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Dan A. Hughes Co. L.P.

CONTINGENCY PLAN

FOR

DRILLING OPERATIONS

DAN A. HUGHES COMPANY, L.P.

HUECO SOUTH UNIT 26 STATE #1

SECTION 26, TOWNSHIP 32 SOUTH, RANGE 17 WEST

HIDALGO COUNTY, NEW MEXICO

NOVEMBER 14, 2007

BEFORE EXAMINER

OIL CONSERVATION DIVISION

HUGHES EXHIBIT NO. 8

CASE NO. 14050

Safety International

a DXP Company

Safety Compliance Rental • Safety Education Specialists

Safety Consultants

HEADQUARTERS TRAINING CENTER • 2348 E. I-20 SOUTH SERVICE RD • ODESSA, TEXAS 79766

MAILING ADDRESS • P.O. BOX 12060-2060

(432) 580-3770 • FAX (432) 332-9223

Safety International

a DXP Company

"Your Total Safety Company"

2148 East I-20, So. Serv. Rd.
Odessa, Texas 79766
432-580-3770

1-800-749-7233

P.O. Box 12060
Odessa, Texas 79768
Fax: 432-332-9223

November 14, 2007

Transmittal Letter

RE: CONTINGENCY PLAN FOR
DAN A. HUGHES COMPANY, L.P.
HUECO SOUTH UNIT 26 STATE #1
HIDALGO COUNTY, NEW MEXICO

Gentleman:

Attached please find the emergency procedures, personnel and equipment plan. In the event of an emergency, the identified individuals should be notified immediately.

Sincerely,

Reggie Phillips
Vice President

CONTINGENCY PLAN

INDEX

SAFETY

It is the DAN A. HUGHES COMPANY, L.P. policy in all operations to do everything possible to insure the safety of its employees and the contractor's employees on the job site; additionally, to provide for the safety and comfort of persons near the operation by protecting the environment to the fullest degree possible.

The primary purpose of the procedures outlined herein is to guide the personnel on location in the event that Hydrogen Sulfide (H_2S) reaches the surface

TO PROTECT THEIR OWN SAFETY AND THE SAFETY OF OTHERS, ALL PERSONNEL ON THE JOB SITE WILL RIGIDLY ADHERE TO THIS PLAN

Initial Suspected Problem Zone:	Unknown (Wildcat)
Potential Open Flow Capacity:	Unknown (Wildcat)
Expected Concentration:	Unknown (Wildcat)

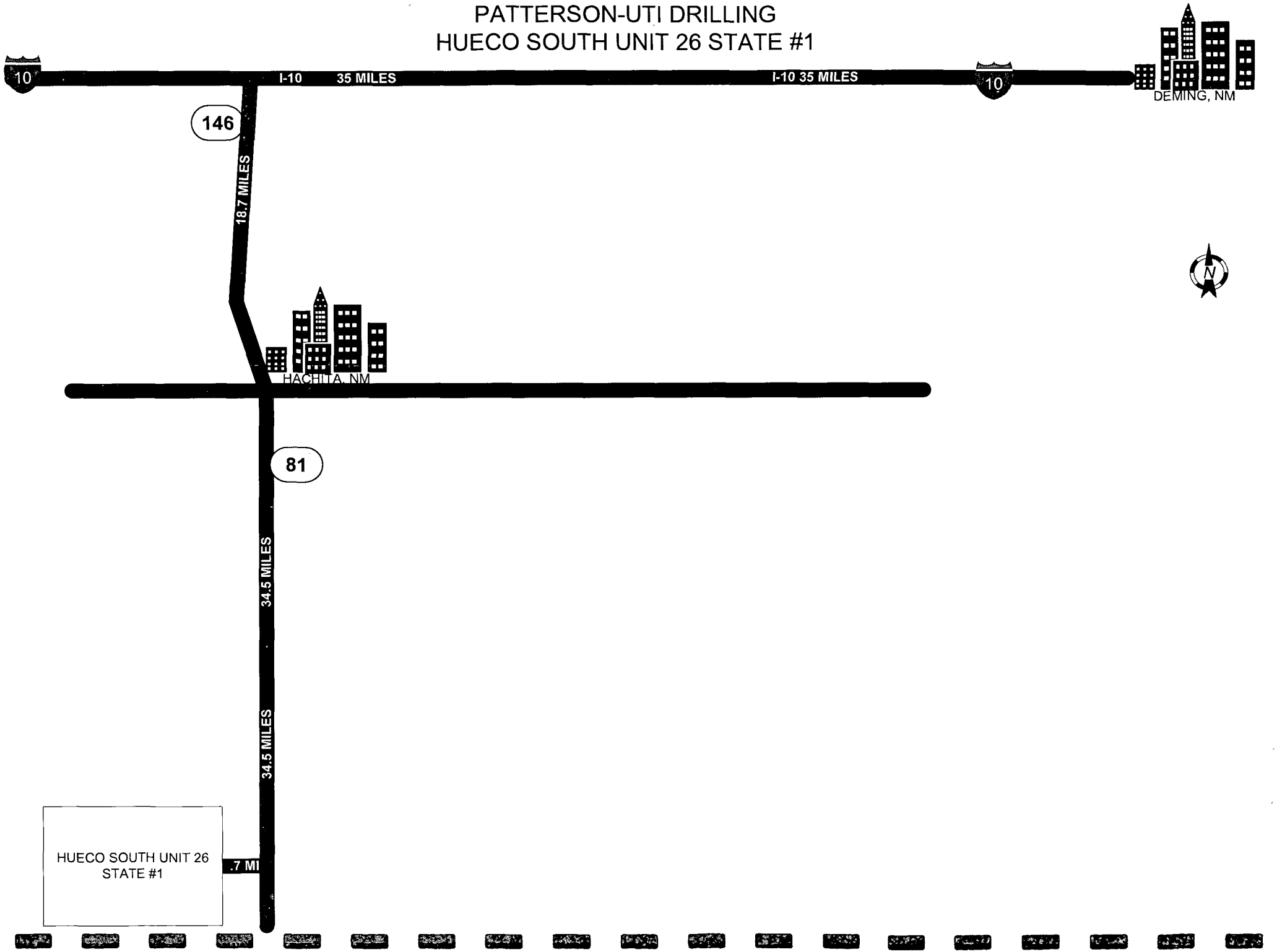
H2S Equipment will be rigged up at Surface.

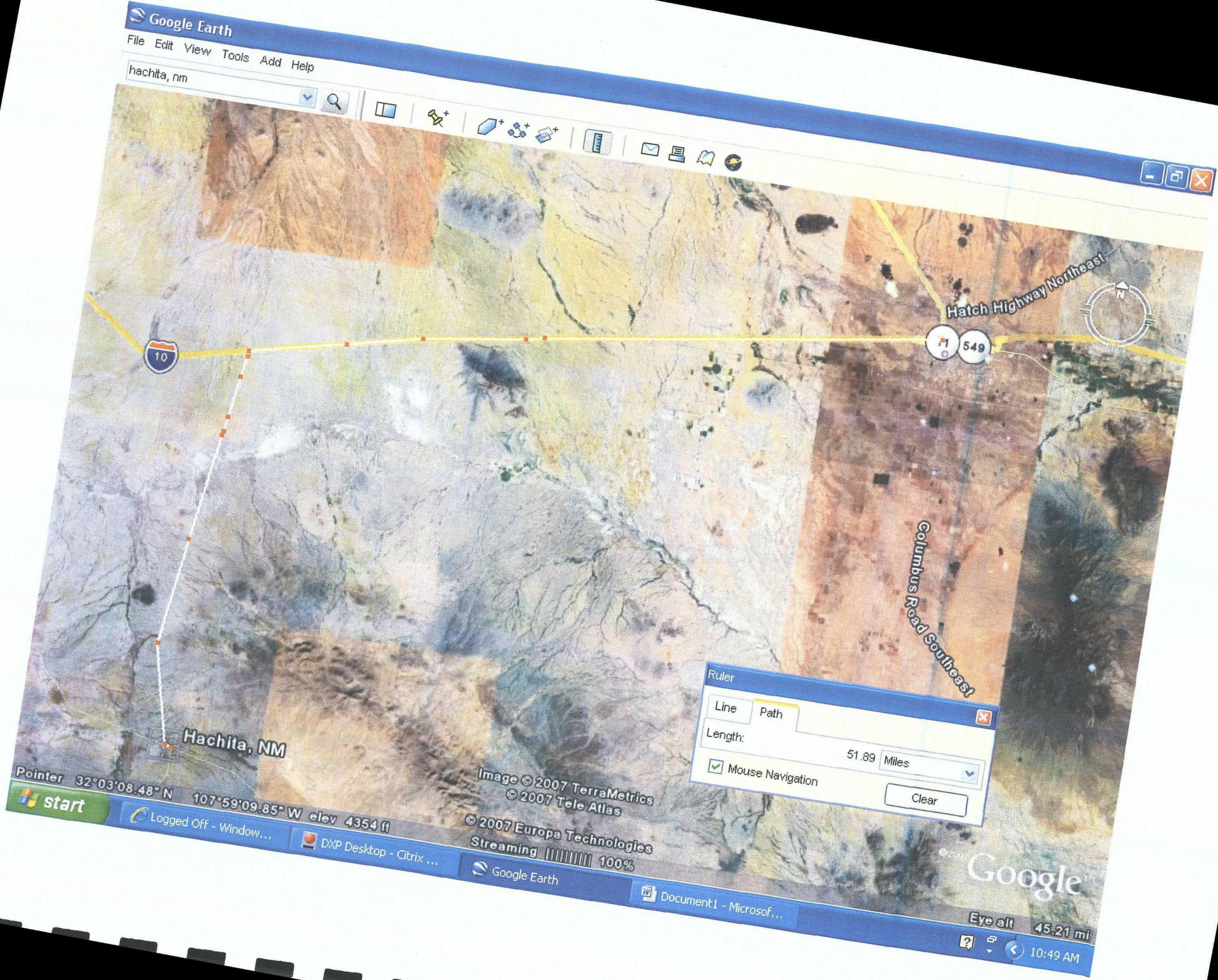
The plan should be implemented before drilling out from under surface.

DIRECTIONS TO LOCATION

FROM DEMING, NEW MEXICO, GO WEST ON I-10 FOR 35 MILES. TURN SOUTH ON HWY 146 (EXIT #49). GO 18.7 MILES TO HACHITA, NM AND CONTINUE SOUTH OUT OF HACHITA ON HWY 81 FOR 34.5 MILES TO GATE ON RIGHT. ENTER GATE TO RIG AHEAD 0.7 MILES.

DAN A HUGHES COMPANY L.P.
PATTERSON-UTI DRILLING
HUECO SOUTH UNIT 26 STATE #1

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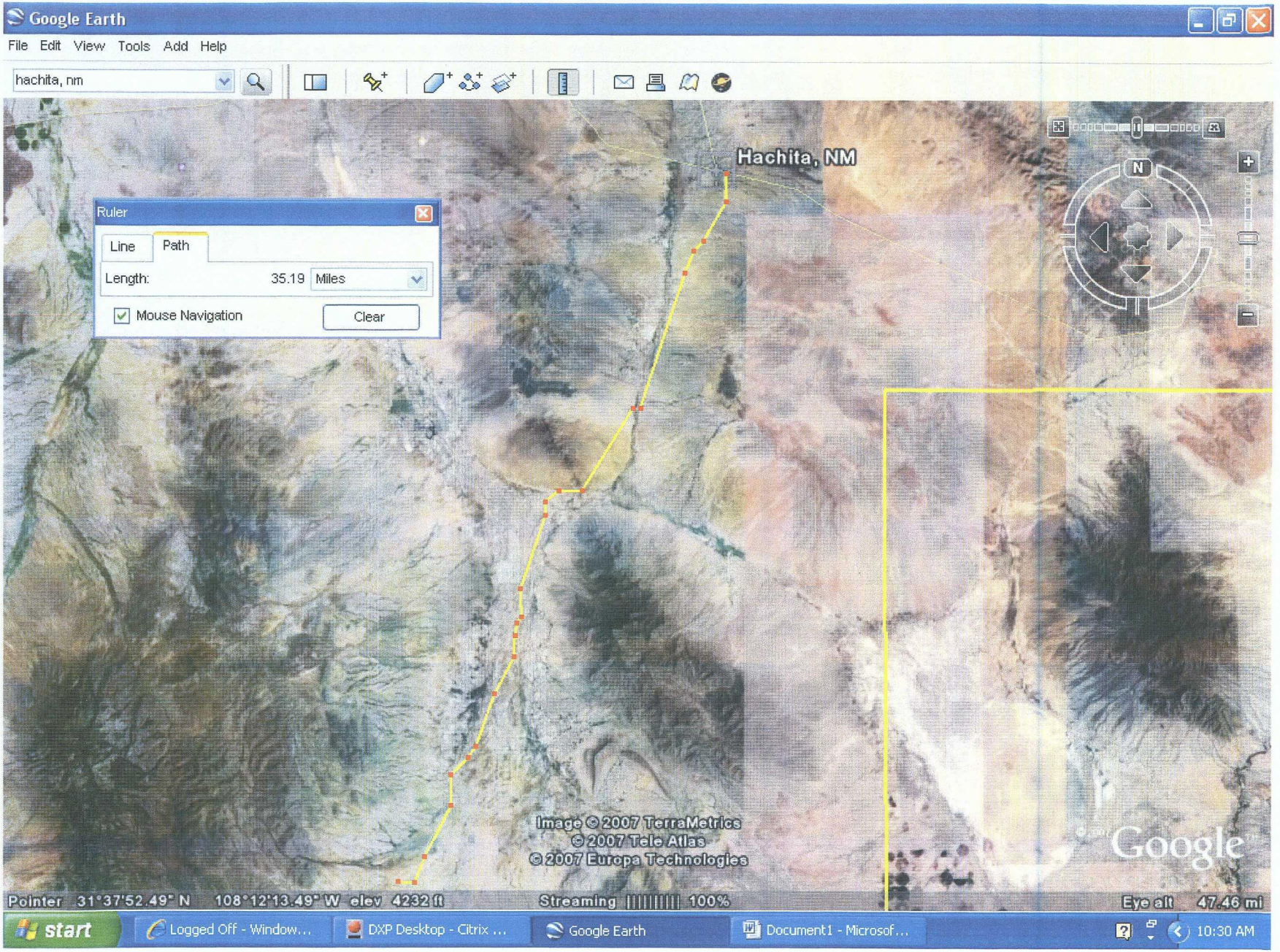
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10:30 AM

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

State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-102
Revised October 12, 2005
Submit to Appropriate District Office
State Lease - 4 Copies
Fee Lease - 3 Copies
☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

1 API Number	2 Pool Code	3 Pool Name

4 Property Code	5 Property Name	6 Well Number

7 OGRID No.	8 Operator Name	9 Elevation
		4527.68

10 Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
	26	32S	17W		660'		660'		Hidalgo

11 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

12 Dedicated Acres	13 Joint or Infill	14 Consolidation Code	15 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.

15

660' ○ 099

17 OPERATOR CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Signature Date

Printed Name

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

9-26-01
Date of Survey

Signature and Seal of Professional Surveyor

REGISTERED ENGINEER AND LAND SURVEYOR NO. 5252 NEW MEXICO IRA L. HARBIN

5252
Certificate Number

EMERGENCY NOTIFICATION

EVACUATION PLAN

The following general plan has been developed in the event that any public evacuation becomes necessary.

1. DAN A. HUGHES COMPANY, L.P. has requested and has been assured the support of the various public safety entities in the area.

2. Any evacuation will be conducted by the HIDALGO County Sheriff's Department and supported by the New Mexico Department of Public Safety, Highway Patrol Division.

3. Assistance from other public safety entities may be requested if required.

4. The included maps detail the area of the well site including the inventory of the public within the radius of exposure of the well.

5. In the event that there is any suspected problem on the well, the well site supervisor will notify the HIDALGO County Sheriff's Office at 911 or (505-542-8828) for ALERT STATUS.

6. ALERT STATUS will require that available public support personnel will proceed to the HIDALGO County Sheriff's Office in LORDSBURG, NEW MEXCIO and standby for instructions.

7. If isolation and evacuation are necessary, then units will be dispatched to points marked on the map with instructions to maintain roadblocks.

8. Evacuation teams will then proceed to sectors to be evacuated. Evacuation procedure will follow appropriate consideration for wind conditions.

9. Personnel from Safety International, Inc. will establish safe perimeters using H_2S Detectors.

10. The NMOCD and other authorities will be notified as soon as possible.

11. Other supplemental contractors will be contacted and called in as needed.

EMERGENCY CALL LIST

PUBLIC SAFETY

AGENCY	LOCATION	TELEPHONE #
Sheriff's Department	LORDSBURG, NM	911 OR 505/542-8828
	DEMING, NM	911 OR 505/546-2655
Police	LORDSBURG, NM	911 OR 505/542-3505
	DEMING, NM	911 OR 505/546-3011
State Police	LORDSBURG, NM	911 OR 505/542-9585
Fire Department	LORDSBURG, NM	911 OR 505/542-9261
	DEMING, NM	911 OR 505/546-6911
NMOCD 1220 S. St. Francis Dr.	SANTE FE, NM	505/476-3440

EMERGENCY CALL LIST
DAN A. HUGHES COMPANY, L.P.
P.O. DRAWER 669
BEEVILLE, TX 78104

NAME	TITLE	PHONE NUMBERS
JEFFERY R. ILSENG	OPERATIONS MANAGER	MOBIL: 361-362-3304 OFFICE: 361-358-3752 HOME: 361-387-9141

EMERGENCY CALL LIST

MEDICAL SUPPORT

AGENCY	LOCATION	TELEPHONE #
Hospitals	MIMBRES MEMORIAL HOSPITAL DEMING, NM	505/546-5800
Ambulance	LORDSBURG, NM	911 OR 505/542-8272
	DEMING, NM	911 OR 505/544-4241
Air Medical Transport	NEW MEXICO	800-827-0745

EMERGENCY CALL LIST

SUPPLEMENTAL EQUIPMENT

SAFETY COMPANY

SAFETY, INTERNATIONAL	OFFICE: 432/580-3770 1-800-749-7233

EMERGENCY CALL LIST
PATTERSON UTI DRILLING
410 N. LORRAINE
MIDLAND, TX 79701
OFFICE (432) 682-9401

NAME	TITLE	PHONE NUMBERS
CHOYR GILBERT	OPERATIONS MANAGER	MOBIL: 432/894-2444 OFFICE: 432/682-9401

EMERGENCY CALL LIST

RESIDENTS WITHIN 3000 FEET RADIUS OF EXPOSURE FOR (WILDCAT) WELL

THERE ARE NO RESIDENTS IN THE RADIUS OF EXPOSURE

EMERGENCY PROCEDURES

RESPONSIBILITY

In the event of a release of potentially hazardous amounts of H_2S, all personnel will immediately proceed upwind to the nearest designated safe area and don their protective breathing equipment. The DAN A. HUGHES COMPANY, L.P. representative will immediately, upon assessing the situation, set this plan into action by taking the proper procedures to contain the gas and notify the appropriate people and agencies.

If the DAN A. HUGHES COMPANY, L.P. representative is incapacitated or not on Location, this responsibility will fall to the PATTERSON UTI DRILLING Toolpusher.

DAN A. HUGHES COMPANY, L.P.

1. In an emergency situation, the Drilling Foreman on duty will have complete responsibility and will take whatever action is deemed necessary in an emergency situation to insure the personnel's safety, to protect the well and to prevent property damage.

2. Advise the Superintendent when procedures as specified herein have been met, will inform of emergencies and deviation from the plan, and see that procedures are observed at all times.

3. Advise each contractor, service company, and all others entering the site that Hydrogen Sulfide may be encountered and the potential hazards that may exist.

4. Authorize the evacuation of local residents if Hydrogen Sulfide threatens their safety.

5. Keep the number of persons on location to a minimum during hazardous operations.

6. Assess the situation when alarm sounds, and issue work orders. When conditions warrant, order all personnel to "Safe Briefing Areas".

7. Direct corrective actions to control flow of gas.

8. Has full responsibility for the decision to ignite the well. The decision will be made only as a last resort.

PATTERSON UTI DRILLING

1. The Toolpusher will assume all responsibilities of the Drilling Foreman in an emergency situation in the event that the Drilling Foreman becomes incapacitated.

2. The Toolpusher will order the Driller to secure the rig, if time permits.

EMERGENCY PROCEDURES

DRILLING CREW ACTIONS

1. All personnel will don their protective breathing apparatus. The drilling crew will take necessary precaution as indicated in OPERATING PROCEDURES.

2. The "Buddy System" will be implemented. All personnel will act upon directions from the Operator's Representative.

3. If there are nonessential personnel on location, they will move off location.

4. Entrance to the location will be patrolled, and the proper well condition flag will be displayed at the entrance to the location.

IN THE EVENT OF AN ACCIDENTAL RELEASE OF POTENTIALLY HAZARDOUS VOLUME OF H_2S, THE FOLLOWING PROCEDURES WILL BE TAKEN:

1. All personnel on location will be accounted for and emergency search should begin for any missing.

2. All search missions will be conducted under fresh air masks in teams of two. Should the search team need to approach the well, safety harness and rope should be used.

3. All individual companies and agencies should be contacted according to the EMERGENCY CALL LIST.

4. An assigned crewmember will blockade the entrance to the location. No unauthorized personnel will be allowed entry into the location.

5. The Operator's Representative will remain on location and attempt to regain control of the well.

6. The Company's designated representatives will begin evacuation of those persons in immediate danger.

TEMPORARY SERVICE PERSONNEL

All service personnel, such as cementing crews, logging crews, specialists, mechanics and welders will furnish their own safety equipment as required to comply with OSHA and DAN A. HUGHES COMPANY, L.P.

VISITORS

Visitors and nonessential personnel will be prohibited from remaining in, or entering a contaminated area where Hydrogen Sulfide concentration in the atmosphere exceeds 15ppm.

EMERGENCY PROCEDURES

NOTE: WHEN HYDROGEN SULFIDE MIGHT BE ENCOUNTERED, NO PERSONNEL ON LOCATION WILL BE PERMITTED TO SLEEP IN VEHICLES.

INSTRUCTIONS FOR IGNITING THE WELL

THE DECISION TO IGNITE THE WELL IS THE RESPONSIBILITY OF THE **DAN A. HUGHES COMPANY, L.P. REPRESENTATIVE**. In the event he is incapacitated or unavailable, it becomes the responsibility of the **PATTERSON UTI DRILLING RIG SUPERINTENDENT.**

The decision to ignite the well should be made only as a last resort and in the situation where it is clear that:

1. Human life is in danger

2. There is no hope of controlling the well under current conditions.

The DAN A. HUGHES COMPANY, L.P. Corporate Office should be notified as soon as possible. The first phase of evacuation should be initiated immediately.

Once the decision has been made the following procedures should be followed:

1. Four (4) people, wearing self-contained breathing apparatus will be needed for the actual lighting of the well. They must first establish the flammable perimeter by using an explosimeter. This should be established at 30% to 40% of the lower flammable limits.

2. After the flammable perimeter has been established and everyone removed from the area, the ignition team should select a site upwind of the well, from which to ignite. This site should offer the maximum protection and have a clear path for retreat from the area.

3. The ignition team should have safety belts and lanyards attached and manned before attempting ignition. If the leak is not ignited on the first attempt, move in 20 to 30 feet and fire again. Continue to monitor with the explosimeter and never fire from an area with over 75% of the Lower explosive Limit (LL). If having trouble igniting the well, try firing 40 degrees to 90 degrees on either side of the well.

4. After ignition or attempted ignition, the toxic perimeter must be established and evacuation continued until the well is contained.

5. All personnel will act only as directed by the person in charge of the operations.

REMEMBER:

After the well is ignited, burning Hydrogen Sulfide (H_2S) will convert to Sulfur Dioxide (SO_2), which is also a highly toxic gas.

DO NOT ASSUME THE AREA IS SAFE AFTER THE WELL IS IGNITED

DRILLSITE LOCATION

1. The drilling rig should be situated on location such that the prevailing winds blow across the rig toward the reserve pit or at right angles to a line from the rig to the reserve pit.

2. The entrance to the location should be designed so that it can be barricaded if Hydrogen Sulfide emergency conditions arise. An auxiliary exit (or entrance) should be available in case of a catastrophe; a shift in wind direction would not preclude escape from the location. Appropriate warning signs and flags should be placed at all location entrances.

3. Once H_2S safety procedures are established on location, no beards or facial hair which will interfere with face seal or mask will be allowed on location.

4. A minimum of two BRIEFING AREAS will be established, not less than 250 feet from the wellhead and in such location that at least one area will be up-wind from the well at all times. Upon recognition of an emergency situation, all personnel should assemble at the designated briefing areas for instructions.

5. A safety equipment trailer will be stationed at one of the briefing areas.

6. Windsocks will be installed and wind streamers (6 to 8 feet above ground level) placed at the location entrance. Windsocks shall be illuminated for nighttime operations. Personnel should develop wind direction consciousness.

7. The mud-logging trailer will be located so as to minimize the danger from gas that breaks out of the drilling fluid.

8. Shale shaker mud tanks will be located so as to minimize the danger from gas that breaks out of the drilling fluid.

9. Electric power plant(s) will be located as far from the well bore as practical so that it may be used under conditions where it otherwise would have to be shut down.

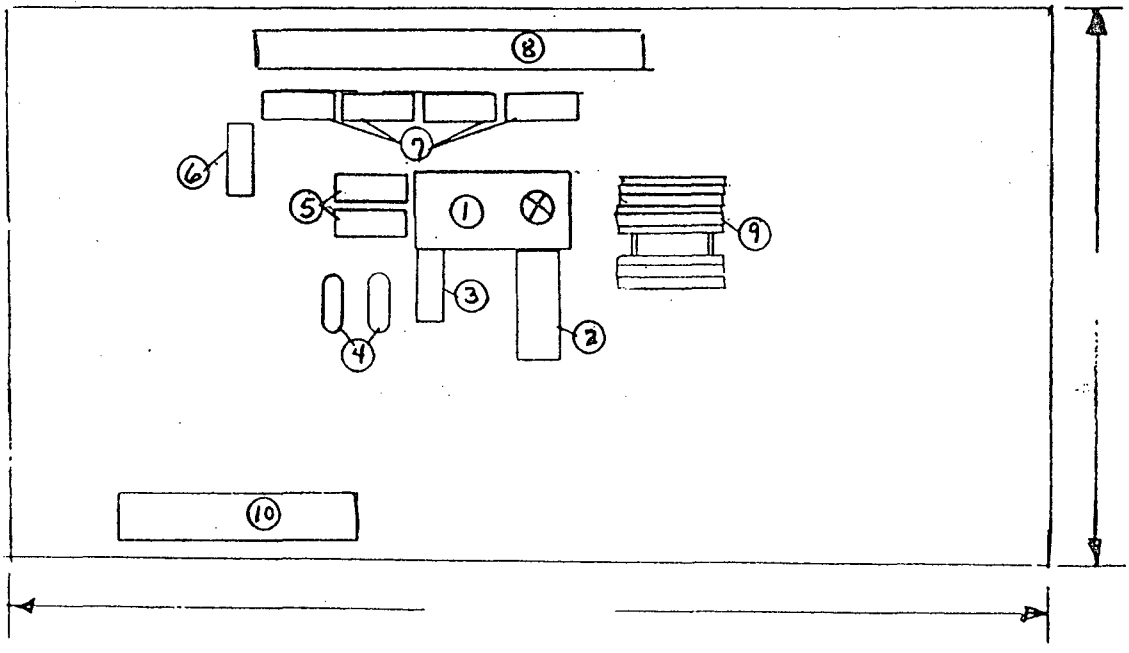
10. When approaching depth where Hydrogen Sulfide may be encountered, appropriate warning signs will be posted on all access roads to the location and at the foot of all stairways to the derrick floor.

11. Appropriate smoking areas will be designated and smoking will be prohibited elsewhere.

COMPANY _____

RIG - _____

LEASE _____



①	FLOOR
②	DOG HOUSE
③	BOTTOM DOGHOUSE
④	WATER TANKS
⑤	PUMPS
⑥	MUD HOUSE
⑦	MUD PITS
⑧	RESERVE PIT
⑨	PIPE RACK
⑩	PUSHERS TRAILER

EQUIPMENT TO BE PROVIDED BY SAFETY INTERNATIONAL

SAFETY TRAILER PACKAGE # 2

1.) One (1) Safety Trailer Containing a 6-Bottle Breathing Air Cascade System.

2.) 750 Feet of Air Line Hose

3.) Four (4) Breathing Air Manifolds

4.) Four (4) 30-Minute Rescue Units

5.) Five (5) Work/Escape Units

6.) Five (5) Escape Capsules

7.) One (1) Filler Hose for the Work/Escape and Rescue Units

8.) One (1) Location Sign with Flags

9.) Two (2) Briefing Area Signs

10.) Two (2) Windsocks

11.) One (1) Electronic Monitor with Three (3) Sensor Heads, Warning Light and Siren

BLOWOUT PREVENTION EQUIPMENT

1. A kill line of ample strength and length will be laid to a safe point to allow pumping into the well in an emergency situation.

2. The closing unit should be located a safe distance from the well bore and positioned for maximum utilization based on the prevailing wind direction.

3. BOP equipment will be tested in accordance with standard company practice.

SPECIAL EQUIPMENT

1. Flare lines should be as long as practical, securely staked.

2. An electronic Hydrogen Sulfide monitor will be installed with a combination visual and audible alarm system located where it can be seen and/or heard throughout the drilling location.

3. The electronic Hydrogen Sulfide monitoring system will be calibrated to actuate the low alarm (visual alarm) at a concentration of 10 ppm Hydrogen Sulfide in the atmosphere and the high alarm at a concentration of 15 ppm Hydrogen Sulfide in the atmosphere.

4. Extra equipment will be available if required to provide adequate respiratory protection for all personnel on location.

DRILL STEM TEST

1. All drill stem tests of Hydrogen Sulfide zones will be approved by the NMOCD.

2. Drill stem testing of Hydrogen Sulfide zones will be permitted only during daylight hours.

3. All nonessential personnel will be moved to "Safe Briefing Area".

4. Put on air mask before formation fluids are expected at the surface and continue "MASKS ON" until flares are lighted and work areas test no more than 10 ppm Hydrogen Sulfide and the area has been declared safe.

TRAINING

Every person working in any capacity on the lease will be required to review the emergency procedures and will participate in the training program.

DAN A. HUGHES COMPANY, L.P. will provide personnel to direct the training program and in doctrinate all authorized persons on the lease in the proper use of the safety equipment.

The training personnel will work individually with each member until they are satisfied that the crew member is familiar with the emergency procedures and the training program. This should be accomplished prior to an individual's work operation.

Training will include hands-on use of all equipment in order to familiarize the trainees with the safety equipment.

SAFETY TRAINING

1. Hydrogen Sulfide Safety Training will be provided to all personnel at 1,000 feet above the expected H_2S formation. The training sessions will cover, but will not be limited to the following

   a. General information on H_2S and SO_2 gas

   b. Hazards of H_2S and SO_2 gas

   c. Safety equipment on location

   d. Proper use and care of personal protective equipment

   e. Operational procedures in dealing with H_2S gas

   f. Evacuation procedures

   g. Chemicals to be used in mud to control H_2S

   h. First aid, reviving an H_2S victim, toxicity, etc.

   I. Designated safe briefing areas (S.B.A.)

   j. Metallurgical considerations

   NOTE: Once H_2S Safety Procedures are established on location, no beards or facial hair which will interfere with face seal or mask will be allowed on location.

2. When H_2S alarm is activated:

   a. Mask up

   b. Raise tool joints above the rotary table and shut down pump

   c. Close in hydril

   d. Go to Safe Briefing Area

SAFETY INTERNATIONAL FIELD SUPERVISOR QUALIFICATIONS

Safety International, Inc. is proud of the training and qualifications of our staff of field personnel. We know that our customers are provided with the best service available in the H_2S safety business. We also know that we have by far, the most rigid requirements for basic qualifications, and the most extensive training program of any H_2S company.

Safety International, Inc. personnel will be qualified in Basic H_2S Safety Training, which includes the maintenance of equipment, training of personnel, and general oil field safety. Specifically, all are trained in Basic First Aid and Cardiopulmonary Resuscitation (CPR).

Safety International, Inc. will provide all needed materials for training of personnel on location as required.

MAIN OFFICE

2348 East I-20
South Service Road
Odessa, TX 79766
OFFICE: (432) 580-3770
FAX: (432) 332-9223

FIELD OFFICE

2412 East I-20
South Service Road
Odessa, TX 79766

EMERGENCY CONDITIONS

Operating Conditions

A. Emergency Procedures and Definition of Warning Flags

1. Condition: YELLOW -- NORMAL OPERATION

2. Condition: ORANGE -- POTENTIAL DANGER, CAUTION

a. **Cause for condition**:

* Circulating up drilling breaks
* Trip gas after trip
* Circulating out gas on choke
* Poisonous gas present, but below threshold concentrations

b. **Safety actions**:

* Check safety equipment and keep it with you
* Be alert for a change in conditions
* Follow instructions

3. **Condition**: RED -- EXTREME DANGER

a. **Cause for condition**:

* Uncontrolled flow from the well with lethal concentrations of H_2S

b. **Safety actions**:

* Masks On. All personnel will have protective breathing equipment with them. All personnel will stay in safe briefing area unless instructed to do otherwise.

* The decision to ignite the well is the responsibility of the company representative and should be made only as a last resort, when it is clear that:

I. Human life is endangered
ii There is no hope of controlling the well under prevailing conditions

* Order evacuation of local people within the danger zone.

THE USE OF SELF CONTAINED BREATHING EQUIPMENT

1. Respirators shall be inspected frequently at random, to insure that they are properly used, cleaned and maintained

2. Anyone who may use the respirators shall be trained in how to insure proper face piece to face seal. They shall wear respirators in normal air and then wear it in a test atmosphere. (Note: such items, as facial hair - beard or sideburns - and eyeglass temple pieces will not allow a proper seal). Anyone who may be reasonably expected to wear respirators should have these items removed before entering a toxic atmosphere. A special mask must be obtained for anyone who must wear eyeglasses. Contact lenses should not be allowed.

3. Maintenance and care of respirators:

   A. A program for maintenance and care of respirators shall include the following:

      * Inspection for defects, including leak checks

      * Cleaning and disinfecting

      * Repair

      * Storage

   B. Inspection: Self contained breathing apparatus for emergency use shall be inspected monthly for the following and a permanent record kept of these inspections.

      * Fully charged cylinders

      * Regulator and warning devise operation

      * Condition of face piece and connections

      * Elastic or rubber parts shall be stretched or massaged to keep them pliable and prevent deterioration.

   C. Routinely used respirators shall be collected, cleaned and disinfected as frequently as necessary to insure proper protection is provided.

4. A person assigned a task that requires use of self contained breathing equipment, should be certified, physically fit for breathing equipment usage by the local physician at least annually.

5. Respirators should be worn:

   A. When breaking out any line where H_2S can reasonably be expected.

   B. When sampling air in areas to determine if toxic concentrations of H_2S exist.

   C. When working in areas where over 15 ppm H_2S has been detected.

   D. At any time there is a doubt as to the H_2S concentration in the zone to be entered.

PHYSICAL EFFECTS OF HYDROGEN SULFIDE POISONING

THE PRINCIPAL HAZARD IS DEATH BY INHALATION

When the amount of gas absorbed into the bloodstream exceeds that which is readily oxidized, systemic poisoning results, with a general action on the nervous system. Labored respiration occurs shortly and respiratory paralysis may follow immediately at concentrations of 700 ppm and above. This condition may be reached almost without warning as the originally detected odor of H_2S may have disappeared due to olfactory paralysis. Death then occurs from asphyxiation unless the exposed person is removed immediately to fresh air and breathing is stimulated by artificial respiration. Other levels of exposure may cause the following symptoms individually or in combination:

1. Headache
2. Dizziness
3. Excitement
4. Nausea or gastro-intestinal disturbances
5. Dryness and sensation of pain in nose, throat, and chest
6. Coughing
7. Drowsiness

All personnel should be alerted to the fact that detection of H_2S solely by sense of smell is highly dangerous, as the sense of smell is rapidly paralyzed by the gas. 10 ppm of H_2S detected should be treated as if it were 700 ppm.

TREATMENT OF HYDROGEN SULFIDE POISONING

INHALATION

As Hydrogen Sulfide in the blood oxidizes rapidly, symptoms of acute poisoning pass off when inhalation of the gas ceases. It is important, therefore, to get the victim of poisoning to fresh air as quickly as possible. He should be kept at rest and chilling should be prevented. If respiration is slow, labored or impaired, artificial respiration may be necessary.

Most persons overcome by Hydrogen Sulfide may be revived if artificial respiration is applied before heart action ceases. Victims of poisoning should be under the care of a physician as soon as possible. Irritation due to subacute poisoning may lead to serious complications such as pneumonia. Under those conditions, treatment by the physician necessarily would be symptomatic. The patient should be kept in fresh air.

CONTACT WITH EYES

Eye contact with liquid and/or gas containing Hydrogen Sulfide will cause painful irritation (conjunctivitis). Keep patient in a darkened room, apply ice compresses to eyes, put ice on forehead, and send for a physician. The irritation caused by exposure to Hydrogen Sulfide requires treatment by a physician, preferably an eye specialist. The prognosis for recovery in these cases is usually good.

CONTACT WITH SKIN

Skin absorption is very low. Skin discoloration is possible after contact with liquids containing Hydrogen Sulfide. If such skin contact is suspected, the area should be thoroughly washed.

CHARACTERISTICS OF HYDROGEN SULFIDE

1. Extremely toxic (Poisonous)
2. Heavier than air and colorless
3. Has the odor of rotten eggs, in small amounts
4. Burns with a blue flame and produces Sulphur Dioxide (SO_2) Gas, which is very irritating to eyes and lungs. The SO_2 is as toxic as H_2S, but the severe discomfort at low concentrations acts as a barrier to human exposure to toxic levels of this gas.
5. H_2S forms explosive mixture with air between 4.3% and 46% by volume
6. H_2S is soluble in water but becomes less soluble as the water temperature increases.
7. The toxicity of Hydrogen Sulfide is second only to Hydrogen Cyanide and is between 5 and 6 times more toxic than Carbon Monoxide.
8. Produces irritation to eyes, throat and respiratory tract.

EFFECTS OF HYDROGEN SULFIDE ON METAL

Hydrogen Sulfide dissolves in water to form a weak acid that can cause some pitting, particularly in the presence of Oxygen and/or Carbon Dioxide. However, the most significant action of H_2S is its contribution to a form of Hydrogen embrittlement known as Sulfide Stress Cracking. Sulfide Stress Cracking is a result of metals being subjected to high stress levels in a corrosive environment where H_2S is present. The metal will often fail in a brittle manner. Sulfide stress cracking of steel is dependent upon and determined by:

1. Strength (hardness) of the steel-the higher the strength, the greater the susceptibility to sulfide stress cracking. Steels having yield strengths up to 95,000 psi and hardness up to Rc22 are generally resistant to sulfide stress cracking. These limitations can be extended slightly higher for properly quenched and tempered materials.

2. Total member stress (load) - higher the stress level (load) the greater the susceptibility to sulfide stress cracking.

3. Corrosive environment - corrosive reactions, acids, bacterial action, thermal degradation of low Ph fluid environment.

Toxicity

Common Name	Chemical Formula	Specific Gravity(SG) Air=1	Threshold [1] Limit	Hazard [2] Limit	Lethal [3] Concentration
Hydrogen Cyanide	**HCN**	0.94	10 ppm	150 ppm/hr	300 ppm
Hydrogen Sulfide	**H_2S**	**1.18**	**10 ppm[4] 15 ppm[5]**	250 ppm/hr	**600 ppm**
Sulfur Dioxide	**SO_2**	2.21	2 ppm	----------	1,000 ppm
Chlorine	**Cl_2**	2.45	1 ppm	4 ppm/hr	1,000 ppm
Carbon Monoxide	**CO**	0.97	50 ppm	400 ppm/hr	1,000 ppm
Carbon Dioxide	**CO_2**	1.52	5,000 ppm	5%	10 %
Methane	**CH_4**	0.55	90,000 ppm	Combustible Above 5% in Air	----------

[1]**Threshold Limit** – Concentration at which it is believed that all workers may be repeatedly exposed day after day without adverse effects.
[2]**Hazardous Limit** – Concentration that may cause death.
[3]**Lethal Concentration** – Concentration that will cause death with short-term exposure.
[4]**Threshold Limit = 10 ppm** – 1972 ACGIH (American Conference of Governmental Industrial Hygienist).
[5]**Threshold Limit = 15 ppm** – 1989 ANSI acceptable Ceiling concentration for eight-hour exposure (based on 40-hour work week) *is 15 ppm. OSHA Rules and regulations (Federal Register, Volume 54, No. 12, dated* January 19,1989)

PROCEDURAL CHECK LIST

PERFORM EACH TOUR BY THE DRILLING CONTRACTOR PERSONNEL

1. Check fire extinguishers to see that they have the proper charge.

2. Check pressure on breathing air cascade system to make sure they are charged to full volume.

3. Check pump pressure on stand pipe gauge and choke manifold gauge to assure proper communication between gauges and also comparison of pressure reading on each gauge.

4. Make a visual check of H_2S monitoring system.

PERFORM EACH WEEK BY DRILLING CONTRACTOR PERSONNEL:

1. Blowout preventer drills

2. Check nitrogen supply pressure on BOP accumulator standby

PERFORM EACH WEEK BY SAFETY INTERNATIONAL PERSONNEL OR DAILY ON SUPERVISION

1. 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 get air.

2. Check butane supply for burn pit for volume and to make sure 1" line is not plugged. Check automatic ignition system.

3. Check all SKA pac units for operation; demand regulator, escape bottle air volume, supply bottle air volume.

4. Check breathing equipment mask assembly to see that straps are loosened and turned back ready to put on.

5. Check pressure on breathing equipment air bottles to make sure they are charged to full volume.

6. Confirm pressure on all supply air bottles

7. Perform breathing equipment drills with onsite personnel.

FOR CONTRACTORS USE ONLY

SURFACE KILL SHEET
PRERECORDED INFORMATION

DATE _____ TIME_____ MUD WEIGHT _____

CASING: SIZE _____ O.D._____ I.D. WEIGHT_____ PPF GRADE_____

SHOE TVD _____ 80% BURST _____

DRILL PIPE: SIZE _____ O.D._____ I.D. WEIGHT _____ PPR GRADE___

CAPACITY _____ BBL/FT

HOLE: SIZE _____

PUMPS: #1 _____ PSI @_____ STKS/MIN _____ BBL/SKT

#2 _____ PSI @ _____ STKS/MIN _____ BBLS/STK

DEPTH; TD _____ TVD_____

MEASURED @ SHUT IN

SHUT IN DRILL PIPE PRESSURE (SIDPP).....____P

SHUT IN CASING PRESSURE.....____P

PIT GAIN.....____B

KILL MUD WEIGHT (KMW)

20 X SIDPP (_____) TVD (_____) + ORIGINAL MUD WEIGHT (OMW) (_____)

= _____ P

INITIAL CIRCULATING PRESSURE (ICP)

KILL RATE PRESSURE (_____) + SIDPP (_____) =_____PSI

FINAL CIRCULATING PRESSURE (FCP)

KRP (_____) X KMW (_____) DMW (_____) =_____PSI

FOR CONTRACTORS USE ONLY

SURFACE TO BIT STROKES (SBS)

DRILL PIPE CAPACITY (BBL/FT) (_____) X TD (_____) BBL/STK (_____)

= _____STKS STKS (_____) SPM (_____) = _____ MIN.

PRESSURE AND DROP CHART (WAIT & WEIGHT)

ICP (_____) - FCP (_____) = _____PSI PRESSURE DROP (PD)

PD (_____) 5 = _____UNITS PRESSURE DROP

SBS (_____) 5 = _____UNITS STKS/PRESSURE DROP

SUBTRACT UNITS PRESSURE DROP FOR EACH LINE

ADD STKS/PRESSURE DROP FOR EACH LINE

CIRCULATING PUMP PRESSURE	@	ACCUMULATED STROKES
(ICP)_____	@	_____STKS
_____	@	_____STKS
_____	@	_____STKS
_____	@	_____STKS
_____	@	_____STKS
(FCP)_____	@ (SBS)	_____STKS

FOR CONTRACTORS USE ONLY

SURFACE KILL SHEET
PRERECORDED INFORMATION

DATE _____ TIME_____ MUD WEIGHT _____

CASING: SIZE _____ O.D._____ I.D. WEIGHT_____ PPF GRADE_____

SHOE TVD _____ 80% BURST _____

DRILL PIPE: SIZE _____ O.D._____ I.D. WEIGHT _____ PPR GRADE___

CAPACITY _____ BBL/FT

HOLE: SIZE _____

PUMPS: #1 _____ PSI @_____ STKS/MIN _____ BBL/SKT

#2 _____ PSI @ _____ STKS/MIN _____ BBLS/STK

DEPTH; TD _____ TVD_____

MEASURED @ SHUT IN

SHUT IN DRILL PIPE PRESSURE (SIDPP)....._____P

SHUT IN CASING PRESSURE....._____P

PIT GAIN....._____B

KILL MUD WEIGHT (KMW)

20 X SIDPP (_____) TVD (_____) + ORIGINAL MUD WEIGHT (OMW) (_____)

= _____ P

INITIAL CIRCULATING PRESSURE (ICP)

KILL RATE PRESSURE (_____) + SIDPP (_____) =_____PSI

FINAL CIRCULATING PRESSURE (FCP)

KRP (_____) X KMW (_____) DMW (_____) =_____PSI

FOR CONTRACTORS USE ONLY

SURFACE TO BIT STROKES (SBS)

DRILL PIPE CAPACITY (BBL/FT) (_____) X TD (_____) BBL/STK (_____)

= _____STKS STKS (_____) SPM (_____) = _____ MIN.

PRESSURE AND DROP CHART (WAIT & WEIGHT)

ICP (_____) - FCP (_____) = _____PSI PRESSURE DROP (PD)

PD (_____) 5 = _____UNITS PRESSURE DROP

SBS (_____) 5 = _____UNITS STKS/PRESSURE DROP

SUBTRACT UNITS PRESSURE DROP FOR EACH LINE

ADD STKS/PRESSURE DROP FOR EACH LINE

CIRCULATING PUMP PRESSURE	@	ACCUMULATED STROKES
(ICP)_____	@	_____STKS
_____	@	_____STKS
_____	@	_____STKS
_____	@	_____STKS
_____	@	_____STKS
(FCP)_____	@ (SBS)	_____STKS