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-101
May 27, 2004

Submit to appropriate District Office

☐ AMENDED REPORT

APPLICATION FOR PERMIT TO DRILL, RE-ENTER, DEEPEN, PLUGBACK, OR ADD A ZONE

[1] Operator Name and Address		[2] OGRID Number
POGO PRODUCING COMPANY P.O. BOX 10340 MIDLAND, TEXAS 79702-7340	RECEIVED FEB 07 2006 OCD-ARTESIA	17891
		[3] API Number 30 - 015-34605

[4] Property Code	[5] Property Name	[6] Well No.
34604	LAKE WOOD "14"	4

[9] Proposed Pool 1	[10] Proposed Pool 2
UNDES. FOUR MILE DRAW-MORROW (76960)	

[7] Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
M	14	19S	26E		660'	SOUTH	660'	WEST	EDDY

[8] Proposed 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

Additional Well Information

[11] Work Type Code	[12] Well Type Code	[13] Cable/Rotary	[14] Lease Type Code	[15] Ground Level Elevation
N	G	ROTARY	P	3295'
[16] Multiple	**[17] Proposed Depth**	**[18] Formation**	**[19] Contractor**	**[20] Spud Date**
NO	9900'	MORROW	CAPSTAR DRILLING	WHEN APPROVED

OK JB

Depth to Groundwater 50'+ | Distance from nearest fresh water well .8 Mi. | Distance from nearest surface water 1+ miles

Pit: Liner: Synthetic ☒ 12 mils thick Clay ☐ Pit Volume: 18M bbls | Drilling Method:

Closed-Loop System ☐ | Fresh Water ☒ Brine ☒ Diesel/Oil-based ☐ Gas/Air ☐

[21] Proposed Casing and Cement Program

Hole Size	Casing Size	Casing weight/foot	Setting Depth	Sacks of Cement	Estimated TOC
26"	20"	Conductor	40'	Redi-mix	Surface
17½"	13 3/8"	48#	500'	550 Sx.	Surface
12¼"	9 5/8"	36#	1050'	600 Sx.	SURFACE
8½"-7 7/8"	5½"	17#	9900'	1600 Sx.	2000' FS

[22] Describe the proposed program. If this application is to DEEPEN or PLUG BACK, give the data on the present productive zone and proposed new productive zone. Describe the blowout prevention program, if any. Use additional sheets if necessary.

NOTIFY OCD OF SPUD &
TIME TO WITNESS
CEMENTING OF SURFACE &
INTERMEDIATE CASING

SEE ATTACHED SHEETS

[23] I hereby certify that the information given above is true and complete to the best of my knowledge and belief. I further certify that the drilling pit will be constructed according to NMOCD guidelines ☒, a general permit ☐, or an (attached) alternative OCD-approved plan ☐.

Printed name: Joe T. Janica

Title: Agent

E-mail Address:

Date: 02/06/06 | Phone: 505-391-8503

OIL CONSERVATION DIVISION

Approved by: Gary W. Wink
District II Supervisor

Approval Date: FEB 09 2006 | Expiration Date: FEB 09 2007

Conditions of Approval Attached ☐

State of New Mexico
Energy, Minerals and Natural Resources Department

DISTRICT I
1625 N. FRENCH DR., HOBBS, NM 88240

DISTRICT II
1301 W. GRAND AVENUE, ARTESIA, NM 88210

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

DISTRICT IV
1220 S. ST. FRANCIS DR., SANTA FE, NM 87505

OIL CONSERVATION DIVISION
1220 SOUTH ST. FRANCIS DR.
Santa Fe, New Mexico 87505

Form C-102
Revised JUNE 10, 2003
Submit to Appropriate District Office
State Lease - 4 Copies
Fee Lease - 3 Copies

WELL LOCATION AND ACREAGE DEDICATION PLAT

☐ AMENDED REPORT

API Number	Pool Code	Pool Name
	76960	UNDES. FOUR MILE DRAW-MORROW

Property Code	Property Name	Well Number
34604	LAKE WOOD 14	4

OGRID No.	Operator Name	Elevation
17891	POGO PRODUCING COMPANY	3295'

Surface Location

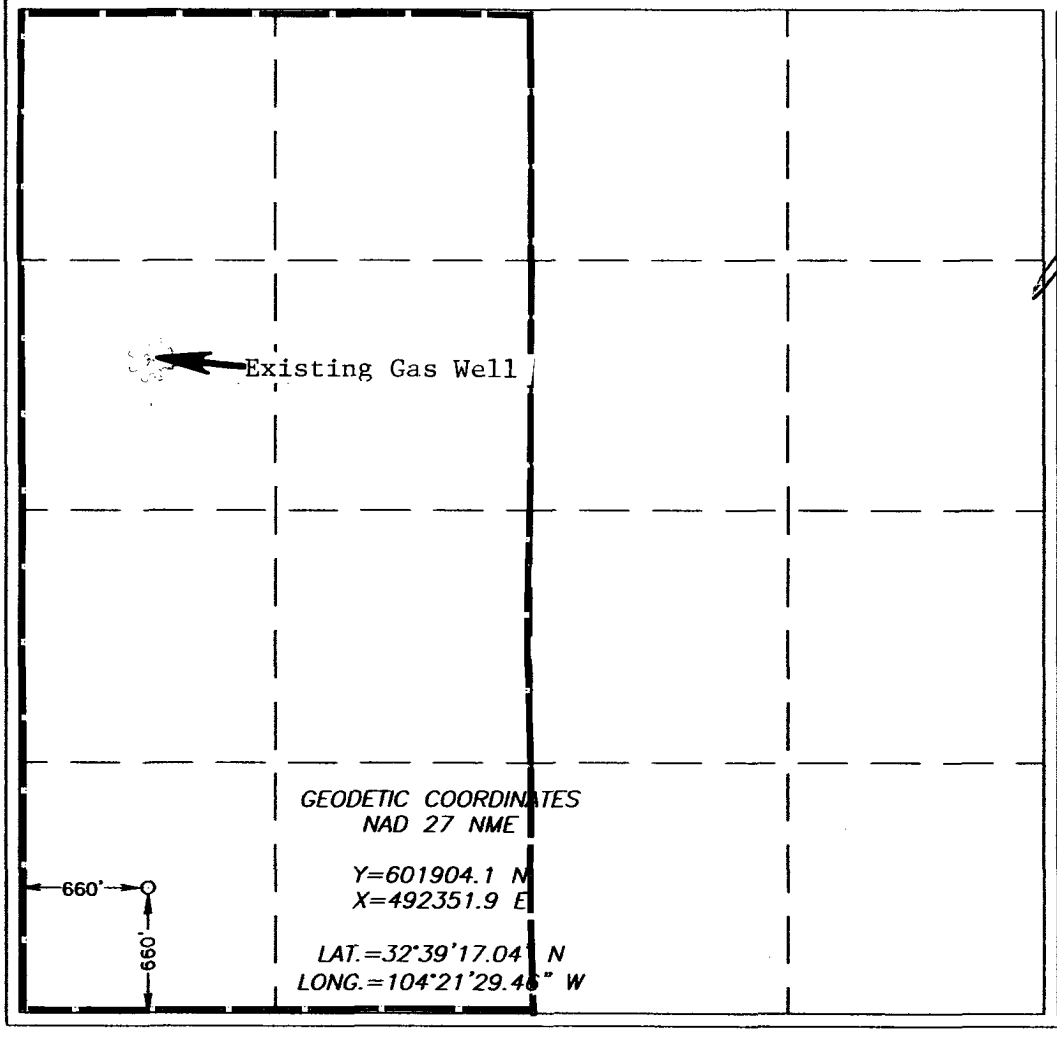
UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
M	14	19-S	26-E		660	SOUTH	660	WEST	EDDY

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	Joint or Infill	Consolidation Code	Order No.
320			

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



OPERATOR CERTIFICATION

I hereby certify the the information contained herein is true and complete to the best of my knowledge and belief.

Signature

Joe T. Janica
Printed Name

Agent
Title

02/06/06
Date

SURVEYOR CERTIFICATION

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 supervison, and that the same is true and correct to the best of my belief.

JANUARY 6, 2006
Date Surveyed LA

Signature & Seal of Professional Surveyor

GARY G. EIDSON
NEW MEXICO
12641
REGISTERED PROFESSIONAL SURVEYOR

Gary G. Eidson 12/13/05
06.11.0008

Certificate No. GARY EIDSON 12641

POGO PRODICING COMPANY

LAKE WOOD "14" # 4

660' FSL & 660' FWL
SECTION 14 T19S-R26E
EDDY CO. NM

1. Drill 26" hole to 40'. Set 40' of 20" conductor pipe and cement to surface with Redi-mix.

2. Drill 17½" hole to 500'. Run and set 500' of 13 3/8" 48# H-40 ST&C casing. Cement with 225 Sx. of Class "C" 35/65/6lite cement mixed at 12.4PPG, tail in with 200 Sx. or Class "C" cement + 2% CaCl, mixed at 14.8 PPG, circulate cement to surface.

3. Drill 12¼" hole to 1050'. Run and set 1050' of 9 5/8" 36# J-55 ST&C casing. Cement with 250 Sx. of 35/65/6 Class "C" lite cement mixed at 12.4 PPG, tqil in with 200 Sx. of Class "C" cement + 2% CaCl, mixed at 14.8 PPG, circulate cement to surface. Rig up mud logger and H_2S monitoring equipment, make shure all rig personel are educated in the danger of H_2S and how to be deal with it if it should be encountered.

4. Drill 8½" hole to 8000'using fresh water, if no lost circulation problems are encountered, the hole size may be reduced to 7 7/8". If lost circulation is a problem in the Cisco a 7" 26# L-80 LT&C string of casing may be run. If this string of casing is run it will be cemented in 2 stages with DV Tool set at 7000'. Cement with 1000 Sx. of Class "C" cement + 8# of Gilsonite/Sx. If this string of casing is not required continue drilling to 9900' with a 7 7/8" bit. Run and set 9900' of 5½"17# N-80 LT&C casing. cement in two stages with the DV Tool set at 7700'. Cement lst stage with 550 Sx. of Class "H" Premium PLus cement + additives, cement 2nd stage with 650 Sx. of of cless "C" lite cement, tail in with 400 Sx. of Class "C" cement + additives. Estimate top of cement 2000' from surface.

POGO PRODICING COMPANY
LAKE WOOD "14" # 4
660' FSL & 660' FWL
SECTION 14 T19S-R26E
EDDY CO. NM

Mud Property Summary

Since Pogo Producing Company has not selected a Mud Retail Company for this project at the time of writing this procedure, the following summary should be enough for NMOCD review.

Depth (FEET)	Weight (PPG)	Viscosity (SEC/QRT)	Fluid Loss (CC/30 MIN)	PV (CPS)	YP (LB/100'2)	LCM (PPB)	MUD TYPE
0-500'	8.5-8.8	28-36	NC	6-8	8-10	sweeps	Native/premix gel/Ph control 9.0
500-1050	8.4 – 8.5	28-29	NC	0	0	sweeps	Clear Water/ paper sweeps
1050-8000'	8.6-8.8	29	NC	0	0	sweeps	Clear Water/Paper sweeps/ PH & corrosion control. Weight may increase due to formation water influx.
8000-9900'	8.8	55	<12	6-8	5-10	sweeps	Cut Brine Base Pre-hydrate gel/starch/ PH & corrosion control. Possible shale inhibition needed and polymer for vis and WL control.

5 ½ 17# L-80 Casing Strength and Load

Depth (feet)	Burst Load (PSI)	Burst Strength (PSI)	Collapse Load (PSI)	Collapse Strength (PSI)	Tensile load (1000lbs)	Tensile Strength (1000lbs)
9900	4125	7740	5148	6280	168.3	348

- All factor of Burst in excess of 1.8 note: casing frac shows load/strength ratio @ 1.3 minimum.
- Design of collapse factor in excess of 1.2
- Tensile factor design in excess of 1.2

Design parameters =

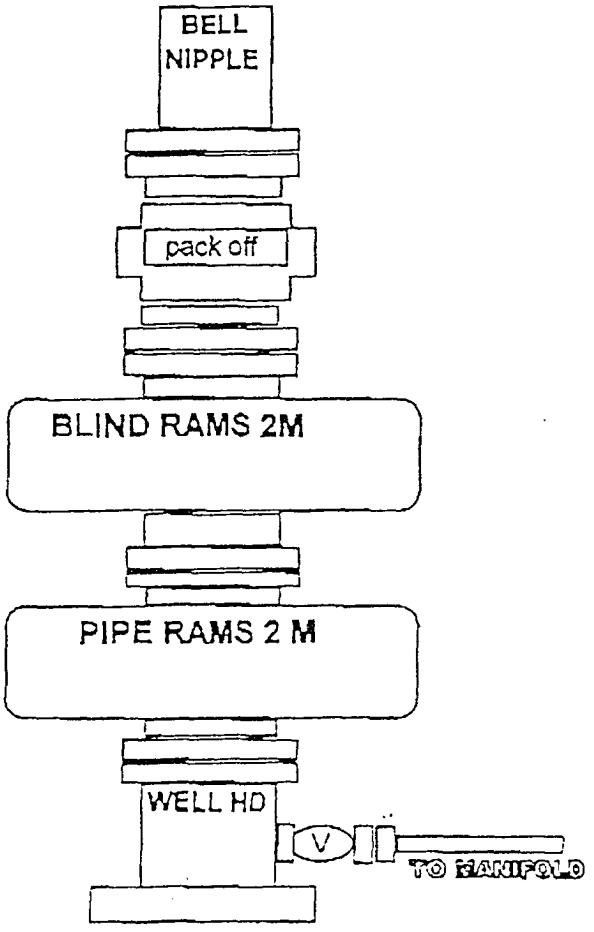
- Design property of Burst = 8.3 ppg pore pressure " Normal" pressure.
- Design property of Collapse = 10 ppg Brine water as produced in some Delaware formations
- No Abnormal pressure is expected in this area
- Frac gradient @ 9900' expected 12.5 ppg. Calculate ± 2500 isip + friction of casing during frac.
- Stage tools have comparable strength of 5 ½" P-110 17# casing because of thickness.

POGO PRODICING COMPANY
LAKE WOOD "14" # 4
660' FSL & 660' FWL
SECTION 14 T19S-R26E
EDDY CO. NM

Formation tops as per Spencer Trust in section 15:

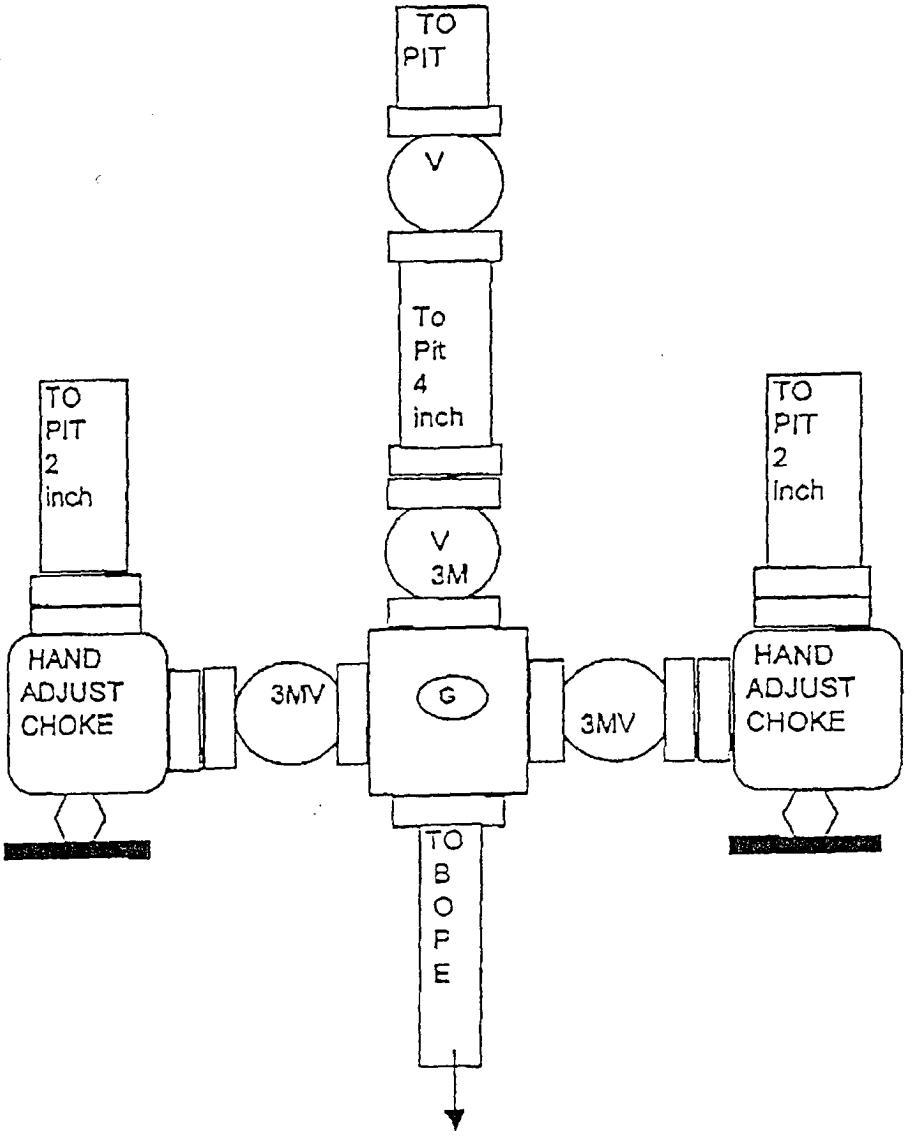
Queen = 600 ft
Grayburg = 910 ft
San Andres = 1310 ft
Yeso = 2928
Bone Spring Lm = 4630 ft
3rd Bone Spring Sd. = 6570 ft
Wolfcamp Lime = 7020 ft
Cisco = 7850 ft
Strawn = 8316
Atoka = 9042
Morrow = 9197
Morrow Clastics = 9446
Chester = 9768

11" 2M


BELL
NIPPLE
pack off
BLIND RAMS 2M
PIPE RAMS 2 M
WELL HD
V
TO MANIFOLD

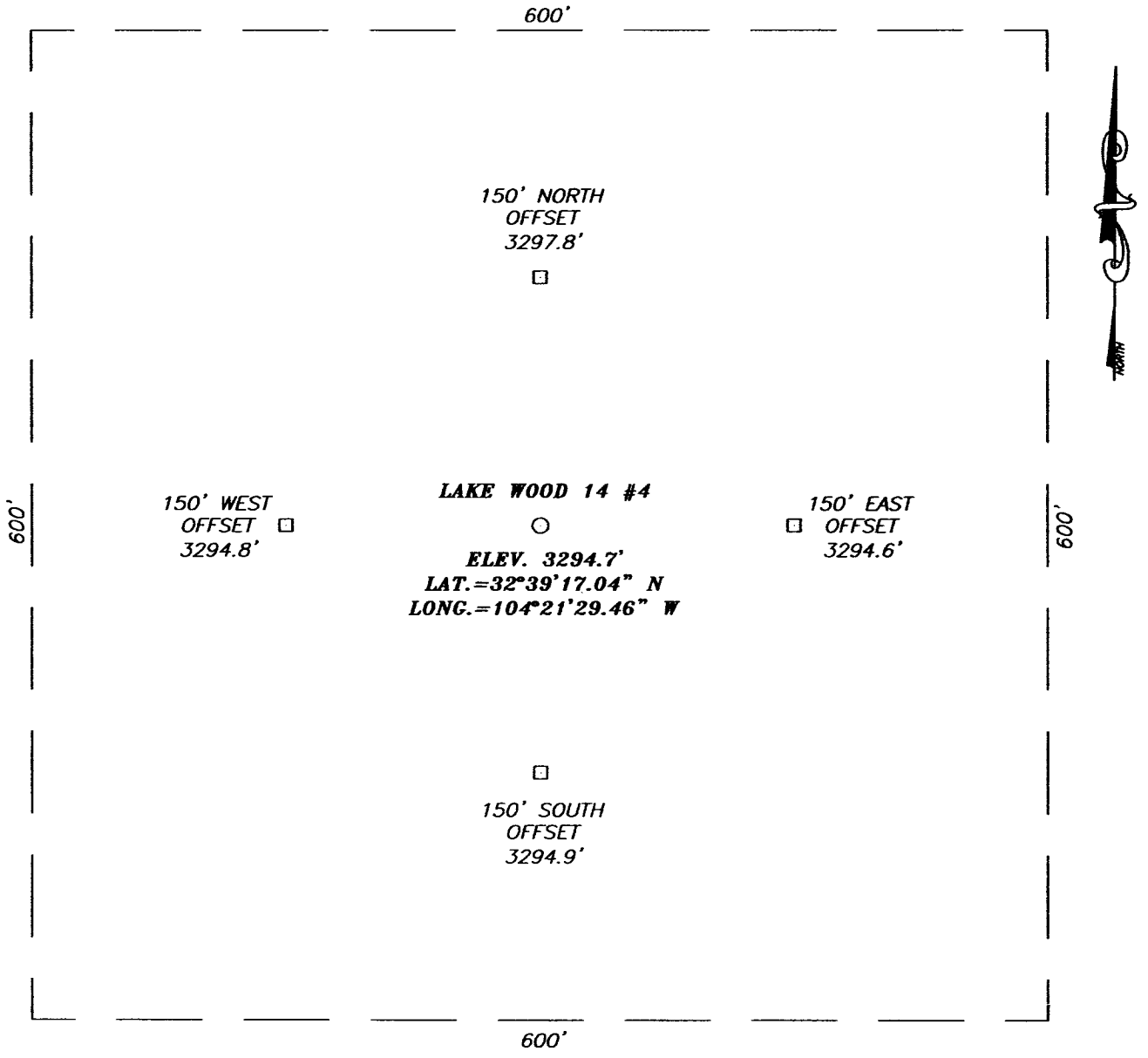
CHOKE MANIFOLD

3000 PSI WP



SECTION 14, TOWNSHIP 19 SOUTH, RANGE 26 EAST, N.M.P.M.,

EDDY COUNTY, NEW MEXICO



DIRECTIONS TO LOCATION

FROM THE INTERSECTION OF U.S. HWY. #285 AND CO. RD. #35 (CRANE RD., APPROX. 12.4 MILES SOUTH OF ARTESIA) GO EAST ON CO. RD. #35 APPROX. 1.5 MILES. TURN RIGHT ON CO. RD. #34 (LAKE RD) AND GO SOUTH APPROX. 0.2 MILES. TURN LEFT AND GO EAST ON CO. RD. #36 FOR APPROX. 0.65 MILES. THIS LOCATION IS APPROX. 650 FEET SOUTH.

100 0 100 200 Feet

Scale: 1"=100'

PROVIDING SURVEYING SERVICES SINCE 1946

JOHN WEST SURVEYING COMPANY

412 N. DAL PASO

HOBBS, N.M. 88240

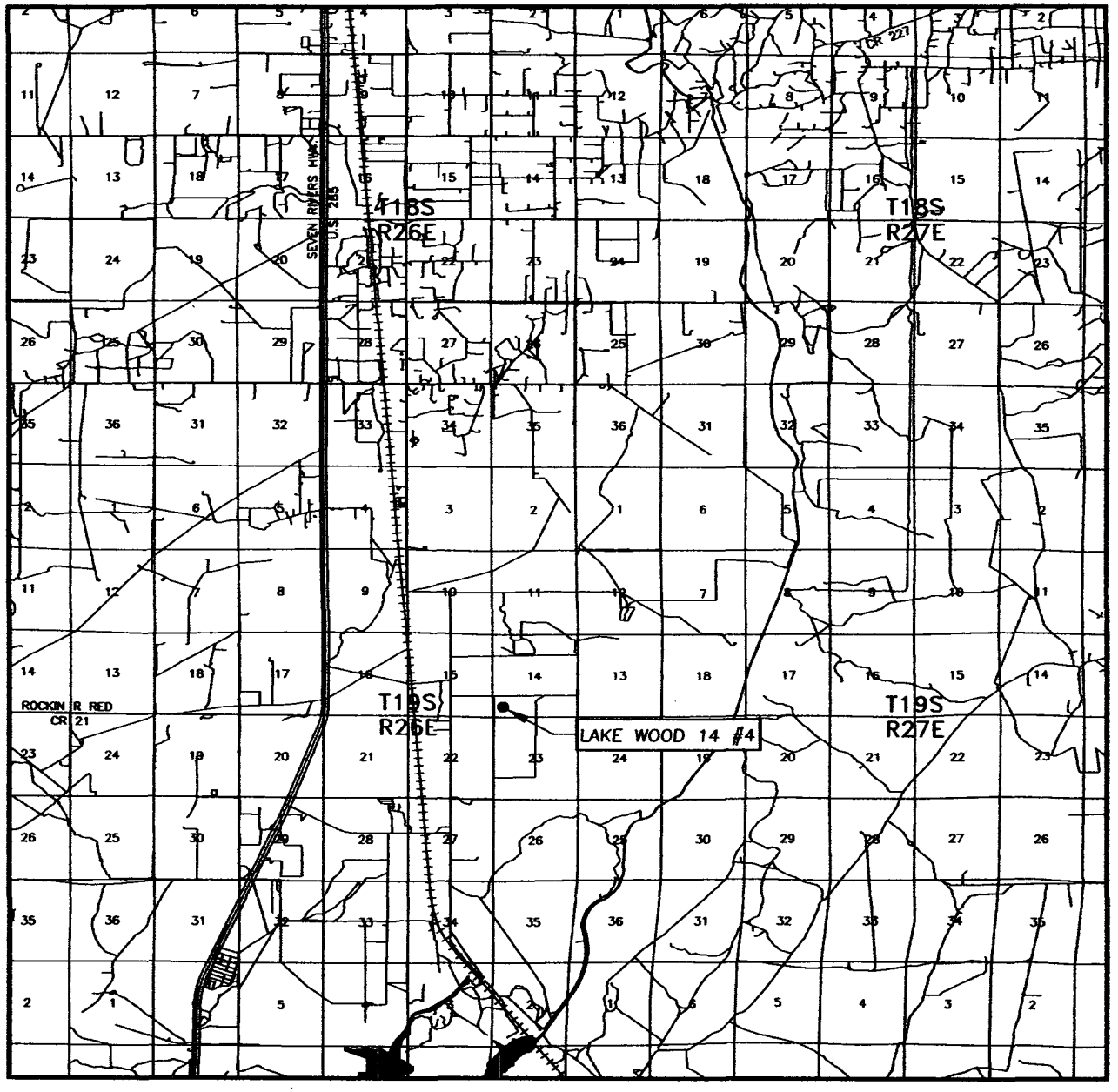
(505) 393-3117

POGO PRODUCING COMPANY

LAKE WOOD 14 #4 WELL
LOCATED 660 FEET FROM THE SOUTH LINE
AND 660 FEET FROM THE WEST LINE OF SECTION 14,
TOWNSHIP 19 SOUTH, RANGE 26 EAST, N.M.P.M.,
EDDY COUNTY, NEW MEXICO.

Survey Date: 1/6/06	Sheet 1 of 1 Sheets		
W.O. Number: 06.11.0008	Dr By: LA	Rev 1:N/A	
Date: 1/12/06	Disk: CD#4	06110008	Scale: 1"=100'

VICINITY MAP



SCALE: 1" = 2 MILES

SEC. 14 TWP. 19-S RGE. 26-E

SURVEY N.M.P.M.

COUNTY EDDY

DESCRIPTION 660' FSL & 660' FWL

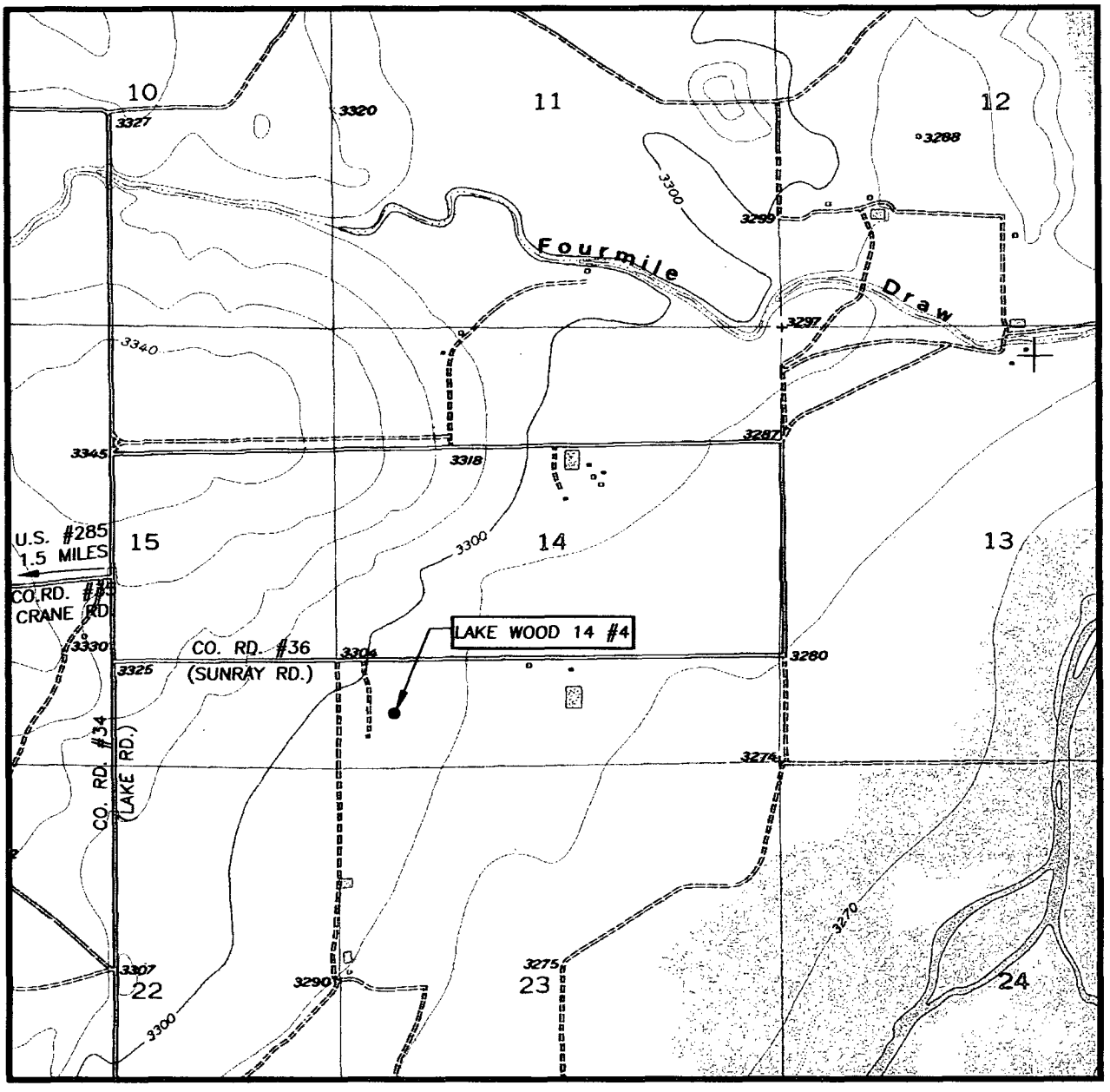
ELEVATION 3295'

OPERATOR POGO PRODUCING COMPANY

LEASE LAKE WOOD 14

PROVIDING SURVEYING SERVICES
SINCE 1946
JOHN WEST SURVEYING COMPANY
412 N. DAL PASO
HOBBS, N.M. 88240
(505) 393-3117

LOCATION VERIFICATION MAP



SCALE: 1" = 2000'

CONTOUR INTERVAL:
LAKE McMILLAN NORTH, N.M. – 10'

SEC. 14 TWP. 19-S RGE. 26-E

SURVEY N.M.P.M.

COUNTY EDDY

DESCRIPTION 660' FSL & 660' FWL

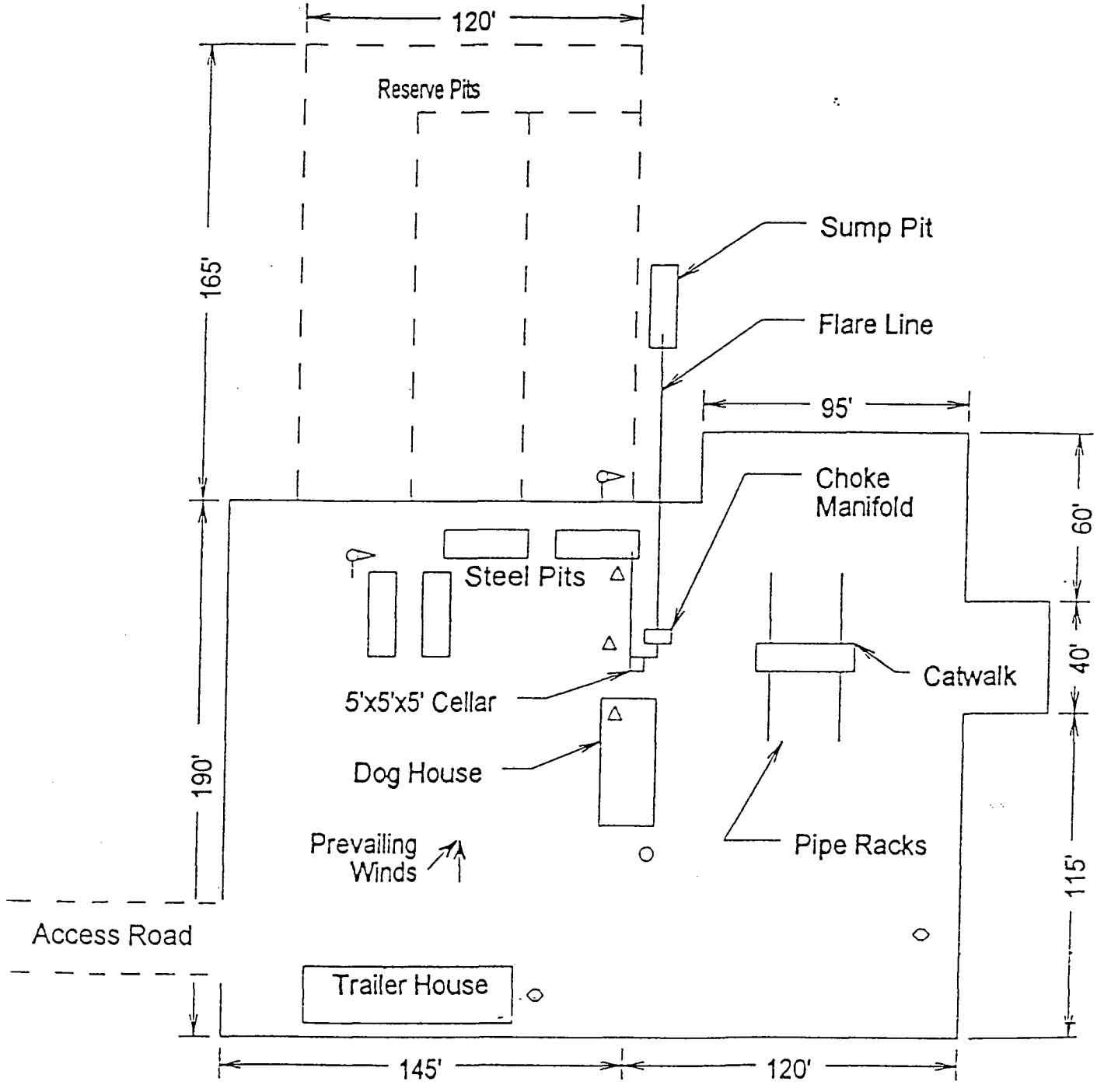
ELEVATION 3295'

OPERATOR POGO PRODUCING COMPANY

LEASE LAKE WOOD 14

U.S.G.S. TOPOGRAPHIC MAP
LAKE McMILLAN NORTH, N.M.

PROVIDING SURVEYING SERVICES
SINCE 1946
JOHN WEST SURVEYING COMPANY
412 N. DAL PASO
HOBBS, N.M. 88240
(505) 393-3117



- Wind Direction Indicators (wind sock or streamers)
- △ H2S Monitors (alarms at bell nipple and shale shaker)
- ◇ Briefing Areas
- ○ Remote BOP Closing Unit
- □ Sign and Condition Flags

POGO PRODICING COMPANY
LAKE WOOD "14" # 4
HYDROGEN SULFIDE CONTINGENCY PLAN
FOR DRILLING/WORKOVER/FACILITY
660' FSL & 660' FWL SECTION 14 T19S-R26E EDDY CO. NM

This well and its anticipated facility are not expected to have Hydrogen Sulfide releases. Pogo Producing Company has had no known H2S problems in this area, however, there is always a possibility of Hydrogen Sulfide production or releases in the Delaware Basin. Due to the subject well's proximity to a private residence the following contingency plan has been orchestrated. Pogo Producing Company will have a Company Representative living on location through out the drilling of this well. An un-man H2S safety trailer and monitoring equipment will also be station on location during the drilling operation below the shallow Intermediate Casing depth of ± 1050 ft. until the completion of the subject well at ± 9,900 ft.

POGO PRODICING COMPANY

LAKE WOOD "14" # 4

HYDROGEN SULFIDE CONTINGENCY PLAN
FOR DRILLING/WORKOVER/FACILITY
660' FSL & 660' FWL SECTION 14 T19S-R26E EDDY CO. NM

TABLE OF CONTENS

POGO PRODICING COMPANY

LAKE WOOD "14" # 4

HYDROGEN SULFIDE CONTINGENCY PLAN
FOR DRILLING/WORKOVER/FACILITY
660' FSL & 660' FWL SECTION 14 T19S-R26E EDDY CO. NM

General H2S Emergency Actions:

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 unsuspection 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 the emergency response agencies and nearby residents.

EMERGENCY PROCEDURES FOR AN UNCONTROLLABLE RELEASE OF H2S

1. All personnel will don the self contained breathing apparatus.
2. Remove all personnel to the "safe area". (always use the buddy system).
3. Contact company personnel if not on location.
4. Set in motion the steps to protect and or remove the general public to an upwind "safe area". Maintain strict security & safety procedures while dealing with the source.
5. No entry to any unauthorized personnel.
6. Notify the appropriate agencies: City Police-City Street (s)
   State Police- State Rd
   County Sheriff – County Rd.
7. Call the NMOCD

POGO PRODICING COMPANY

LAKE WOOD "14" # 4

HYDROGEN SULFIDE CONTINGENCY PLAN
FOR DRILLING/WORKOVER/FACILITY
660' FSL & 660' FWL SECTION 14 T19S-R26E EDDY CO. NM

If at this time the supervising person determines the release of H2S cannot be contained to the site location and the general public is in harms way he will take the necessary steps to protect the workers and the public.
EMERGENCY CALL LIST: (Start and continue until ONE of these people have been contacted)

	OFFICE	MOBILE	HOME
POGO Producing Co.	432 685 8100		
Richard Wright	432 685 8140	432 556 7595	432 699 7108
Barrett Smith	432 685 8141	432 425 0149	432 520 7337
Rex Jasper	432 685 8143	432 631 0127	432 694 1839
Donny Davis	pgr 432 563 6944	432 556 5927	432 570 9555
Jerry Cooper	432 685 8101		432 697 4629

EMERGENCY RESPONSE NUMBERS:

State Police:	Eddy County		505 748 9718
State Police:	Lea County		505 392 5588
Sheriff	Eddy County		505 746 2701
Sheriff	Lea County		
Emergency Medical Ser	Eddy County		911 or 505 746 2701
(Ambulance)	Lea County	Eunice	911 or 505 394 3258
Emergency Response	Eddy County SERC		505 476 9620

POGO PRODICING COMPANY

LAKE WOOD "14" # 4

HYDROGEN SULFIDE CONTINGENCY PLAN
FOR DRILLING/WORKOVER/FACILITY
660' FSL & 660' FWL SECTION 14 T19S-R26E EDDY CO. NM

Artesia Police Dept		505 746 5001
Artesia Fire Dept		505 746 5001
Carlsbad Police Dept		505 885 2111
Carlsbad Fire Dept		505 885 3125
Loco Hills Police Dept		505 677 2349
Jal Police Dept		505 395 2501
Jal Fire Dept		505 395 2221
Jal ambulance		505 395 2221
Eunice Police Dept		505 394 0112
Eunice Fire Dept		505 394 3258
Eunice Ambulance		505 394 3258
Hobbs Police Dept		
NMOCD	District 1 (Lea, Roosevelt, Curry)	505 393 6161
	District 2 (Eddy Chavez)	505 748 1283
Lea County Information		505 393 8203
Callaway Safety	Lea/Eddy County	505 392 2973
BJ Services	Artesia	505 746 3140
	Hobbs	505 392 5556
Halliburton	Artesia	1 800 523 2482
	Hobbs	1 800 523 2482
Wild Well Control	Midland	432 550 6202
	Mobile	432 553 1166

POGO PRODICING COMPANY

LAKE WOOD "14" # 4

HYDROGEN SULFIDE CONTINGENCY PLAN
FOR DRILLING/WORKOVER/FACILITY
660' FSL & 660' FWL SECTION 14 T19S-R26E EDDY CO. NM

PROTECTION OF THE GENERAL PUBLIC (Radius Of Exposure) ROE:

- 100 ppm at any public area (any place not associated with this site)
- 500 ppm at any public road (any road which the general public may travel)
- 100 ppm radius of ¼ mile in New Mexico will be assumed if there is insufficient data to do the calculations, and there is a reasonable expectation that H2S could be present in concentrations greater than 100 ppm in the gas mixture

CALCULATIONS FOR THE 100 PPM (ROE) "Pasquill-Gifford equation"

X = [(1.589) (mole fraction) (Q- volume in std cu ft)] to the power of (0.6258)

CALCULATION FOR THE 500 PPM ROE:

X = [(.4546) (mole fraction) (Q- volume in std cu ft)] to the power of (0.6258)

Example:

If a well/facility has been determined to have 150 / 500 ppm H2S in the gas mixture and the well/facility is producing at a gas rate of 100 MCFPD then:

150 ppm X= [(1.589) (.00015) (100,000 cfd)] to the power of (.6258)
X= 7 ft

500 ppm X= [(.4546) (.0005) (100,000 cfd)] to the power of (.6258)
X = 3.3 ft.

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

PUBLIC EVACUATION PLAN:

- 1. Notification of the emergency response agencies of the hazardous condition and implement evacuation procedures.
- A trained person in H2S safety, shall monitor with detection equipment the H2S concentration, wind and area 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 shall be UL approved, for use in class 1**

groups A,B,C &D, Division 1, hazardous locations. All monitor will have a minimum capability of measuring H2S , oxygen, and flammable values).

- 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.
- 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.

PROCEDURE FOR IGNITING AN UNCONTROLABLE CONDITION:

- 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.

INSTRUCTION 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 qualified safety person who will test the atmosphere for H2S, 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 25 mm flare gun shall be used, with a ± 500 ft. 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.

POGO PRODICING COMPANY

LAKE WOOD "14" # 4

HYDROGEN SULFIDE CONTINGENCY PLAN
FOR DRILLING/WORKOVER/FACILITY
660' FSL & 660' FWL SECTION 14 T19S-R26E EDDY CO. NM

REQUIRED EMERGENCY EQUIPMENT:

- **1. Breathing apparatus:**
  - Rescue Packs (SCBA) – 1 unit shall be placed at each breathing area, 2 shall be stored in the safety trailer.
  - Work/Escape packs – 4 packs shall be stored on the rig floor with sufficient air hose not to restrict work activity.
  - Emergency Escape Packs – 4 packs shall be stored in the doghouse for emergency evacuation.

- **2. Signage & Flagging:**
  - One color code condition sign will be placed at the entrance to the site reflection the possible conditions at the site.
  - A colored condition flag will be on display, reflecting the condition at the site at the time.

- **3. Briefing Area: two perpendicular areas will be designated by signs and readily accessible.**

- **4. Wind Socks: Two wind socks will be placed in strategic locations, visible from all angles.**

- **5. H2S detectors and alarms: The stationary detector with thre sensors will be placed in the upper dog house if equipped, set to visually alarm @ 10 ppm and audible @ 14 ppm. Calibrate a minimum of every 30 days ora as needed. The sensors will be placed in the following places: (Gas sample tubes will be stored in the safety trailer)**
  - Rig Floor
  - Bell Nipple
  - End of Flow line or where well bore fluid are being discharged.

- **6. Auxiliary Rescue Equipment:**
  - Stretcher
  - Two OSHA full body harness
  - 100 ft 5/8 inch OSHA approved rope

- Communication via cell phones on location and vehicles on location.

USING SELF CONTAINED BREATHING AIR EQUIPMENT (SCBA):

- (SCBA) SHOULD BE WORN WHEN ANY OF THE FOLLOWING ARE PERFORMED:
  - Working near the top or on top of a tank
  - Disconnecting any line where H2S can reasonably be expected
  - Sampling air in the area to determine if toxic concentrations of H2S exist.
  - Working in areas where over 10 ppm on H2S has been detected.
  - At any teim there is a doubt as the level of H2S in the area.

- All personnel shall be trained in the use of SCBA prior to working in a potentially hazardous locaton.
- Facial hair and standard eyeglasses are not allowed with SCBA.
- Contact lenses are never allowed with SCBA.
- Air quality shall be continuously be checked during the entire operation.
- After each use, the SCBA unit shall be cleaned, disinfected, serviced and inspected
- All SCBA shall be inspected monthly.

RESCUE AND FIRST AID FOR VICTIMS OF HYDROGEN SULFIDE (H2S) POISONING:

- Do not panic
- Remain Calm & think
- Get on the breathing apparatus

- Remove the victim to the safe breathing area as quickly as possible. Up wind an uphill from source or cross wind to achieve upwind.
- Notify emergency response personnel.
- Provide artificial respiration and or CPR, as necessary
- Remove all contaminated clothing to avoid further exposure.
- A minimum of two personnel on location shall be trained in CPR and First Aid.

HYDROGEN SULFIDE TOXIC EFFECTS

H2S is extremely toxic. The acceptable ceiling for eight hours of exposure is 10 ppm, which is .001% by volume. H2S is approximately 20% heavier than air (Sp. Gr= 1.19)(Air = 1) and colorless. It forms an explosive mixture with air between 4.3% and 46%. By volume hydrogen sulfide is almost as toxic as hydrogen cyanide and is 5-6 times more toxic than carbon monoxide.

Various Gases

COMMON NAME	CHEMICAL ABBREV.	SPECIFIC GRVTY.	THRESHOLD LIMITS	HAZARDOUS LIMITS	LETHAL CONCENTRATIONS
Hydrogen Sulfide	H2S	1.19	10ppm 15 ppm	100 ppm/hr	600 ppm
Hydrogen Cyanide	HCN	0.94	10 ppm	150 ppm/hr	300 ppm
Sulfur Dioxide	SO2	2.21	2 ppm	N/A	1000 ppm
Chlorine	CL2	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	Combustible @ 5%	N/A

Threshold limit: Concentrations at which it is believed that all workers may be repeatedly exposed, day after day without adverse effects.

Hazardous Limit: Concentrations that may cause death

Lethal Concentrations: Concentrations that will cause death with short term exposure

Threshold limit - 10 ppm: NIOSH guide to chemical hazards

PHYSICAL EFFECTS OF HYDROGEN SULFIDE:

CONCENTRATION		PHYSICAL EFFECTS
.001%	10 PPM	Obvious and unpleasant odor. Safe for 8 hr exposure
.005%	50 ppm	Can cause some flu like symptoms and can cause pneumonia
.01%	100 ppm	Kills the sense of smell in 3-15 minutes. May irritate the eyes and throat.
.02%	200 ppm	Kills the sense of smell rapidly. Severly irritates the eyes and throat. Severe flu like symptoms after 4 or more ours. May cause lung damage and or death.
.06%	600 ppm	Loss of consciousness quickly, death will result if not rescued promptly.