apparatus and a "D"-ring style, full body, OSHA approved safety harness. Non-flammable rope will be attached.
- 2) One of the people will be a qualified safety person who will test the atmosphere for H<sub>2</sub>S, Oxygen, & LFL. The other person will be the company supervisor; he is responsible for igniting the well.
- 3) Ignite up-wind from a distance no closer than necessary. Make sure that where you ignite from has the maximum escape avenue available. A 25mm flare gun shall be used, with a +/-500' range to ignite the gas.
- 4) Prior to ignition, make a final check for combustible gases.
- 5) Following ignition, continue with the emergency actions & procedures as before.

#### **CONTACTING AUTHORITIES**

Kaiser-Francis personnel must liaison with local and state agencies to ensure a proper response to a major release. Additionally, the OCD must be notified of the release as soon as possible but no later than 4 hours. Agencies will ask for information such type and volume of release, wind direction, location of release, etc. Be prepared with all information available. The following call list of essential and potential responders has been prepared for use during a release. This response plan must be in coordination with the State of New Mexico's 'Hazardous Materials Emergency Response Plan' (HMER).

EMERGENCY CALL LIST: (Start and continue until ONE of these people have been reached)

	<u>OFFICE</u>	<u>MOBILE</u>	<u>HOME</u>
Kaiser-Francis Oil Co.	918/494-0000		
David Rodawalt	432/563-2992	432/238-6969	432/520-7339
Drew Tyler	918/491-4343		
Charles Lock	918/491-4337	918/671-6510	918/250-1935

EMERGENCY RESPONSE NUMBERS: Eddy County, New Mexico

State Police – Artesia	505/748-9718
State Police – Carlsbad	505/885-3137
State Police – Hobbs	505/392-5588
Eddy County Sheriff - Carlsbad	505/887-7551
Local Emergency Planning Center – Eddy County	505/887-9511
Local Emergency Planning Center – Lea County	505/397-9231
Fire Fighting, Rescue & Ambulance – Artesia	911
Fire Fighting, Rescue & Ambulance – Carlsbad	911 or 505/885-2111
Fire Fighting, Rescue & Ambulance – Hobbs	911 or 505/397-9308
New Mexico Oil & Gas Commission – Artesia	505/748-1283
New Mexico Oil & Gas Commission – Hobbs	505/393-6161
Aerocare – Lubbock	806/725-1100
Med Flight Air Ambulance – Albuquerque	505/842-4433
American Safety	505/748-6660
Indian Fire & Safety	505/746-4660
Callaway Safety	505/392-2973
BJ Services	505/746-3569
Halliburton	505/748-2746

## PROTECTION OF THE GENERAL PUBLIC/ROE:

In the event of a release with a concentration greater than 100 ppm H<sub>2</sub>S, the ROE (Radius of Exposure) calculations will be done to determine if the following conditions have been met:

- Does the 100 ppm ROE include any public area (any place not associated with this site)
- Does the 500 ppm ROE include any public road (any road which the general public may travel)
- Is the 100 ppm ROE equal to or greater than 3000 feet

If any one of these conditions have been met then the Contingency Plan will be implemented. The following shows how to calculate the radius of exposure and an example.

### **Calculation for the 100 ppm ROE:**

$$X = [(1.589)(\text{concentration})(Q)] (0.6258)$$

(H<sub>2</sub>S concentrations in decimal form)  
10,000 ppm +=1.+  
1,000 ppm +=.1+  
100 ppm +=.01+  
10 ppm +=.001+

### **Calculation for the 500 ppm ROE:**

$$X + [(0.4546)(\text{concentration})(Q)] (.06258)$$

EXAMPLE: If a well/facility has been determined to have 150 ppm H<sub>2</sub>S in the gas mixture and the well/facility is producing at a gas rate of 200 MCFPD then:

ROE for 100 PPM       $X = [(1.589)(.0150)(200)] (0.6258)$   
                                  $X = 2.65'$

ROE for 500 PPM       $X = [(0.4546)(.0150)(200)] (0.6258)$   
                                  $X = 1.2'$

(These calculations will be forwarded to the appropriate District NMOCD office when applicable.)

## PUBLIC EVACUATION PLAN:

(When the supervisor has determined that the General Public will be involved, the following plan will be implemented)

- 1) Notification of the emergency response agencies of the hazardous condition and Implement evacuation procedures.
- 2) A trained person in H<sub>2</sub>S safety, shall monitor with detection equipment the H<sub>2</sub>S Concentration, wind and area of exposure (ROE). This person will determine the outer perimeter of the hazardous area. The extent of the evacuation area will be determined from the data being collected. Monitoring shall continue until the situation has been resolved. **(All monitoring equipment will be UL approved, for use in class I groups A,B,C & D, Division I, hazardous locations. All monitors will have a minimum capability of measuring H<sub>2</sub>S, oxygen, and flammable values.)**
- 3) Law enforcement shall be notified to set up necessary barriers and maintain such for the duration of the situation as well as aid in the evacuation procedure.
- 4) The company supervising personnel shall stay in communication with all agencies through out the duration of the situation and inform such agencies when the situation has been contained and the effected area(s) is safe to enter.



### **CHARACTERISTICS OF H<sub>2</sub>S AND SO<sub>2</sub>**

Common Name	Chemical Formula	Specific Gravity	Threshold Limit	Hazardous Limit	Lethal Concentration
Hydrogen Sulfide	H <sub>2</sub> S	1.189 Air = 1	10 ppm	100 ppm	600 ppm
Sulfur Dioxide	SO <sub>2</sub>	2.21 Air = 1	2 ppm	N/A	1000 ppm

### **TRAINING:**

All responders must have training in the detection of H<sub>2</sub>S measures for protection against the gas, equipment used for protection and emergency response. Weekly drills by all crews will be conducted and recorded in the IADC daily log. Additionally, responders must be equipped with H<sub>2</sub>S monitors at all times.

### **PUBLIC RELATIONS**

Kaiser-Francis recognizes that the news media have a legitimate interest in incidents at Kaiser-Francis facilities that could affect the public. It is to the company's benefit to cooperate with the news media when incidents occur because these media are our best liaison with the public.

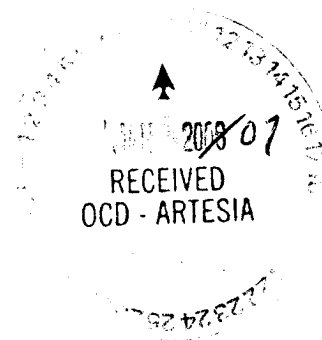
Our objective is to see that all reports of any emergency are factual and represent the company's position fairly and accurately. Cooperation with news media representatives is the most reliable guarantee that this objective will be met.

All contract and Kaiser-Francis employees are instructed **NOT** to make any statement to the media concerning the emergency incident. If a media representative contacts any employee, they should refer them to the designated Emergency Command Center where they should contact the Incident Commander or his designated relief for any information concerning the incident.

**HALLIBURTON**

**Baroid**

**Kaiser Francis  
6733 S. Yale  
Tulsa, OK. 74121**



**Mesa 11 Grande #4  
Sec. 11 - T22S - R26E  
Eddy Co., New Mexico**

## **Drilling Fluids Proposal**

**Prepared For:**

**Mr. Drew Tyler  
Kaiser Francis  
December 1, 2006**

**Prepared By:**

**Billy Sumpter  
Technical Professional  
Baroid Fluid Services  
A Halliburton Company  
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Midland, Texas 79705  
(432) 683-0222**

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# HALLIBURTON

## Baroid

Kaiser Francis  
Mesa 11 Grande #4  
Sec. 11 – T22S – R26E  
Eddy Co., NM.

### PROGRAM BRIEFING

**Baroid's** drilling fluid recommendation for the Mesa 11 Grande #4 to be drilled in Eddy County, New Mexico is based on information provided by **Kaiser Francis**. In addition, well data from offset wells was utilized to provide information relative to mud systems, operating procedures, and problem areas.

Based on the above sources, **Baroid** has established the following objectives as focal points for the drilling fluid program:

- 1) Meet environmental standards.
- 2) Provide borehole stability.
- 3) Prevent induced kicks and lost circulation. Minimize swab/surge pressures.
- 4) Optimize well bore cleaning in large diameter hole.
- 5) Seal massive and/or depleted sands.
- 6) Prevent differentially stuck pipe.
- 7) Safe and economical completion of the project.

In order to meet these objectives, **Baroid** recommends drilling with fresh water from 0 to 500', from 500' to 2,350' with fresh water, and from 2,350' to 11,600' with brine water.

We anticipate the proposed depth of 11,600' to be reached in 35 total days with an estimated drilling fluid cost of **\$45,818.58** at current **CONTRACT** prices. ***This premise is without unusual problems, protracted drilling time, mechanical interruptions/failures, excessive lost circulation, water flows, and/or abnormal pressure.***

Depth (MD/RKB)	Hole Size	Casing Size	Mud Weight (ppg)	Mud Type	Cum. Days	Cumulative Cost
<u>Surface</u> 0 - 500'	17 1/2"	13 3/8"	8.4-8.8	Fresh water	2	\$1,991.50
<u>Intermediate</u> 500' – 2,350'	12 1/4"	9 5/8"	8.4	Fresh water	3	\$3,594.68
<u>Production</u> 2,350' – 11,600'	7 7/8"	5 1/2"	8.4-12.0	Fresh water/ Brine water	30	\$40,232.40

This well will be serviced from our Lovington, NM. service center. Our Lovington service center stocks a complete line of drilling fluid products, forklifts, and is a 24-hour service facility that will handle all of the product needs for this project. For 24-hour mud deliveries, please call (505) 396-1565.

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**OBJECTIVES AND METHODS**

- 1) Meet environmental standards.
  - The proposed mud system provides economical inhibition and excellent well bore stability.
- 2) Provide borehole stability.
  - The **Baroid** Engineer will control flow properties, gel strengths, and solids in the desired ranges. In addition, we must follow prudent operating procedures such as short trips and optimized penetration rates.
- 3) Prevent induced kicks and lost circulation. Minimize swab/surge pressures.
- 4) Optimize well bore cleaning in large diameter hole.
  - This is accomplished by coordinating flow rates, penetration rates, and mud properties. Short trips are essential.
- 5) Seal massive and/or depleted sands/limestone.
  - The recommended LCM products and concentrations will provide a good particle size distribution and a controlled fluid loss for plugging depleted or weak sands/limestone in the hole intervals.
- 6) Prevent differentially stuck pipe.
- 7) Safe and economical completion of the project.
  - **Baroid** personnel are dedicated to safety. The recommended fluid system is quite cost effective, when used to reduce total well cost, by reducing well bore related problems and the associated days.

# HALLIBURTON

## Baroid

Kaiser Francis  
Mesa 11 Grande #4  
Sec. 11 – T22S – R26E  
Eddy Co., NM.

### Casing Program

Hole Size	Casing Size	Set @ MD / RKB	Fluid Density	Drilling Fluid System
17 1/2"	13 3/8"	500'	8.4-8.8	Fresh water
12 1/4"	9 5/8"	2,350'	8.4	Fresh water
7 7/8"	5 1/2"	11,600'	8.4-12.0	Fresh water/ Brine water

### Estimated Formation Tops

System	Formation	Estimated Depths		Remarks
		TVD	MD	
	Anhydrite		~425'	
	Capitan Reef		N/A	Probably absent at this location
	Lamar Limestone		~1,630'	
<i>Permian</i>	Delaware		~1,900'	
	Cherry Canyon	~2,562'	~2,562'	
	Brushy Canyon	~3,722'	~3,730'	Possible lost circulation
	Bone Spring LS	~5,172'	~5,239'	Possible H <sub>2</sub> S
	Wolfcamp	~8,737'	~8,949'	Possible Gas
<i>Pennsylvanian</i>	Strawn	~10,182'	10,399'	
	Atoka	~10,402'	~10,660'	High pressure gas (~12.0 ppg)
	Atoka Bank	~10,504'	~10,762'	
	Morrow "A"	~11,132'	~11,390'	Estimated BHP=4800 psi (8.2 ppg)
	TD	~11,242'	~11,600'	Estimated FG=12.6 ppg

# **HALLIBURTON**

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## **Baroid**

Kaiser Francis  
Mesa 11 Grande #4  
Sec. 11 – T22S – R26E  
Eddy Co., NM.

### **RECOMMENDED MUD PROPERTIES**

<b>MD(RKB) (ft)</b>	<b>WEIGHT (ppg)</b>	<b>FUN</b>	<b>PV</b>	<b>YP</b>	<b>API</b>	<b>HTHP @ 250</b>	<b>pH</b>	<b>CF</b>	<b>% Solid s</b>
0 - 500'	8.4-8.8	26-32	4-8	8-16	N/C	N/A	9.5-10.0	<5,000	<5
500' – 2,350'	8.4	26-30	1	1	N/C	N/A	10.0-10.5	<5,000	<3
2,350' – 9,500'	8.4-9.5	26-30	0	0	N/C	N/A	10.0-10.5	<150,000	<3
9,500' – 11,600'	10-12.0	34-40	1-10	5-10	10-15	N/A	10.0-10.5	180,000	<5

**DRILLING FLUID DISCUSSION BY INTERVAL****Interval: 0 – 500' MD: Fresh Water****Mud Properties:**

Interval	MW	VIS	PV	YP	FL	pH	% Solid s	CT
0 - 500'	8.4-8.8	26-32	4-8	8-16	N/C	9.5-10.0	<5	1-5K

**Operation:** Spud in and drill 17 ½" hole and drill to 500'. Run and cement 13 3/8" surface casing.**Mud System:** A fresh water system is recommended for drilling this interval. Build spud mud with **AQUAGEL®** for the desired funnel viscosity. **Lime** will be added to aid flocculation and to adjust pH for corrosion control.**Solids Control:** Fully utilize at least two linear motion shakers, rig desilter, and rig desander to control drill solids. Run the finest mesh screens that will accommodate pump rates.**Issues:** Lost returns/Seepage - Add **HY-SEAL®** for seepage. For excessive seepage or lost returns mix in 100 bbls of fresh water the following: 1 sack of **soda ash**, **AQUAGEL®** for a 35+ viscosity, 8-10 ppb **PLUG-GIT®**, 8-10 ppb **BARO-SEAL®**, and 6-8 ppb **cottonseed hulls**. ***Be prepared for severe lost circulation and the possibility of "dry drilling" to TD.***Hole Cleaning: Use **EZ-MUD®** as in sweeps or poured directly down the drill pipe on connections. **BAROLIFT™** can also be used in the sweep program if gravel is encountered.Corrosion Control- **Refer to Corrosion Control Program.** Add **DA-370 (corrosion inhibitor)** and **FA-200 (filming amine)** for corrosion control. Run corrosion rings in the drill pipe. Rings should be in place for a minimum of 100 hours unless the drill pipe is observed to be corroding or as instructed by the Corrosion Engineer. Monitor effectiveness of corrosion treatments. Record results on morning reports. Monitor corrosion rates and assure a rate of less than 1.5 lbs/ft<sup>2</sup>/yr. Ensure that the mud engineer's corrosion formulae are followed precisely and ensure that corrosion rings are submitted in a timely manner. Pure/Baroid is responsible for corrosion control.**\*At TD, sweep the hole with 50 bbls of pre-mixed fresh water/ AQUAGEL®/Lime/ HY-SEAL® with a funnel viscosity of 60-80 sec/qt., and spot a second pill on bottom for casing operations.**



**Interval: 500'-2,350' MD: Fresh Water**

**Mud Properties:**

Interval	MW	VIS	PV	YP	FL	pH	% Solids	CF
500' – 2,350'	8.4	26-30	1	1	N/C	10.0-10.5	<3	Fresh water

**Operation:** Drill out of surface casing and obtain a successful shoe test. Drill a 12 ¼" hole to 2,350'. Run and cement 9 5/8" intermediate casing just below the top of the Delaware.

**Mud System:** Fresh water is recommended to drill this interval. **Lime** will be added to aid flocculation and to adjust pH for corrosion control.

**Solids Control:** Fully utilize at least two linear motion shakers, rig desilter, and rig desander to control drill solids. Run the finest mesh screens that will accommodate pump rates.

**Issues:** Lost Returns/Seepage - Add **BARO-SEAL®**, **PLUG-GIT®**, or **HY-SEAL®** for seepage or lost returns. **DIAMONDSEAL™** is a water-swellaable but not water soluble, 100% crystalline synthetic polymer that absorbs hundreds of times its own weight in water. It has been used in the area in conjunction with "regular" LCM products with good success. ***There is significant risk of severe lost circulation throughout this interval.***

Hole Cleaning: Use **EZ-MUD®** in sweeps or poured directly down the drill pipe on connections. **BAROLIFT™** can also be used in sweeps for additional hole cleaning.

Corrosion Control- Add **DA-370 (corrosion inhibitor)** and **FA-200 (filming amine)** for corrosion control. *Keep the corrosion rates below 1.5 lbs/ft<sup>2</sup>/yr.* Run corrosion rings in the drill pipe. Rings should be in place for a minimum of 100 hours unless the drill pipe is observed to be corroding or as instructed by the Corrosion Engineer. Monitor effectiveness of corrosion treatments. Record results on morning reports. Monitor corrosion rates and assure a rate of less than 1.5 lbs/ft<sup>2</sup>/yr. Ensure that the mud engineer's corrosion formulae are followed precisely and ensure that corrosion rings are submitted in a timely manner. Pure/Baroid is responsible for corrosion control.

**\*At TD, sweep the hole with 50 bbls of pre-mixed fresh water/ AQUAGEL®/Lime/ HY-SEAL® with a funnel viscosity of 60-80 sec/qt., and spot a second pill on bottom for casing operations.**

# HALLIBURTON

## Baroid

Kaiser Francis  
Mesa 11 Grande #4  
Sec. 11 – T22S – R26E  
Eddy Co., NM.

Interval: 2,350' - 9,500' MD: Fresh Water/Brine Water

### Mud Properties:

Interval	MW	VIS	PV	YP	FL	pH	% Solids	CT
2,350' – 9,500'	8.5-9.0	26-30	1-4	1-6	N/C	>10.0	<3	>60K

**Operation:** Drill out of intermediate casing and obtain a successful shoe test. Drill an 7 7/8" Hole.

**Mud System:** Fresh water is recommended to drill this interval. Use **caustic soda** to maintain the pH of 10.0-10.5

**Solids Control:** Fully utilize at least two linear motion shakers, rig desilter, and rig desander to control drill solids. Run the finest mesh screens that will accommodate pump rates. **To control solids, add 2.5 gals/2 hrs. of SS-105 at the flowline.**

**Issues:** Mud Weight: If needed add 10 ppg brine water to increase weight.

Lost Returns/Seepage - Add **BARO-SEAL®**, **PLUG-GIT®**, or **HY-SEAL®** for seepage or lost returns. **Pump LCM (starting with 3-4 sx/hr of paper) as needed to control seepage and lost circulation. For excessive seepage mix 35-40 sx of starch to the system at 5 min/sk.**

Hole Cleaning: Use **EZ-MUD®** in sweeps or poured directly down the drill pipe on connections. **HY-SEAL®** can also be used in sweeps for additional hole cleaning. **Sweep the hole every 200' or as needed for fill or drag with 1-2 gals. of SS-105 (add at the pump suction).**

Corrosion Control- Add **DA-370 (corrosion inhibitor)**, **DA-320 (H<sub>2</sub>S scavenger)**, and **FA-200 (filming amine)** for corrosion control. Run corrosion rings in the drill pipe. Rings should be in place for a minimum of 100 hours unless the drill pipe is observed to be corroding or as instructed by the Corrosion Engineer. Monitor effectiveness of corrosion treatments. Record results on morning reports. Monitor corrosion rates and assure a rate of less than 1.5 lbs/ft<sup>2</sup>/yr. Ensure that the mud engineer's corrosion formulae are followed precisely and ensure that corrosion rings are submitted in a timely manner. Pure/Baroid is responsible for corrosion control.

**\*Ensure corrosion chemicals are mixed exactly as recommended by the mud engineer. Ensure that corrosion rings are run in saver sub and top of drill collars. Rings should be submitted for analysis on each trip. Visually check pipe on trips and check for unusual wear or corrosion**

**Interval: 9,500' - 11,600': Brine Water**
**Mud Properties:**

Interval	MW	VIS	PV	YP	FL	pH	% Solids	CG
9,500' – 11,600'	10.0-12.0	36-42	10-20	10-20	8-10	9.0-10.0	<3	>180K

**Operation:** Drill a 7 7/8" hole thru the overpressured Atoka formation at ~10,660' to 11,600'. Run and cement 5 1/2" casing.

**Mud System:** Brine water is recommended to drill this interval. Use **caustic soda** to maintain the pH 10.0-10.5. After obtaining a successful shoe test displace the wellbore with clean 10 ppg BW and immediately begin mud-up with **BARAZAN® D PLUS**. Reduce the API fluid loss to 8-10 with **DEXTRID LT™**. Adjust weight as needed with **BARITE**. The anticipated MW ramp is as follows:

TVD	MD	MW <sup>1</sup>	MW <sup>2</sup>
9,000' <sub>a</sub>	9,222'	9.0	9.0
9,500' <sub>n</sub>	9,742'	10.0	9.5
10,000' <sub>a</sub>	10,255'	11.0	9.5
10,500' <sub>n</sub>	10,658'	12.0	9.6
10,700'	± 12,000'	12.0	9.8
Note: h MW <sup>1</sup> was the mud weight required to drill the Esperanza "13" No. 1 well. The 12.0 e ppg MW was required after drilling into the Atoka @ 11,070' MD / 10,506' TVD. This o pressure was an anomaly for the area. The Esperanza will be drilled between the l Carlsbad "13" Com No. 1 and the City of Carlsbad No. 1 wells that were drilled to o 11,700'+ with MWs of 9.8 ppg and 9.6 ppg respectively. MW <sup>2</sup> will most likely be the g required MWs for this well.			

**Solids Control:** Fully utilize at least two linear motion shakers, rig desilter, and rig desander to control drill solids. Run the finest mesh screens that will accommodate pump rates. ***To control solids, add 2.5 gals/2 hrs. of SS-105 at the flowline.***

**Issues:** Lost Returns/Seepage - Add **BARO-SEAL®**, **PLUG-GIT®**, or **HY-SEAL®** for seepage or lost returns. ***Pump LCM (starting with 3-4 sx/hr of paper) as needed to control seepage and lost circulation. For excessive seepage mix 35-40 sx of starch to the system at 5 min/sk. Maintain a good selection of LC materials, including LCP 2000, on location at all times.***

Hole Cleaning: Use **EZ-MUD®** in sweeps or poured directly down the drill pipe on connections. **HY-SEAL®** can also be used in sweeps for additional hole cleaning. ***Sweep the hole every 200' or as needed for fill or drag with 1-2 gals. of SS-105 (add at the pump suction).***

Corrosion Control- Add **DA-370 (corrosion inhibitor)**, **DA-320 (H<sub>2</sub>S scavenger)**, and **FA-200 (filming amine)** for corrosion control. Run corrosion rings in the drill pipe. Rings should be in place for a minimum of 100 hours unless the drill pipe is observed to be corroding or as instructed by the Corrosion Engineer. Monitor effectiveness of corrosion treatments. Record results on morning reports. Monitor corrosion rates and assure a rate of less than 1.5 lbs/ft<sup>2</sup>/yr. Ensure that the mud engineer's corrosion formulae are followed precisely and ensure that corrosion rings are submitted in a timely manner. Pure/Baroid is responsible for corrosion control.

***\*Ensure corrosion chemicals are mixed exactly as recommended by the mud engineer. Ensure that corrosion rings are run in saver sub and top of drill collars. Rings should be submitted for analysis on each trip. Visually check pipe on trips and check for unusual wear or corrosion***

**HALLIBURTON**

**Baroid**

Kaiser Francis  
Mesa 11 Grande #4  
Sec. 11 – T22S – R26E  
Eddy Co., NM.

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# Cost Estimates

**HALLIBURTON****Baroid**

Kaiser Francis  
Mesa 11 Grande #4  
Sec. 11 – T22S – R26E  
Eddy Co., NM.

Kaiser Francis  
Mesa 11 Grande #4  
Sec. 11, T22S R26E  
Eddy Co., NM

Discount

INTERVAL: 0 - 500' MD

	I D	DEPTH	BBLs
Pit Vol			1,000
Riser	0.0	0	0
Casing	0.0	0	0
Open Hole	17.5	500	149
Washout %	10		15
%SCE	75		
% LGS	10		
Dilution	2.5		409
Total Volume			1,573

FW/Native  
8.4 ppg

PRODUCTS	Size	ppb	Units	Cost	Total
AQUAGEL	50	3.00	80	6.61	528.80
BARO-SEAL	40	0.25	10	11.85	118.50
Soda ash	50	0.00	0	12.07	0.00
Lime	50	0.50	15	6.28	94.20
EZ MUD	5	0.01	2	125.00	250.00

Transportation/Drayage/Tax

1,000.00

INTERVAL COST

\$1,991.50

**HALLIBURTON****Baroid**

Kaiser Francis  
Mesa 11 Grande #4  
Sec. 11 – T22S – R26E  
Eddy Co., NM.

**INTERVAL: 500' - 2,350' MD**

	I D	DEPTH	BBLs
Surface			2,500
Riser	0.0	0	0
Csg	12.715	640	100
Open Hole	12.25	2,350	249
Washout %	10		25
%SCE	75		
% LGS	10		
Dilution	2.5		685
<b>Total</b>			<b>3,560</b>

**BRINE**  
**10 PPG**

PRODUCTS	Size	ppb	Units	Cost	Total
AQUAGEL	50	1.50	80	6.61	528.80
MF 55	5	0.00	3	160.61	481.83
CAUSTIC	50	0.05	15	39.98	599.70
Drilling paper	40	0.30	15	12.15	182.25
EZ MUD	5	0.00	3	125.00	375.00
BARO-SEAL	40	0.20	10	11.85	118.50
PLUG-GIT	40	0.20	10	18.30	183.00
soda ash	50	0.00	0	12.07	0.00
Lime	50	0.40	20	6.28	125.60

Transportation/Drayage/Tax

1,000.00

INTERVAL COST

3,594.68

**CUMULATIVE COST****\$5,586.18****INTERVAL: 2,350' - 11,600' MD**

# HALLIBURTON

## Baroid

Kaiser Francis  
Mesa 11 Grande #4  
Sec. 11 – T22S – R26E  
Eddy Co., NM.

	I D	DEPTH	BBLs
Surface			600
Csg	5.01	5,040	123
Open Hole	7.870	11,600	394
Washout %	10		39
%SCE	75		
% LGS	10		
Dilution	2.5		1,085
Total			2,242

### 8.5-9.5 PPG

PRODUCTS	Size	ppb	Units	Cost	Total
DEXTRID LT	50	0.50	50	85.14	4,257.00
ZEOGEL	50	1.50	45	7.85	353.25
CAUSTIC	50	0.40	25	39.98	999.50
BAROSEAL	40	0.02	15	11.85	177.75
ALDACIDE G	5	0.00	12	115.25	1,383.00
Drilling Paper	40	0.02	15	12.15	182.25
CON DET	5	0.00	12	55.75	669.00
LIME	50	0.35	45	6.28	282.60
EZ MUD	5	0.00	5	125.00	625.00
Barite	2000	0.00	40	165.00	6,600.00
MF 55	5	0.01	5	160.61	803.05
BARAZAN	25	0.00	120	190.00	22,800.00
TAX					600.00
Transportation/Drayage					500.00
INTERVAL COST					40,232.40
CUMULATIVE COST					\$45,818.58



**HALLIBURTON****Baroid**

Kaiser Francis  
Mesa 11 Grande #4  
Sec. 11 – T22S – R26E  
Eddy Co., NM.

**Material/Product Applications**

Product	Purpose/Description	Concentration
AKTAFLO® S	Surfactant	0.5-3.0 lb/bbl
ALDACIDE® G	Microbiocide	0.2-0.05 lb/bbl
AQUAGEL®	Viscosifier	0-25.0 lb/bbl
BARABLOK™	Filtration Control Agent	2.0-10.0 lb/bbl
BARACARB®	Bridging Agent	Per recommendations
BARACAT®	Shale Stabilizer	1.0-3.0 lb/bbl
BARACOR® 129	Hydrogen Sulfide/Oxygen Scavenger	Per recommendations
BARACOR® 100	Corrosion Inhibitor	Per recommendations
BARACOR® 95	Alkalinity Control Agent	0.25-1.4 lb/bbl
BARA-DEFOAM® HP	Defoamer	0.05-0.3 lb/bbl
BARAFLOC®	Flocculant	0.005-0.01 lb/bbl
BARAFOS®	Thinner	0.1-.05 lb/bbl
BARASCAV™ D	Oxygen Scavenger	0.1-0.5 lb/bbl
BARAZAN® D PLUS	Viscosifier/Suspension Agent	0.1-2.0 lb/bbl
BAROFIBRE®	Seepage Loss Additive	2.0-10.0 lb/bbl
BAROID® OIL ABSORBENT	Oil Absorbent	As needed
BAROID®	Weighting Agent	As needed
BAROLIFT™	Sweeping Agent	0.25-0.5 lb/bbl
BARO-LUBE GOLD SEAL™	Lubricant	2% by volume
BARO-SEAL™	Lost Circulation Material	5.0-20.0 lb/bbl
BARO-SPOT™	Spotting Fluid	Per recommendations
BARO-TROL® PLUS	Shale Stabilizer	2.0-6.0 lb/bbl
BXR™	Borehole Stabilizer	4.0-20.0 lb/bbl
CLAY SYNC™	Shale Stabilizer	0.5-5.0 lb/bbl
CON DET®	Wetting Agent	0.25-1.0 lb/bbl
DA-370	Corrosion Inhibitor	0.5-1.5 lb/bbl
DEXTRID® LT	Filtration Control Agent	2.0-6.0 lb/bbl
DRILTREAT®	Oil Wetting Agent	0.25-2.0 lb/bbl
DURATONE® HT	Filtration Control Agent	2.0-20.0 lb/bbl
EZ GLIDE™	Lubricant	2%-7% by volume
EZ-MUD®	Shale Stabilizer	1.0-4.0 lb/bbl
EZ MUL®	Emulsifier	4.0-12.0 lb/bbl
EZ-SPOT™	Spotting Fluid	Per recommendations
FA-200	Filming Amine	21.0-42.0 gal/100 bbl
FACTANT™	Filtration Control Agent/Emulsifier	Per recommendations
FILTER-CHEK™	Filtration Control Agent	1.0-5.0 lb/bbl
GELTONE® V	Viscosifier	1.0-15.0 lb/bbl
HYDRO-PLUG™	Lost Circulation Material	Per recommendations
INVERMUL®	Emulsifier	4.0-12.0 lb/bbl
HY-SEAL®	Lost Circulation Material	5.0-15.0 lb/bbl
JELFLAKE®	Lost Circulation Material	Per recommendations
LIQUI-DRIL™	ROP Enhancer	Per recommendations
LUBRA-BEADS®	Lubricant	4.0-8.0 lb/bbl
MICATEX®	Lost Circulation Material	Per recommendations
N-DRIL™ LO	Filtration Control Agent	1.0-3.0 lb/bbl
N-PLEX™	Lost Circulation Material	Per recommendations
N-SEAL™	Lost Circulation Material	Per recommendations
N-SQUEEZE™	Lost Circulation Material	Per recommendations
OMC® 42	Oil Mud Conditioner	0.25-1.5 lb/bbl
PAC™-R	Filtration Control Agent	0.5-2.0 lb/bbl
PLUG-GIT®	Lost Circulation Material	3.0-10.0 lb/bbl
QUIK-THIN™	Thinner	1.0-8.0 lb/bbl
RB-63™	Rheology Modifier	0.25-1.5 lb/bbl
STEELSEAL™	Lost Circulation Material	Per recommendations
STICK-LESS®	Lubricant	Per recommendations
STOP-FRAC™	Lost Circulation Material	Per recommendations
SUSPENTONE™	Suspension Agent	1.0-5.0 lb/bbl
SWEEP-WATE™	Weighting Material	Per recommendations
THERMA-THIN®	Deflocculant	1.0-4.0 lb/bbl
TORQUE-LESS®	Lubricant	4.0-8.0 lb/bbl
WALL-NUT®	Lost Circulation Material	Per recommendations
X-TEND® II	Bentonite Extender	0.01-0.05 lb/bbl
ZEUGEL®	Viscosifier	5.0-30.0 lb/bbl

**HALLIBURTON**

**Baroid**

Kaiser Francis  
Mesa 11 Grande #4  
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# **Facilities & Personnel**

**HALLIBURTON****Baroid**

Kaiser Francis  
 Mesa 11 Grande #4  
 Sec. 11 – T22S – R26E  
 Eddy Co., NM.

**Baroid Fluid Services**  
**4000 North Big Spring, Suite 300**  
**Midland, Texas 79705**  
**Phone:(432) 686-4574; Fax:(432) 686-4597**

**☎ PERSONNEL ROSTER ☎**

NAME	MAIN	CELLULAR	PAGER
<b>New Mexico</b>			
Russell Sumpter, FSR	(432) 686-4574	(505) 390-2679	N/A
Bobby West, FSR	(432) 686-4574	(432) 557-1827	N/A
<b>Texas</b>			
Leon Roberts, Sr. FSR	(432) 686-4574	(432) 557-1623	N/A
Joseph Abraham, FSR	(432) 686-4574	(432) 557-0127	N/A
Clay Sellers, FSR	(432) 686-4574	(432) 557-1779	N/A
Ken Rumbaugh, Sr. FSR	(432) 686-4574	(432) 425-4135	N/A
John Caraway, FSR	(432) 686-4574	(432) 557-2064	N/A
Rusty Gleghorn, FSR	(432) 686-4574	(432) 557-1838	N/A
G.W. Goodson, FSR	(432) 686-4574	(432) 557-1762	N/A
Josh Tipton, FSR	(432) 686-4574	(432) 557-1748	N/A
Larry Jones, FSR	(432) 686-4574	(432) 557-2077	N/A
Charles Merrick, Sr. FSR	(432) 686-4574	(432) 557-1898	N/A
Jason Merrick, FSR	(432) 686-4574	(432) 557-1911	N/A
Steve Becker, FSR	(432) 686-4574	(432) 557-2043	N/A
Tom Becker, FSR	(432) 686-4574	(432) 557-8241	N/A
<b>Baroid - West Texas / New Mexico (Staff) Operations</b>			
Justin Hunter, Service Coordinator	(432) 686-4574	(432) 557-1811	N/A
Ken Sewell, Sales Consultant	(432) 686-4574	(432) 528-6786	N/A
Sam Stephens, Technical Professional	(432) 683-0239	(432) 557-2008	N/A
Billy Sumpter, Technical Professional	(432) 683-0222	(505) 390-5462	N/A
Randy Auburg, Technical Professional	(432) 683-0288	(432) 557-1868	N/A
Jimmy Tindol, Account Leader	(432) 686-4574	(432) 553-4512	N/A
Shiloh Alastuey, Operations Manager	(432) 683-0245	(432) 238-6423	N/A

**☎ DISTRIBUTION WAREHOUSES ☎**

WAREHOUSE	PHONE	FAX
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Monahans, TX	Fernando Arizpe (432) 557-1960	(432) 943-8694