

1001 W. Grand Avenue  
Artesia, NM 88210

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

FORM APPROVED  
OMB No. 1004-0137  
Expires March 31, 2007

1a. Type of work: <input checked="" type="checkbox"/> DRILL <input type="checkbox"/> REENTER		5. Lease Serial No. <b>NMNM 95627</b>
1b. Type of Well: <input type="checkbox"/> Oil Well <input checked="" type="checkbox"/> Gas Well <input type="checkbox"/> Other <input type="checkbox"/> Single Zone <input type="checkbox"/> Multiple Zone		6. If Indian, Allottee or Tribe Name
2. Name of Operator <b>Clayton Williams Energy, Inc. 25704</b>		7. If Unit or CA Agreement, Name and No. <b>35214</b>
3a. Address <b>Six Desta Drive, Ste. 3000</b> <b>Midland, TX 79705</b>	3b. Phone No. (include area code) <b>(432) 682-6324 Unders.</b>	8. Lease Name and Well No. <b>Rocky Arroyo Federal "9" #1</b>
4. Location of Well (Report location clearly and in accordance with any State requirements.) At surface <b>UL H; 1930' FNL &amp; 710' FEL</b> At proposed prod. zone		9. API Well No. <b>30-015- 34413</b>
10. Field and Pool, or Exploratory <b>Rocky Arroyo (Morrow Gas)</b>		11. Sec., T. R. M. or Blk. and Survey or Area <b>Sec. 9, T22S, R22E</b>
12. Distance in miles and direction from nearest town or post office* <b>30 miles NW of Carlsbad, NM</b>		12. County or Parish <b>Eddy County</b>
13. State <b>New Mexico</b>		
15. Distance from proposed* <b>APD pending on #3</b> location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) <b>710</b>	16. No. of acres in lease <b>320</b>	17. Spacing Unit dedicated to this well <b>320</b>
18. Distance from proposed location* <b>APD pending on</b> to nearest well, drilling, completed, <b>#3 well 2490'</b> applied for, on this lease, ft. <b>to south</b>	19. Proposed Depth <b>10,000'</b>	20. BLM/BIA Bond No. on file <b>NM 2787</b>
21. Elevations (Show whether DF, KDB, RT, GL, etc.) <b>4346'</b>	22. Approximate date work will start* <b>upon APD approval</b>	23. Estimated duration <b>30 to drill,</b> <b>25 days for completion &amp; tstg</b>

24. Attachments

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No. 1, shall be attached to this form:

- |   |  |
|---|--|
| 1. Well plat certified by a registered surveyor.  | 4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above).    |
| 2. A Drilling Plan.   | 5. Operator certification  |
| 3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO shall be filed with the appropriate Forest Service Office). | 6. Such other site specific information and/or plans as may be required by the authorized officer. |

25. Signature <i>Betsy Luna</i>	Name (Printed/Typed) <b>Betsy Luna</b>	Date <b>09-08-2005</b>
Title <b>Engineering Technician</b>		
Approved by (Signature) <i>/s/ Joe G. Lara</i>	Name (Printed/Typed) <b>/s/ Joe G. Lara</b>	Date <b>NOV 02 2005</b>
Title <b>FIELD MANAGER</b>	Office <b>CARLSBAD FIELD OFFICE</b>	

Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.  
Conditions of approval, if any, are attached.

APPROVAL FOR 1 YEAR

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

\*(Instructions on page 2)

APPROVAL SUBJECT TO  
GENERAL REQUIREMENTS  
AND SPECIAL STIPULATIONS  
ATTACHED

CARLSBAD CONTROLLED WATER BASIN

DISTRICT I  
1625 N. French Dr., Hobbs, NM 88240  
District II  
1301 W. Grand Avenue, Artesia, NM 88210  
District III  
1000 Rio Brazos Road, Aztec, NM 87410  
District IV  
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico  
Energy Minerals and Natural Resources

Oil Conservation Division  
1220 South St. Francis Dr.  
Santa Fe, NM 87505

Form C-144  
June 1, 2004

For drilling and production facilities, submit to  
appropriate NMOCD District Office.  
For downstream facilities, submit to Santa Fe  
office

**Pit or Below-Grade Tank Registration or Closure**

Is pit or below-grade tank covered by a "general plan"? Yes ☐ No ☒

Type of action: Registration of a pit or below-grade tank ☒ Closure of a pit or below-grade tank ☐

Operator: **CLAYTON WILLIAMS ENERGY, INC.** Telephone: **432-682-6324** e-mail address: **mswierc@claytonwilliams.com**  
Address: **Six Desta Drive, Suite 3000, Midland, TX 79705**  
Facility or well name: **Rocky Arroyo Federal "9" #1** API #: **30-015-34413** U/L or Qtr/Qtr **H** Sec **9** T **22 S** R **22 E**  
County: **EDDY** Latitude **N32°24'27.4"** Longitude **W104°42'07.4"** NAD: 1927 ☒ 1983 ☐  
Surface Owner: Federal ☒ State ☐ Private ☐ Indian ☐

**Pit**  
Type: Drilling ☒ Production ☐ Disposal ☐  
Workover ☐ Emergency ☐  
Lined ☒ Unlined ☐  
Liner type: Synthetic ☒ Thickness **20** mil Clay ☐  
Pit Volume **8000** bbl

**Below-grade tank**  
Volume: \_\_\_\_\_ bbl Type of fluid: \_\_\_\_\_  
Construction material: \_\_\_\_\_  
Double-walled, with leak detection? Yes ☐ If not, explain why not.  
**RECEIVED**  
**NOV 04 2005**  
**OOB-ARTESIA**

Depth to ground water (vertical distance from bottom of pit to seasonal  
high water elevation of ground water.) **100'**

Less than 50 feet	(20 points)
50 feet or more, but less than 100 feet	(10 points)
<b>100 feet or more</b>	( 0 points)

Wellhead protection area: (Less than 200 feet from a private domestic  
water source, or less than 1000 feet from all other water sources.)

Yes	(20 points)
<b>No</b>	( 0 points)

Distance to surface water: (horizontal distance to all wetlands, playas,  
irrigation canals, ditches, and perennial and ephemeral watercourses.)

Less than 200 feet	(20 points)
200 feet or more, but less than 1000 feet	(10 points)
<b>1000 feet or more</b>	( 0 points)

**Ranking Score (Total Points)**

**0**

**If this is a pit closure:** (1) Attach a diagram of the facility showing the pit's relationship to other equipment and tanks. (2) Indicate disposal location: (check the onsite box if you are burying in place) onsite ☐ offsite ☐ If offsite, name of facility \_\_\_\_\_. (3) Attach a general description of remedial action taken including remediation start date and end date. (4) Groundwater encountered: No ☐ Yes ☐ If yes, show depth below ground surface \_\_\_\_\_ ft. and attach sample results. (5) Attach soil sample results and a diagram of sample locations and excavations.

Additional Comments:

I hereby certify that the information above is true and complete to the best of my knowledge and belief. I further certify that the above-described pit or below-grade tank has been/will be constructed or closed according to NMOCD guidelines ☒, a general permit ☐, or an (attached) alternative OCD-approved plan ☐.

Date: **9-8-05**  
**08/19/2005**

Printed Name/Title **Matt Swierc, Production Supt.**

Signature **Matt Swierc**

Your certification and NMOCD approval of this application/closure does not relieve the operator of liability should the contents of the pit or tank contaminate ground water or otherwise endanger public health or the environment. Nor does it relieve the operator of its responsibility for compliance with any other federal, state, or local laws and/or regulations.

Approval:

Field Supervisor

Printed Name/Title

Signature

Date:

**NOV 8 2005**

DISTRICT I  
1625 N. French Dr., Hobbs, NM 88240

DISTRICT II  
811 South First, Artesia, NM 88210

DISTRICT III  
1000 Rio Brazos Rd., Aztec, NM 87410

DISTRICT IV  
2040 South Pacheco, Santa Fe, NM 87505

State of New Mexico  
Energy, Minerals and Natural Resources Department

Form C-102  
Revised March 17, 1999

Submit to Appropriate District Office  
State Lease - 4 Copies  
Fee Lease - 3 Copies

OIL CONSERVATION DIVISION

2040 South Pacheco  
Santa Fe, New Mexico 87504-2088

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number 30-015-	Pool Code 84160	Pool Name Rocky Arroyo (Morrow Gas)
Property Code	Property Name ROCKY ARROYO FEDERAL "9"	Well Number 1
OGRID No. 25706	Operator Name CLAYTON WILLIAMS ENERGY, INC.	Elevation 4346'

Surface Location

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
H	9	22 S	22 E		1930	NORTH	710	EAST	EDDY

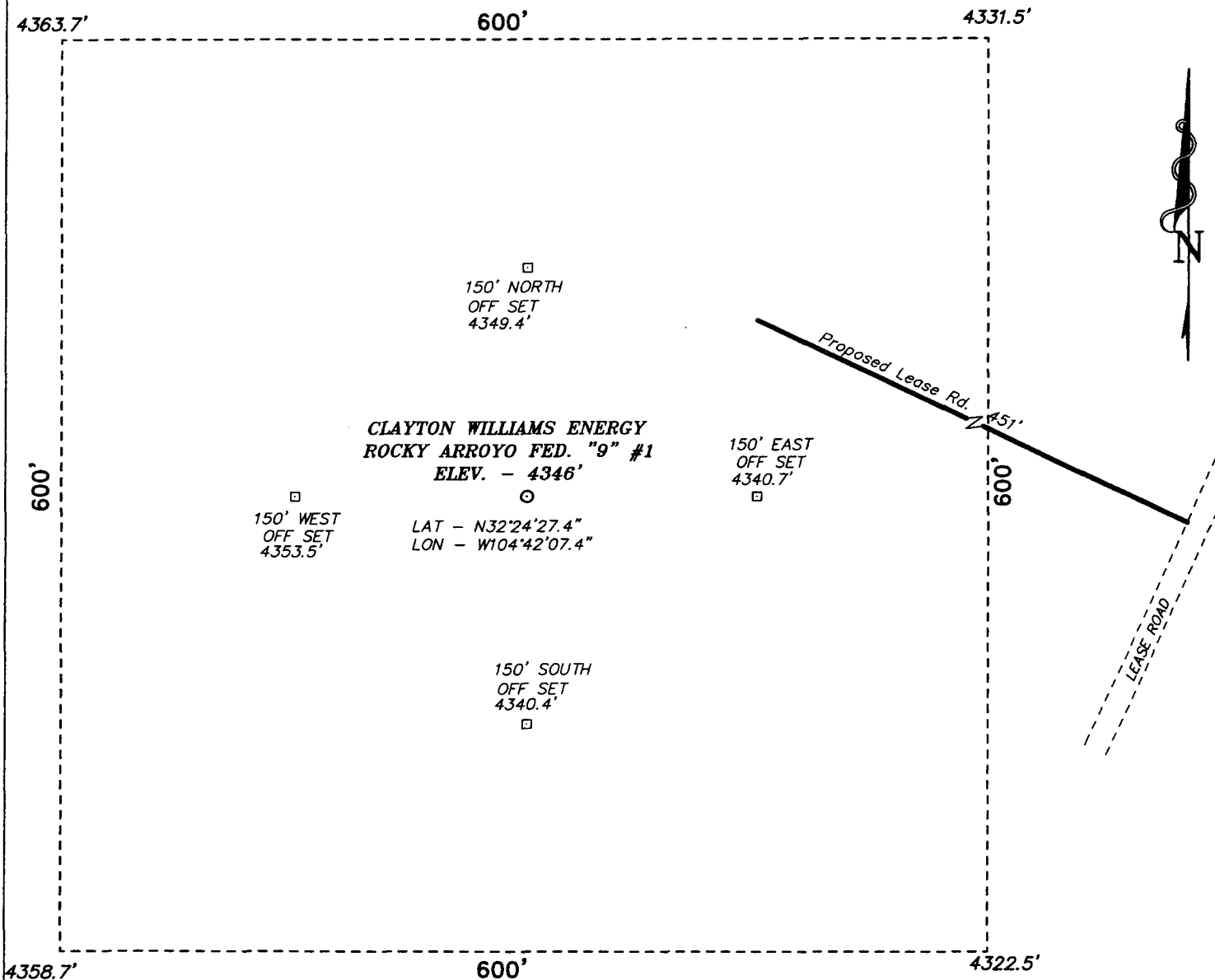
Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
Dedicated Acres 320	Joint or Infill	Consolidation Code	Order No.						

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED  
OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

	<p><b>OPERATOR CERTIFICATION</b></p> <p>I hereby certify the the information contained herein is true and complete to the best of my knowledge and belief.</p> <p><i>Betsy Luna</i> Signature</p> <p>Betsy Luna Printed Name</p> <p>Engineering Technician Title</p> <p>09-08-2005 Date</p> <p><b>SURVEYOR CERTIFICATION</b></p> <p>I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.</p> <p>JUNE 28, 2005 Date Surveyed</p> <p><i>Gary L. Jones</i> Signature &amp; Seal of Jones Professional Surveyor</p> <p>NEW MEXICO 7977 W.O. No. 5597 Certified by Gary L. Jones 7977 PROFESSIONAL LAND SURVEYOR</p>
--	--

SECTION 9, TOWNSHIP 22 SOUTH, RANGE 22 EAST, N.M.P.M.,  
EDDY COUNTY, NEW MEXICO.



DIRECTIONS TO LOCATION:

FROM THE JUNCTION OF CO. RD. 401(MARATHON ROAD) & CO. RD. 400(BOX CANYON), GO WEST FOR 2.1 MILES TO LEASE ROAD; THENCE SOUTH ON LEASE ROAD FOR 3.6 MILES TO PROPOSED ROAD.



SCALE: 1" = 100'

**CLAYTON WILLIAMS ENERGY, INC.**

REF: ROCKY ARROYO FEDERAL "9" #1/Well Pad Topo

THE ROCKY ARROYO FEDERAL "9" #1 LOCATED 1930' FROM THE NORTH LINE AND 710' FROM THE EAST LINE OF SECTION 9, TOWNSHIP 22 SOUTH, RANGE 22 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO.

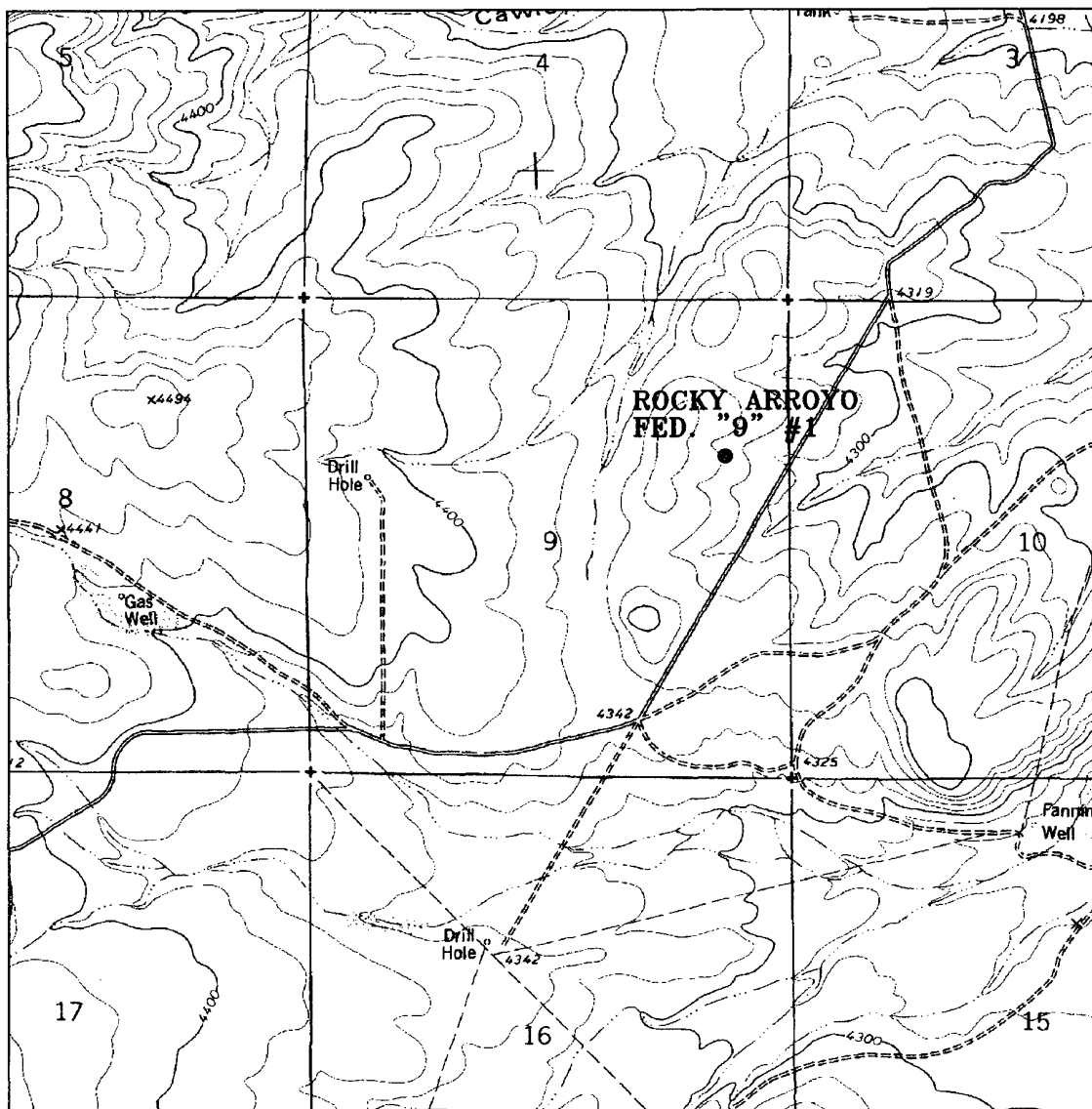
**Basin Surveys** P.O. BOX 1786-HOBBS, NEW MEXICO

W.O. Number: 5597

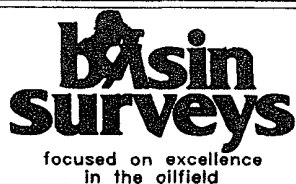
Drawn By: K. GOAD

Date: 07-11-2005 | Disk: KJG #5 - 5597A.DWG

Survey Date: 06-28-2005 | Sheet 1 of 1 Sheets



**ROCKY ARROYO FEDERAL "9" #1**  
 Located at 1930' FNL and 710' FEL  
 Section 9, Township 22 South, Range 22 East,  
 N.M.P.M., Eddy County, New Mexico.



P.O. Box 1786  
 1120 N. West County Rd.  
 Hobbs, New Mexico 88241  
 (505) 393-7316 - Office  
 (505) 392-3074 - Fax  
 basinsurveys.com

W.O. Number: 5597AA - KJG #5

Survey Date: 06-28-2005

Scale: 1" = 2000'

Date: 07-11-2005

**CLAYTON WILLIAMS  
 ENERGY, INC.**

**CLAYTON WILLIAMS ENERGY, INC.**  
**DRILLING PROGRAM**

Attached to BLM form 3160-3

**Lease Name:** Rocky Arroyo "9"

**Well No.:** 1

**Location:** 1930' FNL & 710' FEL, UL H  
Sec. 9, T22S, R22E  
Eddy Co., NM

1. Geological name of surface location: Quaternary Deposits
2. Estimated tops of important geological markers:

<u>Name</u>	<u>Depth</u>
Glorieta	2025
Wolfcamp	5030
Cisco	7215
Strawn	7970
Atoka	8510
Morrow	8885

3. Estimated name of anticipated fresh water, oil, and gas:

<u>Formation</u>	<u>Depth</u>	<u>Fresh Water/Oil/Gas</u>
Usable Quality Water	350-900	Fresh Water
Wolfcamp	5025	Oil/Gas
Strawn	7925	Gas
Atoka	8465	Gas
Morrow	8885	Gas

4. CASING PROGRAM

<u>Hole Size</u>	<u>Interval</u>	<u>OD Csg</u>	<u>Weight, Grade, Type.</u>
11"	1700'	8-5/8	24#, J-55, ST&C
7-7/8"	9500'	5-1/2"	17#, L-80, LT&C

WITNESS

CEMENT PROGRAM

Conductor Casing: 20" set at 40'; cement to surface

8-5/8" Surface Casing:

770 sx Light + 6% gel + 0.25 ppsk cello flake  
380 sx 'C' + 2% CaCl<sub>2</sub>

*Circulate to surface*

5-1/2" Production Casing:

Stage tool @ +/- 5500'

1<sup>st</sup> Stage: 1000 sx 50/50 Poz 'H' + fluid loss additive  
300 sx 50/50 Poz 'H' + fluid loss additive + SMS + salt

2<sup>nd</sup> Stage: Lead: 1200 sx 50/50 Poz 'C' + 4% gel + fluid loss additive

5. Minimum Specifications for Pressure Control:

The blowout preventer equipment (BOP) schematic attached will consist of a double ram-type (5000 psi WP) preventer and/or a bag-type (hydril) preventer (5000 psi WP). BOP will be hydraulically operated and the ram-type preventer will be equipped with blind rams and appropriate pipe rams. The BOP will be nipped up on the surface casing and used continuously until TD is reached. Before drilling out of surface casing, the ram-type BOP and accessory equipment will be tested to 5000 psi and the hydril to 50% of rated working pressure (2500 psi). Pipe rams will be operationally checked each 24-hour period. Blind rams will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets. A 2" kill line and 3" choke line will be attached to a drilling spool or BOP side outlets. Other accessories to the BOP equipment will include a kelly cock and floor safety valve (inside BOP) and choke lines and choke manifold with 5000 psi WP rating.

6. Type & Characteristics of the Proposed Mud System:

The well will be drilled to TD with a Fresh Water system .

The applicable depths and properties of this system are as follows:

<u>Depth</u>	<u>Type</u>	<u>Weight (ppg)</u>	<u>Viscosity (sec)</u>	<u>Water Loss (cc)</u>
1700'	FW Gel	8.4-8.8	29-60	NC
9500'	FW Gel	8.4-8.8	29-45	NC - 10

Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept at the well site at all times.

7. Auxiliary Well Control and Monitoring Equipment:

- A. A Kelly cock will be kept in the drill string at all times.
- B. A full opening drill pipe stabbing valve (inside BOP) with proper drill pipe connections will be on the rig floor at all times.
- C. The drilling fluids system will be visually monitored at all times.
- D. A mudlogging unit will be continuously monitoring drilling penetration rate and hydrocarbon shows from surface casing to TD.
- E. A fixed electronic H2S monitoring system, including alarms with monitors at the shaker and the bell nipple, will be in operation from 1700' to TD.

8. Logging, Testing, & Coring Program:

- A. Drill stem tests: Possible DST's in Wolfcamp, Atoka, Morrow
- B. Electronic logging program: DSN, MSFL, DIL, FMI (optional)
- C. Coring: Possible side wall wireline cores

9. Abnormal Conditions, Pressures, Temperatures & Potentials Hazards:

Hole instability plus losses in surface rubble zones.

10. Anticipated Starting Date & Duration of Operations:

Road and location work will not begin until approval has been received from the BLM. The anticipated spud date is upon approval of APD. Once commenced, the drilling operations should be finished within approximately 30 days. If the well is productive, an additional 25 days will be required for completion and testing.

CLAYTON WILLIAMS ENERGY, INC.  
HYDROGEN SULFIDE DRILLING OPERATIONS PLAN

I. HYDROGEN SULFIDE TRAINING

All personnel, whether regularly assigned, contracted, or employed on an unscheduled basis, will receive training from a qualified instructor in the following areas prior to commencing drilling operations on this well.

1. The hazards and characteristics of hydrogen sulfide (H<sub>2</sub>S).
2. The proper use and maintenance of personal protective equipment and life support systems.
3. The proper use of H<sub>2</sub>S detectors, alarms, warning systems, briefing areas, evacuation procedures, and prevailing winds.
4. The proper techniques for first aid and rescue procedures.

In addition, supervisory personnel will be trained in the following areas:

1. The effects of H<sub>2</sub>S on metal components. If high tensile tubulars are to be used, personnel will be trained in their special maintenance requirements.
2. Corrective action and shut-in procedures when drilling or reworking a well and blowout prevention and well control procedures.
3. The contents and requirements of the H<sub>2</sub>S Drilling Operations Plan and the Public Protection Plan.

There will be an initial training session just prior to encountering a known or probable H<sub>2</sub>S zone (within 3 days or 500 feet) and weekly H<sub>2</sub>S and well control drills for all personnel in each crew. The initial training session shall include a review of the site, specific H<sub>2</sub>S Drilling Operations Plan, and the Public Protection Plan. This plan shall be available at the well site. All personnel will be required to carry documentation that they have received the proper training.

II. H<sub>2</sub>S SAFETY EQUIPMENT AND SYSTEMS

NOTE: All H<sub>2</sub>S safety equipment and systems will be installed, tested, and operational when drilling reaches a depth of 500 feet above, or three days prior to penetrating the first zone containing or reasonably expected to contain H<sub>2</sub>S.

1. Well Control Equipment:
  - A. Blind rams and pipe rams to accommodate all pipe sizes with properly sized closing unit.
  - B. Auxiliary equipment to include: annular preventer
2. Protective Equipment for Essential Personnel:

Five – 30 minute self – contained breathing apparatuses (Scott).
3. H<sub>2</sub>S Detection and Monitoring Equipment:
  - A. Fixed electronic monitoring system and alarms with two monitors:

one at shaker and one at bell nipple.



4. Visual Warning Systems:

- A. Two windsocks with frames and extension poles.
- B. One entrance sign with flags (with "CAUTION" and present well condition).
- C. Two briefing area signs.

5. Mud Program:

- A. The mud program has been designed to minimize the volume of H<sub>2</sub>S circulated to the surface. Proper mud weight, safe drilling practice, and the use of H<sub>2</sub>S scavengers will minimize hazards when penetrating H<sub>2</sub>S bearing zones.

6. Metallurgy:

- A. All drill strings, casing, tubing, wellhead, blowout preventers, drilling spool, kill lines, choke manifold and lines, and valves shall be suitable for H<sub>2</sub>S service.

7. Communication:

- A. Cellular telephones in Company vehicles and at rig.

8. Well Testing:

- A. Drill stem testing will be performed with a minimum number of personnel in the immediate vicinity which is necessary to safely and adequately conduct the test. All drill stem testing operations conducted in an H<sub>2</sub>S environment will use the closed chamber method of testing.

**CLAYTON WILLIAMS ENERGY, INC.  
SURFACE USE PLAN**

**Attached to form 3160-3**

**Lease Name:** Rocky Arroyo "9"

**Well No.:** 1

**Location:** 1930' FNL & 710' FEL, UL H  
Sec. 9, T22S, R22E  
Eddy Co., NM

**1. Existing Roads:**

- A. The well site and elevation for the proposed well are shown on the attached plat.
- B. Existing roads are indicated on attached map. Existing roads are adequate for travel during drilling and production operations. Upgrading of the road prior to drilling well will be done when necessary as determined during the onsite inspection.
- C. Direction to location:  
Go 9 miles north of Carlsbad, NM on US Hwy. 285 to State Hwy. 137 on the left (west side – this black top hwy is between US 285 mile markers 45 & 46, State Hwy 173 is also known as "Sitting Bull Falls Hwy"). Turn left on State Hwy 137 & proceed west 8.6 miles to Y in road. Take right Y onto CR 401 (CR 401 is also known as Marathon Road), go 9.6 miles on CR 401 to CR 400 on right (CR 400 is also known as Box Canyon Rd). Go right onto CR 400 & proceed 2.3 miles to caliche road on left (Devon sign Wagon Wheel Fed). Turn left onto calich road & go 1.3 miles and cross cattleguard. Continue on main traveled road 1.7 miles to location on the right.
- D. Routine grading and maintenance of existing roads will be conducted as necessary to maintain their condition as long as any operations continue on this lease.

**2. Proposed access Roads:**

Attached map indicates the proposed new access road to be constructed. The road will be constructed as follows:

- A. The maximum width of the running surface will be 20'. The road will be crowned and ditched and constructed of 6" rolled and compacted caliche. Ditches will be 3:1 slope and 4 feet wide. Water will be diverted where necessary to avoid ponding, prevent erosion, maintain good drainage, and to be consistent with local drainage patterns. BLM may specify any additions or changes during the onsite inspection.
- B. The average grade will be less than 1%
- C. No turnouts are planned
- D. Culverts, cattle guards, low-water crossing, fence cuts:
- E. Surface material will consist of native caliche. Caliche will be obtained from nearest BLM approved pit. Any additional materials required will be purchased from the dirt contractor.
- F. The proposed access road will be centerlined flagged.

**3. Location of Existing Wells : NONE**

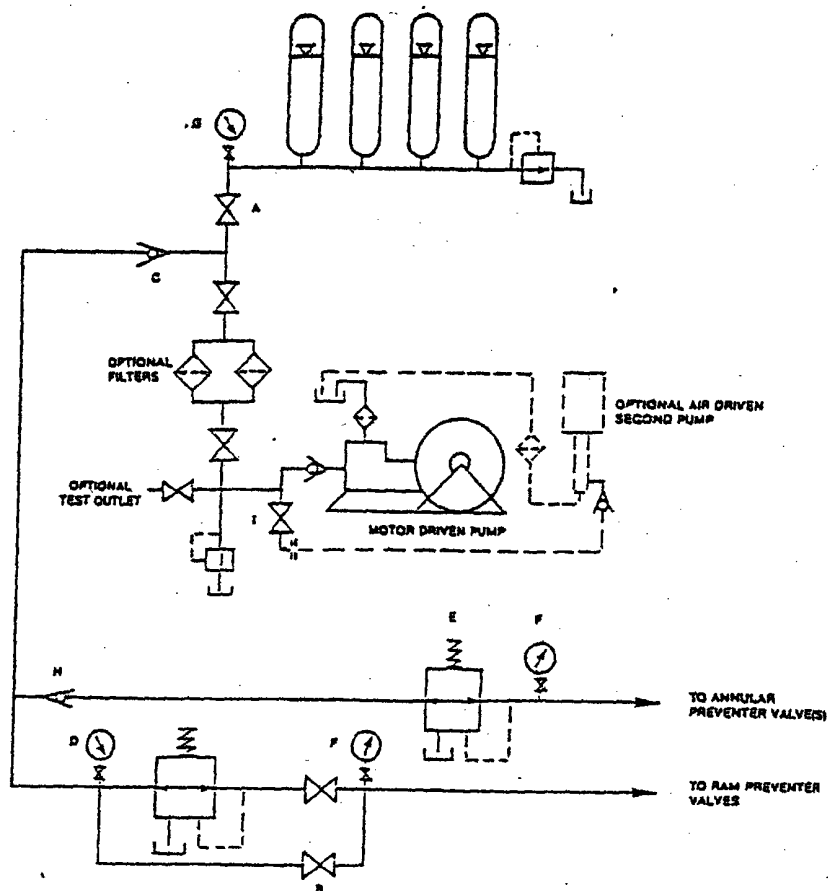


FIGURE K6-1. The schematic sketch of an accumulator system shows required and optional components.

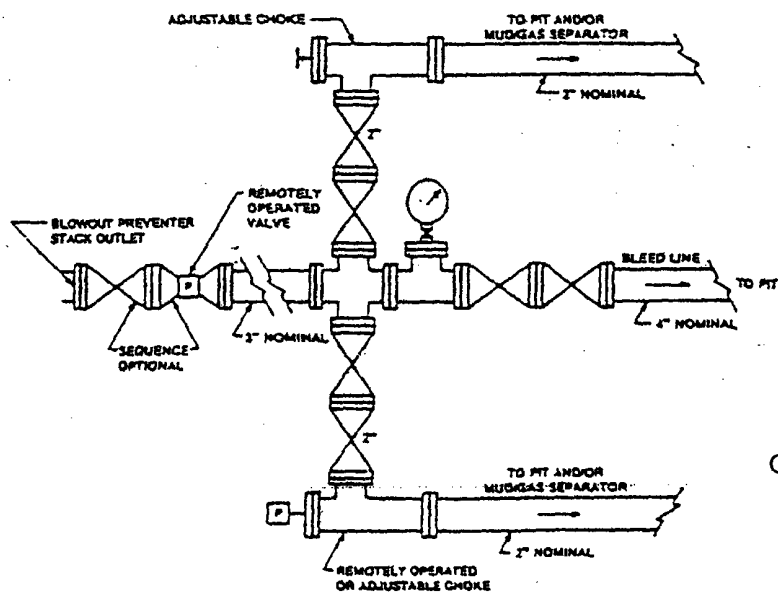
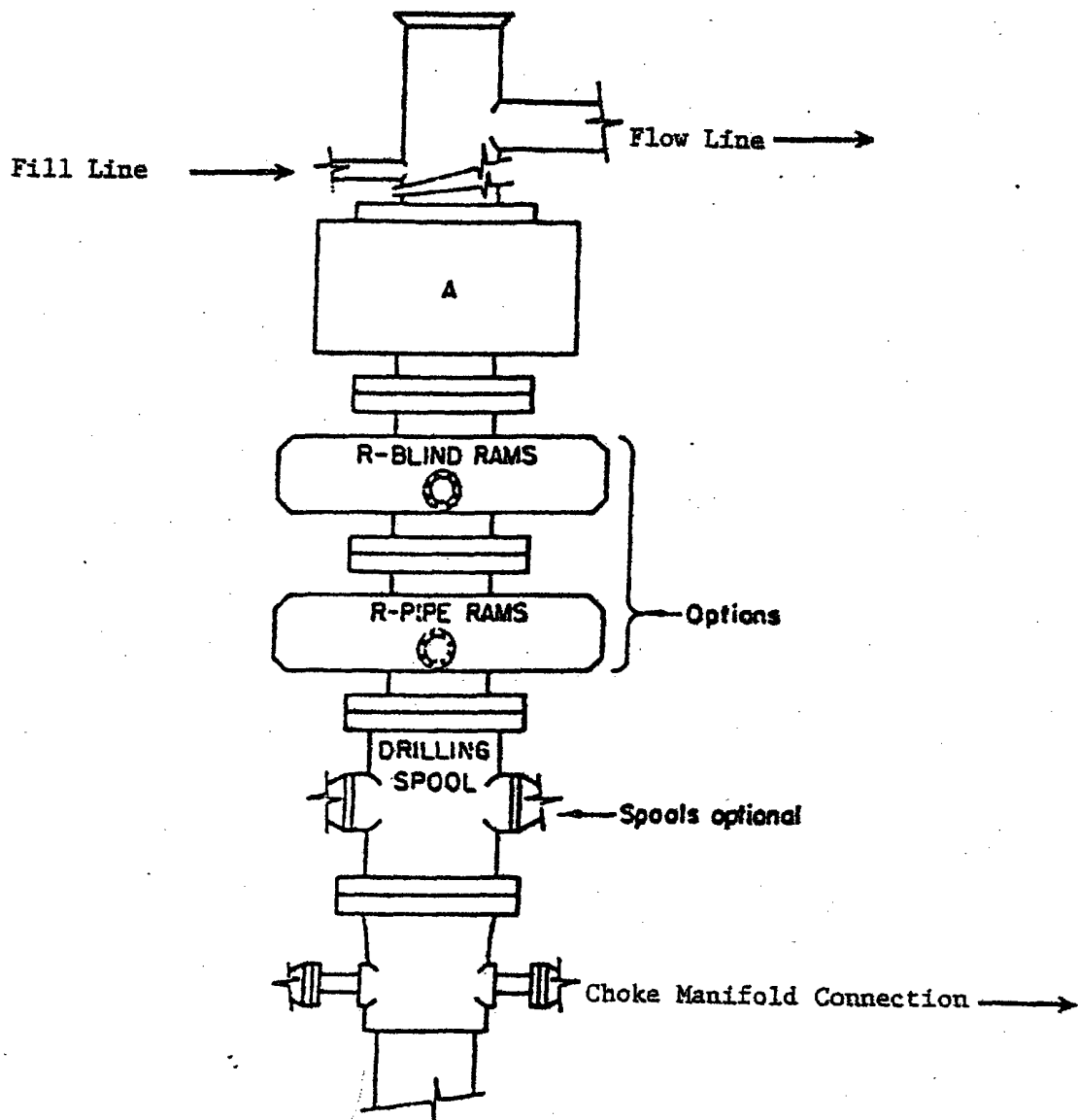


FIGURE K4-1. Typical choke manifold assembly for 5M rated working pressure service — surface installation.

CHOKE MANIFOLD ARRANGEMENT  
Rocky Arroyo "9" #1  
Unit H  
Sec. 9, T22S, R22E  
Eddy Co., NM



**ARRANGEMENT SRRA**

1500 Series  
5000 PSI WP

BOPE ARRANGEMENT  
Rocky Arroyo "9" #1  
Unit H  
Sec. 9, T22S, R22E  
Eddy Co., NM

# ***CONTINGENCY PLAN***

**CLAYTON WILLIAMS ENERGY, INC.**



## **ROCKY ARROYO FEDERAL “9” #1**

1930' FNL & 710' FEL  
Section 9: T-22-S R-22-E  
Eddy County, New Mexico

**Prepared For:**  
**Date Prepared:**  
**Prepared By:**

**Clayton Williams Energy, Inc.**  
**August 18, 2005**  
**INDIAN Fire & Safety, Inc.**

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## **HYDROGEN SULFIDE CONTINGENCY PLAN**

### **SCOPE**

**THIS CONTINGENCY PLAN ESTABLISHES GUIDELINES FOR THE PUBLIC, ALL COMPANY EMPLOYEES WHO'S WORK ACTIVITIES MAY INVOLVE EXPOSURE TO HYDROGEN SULFIDE (H<sub>2</sub>S) GAS.**

### **OBJECTIVE**

- 1. PREVENT ANY AND ALL ACCIDENTS, AND PREVENT THE UNCONTROLLED RELEASE OF HYDROGEN SULFIDE INTO THE ATMOSPHERE.**
- 2. PROVIDE PROPER EVACUATION PROCEDURES TO COPE WITH EMERGENCIES.**
- 3. PROVIDE IMMEDIATE AND ADEQUATE MEDICAL ATTENTION SHOULD AN INJURY OCCUR.**

## H2S CONTINGENCY PLAN

### DISCUSSION

#### GEOLOGICAL PROGNOSIS

#### IMPLEMENTATION:

THIS PLAN WITH ALL DETAILS IS TO BE FULLY IMPLEMENTED AFTER DRILLING TO INTERMEDIATE CASING POINT.

#### EMERGENCY RESPONSE PROCEDURE:

THIS SECTION OUTLINES THE CONDITIONS AND DENOTES STEPS TO BE TAKEN IN THE EVENT OF AN EMERGENCY.

#### EMERGENCY EQUIPMENT PROCEDURE:

THIS SECTION OUTLINES THE SAFETY AND EMERGENCY EQUIPMENT THAT WILL BE REQUIRED FOR THE DRILLING OF THIS WELL.

#### TRAINING PROVISIONS:

THIS SECTION OUTLINES THE TRAINING PROVISIONS THAT MUST BE ADHERED TO PRIOR TO DRILLING TO INTERMEDIATE CASING POINT.

#### DRILLING EMERGENCY CALL LISTS:

INCLUDED ARE THE TELEPHONE NUMBERS OF ALL PERSONS TO BE CONTACTED SHOULD AN EMERGENCY EXIST.

#### BRIEFING:

THIS SECTION DEALS WITH THE BRIEFING OF ALL PEOPLE INVOLVED IN THE DRILLING OPERATION.

#### PUBLIC SAFETY:

PUBLIC SAFETY PERSONNEL WILL BE MADE AWARE OF THE DRILLING OF THIS WELL.

#### CHECK LISTS:

STATUS CHECK LISTS AND PROCEDURAL CHECK LISTS HAVE BEEN INCLUDED TO INSURE ADHERENCE TO THE PLAN.

#### GENERAL INFORMATION:

A GENERAL INFORMATION SECTION HAS BEEN INCLUDED TO SUPPLY SUPPORT INFORMATION.



## **12S CONTINGENCY PLAN**

### **EMERGENCY PROCEDURES**

- A. IN THE EVENT OF ANY EVIDENCE OF H<sub>2</sub>S LEVEL ABOVE 10 PPM, TAKE THE FOLLOWING STEPS:**
- 1. SECURE BREATHING EQUIPMENT.**
  - 2. ORDER NON-ESSENTIAL PERSONNEL OUT OF DANGER ZONE.**
  - 3. TAKE STEPS TO DETERMINE IF THE H<sub>2</sub>S LEVEL CAN BE CORRECTED OR SUPPRESSED AND, IF SO, PROCEED IN NORMAL OPERATION.**
- B. IF UNCONTROLLABLE CONDITIONS OCCUR:**
- 1. TAKE STEPS TO PROTECT AND/OR REMOVE ANY PUBLIC IN THE DOWN-WIND AREA FROM THE RIG - PARTIAL EVACUATION AND ISOLATION. NOTIFY NECESSARY PUBLIC SAFETY PERSONNEL AND THE BUREAU OF LAND MANAGEMENT OF THE SITUATION.**
  - 2. REMOVE ALL PERSONNEL TO SAFE BREATHING AREA.**
  - 3. NOTIFY PUBLIC SAFETY PERSONNEL TO SAFE BREATHING AREA.**
  - 4. PROCEED WITH BEST PLAN (AT THE TIME) TO REGAIN CONTROL OF THE WELL. MAINTAIN TIGHT SECURITY AND SAFETY PROCEDURES.**

### **RESPONSIBILITY:**

- 1. DESIGNATED PERSONNEL.**
  - a. SHALL BE RESPONSIBLE FOR THE TOTAL IMPLEMENTATION OF THIS PLAN.**
  - b. SHALL BE IN COMPLETE COMMAND DURING ANY EMERGENCY.**
  - c. SHALL DESIGNATE A BACK-UP.**

## EMERGENCY PROCEDURES

\*(Procedures are the same for both Drilling and Tripping).

- ALL PERSONNEL:**
1. ON ALARM, DON ESCAPE UNIT AND REPORT IN UP WIND BRIEFING AREA.
  2. CHECK STATUS OF PERSONNEL (BUDDY SYSTEM).
  3. SECURE BREATHING EQUIPMENT.
  4. AWAIT ORDERS FROM SUPERVISOR.

- DRILLING FOREMAN:**
1. REPORT TO UP WIND BRIEFING AREA.
  2. DON BREATHING EQUIPMENT AND RETURN TO POINT OF RELEASE WITH TOOL PUSHER OR DRILLER (BUDDY SYSTEM).
  3. DETERMINE H<sub>2</sub>S CONCENTRATIONS.
  4. ASSESS SITUATION AND TAKE CONTROL MEASURES.

- TOOL PUSHER:**
1. REPORT TO UP WIND BRIEFING AREA.
  2. DON BREATHING EQUIPMENT AND RETURN TO POINT OF RELEASE WITH DRILLING FOREMAN OR DRILLER (BUDDY SYSTEM).
  3. DETERMINE H<sub>2</sub>S CONCENTRATION.
  4. ASSESS SITUATION AND TAKE CONTROL MEASURES.

- DRILLER:**
1. DON ESCAPE UNIT.
  2. CHECK MONITOR FOR POINT OF RELEASE.
  3. REPORT TO BRIEFING AREA.
  4. CHECK STATUS OF PERSONNEL (IN AN ATTEMPT TO RESCUE, USE THE BUDDY SYSTEM).
  5. ASSIGNS LEAST ESSENTIAL PERSON TO NOTIFY DRILLING FOREMAN AND TOOL PUSHER BY QUICKEST MEANS IN CASE OF THEIR ABSENCE.
  6. ASSUMES THE RESPONSIBILITIES OF THE DRILLING FORMAN AND TOOL PUSHER UNTIL THEY ARRIVE SHOULD THEY BE ABSENT.

## EMERGENCY PROCEDURES

DERRICK MAN  
FLOOR MAN #1  
FLOOR MAN #2

1. WILL REMAIN IN BRIEFING AREA UNTIL INSTRUCTED BY SUPERVISOR.

MUD ENGINEER:

1. REPORT TO BRIEFING AREA.
2. WHEN INSTRUCTED, BEGIN CHECK OF MUD FOR PH AND H<sub>2</sub>S LEVEL. (GARETT GAS TRAIN.)

SAFETY PERSONNEL:

1. MASK UP AND CHECK STATUS OF ALL PERSONNEL AND SECURE OPERATIONS AS INSTRUCTED BY DRILLING FOREMAN AND REPORT TO BRIEFING AREA.

## TAKING A KICK

WHEN TAKING A KICK DURING AN H<sub>2</sub>S EMERGENCY, ALL PERSONNEL WILL FOLLOW STANDARD BOP PROCEDURES AFTER REPORTING TO BRIEFING AREA AND MASKING UP.

## PEN-HOLE LOGGING

ALL UNNECESSARY PERSONNEL OFF FLOOR. DRILLING FOREMAN AND SAFETY PERSONNEL SHOULD MONITOR CONDITION, ADVISE STATUS AND DETERMINE NEED FOR USE OF AID EQUIPMENT.

## RUNNING CASING OR PLUGGING

FOLLOWING THE SAME "TRIPPING" PROCEDURE AS ABOVE. DRILLING FOREMAN AND SAFETY PERSONNEL SHOULD DETERMINE IF ALL PERSONNEL HAVE ACCESS TO PROTECTIVE EQUIPMENT.

## H2S CONTINGENCY PLAN

### IGNITION PROCEDURES

THE DECISION TO IGNITE THE WELL IS THE RESPONSIBILITY OF COMPANY FOREMAN. IN THE EVENT HE IS INCAPACITATED, IT BECOMES THE RESPONSIBILITY OF THE CONTRACT RIG TOOL PUSHER. THE DECISION SHOULD BE MADE ONLY AS A LAST RESORT AND IN A SITUATION WHERE IT IS CLEAR THAT:

1. HUMAN LIFE AND PROPERTY ARE ENDANGERED.
2. THERE IS NO HOPE CONTROLLING THE BLOWOUT UNDER THE PREVAILING CONDITIONS AT THE WELL.

NOTIFY THE DISTRICT OFFICE IF TIME PERMITS, BUT DO NOT DELAY IF HUMAN LIFE IS IN DANGER.

INITIATE FIRST PHASE OF EVACUATION PLAN.

## IGNITION PROCEDURES

### INSTRUCTIONS FOR IGNITING THE WELL

1. TWO PEOPLE ARE REQUIRED FOR THE ACTUAL IGNITING OPERATION. THEY MUST WEAR SELF-CONTAINED BREATHING UNITS AND HAVE SAFETY ROPE ATTACHED. ONE MAN (TOOL PUSHER OR SAFETY ENGINEER) WILL CHECK THE ATMOSPHERE FOR EXPLOSIVE GASES WITH THE EXPLOSIMETER. THE OTHER MAN (DRILLING FOREMAN) IS RESPONSIBLE FOR IGNITING THE WELL.
2. PRIMARY METHOD TO IGNITE: 25 MM FLARE GUN WITH RANGE OF APPROXIMATELY 500 FEET.
3. IGNITE UP WIND AND DO NOT APPROACH ANY CLOSER THAN IS WARRANTED.
4. SELECT THE IGNITION SITE BEST FOR PROTECTION, AND WHICH OFFERS AN EASY ESCAPE ROUTE.
5. BEFORE FIRING, CHECK FOR PRESENCE OF COMBUSTIBLE GAS.
6. AFTER LIGHTING, CONTINUE EMERGENCY ACTION AND PROCEDURE AS BEFORE.
7. ALL UNASSIGNED PERSONNEL WILL LIMIT THEIR ACTIONS TO THOSE DIRECTED BY THE DRILLING FOREMAN.

**REMEMBER:** AFTER WELL IS IGNITED, BURNING HYDROGEN SULFIDE WILL CONVERT TO SULFUR DIOXIDE, WHICH IS ALSO HIGHLY TOXIC. **DO NOT ASSUME THE AREA IS SAFE AFTER THE WELL IS IGNITED.**

## **H2S CONTINGENCY PLAN**

### **TRAINING REQUIREMENTS**

WHEN WORKING IN AN AREA WHERE HYDROGEN SULFIDE GAS (H<sub>2</sub>S) MIGHT BE ENCOUNTERED, DEFINITE TRAINING REQUIREMENTS MUST BE CARRIED OUT. ALL COMPANIES WILL INSURE THAT ALL PERSONNEL AT THE WELL SITE WILL HAVE HAD ADEQUATE TRAINING IN THE FOLLOWING:

1. HAZARDS AND CHARACTERISTICS OF H<sub>2</sub>S.
2. PHYSICAL EFFECTS OF HYDROGEN SULFIDE ON THE HUMAN BODY.
3. TOXICITY OF HYDROGEN SULFIDE AND SULFUR DIOXIDE.
4. H<sub>2</sub>S DETECTION.
5. EMERGENCY RESCUE.
6. RESUSCITATORS.
7. FIRST AID AND ARTIFICIAL RESPIRATION.
8. EFFECTS OF H<sub>2</sub>S ON METALS.
9. LOCATION SAFETY.

### **SERVICE COMPANY AND VISITING PERSONNEL**

- A. EACH SERVICE COMPANY THAT WILL BE ON THIS WELL WILL BE NOTIFIED IF THE ZONE CONTAINS H<sub>2</sub>S.
- B. EACH SERVICE COMPANY MUST PROVIDE FOR THE TRAINING AND EQUIPMENT OF THEIR EMPLOYEES BEFORE THEY ARRIVE AT THE WELL SITE.
- C. EACH SERVICE COMPANY WILL BE EXPECTED TO ATTEND A WELL SITE BRIEFING.

## **H2S CONTINGENCY PLAN**

### **EMERGENCY EQUIPMENT REQUIREMENTS**

#### **SIGNS**

- A. ONE SIGN LOCATED AT LOCATION ENTRANCE WITH THE FOLLOWING LANGUAGE:

**(LEASE)**

**CAUTION – POTENTIAL POISON GAS  
HYDROGEN SULFIDE  
NO ADMITTANCE WITHOUT AUTHORIZATION**

#### **WIND SOCK – WIND STREAMERS**

- A. ONE 36" (IN LENGTH) WIND SOCK LOCATED AT PROTECTION CENTER, AT HEIGHT VISIBLE FROM RIG FLOOR.  
B. ONE 36" (IN LENGTH) WIND SOCK LOCATED AT HEIGHT VISIBLE FROM PIT AREAS.

#### **HYDROGEN SULFIDE DETECTOR AND ALARMS**

- A. H2S MONITORS WITH ALARMS WILL BE LOCATED ON THE RIG FLOOR, AT THE BELL NIPPLE, AND AT THE FLOW LINE. THESE MONITORS WILL BE SET TO ALARM AT 10 PPM WITH RED LIGHT, AND TO ALARM AT 15 PPM WITH RED LIGHT AND AUDIBLE ALARM.  
B. HAND OPERATED DETECTORS WITH TUBES.  
C. H2S MONITOR TESTER.

#### **CONDITION FLAGS**

- A. ONE EACH OF GREEN, YELLOW, AND RED CONDITION FLAGS TO BE DISPLAYED TO DENOTE CONDITIONS.

**GREEN – NORMAL CONDITIONS**

**YELLOW – POTENTIAL DANGER**

**RED – DANGER, H2S PRESENT**

- B. CONDITION FLAG SHALL BE POSTED AT LOCATION SIGN ENTRANCE.

## H2S CONTINGENCY PLAN

### EMERGENCY EQUIPMENT REQUIREMENTS

#### 5. AUXILIARY RESCUE EQUIPMENT

- A. STRETCHER
- B. 100' LENGTH OF 5/8" NYLON ROPE.

#### 6. MUD INSPECTION DEVICES

GARRETT GAS TRAIN OR HACH TESTER FOR INSPECTION OF SULFIDE CONCENTRATION IN MUD SYSTEM.

#### 7. FIRE EXTINGUISHER

ADEQUATE FIRE EXTINGUISHERS SHALL BE LOCATED AT STRATEGIC LOCATIONS.

#### 8. BLOW OUT PREVENTION EQUIPMENT

THE WELL SHALL HAVE HYDRAULIC BOP EQUIPMENT FOR THE ANTICIPATED BHP OF 1500 PSI. EQUIPMENT IS TO BE TESTED ON INSTALLATION.

#### 9. COMBUSTIBLE GAS DETECTOR

THERE SHALL BE ONE COMBUSTIBLE GAS DETECTOR ON LOCATION AT ALL TIMES.

#### 10. BOP TESTING

BOP AND CHOKE LINE AND KILL LINE WILL BE TESTED.

#### 11. AUDIO SYSTEM

RADIO COMMUNICATION WILL BE AVAILABLE AT THE RIG.

- A. RIG FLOOR OR TRAILER
- B. VEHICLE

#### 12. SPECIAL CONTROL EQUIPMENT

- A. HYDRAULIC BOP EQUIPMENT WITH REMOTE CONTROL ON GROUND.
- B. ROTATING HEAD



## **H2S CONTINGENCY PLAN**

### **EMERGENCY EQUIPMENT REQUIREMENTS**

#### **13. EVACUATION PLAN**

**EVACUATION ROUTES SHOULD BE ESTABLISHED PRIOR TO SPUDDING EACH WELL AND DISCUSSED WITH ALL RIG PERSONNEL.**

#### **14. DESIGNATED AREA**

- A. PARKING AND VISITOR AREA: ALL VEHICLES ARE TO BE PARKED AT A PREDETERMINED SAFE DISTANCE FROM THE WELLHEAD. THIS WILL BE THE DESIGNATED SMOKING AREA.**
- B. TWO BRIEFING AREAS ON EITHER SIDE OF THE LOCATION AT THE MAXIMUM ALLOWABLE DISTANCE FROM THE WELL BORE SO THEY OFFSET PREVAILING WINDS PERPENDICULARLY, OR AT A 45-DEGREE ANGLE IF WIND DIRECTION TENDS TO SHIFT IN THE AREA.**
- C. PROTECTION CENTERS OR IF A MOVABLE TRAILER IS USED, IT SHOULD BE DEPT UPWIND OF EXISTING WINDS. WHEN WIND IS FROM THE PREVAILING DIRECTIONS, BOTH PROTECTION CENTERS SHOULD BE ACCESSIBLE.**

## H2S CONTINGENCY PLAN

### STATUS CHECK LIST

NOTE: ALL ITEMS ON THIS LIST MUST BE COMPLETED BEFORE DRILLING TO 2,000'.

1. SIGN AT LOCATION ENTRANCE.
2. TWO (2) WIND SOCKS LOCATED AS REQUIRED.
3. TWO (2) 30-MINUTE PRESSURE DEMAND AIR PACKS ON LOCATION FOR ALL RIG PERSONNEL AND MUD LOGGERS.
4. AIR PACK INSPECTED FOR READY USE.
5. CASCADE SYSTEM AND HOSE LINE HOOK-UP.
6. CASCADE SYSTEM FOR REFILLING AIR BOTTLES.
7. SAFE BREATHING AREAS SET UP.
8. CONDITION FLAG ON LOCATION AND READY FOR USE.
9. H2S DETECTION SYSTEM HOOKED UP.
10. H2S ALARM SYSTEM HOOKED UP AND READY.
11. OXYGEN RESUSCITATOR ON LOCATION AND TESTED FOR USE.
12. STRETCHER ON LOCATION AT SAFETY TRAILER.
13. 1 - 100' LENGTH OF NYLON ROPE ON LOCATION.
14. ALL RIG CREW AND SUPERVISORS TRAINED AS REQUIRED.
15. ALL OUTSIDE SERVICE CONTRACTORS ADVISED OF POTENTIAL H2S HAZARD ON WELL.
16. NO SMOKING SIGN POSTED.
17. HAND OPERATED H2S DETECTOR WITH TUBES ON LOCATION.

CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

## **H2S CONTINGENCY PLAN**

### **PROCEDURAL CHECK LIST**

#### **PERFORM EACH TOUR:**

- **CHECK FIRE EXTINGUISHERS TO SEE THAT THEY HAVE THE PROPER CHARGE.**
- **CHECK BREATHING EQUIPMENT TO ENSURE THAT IT HAS NOT BEEN TAMPERED WITH.**
- **MAKE SURE ALL THE H2S DETECTION SYSTEM IS OPERATIVE.**

#### **PERFORM EACH WEEK:**

**CHECK EACH PIECE OF BREATHING EQUIPMENT TO MAKE SURE THAT DEMAND REGULATOR IS WORKING. THIS REQUIRES THAT THE BOTTLE BE OPENED AND THE MASK ASSEMBLY BE PUT ON TIGHT ENOUGH SO THAT WHEN YOU INHALE, YOU RECEIVE AIR.**

**BLOW OUT PREVENTER SKILLS.**

**CHECK SUPPLY PRESSURE ON BOP ACCUMULATOR STAND BY SOURCE.**

**CHECK ALL SKA-PAC UNITS FOR OPERATION: DEMAND REGULATOR, ESCAPE BOTTLE AIR VOLUMES, SUPPLY BOTTLE OF AIR VOLUME.**

**CHECK BREATHING EQUIPMENT MASK ASSEMBLY TO SEE THAT STRAPS ARE LOOSENED AND TURNED BACK, READY TO PUT ON.**

**CHECK PRESSURE ON BREATHING EQUIPMENT AIR BOTTLES TO MAKE SURE THEY ARE CHARGED TO FULL VOLUME.**

**CONFIRM PRESSURE ON ALL SUPPLY AIR BOTTLES.**

**PERFORM BREATHING EQUIPMENT DRILLS WITH ON-SITE PERSONNEL.**

**CHECK THE FOLLOWING SUPPLIES FOR AVAILABILITY.**

- A. **EMERGENCY TELEPHONE LIST.**
- B. **HAND OPERATED H2S DETECTORS AND TUBES.**

## H2S CONTINGENCY PLAN

### GENERAL EVACUATION PLAN

THE DIRECT LINES OF ACTION PREPARED BY INDIAN FIRE & SAFETY, INC. TO PROTECT THE PUBLIC FROM HAZARDOUS GAS SITUATIONS ARE AS FOLLOWS:

1. WHEN THE COMPANY APPROVED SUPERVISOR (DRILLING FOREMAN, CONSULTANT, RIG PUSHER, OR DRILLER) DETERMINES THE H2S GAS CANNOT BE LIMITED TO THE WELL LOCATION AND THE PUBLIC WILL BE INVOLVED, HE WILL ACTIVATE THE EVACUATION PLAN. ESCAPE ROUTES ARE NOTED ON AREA MAP.
  2. "COMPANY MAN" OR DESIGNEE WILL NOTIFY LOCAL GOVERNMENT AGENCY THAT A HAZARDOUS CONDITION EXISTS AND EVACUATION NEEDS TO BE IMPLEMENTED.
  3. COMPANY SAFETY PERSONNEL THAT HAVE BEEN TRAINED IN THE USE OF H2S DETECTION EQUIPMENT AND SELF-CONTAINED BREATHING EQUIPMENT WILL MONITOR H2S CONCENTRATIONS, WIND DIRECTIONS, AND AREA OF EXPOSURE. THEY WILL DELINEATE THE OUTER PERIMETER OF THE HAZARDOUS GAS AREA. EXTENSION TO THE EVACUATION AREA WILL BE DETERMINED FROM INFORMATION GATHERED.
  4. LAW ENFORCEMENT PERSONNEL (STATE POLICE, POLICE DEPT., FIRE DEPT., AND SHERIFF'S DEPT.) WILL BE CALLED TO AID IN SETTING UP AND MAINTAINING ROAD BLOCKS. ALSO, THEY WILL AID IN EVACUATION OF THE PUBLIC IF NECESSARY.
- IMPORTANT: LAW ENFORCEMENT PERSONNEL WILL NOT BE ASKED TO COME INTO A CONTAMINATED AREA. THEIR ASSISTANCE WILL BE LIMITED TO UNCONTAMINATED AREAS. CONSTANT RADIO CONTACT WILL BE MAINTAINED WITH THEM.**
5. AFTER THE DISCHARGE OF GAS HAS BEEN CONTROLLED, COMPANY SAFETY PERSONNEL WILL DETERMINE WHEN THE AREA IS SAFE FOR RE-ENTRY.

## **12S CONTINGENCY PLAN**

### **EMERGENCY ACTIONS**

#### **WELL BLOWOUT - IF EMERGENCY**

**EVACUATE ALL PERSONNEL IF POSSIBLE.**

**IF SOUR GAS - EVACUATE RIG PERSONNEL.**

**IF SOUR GAS - EVACUATE PUBLIC WITHIN 1 HOUR RADIUS OF EXPOSURE.**

**DON SCBA AND RESCUE.**

**CALL 911 FOR EMERGENCY HELP (FIRE DEPT AND AMBULANCE) AND NOTIFY SR. DRILLING FOREMAN AND DISTRICT FOREMAN.**

**GIVE FIRST AID.**

#### **PERSON DOWN LOCATION/FACILITY**

**IF IMMEDIATELY POSSIBLE, CONTACT 911. GIVE LOCATION AND WAIT FOR CONFIRMATION.**

**DON SCBA AND RESCUE.**

## EMERGENCY PHONE LIST

### GOVERNMENTAL AGENCIES

#### Eddy County Sheriff's Office

911

Non emergency ..... 505-746-9888

#### Fire Departments

911

Artesia - Non-emergency ..... 505-746-5050

Atoka - Non-emergency..... 505-746-5050

#### State Police Department

911

Non-emergency ..... 505-437-1313

#### Ambulance

911

Artesia - Non Emergency..... 505-746-5050

Atoka - Non-Emergency..... 505-746-5050

#### Hospital -Artesia

505-748-3333

#### Indian Fire & Safety, Inc.

24 Hour Emergency Service 800-530-8693

## **CLAYTON WILLIAMS ENERGY, INC. COMPANY EMERGENCY NUMBERS**

### **Clayton Williams Energy, Inc.**

Midland, Texas..... 432-682-6324

### **John Kennedy – Drilling Manager**

Office..... 432-688-3218  
Pager..... 800-917-9815  
Home..... 432-620-0769

### **Mike Langford**

Sierra Engineering..... 432-683-8000  
Cell..... 432-557-4698

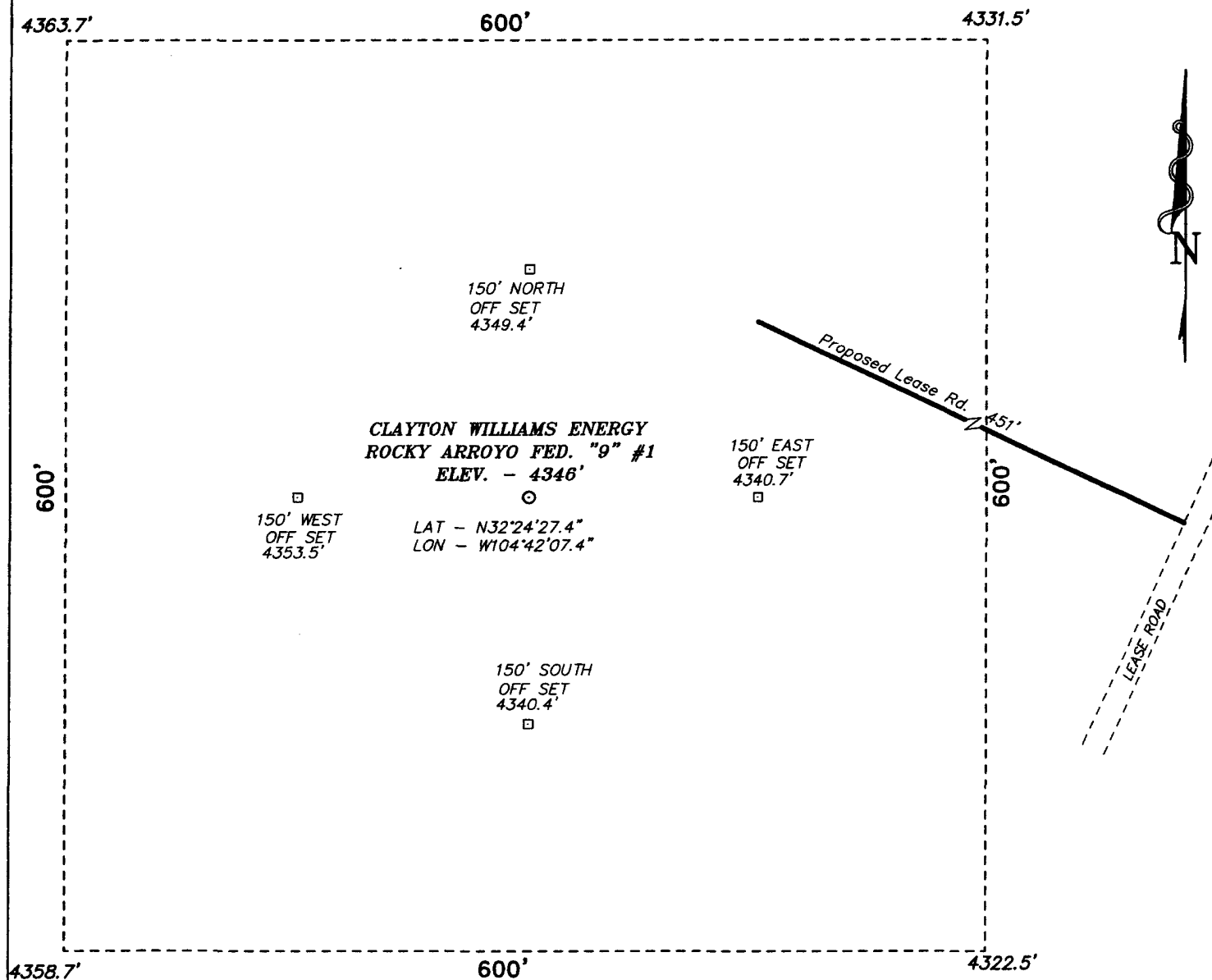
### **Matt Swiere – Production and Regulatory**

Office..... 432-688-3251  
Fax..... 877-626-8106  
Home..... 432-699-0147

### **Phillip Creech – Production Foreman**

Cell..... 432-634-4018  
Pager..... 877-612-6746  
Home..... 432-389-5793

SECTION 9, TOWNSHIP 22 SOUTH, RANGE 22 EAST, N.M.P.M.,  
EDDY COUNTY, NEW MEXICO.



DIRECTIONS TO LOCATION:

FROM THE JUNCTION OF CO. RD. 401(MARATHON ROAD) & CO. RD. 400(BOX CANYON), GO WEST FOR 2.1 MILES TO LEASE ROAD; THENCE SOUTH ON LEASE ROAD FOR 3.6 MILES TO PROPOSED ROAD.

100 0 100 200 FEET

SCALE: 1" = 100'

**CLAYTON WILLIAMS ENERGY, INC.**

REF: ROCKY ARROYO FEDERAL "9" #1/Well Pad Topo

THE ROCKY ARROYO FEDERAL "9" #1 LOCATED 1930' FROM THE NORTH LINE AND 710' FROM THE EAST LINE OF SECTION 9, TOWNSHIP 22 SOUTH, RANGE 22 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO.

**Basin Surveys** P.O. BOX 1786-HOBBS, NEW MEXICO

W.O. Number: 5597

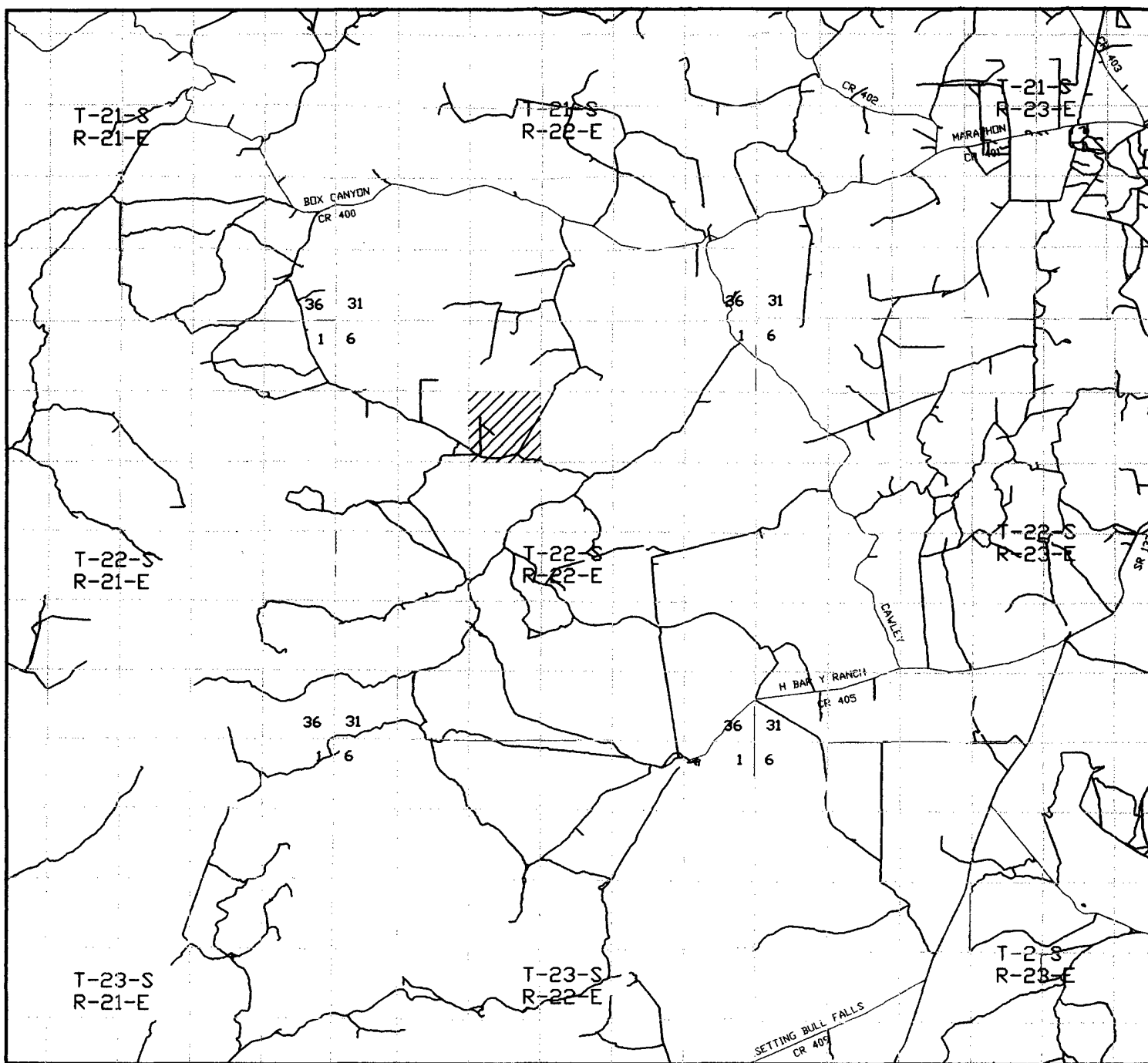
Drawn By: K. GOAD

Date: 07-11-2005 Disk: KIG #5 - 5597A.DWG

Survey Date: 06-28-2005

Sheet 1 of 1 Sheets





ROCKY ARROYO FEDERAL "9" #1  
 Located at 1930' FNL and 710' FEL  
 Section 9, Township 22 South, Range 22 East,  
 N.M.P.M., Eddy County, New Mexico.

**basin**  
**surveys**  
 focused on excellence  
 in the oilfield

P.O. Box 1786  
 1120 N. West County Rd.  
 Hobbs, New Mexico 88241  
 (505) 393-7316 - Office  
 (505) 392-3074 - Fax  
 basin-surveys.com

W.O. Number: 5597AA - KJG #5

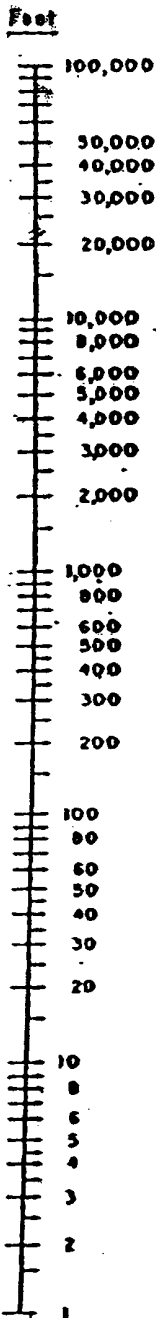
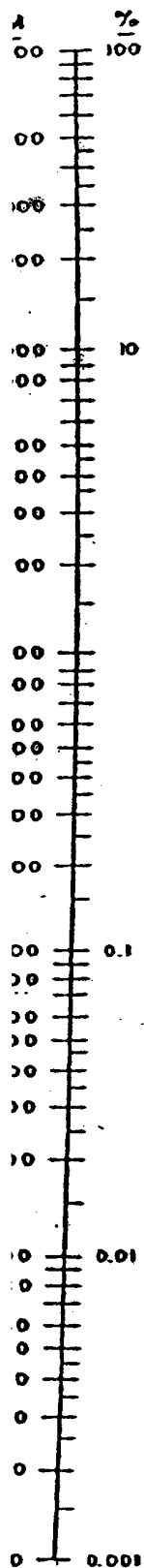
Survey Date: 06-28-2005

Scale: 1" = 2 miles

Date: 07-11-2005

**CLAYTON WILLIAMS**  
**ENERGY, INC.**

# HYDROGEN SULFIDE 100 PPM EXPOSURE RADIUS



At  $X = 3000 \text{ Ft.}$

$Q = 226,547$   
PPM

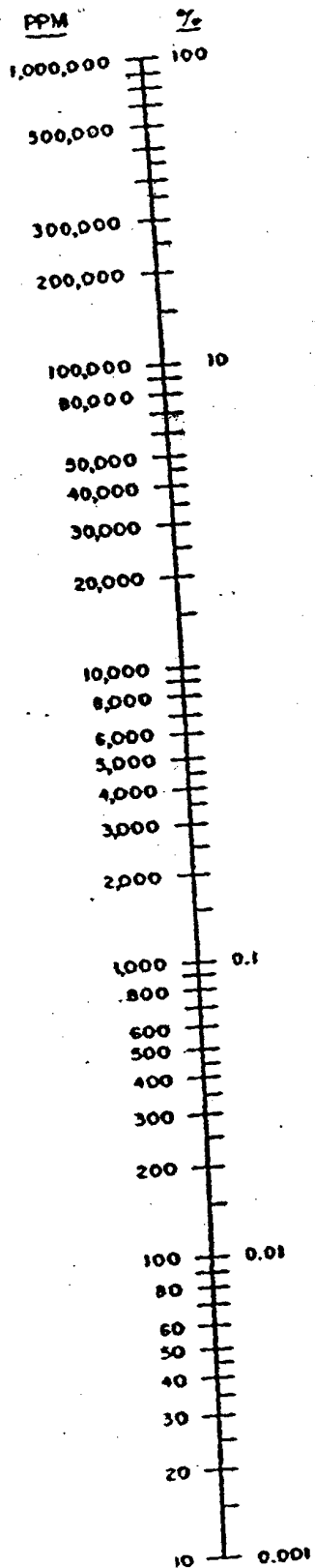
At  $X = 50 \text{ Ft.}$

$Q = 326.4$   
PPM

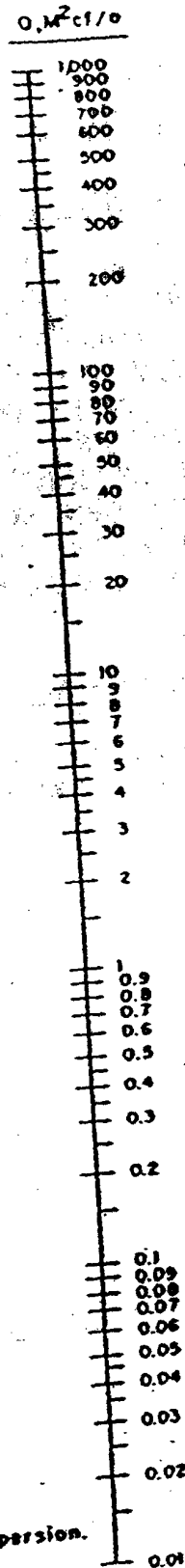
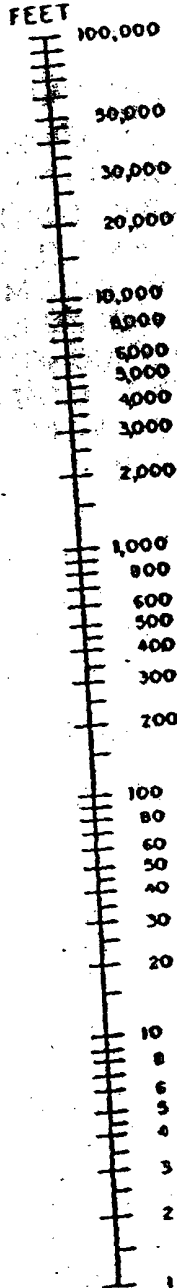
Below 100 PPM  
Rule 36 N.A.

$$\begin{aligned}
 &100 \text{ PPM Radius of Exposure in Feet} = X \\
 &X = [(1.589)(\text{Mole Fraction})(\text{Escape Rate})]^{0.6258} \\
 &= [(1.589)(\text{PPM})(Q \text{ in } M^2 \text{ ft}^2/d)]^{0.6258}
 \end{aligned}$$

$P_0 14.65 \text{ psia}$   $T 60^\circ \text{F}$



# HYDROGEN SULFIDE 500 PPM EXPOSURE RADIUS



At  $X = 50$  Ft.  
 $Q = 1140.9$   
PPM

500 PPM Radius of Exposure in Feet =  $X$   
 $X = [(0.4546)(\text{Mole Fraction})(\text{Escape Rate})]^{0.6258}$   
 $X = [(0.4546)(\text{PPM} \times 10^6)(Q \times 10^6 \text{ cu. ft.})]^{0.6258}$   
 Wind velocity = 1 mph; Plume is shape of  $H_2S$  dispersion.  
 Pressure base 14.65 psia,  $T_b = 60^\circ F$

## H2S CONTINGENCY PLAN

### TOXIC EFFECTS OF HYDROGEN SULFIDE

HYDROGEN SULFIDE IS EXTREMELY TOXIC. THE ACCEPTABLE CEILING CONCENTRATION FOR EIGHT-HOUR EXPOSURE IS 10 PPM, WHICH IS .001% BY VOLUME. HYDROGEN SULFIDE IS HEAVIER THAN AIR (SPECIFIC GRAVITY - 1.192) AND COLORLESS. IT FORMS AN EXPLOSIVE MIXTURE WITH AIR BETWEEN 4.3 AND 46.0 PERCENT BY VOLUME. HYDROGEN SULFIDE IS ALMOST AS TOXIC AS HYDROGEN CYANIDE AND IS BETWEEN FIVE AND SIX TIMES MORE TOXIC THAN CARBON MONOXIDE. TOXICITY DATA FOR HYDROGEN SULFIDE AND VARIOUS OTHER GASES ARE COMPARED IN TABLE I. PHYSICAL EFFECTS AT VARIOUS HYDROGEN SULFIDE EXPOSURE LEVELS ARE SHOWN IN TABLE II.

**TABLE I**  
**TOXICITY OF VARIOUS GASES**

COMMON NAME	CHEMICAL FORMULA	SPECIFIC GRAVITY (SC=1)	THRESHOLD LIMIT (1)	HAZARDOUS LIMIT (2)	LETHAL CONCENTRATION (3)
HYDROGEN CYANIDE	HCN	0.94	10 PPM	150 PPM/HR	300 PPM
HYDROGEN SULFIDE	H2S	1.18	10 PPM	250 PPM/HR	600 PPM
SULFUR DIOXIDE	SO2	2.21	5 PPM	-	1000 PPM
PHOSPHORUS TRICHLORIDE	PCl3	2.45	1 PPM	4 PPM/HR	1000 PPM
CARBON MONOXIDE	CO	0.97	50 PPM	400 PPM/HR	1000 PPM
CARBON DIOXIDE	CO2	1.52	5000 PPM	5%	10%
METHANE	CH4	0.55	90,000 PPM	COMBUSTIBLE ABOVE 5% IN AIR	

**THRESHOLD LIMIT - CONCENTRATION AT WHICH IT IS BELIEVED THAT ALL WORKERS MAY BE REPEATEDLY EXPOSED DAY AFTER DAY WITHOUT ADVERSE EFFECTS.**

**HAZARDOUS LIMIT - CONCENTRATION THAT WILL CAUSE DEATH WITH SHORT-TERM EXPOSURE.**

**LETHAL CONCENTRATION - CONCENTRATION THAT WILL CAUSE DEATH WITH SHORT-TERM EXPOSURE.**

## H2S CONTINGENCY PLAN

### TOXIC EFFECTS OF HYDROGEN SULFIDE

**TABLE II**  
**PHYSICAL EFFECTS OF HYDROGEN SULFIDE**

<u>PERCENT (%)</u>	<u>PPM</u>	<u>CONCENTRATION</u> <u>GRAINS</u> <u>100 STD. FT3*</u>	<u>PHYSICAL EFFECTS</u>
0.001	10	00.65	Obvious and unpleasant odor.
0.002	20	01.30	Safe for 8 hours of exposure.
0.010	100	06.48	Kill smell in 3 - 15 minutes. May sting eyes and throat.
0.020	200	12.96	Kills smell shortly; Stings eyes and throat.
0.050	500	32.96	Dizziness; Breathing ceases in a few minutes; Needs prompt artificial respiration.
0.070	700	45.36	Unconscious quickly; Death will result if not rescued promptly.
0.100	1000	64.30	Unconscious at once; Followed by death within minutes.

\*AT 15.00 PSIA AND 60°F.

## **12S CONTINGENCY PLAN**

### **USE OF SELF-CONTAINED BREATHING EQUIPMENT**

WRITTEN PROCEDURES SHALL BE PREPARED COVERING SAFE USE OF SCBA'S IN DANGEROUS ATMOSPHERE, WHICH MIGHT BE ENCOUNTERED IN NORMAL OPERATIONS OR IN EMERGENCIES. PERSONNEL SHALL BE FAMILIAR WITH THESE PROCEDURES AND THE AVAILABLE SCBA.

SCBA'S SHALL BE INSPECTED FREQUENTLY AT RANDOM TO INSURE THAT THEY ARE PROPERLY USED, CLEANED, AND MAINTAINED.

ANYONE WHO MAY USE THE SCBA'S SHALL BE TRAINED IN HOW TO INSURE PROPER FACE-PIECE TO FACE SEAL. THEY SHALL WEAR SCBA'S IN NORMAL AIR AND THEN WEAR THEM IN A TEST ATMOSPHERE. (NOTE: SUCH ITEMS AS FACIAL HAIR (BEARD OR SIDEBURNS) AND EYEGLASSES WILL NOT ALLOW PROPER SEAL.) ANYONE THAT MAY BE REASONABLY EXPECTED TO WEAR SCBA'S SHOULD HAVE THESE ITEMS REMOVED BEFORE ENTERING A TOXIC ATMOSPHERE. A SPECIAL MASK MUST BE OBTAINED FOR ANYONE WHO MUST WEAR EYEGLASSES OR CONTACT LENSES.

#### **MAINTENANCE AND CARE OF SCBA'S:**

- A. A PROGRAM FOR MAINTENANCE AND CARE OF SCBA'S SHALL INCLUDE THE FOLLOWING:
  - 1. INSPECTION FOR DEFECTS, INCLUDING LEAK CHECKS.
  - 2. CLEANING AND DISINFECTING.
  - 3. REPAIR.
  - 4. STORAGE.
- B. INSPECTION; SELF-CONTAINED BREATHING APPARATUS FOR EMERGENCY USE SHALL BE INSPECTED MONTHLY FOR THE FOLLOWING PERMANENT RECORDS KEPT OF THESE INSPECTIONS.
  - 1. FULLY CHARGED CYLINDERS.
  - 2. REGULATOR AND WARNING DEVICE OPERATION.
  - 3. CONDITION OF FACE PIECE AND CONNECTIONS.
  - 4. ELASTOMER OR RUBBER PARTS SHALL BE STRETCHED OR MASSAGED TO KEEP THEM PLIABLE AND PREVENT DETERIORATION.
- C. ROUTINELY USED SCBA'S SHALL BE COLLECTED, CLEANED AND DISINFECTED AS FREQUENTLY AS NECESSARY TO INSURE PROPER PROTECTION IS PROVIDED.

## H2S CONTINGENCY PLAN

### USE OF SELF-CONTAINED BREATHING EQUIPMENT

5. PERSONS ASSIGNED TASKS THAT REQUIRES USE OF SELF-CONTAINED BREATHING EQUIPMENT SHALL BE CERTIFIED PHYSICALLY FIT FOR BREATHING EQUIPMENT USAGE BY THE LOCAL COMPANY PHYSICIAN AT LEAST ANNUALLY.
6. SCBA'S SHOULD BE WORN WHEN:
  - A. ANY EMPLOYEE WORKS NEAR THE TOP OR ON TOP OF ANY TANK UNLESS TEST REVEALS LESS THAN 10 PPM OF H<sub>2</sub>S.
  - B. WHEN BREAKING OUT ANY LINE WHERE H<sub>2</sub>S CAN REASONABLY BE EXPECTED.
  - C. WHEN SAMPLING AIR IN AREAS TO DETERMINE IF TOXIC CONCENTRATIONS OF H<sub>2</sub>S EXISTS.
  - D. WHEN WORKING IN AREAS WHERE OVER 10 PPM H<sub>2</sub>S HAS BEEN DETECTED.
  - E. AT ANY TIME THERE IS A DOUBT AS TO THE H<sub>2</sub>S LEVEL IN THE AREA TO BE ENTERED.

## **H2S CONTINGENCY PLAN**

### **RESCUE** **FIRST AID FOR H2S POISONING**

**DO NOT PANIC!**

**REMAIN CALM - THINK!**

**HOLD YOUR BREATH. (DO NOT INHALE FIRST, STOP BREATHING.)**

**PUT ON BREATHING APPARATUS.**

**REMOVE VICTIM(S) TO FRESH AIR AS QUICKLY AS POSSIBLE. (GO UP-WIND FROM SOURCE OR AT RIGHT ANGLE TO THE WIND. NOT DOWN WIND.)**

**BRIEFLY APPLY CHEST PRESSURE - ARM LIFT METHOD OF ARTIFICIAL RESPIRATION TO CLEAN THE VICTIM'S LUNGS AND TO AVOID INHALING ANY TOXIC GAS DIRECTLY FROM THE VICTIM'S LUNGS.**

**PROVIDE FOR PROMPT TRANSPORTATION TO THE HOSPITAL, AND CONTINUE GIVING ARTIFICIAL RESPIRATION IF NEEDED.**

**HOSPITAL(S) OR MEDICAL FACILITIES NEED TO BE INFORMED, BEFORE-HAND, OF THE POSSIBILITY OF H2S GAS POISONING - NO MATTER HOW REMOTE THE POSSIBILITY IS.**

**NOTIFY EMERGENCY ROOM PERSONNEL THAT THE VICTIM(S) HAS BEEN EXPOSED TO H2S GAS.**

**SIDES BASIC FIRST AID, EVERYONE ON LOCATION SHOULD HAVE A GOOD WORKING KNOWLEDGE OF ARTIFICIAL RESPIRATION, AS WELL AS FIRST AID FOR EYES AND SKIN CONTACT WITH LIQUID H2S. EVERYONE NEEDS TO MASTER THESE NECESSARY SKILLS.**