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H2S CONTINGENCY PLAN

REVIEW

Anadarko
Petroleum Corporation

H_2S CONTINGENCY PLAN
(Amendment Related to Acid Gas Injection Well)

San Juan River Gas Plant
Kirtland, New Mexico

WESTERN GAS RESOURCES ASSET HOLDING COMPANY, LLC, a wholly owned subsidiary of Anadarko Petroleum Corporation

(October 2009)

10/7/2009

Preface

This amendment addresses the H_2S Contingency Plan to be implemented with the installation of an acid gas injection well and associated equipment at the San Juan River Gas Plant. In that this Plan addresses *proposed* conditions, it should be noted that the Plan and associated appendices will be updated and a revised Plan duly distributed to reflect the *actual* installation of the well, associated injection facilities and additional monitoring where and if applicable.

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I. INTRODUCTION

The San Juan River Gas Plant (hereinafter the "Plant") is a natural gas processing plant which handles and/or generates hydrogen sulfide and/or sulfur dioxide; therefore this Hydrogen Sulfide Contingency Plan (the "H_2S Plan" or "the Plan") has been developed: 1) to satisfy the New Mexico Oil Conservation Division Rule 11, 2) to conform with API "Recommended Practices for Oil and Gas Producing and Gas Processing Plant Operations Involving Hydrogen Sulfide," RP 55, and 3) to create a site-specific hydrogen sulfide contingency plan that outlines the emergency response procedures that will be implemented to ensure a coordinated, efficient and immediate action Plan for alerting and protecting operating personnel and the public as well as to prevent or minimize environmental hazards and damage to property. The terms used in this Plan are to be used in the same manner as defined in Title 19 Chapter 15 Part II of the New Mexico Administrative code (19.15.11.7- Definitions) unless otherwise defined herein.

A. PLANT DESCRIPTION & MAP (Figure 1)

The Plant is located in Kirtland, San Juan County, New Mexico and encompasses 300+ acres. It is owned and operated by Western Gas Resources Asset Holding Company LLC, which is a wholly owned subsidiary of Anadarko Petroleum Corporation (hereinafter collectively referred to as the Company).

More specifically, the Plant is located in Section 1, Township 29N, Range 15 W in Kirtland, San Juan County, New Mexico.

1. Its coordinates are:
   Latitude: 36.453 N **Longitude: 108.220 W**

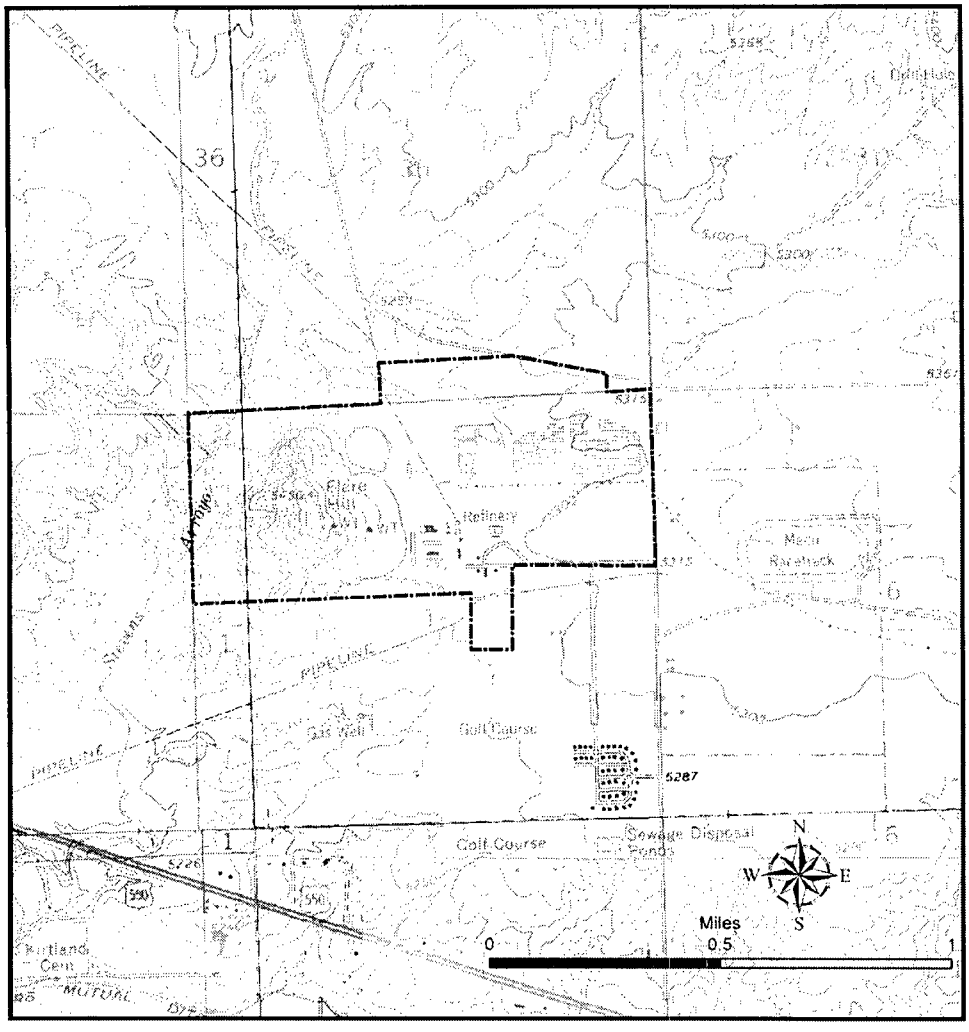
2. Its physical address is:
   99 County Road 6500, Kirtland, New Mexico 87417

3. Its mailing address is:
   P. O. Box 70, Kirtland, New Mexico 87417

4. Driving Directions from Farmington, New Mexico to the Plant:

   From the intersection of US Highway 64 and the La Plata Highway (New Mexico Highway 170), travel west on US Highway 64 approximately 6.2 miles to the intersection of US Hwy 64 and County Road 6500 in Kirtland, New Mexico. Turn right on County Road 6500 and travel north approximately 1.7 mile to the entrance to the San Juan River Gas Plant.

The location of the Plant is illustrated herein on Figure 1.



Approximate Boundaries of Western Gas Resources Property
Anadarko San Juan River Natural Gas Processing Plant

Figure 1 Anadarko San Juan River Plant Location

B. DESCRIPTION OF OPERATIONS

1. The Plant operations include gas processing, conditioning and compression, as well as flow lines and storage tanks. The Plant gathers produced natural gas from San Juan County, New Mexico, as well as, from Southwestern Colorado, Northeastern Arizona, and Southeastern Utah. Once gathered at the Plant, the produced natural gas is compressed; treated in an amine process for the removal of carbon dioxide and hydrogen sulfide; and dehydrated to remove the water content. The processed natural gas is then sold and shipped to various customers.

2. Because the natural gas that is gathered at the Plant contains hydrogen sulfide ("sour gas"), it must be treated or processed to remove these and other impurities. The carbon dioxide and hydrogen sulfide (H_2S) stream that is removed from the natural gas in the amine treating process is then sent to the Claus sulfur recovery unit whereby sulfur is removed, which results in the generation of molten elemental sulfur. Any residual H_2S is routed to an incinerator where it is combusted into sulfur dioxide.

3. The Plant anticipates the need to process a higher volume of natural gas due to the development of additional natural gas resources in the area. This increased processing capacity will necessitate an expansion of the Plant. The Plant predicts an increase in inlet volume to 50 MMCFD with about 6000 ppm H_2S content. The Plant has proposed the installation of an acid gas injection (AGI) well to accommodate disposal of the acid gas stream generated by existing and expanded operations. The expanded operation is expected to generate approximately 3.80 MMCFD of acid gas for disposal. The existing sulfur reduction unit (SRU) currently being used to treat the acid gas will be replaced by the AGI well following approval of the AGI well permit by NMOCD and successful completion of the AGI well.

II. THE PLAN

A. RESPONSIBILITY FOR CONFORMANCE WITH THE H_2S PLAN

It is the responsibility of all personnel on-site to follow the safety and emergency procedures outlined in the Hydrogen Sulfide Contingency Plan (the H_2S Plan) as well as the following documents:

- Anadarko Petroleum Corporation Safety & Health Manual
- Anadarko Petroleum Corporation Emergency Response & Oil Spill Contingency Plan; and
- Anadarko Petroleum Corporation Environmental Policies and Programs.

B. REVISIONS TO THE PLAN

The H_2S Plan will be reviewed annually and revised at this time as necessary to address changes to the Plant facilities, operations, or training requirements, contact information

and the public areas including roads, businesses, or residents potentially affected by the operations of the Plant, specifically those areas within the radii-of-exposure.

C. AVAILABILITY OF THE H_2S PLAN

The H_2S Plan shall be available to all personnel responsible for implementation, regardless of their normal location assignment. A copy of the Plan will be maintained at the Plant in the Plant Superintendent's office and at the Anadarko Corporate Headquarters in The Woodlands, Texas. **See Appendix H for the H_2S Distribution List,** which lists all the additional entities that have been provided a copy of the H_2S Plan.

D. CONTENT OF THE PLAN

At a minimum, the H_2S Plan will contain information regarding: 1) the emergency procedures to be followed in the event of an H_2S or SO_2 release that may pose a threat to the Plant, public or public areas, 2) the characteristics of H_2S and SO_2, 3) a facility description, map and/or drawings, and 4) information regarding training and drills to be conducted related to this Plan.

III. PLAN DESIGN CONSIDERATIONS

A. CHARACTERISTICS OF H_2S, SO_2 AND CARBON DIOXIDE

1. Hydrogen Sulfide (H_2S)

The proposed inlet gas streams into the Plant will contain approximately 6,000 ppm (or 0.60 mole percent) of hydrogen sulfide based on data generated from the sampling of the inlet gas at least three times daily.

Hydrogen sulfide is a colorless, toxic and flammable gas, and has the odor of rotten eggs. Hydrogen sulfide gas is heavier than air.

Hydrogen sulfide presents a significant health hazard by paralyzing the respiratory system resulting in serious injury or death.

Hydrogen Sulfide Properties & Characteristics	
CAS No.	7783-06-4
Molecular Formula	H_2S
Molecular Weight	34.082
TWA	10 ppm
STEL	15 ppm
IDLH	100 ppm
Specific Gravity (air = 1.0)	1.189
Boiling Point	-76.5°F

Freezing Point	-121.8°F
Vapor Pressure	396 psia
Autoignition Temperature	518°F
Lower Flammability Limit	4.3%
Upper Flammability Limit	46.0%
Stability	Stable
pH in water	3
Corrosivity	Reacts with metals, plastics, tissues & nerves

Physical Effects of Hydrogen Sulfide		
Concentration		
ppm	**%**	**Physical Effect**
1	.00010	Can be smelled (rotten egg odor)
10	0.0010	Obvious & unpleasant odor; Permissible Exposure Limit; Safe for 8-hour exposure
15	0.0015	Short Term Exposure Limit (STEL); Safe for 15 minutes of exposure without respirator
50	0.0050	Loss of sense of smell in 15 minutes
100	0.0100	Immediately Dangerous to Life & Health (IDLH); Loss of sense of smell in 3-15 minutes; Stinging in eyes & throat; Altered breathing
200	0.0200	Kills smell rapidly; Stinging in eyes & throat
500	0.0500	Dizziness; Unconscious after short exposure; Need artificial respiration
700	0.0700	Unconscious quickly; death will result if not rescued promptly
1,000	0.1000	Instant unconsciousness; followed by death within minutes

2. Sulfur Dioxide ($S0_2$)

Sulfur dioxide is produced as a by-product of H_2S combustion at the incinerator. The incinerator unit receives the residual hydrogen sulfide and carbon dioxide stream that is routed from the amine unit.

It is colorless, transparent, and is non-flammable, with a pungent odor associated with burning sulfur.

Sulfur dioxide is heavier than air, but will be picked up by a breeze and carried downwind at elevated temperatures. Sulfur dioxide can be extremely irritating to the eyes and mucous membranes of the upper respiratory tract.

Sulfur Dioxide Properties & Characteristics	
CAS No.	7446-09-5
Molecular Formula	SO_2
Molecular Weight	64.07
TWA	2 ppm
STEL	5 ppm
IDLH	100 ppm
Specific Gravity (air = 1.0)	2.26
Boiling Point	14°F
Freezing Point	-103.9°F
Vapor Pressure	49.1 psia
Autoignition Temperature	N/A
Lower Flammability Limit	N/A
Upper Flammability Limit	N/A
Stability	Stable
Corrosivity	Could form an acid rain in aqueous solutions

Physical Effects of Sulfur Dioxide	
Concentration	**Effect**
1 ppm	Pungent odor, may cause respiratory changes
2 ppm	Permissible exposure limit; Safe for an 8 hour exposure
3-5 ppm	Pungent odor; normally a person can detect sulfur dioxide in this range
5 ppm	Short Term Exposure Limit (STEL); Safe for 15 minutes of exposure
12 ppm	Throat irritation, coughing, chest constriction, eyes tear and burn
100 ppm	Immediately Dangerous To Life & Health (IDLH)
150 ppm	So irritating that it can only be endured for a few minutes
500 ppm	Causes a sense of suffocation, even with first breath
1,000 ppm	Death may result unless rescued promptly.

3. Carbon Dioxide

The proposed inlet gas streams to the Plant will contain approximately 7% carbon dioxide based on the anticipated additional gas to the Plant which will be confirmed with inlet gas monitoring readings. Carbon dioxide gas is colorless, odorless, and non-flammable. Carbon dioxide is heavier than air.

Carbon Dioxide Properties & Characteristics	
CAS No.	124-38-9
Molecular Formula	CO_2
Molecular Weight	44.010
TWA	5,000 ppm
STEL	30,000 ppm
IDLH	40,000 ppm
Specific Gravity (air = 1.0)	1.5197
Boiling Point	-109.12°F
Freezing Point	-69.81°F
Vapor Pressure	830 psia
Autoignition Temperature	N/A
Lower Flammability Limit	N/A
Upper Flammability Limit	N/A
Stability	Stable
pH in saturated solution	3.7
Corrosivity	dry gas is relatively inert & not corrosive; can be corrosive to mild steels in aqueous solutions

Physical Effects of Carbon Dioxide	
Concentration	**Effect**
1.0 %	Breathing rate increases slightly
2.0 %	Breathing rate increases to 50% above normal level. Prolonged exposure can cause headache, tiredness
3.0 %	Breathing rate increases to twice normal rate and becomes labored. Weak narcotic effect. Impaired hearing, headache, increased blood pressure and pulse rate
4 – 5 %	Breathing increases to approximately four times normal rate, symptoms of intoxication become evident, and slight choking may be felt
5 – 10 %	Characteristic sharp odor noticeable. Very labored breathing, headache, visual impairment, and ringing in the ears. Judgment may be impaired, followed within minutes by loss of consciousness
10 – 100 %	Unconsciousness occurs more rapidly above 10% level. Prolonged exposure to high concentrations may eventually result in death from asphyxiation

B. RADII OF EXPOSURE (ROE)

For the existing operations, the "Radius of Exposure" for both 500-ppm and 100-ppm of H_2S gas was determined using the "escape rate", which is calculated using the maximum daily rate of the gaseous mixture that is handled by the Plant. The rates and other variables used to calculate the ROE is discussed in greater detail in **Appendix B - ROE**

500-ppm ROE	**1634 feet**
100-ppm ROE	**3576 feet**

IV. EMERGENCY ACTION PROCEDURES

A. EMERGENCY RESPONSE ORGANIZATION

The Plant uses the Incident Command System (ICS) for emergency response. The ICS structure used is based on the National Interagency Incident Management System (NIIMS), and is consistent with the National Contingency Plan (NCP).

In the event of an accidental release that results in the activation of the H_2S Plan and all personnel have been evacuated out of the affected area, the Plant Superintendent, or his designee, will be the On-Scene Incident Commander (IC in this Plan). The IC will contact and coordinate with Anadarko's management in corporate office. If the severity of the response requires activation of the Emergency Response Center in The Woodlands, Texas office, the ICS structure will be staffed per the Anadarko Southern Region Emergency Response & Oil Spill Contingency Plan Manual. The staffing will not change the H_2S Plan contained herein.

1) Plant Shutdowns
2) Isolation of pipeline segments
3) Repairs, tests or restarts as required

If an emergency occurs, the Plant Superintendent, or his designee, shall be notified first. The Plant Superintendent, or his designee, shall notify Anadarko's Office in The Woodlands, Texas

B. EMERGENCY RESPONSE

This section explains the procedures and decision to be used in the event of an H_2S release; much of which has been pre-determined to ensure a coordinated, efficient and

immediate action Plan for alerting and protecting operating personnel and the public as well as to prevent or minimize environmental hazards and damage to property.

1. OBJECTIVE

All Plant employees shall be prepared to respond to an H_2S or SO_2 emergency at the Plant. Emergency response actions may be taken for a variety of situations that may occur in the Plant. The Plan is activated in progressive levels based on the concentration of H_2S that has been released. The Plant has three (3) activation levels that are described below and in detail in the Response Flow diagram in **Appendix F**.

Level 1 – Intermittent alarm sounded and/or flashing red beacons activated for H_2S greater than 10 ppm

Level 2 – Continuous alarm sounded and/or flashing red beacons activated for H_2S greater than 20 ppm

Level 3 – Catastrophic release; fire; explosion; a continuous release of maximum volume for 24 hours; or Rule 11 Mandatory Activation for 100 ppm in any defined public area; 500 ppm at any public road; or 100 ppm at a distance greater than 3000 feet from the site or the release. Because the 100 ppm ROE boundary is greater than 3000 ft from the site of release, a Level 3 response would occur before the escape of the 24 hour release volume.

As soon as the Plan has been activated based on the criteria above, the Plant Superintendent, or his designee, should be notified.

2. PLANT EVACUATION AND EMERGENCY ASSEMBLY AREAS

A. Plant evacuation for all visitors and Plant personnel that are not operators begins at the 10 ppm H_2S intermittent alarm and/or flashing red beacon. The Plant operators are to put on the 30-min SCBA and first determine if any personnel are in distress and assist any distressed personnel in evacuating to Emergency Assembly Area 1. Emergency services (911) will be contacted if there are injuries or as otherwise deemed necessary. BHP Mines and Praxair and the unmanned facilities within the 500 ppm radius of exposure (**Appendices C and G)** are also to be notified. The operators will then, wearing the SCBA, investigate the cause of the release. At the sound of the alarm and/or flashing red beacons, all other personnel in the Plant are to stop work, check the prevailing wind direction and immediately proceed along designated evacuation routes and/or upwind to the pre-designated Emergency Assembly Area(s) that are described in **Appendix F**.

Prevailing winds for the area are from the east and evacuation along the designated routes should be upwind. If the designated evacuation route is

downwind of the release (based on the windsock), then all evacuees should proceed upwind to the Emergency Assembly Areas

The Plant evacuation diagram showing evacuation routes and Emergency Assembly Areas is attached in **Appendix D.**

The Emergency Assembly Area 1 is:

Parking Area on the eastside of the Plant Superintendent Office Building (see Appendix C & D)

The Emergency Assembly Area 2 is:

Area at Plant Rd and Hwy 6500 (see Appendix C)

The Emergency Assembly Area 3 is:

Kirtland Elementary School Parking Lot , 30 Road 6446 (see Appendix C)

B. Roll call shall be conducted at the Emergency Assembly Area to assure all personnel have evacuated safely. This facility is a PSM facility and requires all visitors check in before entering the Plant, thus the check-in sheet will be used at the Emergency Assembly Areas to make a full accounting of all personnel and visitors.

3. IMMEDIATE ACTION PLAN/ INITIAL RESPONSE

The following outlines the immediate action Plan that is illustrated by flow diagram in **Appendix F**. This is to be used when responding to an H_2S release. Additional or long term response actions will be determined on a case-by-case basis, if needed, once the Incident Command Center and System is established following the immediate response.

LEVEL 1 RESPONSE

1. The audible signal for a Plant emergency and evacuation is an intermittent horn (repeating off/on) activated when levels of H_2S of 10 ppm are detected. The frequency of this intermittent alarm will increase as the concentration of the H_2S increases. In addition, a flashing red light or beacon will be activated at 10 ppm H_2S. A control panel in the Plant control room establishes which H_2S monitor has activated the alarm and or flashing red beacon, be it a plant monitor or a perimeter monitor. At the initial sound of the intermittent alarm or the flashing red beacon,

each operator (2 per shift) will put on a 30 minute SCBA and all other personnel in the Plant complex shall immediately evacuate the Plant using the evacuation routes to the Emergency Assembly Area 1 (see **Appendix D**). A fixed H_2S perimeter monitor at Emergency Assembly Area 1 has a H_2S concentration read out to assure safety or further evacuation to Assembly Area 2 (>10 ppm). The operators, upon suit up with the SCBA, will first help any persons in distress evacuate to the Emergency Assembly Area. If deemed necessary by the Senior Operator, local emergency response service providers will be contacted by Plant personnel designated by the Senior Operator.

2. All entities within the 500 ppm ROE (see **Appendices C and G**) and BHP Mines will be notified of a release by personnel designated by the Plant Superintendent or his designee. The nature of the release and status of containment will be conveyed. Parties will be advised to report the incident to employees working near the Plant and to alert any third party contractors or service companies working in the Plant vicinity or imminently scheduled to work in the Plant vicinity of the release. All should be instructed to leave the area and not to enter/re-enter area until further notice.

3. Wearing the SCBA, the operator(s) will attempt to fix the cause of the release. OSHA guidelines allow operators to work in areas with 10ppm for up to 8 hours. The H_2S levels at the Emergency Assembly Area 1 will be monitored with a hand held or personal monitor as well as with the fixed monitor.

4. The Senior Operator will set up secondary re-entry team(s) with 30 min. SCBA to re-enter and resolve the situation. Re-entry will occur in 15 minute shifts at the direction of the IC until the problem is resolved or the ESD activated. If H_2S levels in Emergency Assembly Area 1 exceed 10 ppm, evacuate to Emergency Assembly Area 2 and continue to monitor Assembly Area H_2S level. In addition, a fixed H_2S perimeter monitor at Assembly Area 2 has a H_2S concentration read out. If evacuation to Emergency Assembly Area 2 occurs, a road block to the Plant entrance will be established. If release is resolved and monitored levels in the Plant are less than 10 ppm, personnel may re-enter the Plant. BHP, Praxair and the unmanned facilities within the 500 ppm radius of exposure (**Appendices C and G**) will be notified once release is contained and monitored H_2S levels are less than 10 ppm The OCD shall be notified within one hour of any release that activates the Plan. If the release is not resolved and H_2S levels continue to increase, Level 2 Response is indicated.

LEVEL 2 RESPONSE

1. The continuous alarm and indicates the detection of H_2S greater than 20 PPM. Flashing red beacons indicate a H_2S release of 10 ppm or greater and they will continue for a release of 20 ppm or greater. A control panel in the Plant control room establishes which H_2S monitor has activated the alarm and or flashing red beacon, be it a plant monitor or a perimeter monitor. At the initial sound of the

continuous alarm or observance of the flashing red beacons, the operators will immediately put on a 30 minute SCBA and all other personnel in the Plant complex will put on emergency escape packs if they are wearing them and evacuate along with all other personnel using the evacuation routes to the Emergency Assembly Area 2 (see **Appendix C**). necessary by the Senior Operator, local emergency response service providers will be contacted by Plant personnel as designated by the Senior Operator.

2. Praxair is trained to evacuate at continuous alarm sounds. Praxair, BHP Mines and all other entities within the 500 ppm ROE (see **Appendices C and G**) will be contacted by phone and notified of release and asked to evacuate, if they have not already. All entities within the 100 ppm ROE (see **Appendices C and G**) will be contacted by phone and notified of release. The nature of the release and status of containment will be conveyed. Depending on release status and prevailing wind conditions, some entities within the 100 ppm ROE may be asked to shelter in place or evacuate Notifications will include but are not limited to the following:

   - Praxair, BHP and all unmanned businesses will be instructed to alert all company personnel, third party contractors and/or services companies working in the area and those imminently scheduled to work in the area, of the release and evacuation status of the Plant. They should be instructed to immediately leave and/or not enter/re-enter the Plant vicinity until further instruction.

   - BHP will be advised to check ventilation shaft status within the 500 and 100 ppm ROE and take internal company pre-emptive safety action(s) as deemed appropriate.

   - Riverview Golf Course will be instructed to clear the course of both employees and golfers until further notice.

   - San Juan College will be notified of the release and depending on prevailing wind conditions may be requested to shelter in place or evacuate.

   - Other entities within the 100 ppm ROE, depending on release status and prevailing wind conditions, will be asked to shelter in place. Those entities will be instructed to close any windows and shut off any air conditioning/heating until further notice. In addition, they will be instructed to contact other employees/residents not currently present to not enter/reenter the area until further instruction.

3. The LEPC and law enforcement will be contacted by phone and notified of the release and status of containment. The Plant Superintendent or his designee will assign personnel notification responsibility.

4. Operator(s) with 30 minute SCBA will assess the release and attempt to resolve it. If after 15 minutes there is no resolution, the operator(s) will activate the ESD and will evacuate to Emergency Assembly Area 2.

5. If monitored H_2S levels at Emergency Assembly Area 2 exceed 10 ppm, evacuate to Emergency Assembly Area 3, Kirtland Elementary School parking lot. If deemed necessary, local emergency response service providers will be contacted by the operator.

   a) Re-entry will occur in full SCBA and in 15 minute shifts at the direction of the IC until IC determines problem has been resolved or additional ESD (pipeline) activated.

   b) If release is resolved and monitored levels of H_2S in the Plant are less than 10 ppm, personnel may return to Plant. The OCD shall be notified within one hour of any release that activates the Plan. All entities previously notified will be informed that the release has been resolved and advised of the current monitored H_2S levels at the Plant.

   c) No resolution requires activation of full H_2S Plan with notifications and reporting as per Plan. If the release is not resolved and/or H_2S levels continue to increase, Level 3 Response is indicated.

LEVEL 3 RESPONSE

1. For H_2S at 20 ppm or greater at Assembly Area 2, repair efforts at Level 2 unsuccessful, worst case scenario, and/or catastrophic release have occurred then implement a Level 3 response.

2. Road blocks will be set up at the intersection of County Road 6500 and County Roads 6446 and 6480. In addition, a roadblock will be set up at the intersection of County Road 6520 and County Road 6527 on the west, and where 6520 turns south on the east. A roadblock will also be set up on the Indian Service Route outside the 100 ppm ROE (approximately 4000 feet north of the Plant) (see **Appendix C**.)

3. All personnel shall have evacuated to Emergency Assembly Area 3, Kirtland Elementary School. Evacuation of all entities within the 500 ppm ROE will have been confirmed. Implement full H_2S Plan with all notifications and public agency involvement. Notifications to all entities within the 100 ppm ROE will include the nature of the release and status of containment. Notifications will include but are not limited to the following:

   - All businesses within the 100 ppm ROE will be instructed to immediately alert all company personnel, third party contractors and/or services companies working in the area and those imminently scheduled to work in the area, of the

release and evacuation status of the Plant. They will be instructed to immediately leave and/or not enter/reenter the area within the roadblocks until further instruction.

- All other entities (including private residents) within the 100 ppm ROE will be instructed to immediately shelter in place. Those entities will be instructed to close any windows and shut off any air conditioning/heating until further notice. In addition, they will be instructed to contact other employees/residents not currently present to not enter/reenter the area until further instruction.
- BHP will be advised to check ventilation shaft status within the Plant vicinity and take internal company pre-emptive safety action(s) as deemed appropriate.
- Riverview Golf Course will be instructed to immediately clear the course of both employees and golfers and to shelter in place. Those entities will be instructed to close any windows and shut off any air conditioning/heating until further notice. In addition, they will be instructed to contact other employees not currently present to not enter/reenter the area until further instruction.
- San Juan College will be notified of the release and advised to shelter in place. Those entities will be instructed to close any windows and shut off any air conditioning/heating until further notice. In addition, they will be instructed to contact other employees not currently present to not enter/reenter the area until further instruction. Depending on the event circumstances, the IC commander will make a summary judgment, based on but not limited to H_2S concentration and wind direction, whether a safe evacuation should be implemented and advise on evacuation route.

4. If escaping vapors have been ignited, the vapors should be allowed to continue to burn unless the fire endangers personnel, other property, or other equipment.

5. When applicable: Maintain communication with the Plant Superintendent, or his designee, to keep him up-to-date of the situation and the action taken prior to his arrival at the location.

6. Initiate and maintain a Chronological Record of Events log.

7. Within one hour after the activation of the H_2S Plan, begin agency notifications by calling OCD and NRC.

8. Establish media staging area adjacent to Assembly Area 3 and direct all media to it.

9. Once resolved and monitored levels in the Plant and at Assembly Area 2 are less than 10 ppm, roadblocks will be removed, and all entities within the 100 ppm ROE will be allowed to return. All entities previously notified will be informed

that the release had been resolved and advised of the current monitored H_2S levels.

10. Agency reports to be submitted as required.

4. EMERGENCY SHUTDOWN SYSTEM

The Plant has an extensive Emergency Shut Down (ESD) system that is located within the Plant and in various locations along the pipelines that feed the Plant. The ESD is designed to prevent a Level 3 response. See **Appendix E** for a more detailed description of the ESD.

5. NOTIFICATIONS AND REPORTS

The Plant has various notification and reporting obligations. Some are related to its state air quality permit that is overseen by NMED as well as well as state and federal spill reporting obligations. In addition to the regulatory obligations noted above, Plant personnel also have internal and external notification and reporting obligations associated with the activation of this Plan.

A. DISCOVERY AND INTERNAL REPORTING

1. All Plant personnel who perform maintenance and/or repair work within the Plant wear H_2S monitoring devices to assist them in detecting the presence of unsafe levels of H_2S. When any Plant personnel while performing such work discover a leak or emission release they are to attempt to resolve the issue as long as H_2S levels remain below 10 ppm. The personal monitoring devices they wear will give off an audible alarm at 10 ppm. These devises are to be worn as low on the body as possible since H_2S is heavier than air and will tend to stand or accumulate in low lying areas. If the response action needed to resolve the issue is more than simply closing a value or stopping a small leak, the Plant personnel shall notify the Plant Superintendent, or his designee and convey, at a minimum, the following information:

    - Name, telephone number, and location of person reporting the situation; and
    - Type and severity of the emergency; and

- Location of the emergency (area/block, mile markers, latitude & longitude, or building), and the distance to surrounding equipment and/or structures; and
- The cause of the spill or leak, name and quantity of material released, and extent of the affected area including the degree of environmental hazard; and
- Description of injuries and report of damage to property and structures; and
- Initiate and maintain a Chronological Record of Events log. This record should record the time, date, and a summary of the event.

2. If the Plant personnel detect H_2S levels greater than 10 ppm either as a result of his/her personal monitoring device or the Plant intermittent alarm and/or red flashing beacon, Plant operators are to contact their immediate supervisor for assistance and put on the 30-min SCBA so they can attempt to resolve the issue. All non essential persons shall be notified of the release and evacuated from the area. Operators wearing the SCBAs are to first assist any persons requiring assistance during the evacuation, then attempt to resolve the issue. The immediate supervisor is then responsible for notifying the Plant Superintendent or his designee so that the IC system can be implemented and H_2S Plan activated if necessary.

3. Once the Plant Superintendent is contacted, he or his designee is to notify the appropriate Corporate management, EHS personnel, Plant emergency response personnel, and advise them of the existing emergency situation. Corporate management will then conduct the reporting up that is necessary based on the situation.

4. Plant personnel are to advise any contractor, service company, and all others on-site or attempting to enter the Plant that the H_2S Plan has been activated.

B. PUBLIC AWARENESS AND COMMUNICATION

Public awareness and communication is a primary function of the H_2S Plan. The Company has compiled a list of various public, private, state and local contacts that are to be notified at various phases during the activation of the Plan. Refer to the Response Flow diagram in **Appendix F** that indicates when certain entities are to be contacted in event of activation of this Plan. **Appendix G** is a listing of the entities to be contacted and **Appendix H** is a list of community organizations that have received a copy of the Plan. Company will inform all state and local response organizations of its Plan as well as those businesses that fall within its 500-ppm and 100-ppm ROE as illustrated in **Appendix C**.

C. PUBLIC AREAS, NEARBY BUSINESSES AND RESIDENTS

The contact information for all residents, businesses and public areas is contained in **Appendix G**. All entities within the 500 ppm and 100 ppm radius of exposure will be contacted by Plant personnel as designated by Plant Superintendent if the Plan is activated and based on response level as described in the Immediate Action Plan and advised of the following:

- The nature and extent of the release/emergency at the Plant and recommendations for protective actions, such as evacuation or shelter-in-place
- Any other event specific information that is necessary to protect the public; and
- Updates as to the status of the release and continued safety measures to be taken, including but not limited to when to evacuate and/or when it is safe to return to the area.

1. Residences or Public Roads:

Public Road 6500 is within the 100 ppm radius of exposure, and portions of Public Roads 6520, 6257 and Cemetery Road are slightly within the southernmost extension of the 100 ppm radius of exposure. Similarly, a small portion of Public Roads 6448 and 6480 are slightly within the eastern portion of the 100 ppm radius of exposure (see **Appendix C**). The specific residences included within the 100 ppm radius of exposure are listed on **Appendix G** along with addresses and contact phone numbers.

2. Businesses or Other Public Areas:

All businesses included in **Appendix G** will be provided with a copy of the H_2S Plan and will be contacted about participation when local emergency response training events or drills occur.

Within the 100 ppm ROE:

The public areas located within the 100 ppm radius of exposure are identified in **Appendix G**.

BHP will be contacted when the Plan is activated to ensure that the out of service vent pipes have not been activated. Currently, there are active BHP Mining ventilation pipe ducts within the 100 ppm radius of exposure and inactive ventilation pipe ducts within the 500 ppm radius of exposure.

Additional businesses within the 100 ppm radius of exposure are listed on **Appendix G** and they will be notified if the Plan is activated as per the various levels of the immediate action Plan described above. These businesses or their

corporate offices (in the case of unmanned facilities) will be notified if the Plan is activated as per the immediate action Plan.

Within the 500 ppm ROE:

One manned business (Praxair) is located within the 500 ppm radius of exposure (see **Appendix G**). Praxair, BHP Mines and all other entities within the 500 ppm ROE (see **Appendices C and G**) will be contacted by phone and notified of release and asked to evacuate. The corporate offices of the four unmanned businesses will also be notified immediately if the Plan is activated according to the level specific procedures described above.

Riverview Golf Course will be instructed to clear the course of both employees and golfers until further notice.

6. SITE SECURITY

A. In order to have an accurate listing of all personnel on-site in the event of an emergency, a daily sign-in log sheet shall be utilized. The sign-in log sheet shall include at a minimum the person's name, the company name, the time of arrival, and the time of departure.

B. The Incident Commander shall be responsible to assure that all personnel sign-in upon arrival and sign-out upon departure from the job site.

C. The Incident Commander may at his discretion assign the responsibilities for the daily sign-in log sheet to the individual designated as the Record Keeper or another designee.

D. At the discretion of the Incident Commander, a security coordinator and/or a security team may be established, and the access to the job site restricted.

E. For any evacuation to Emergency Assembly Area 2, a road block at the Plant entrance will be established to prevent further entrance to the Plant.

F. For a Level 3 release a road block would be set up at the intersection of County Road 6500and County Roads 6446 and 6480. In addition, a roadblock would be set up at the intersection of County Road 6520 and County Road 6527 on the west, and where 6520 turns south on the east. A roadblock will also be set up on the Indian Service Route outside the 100 ppm ROE (approximately 4000 feet north of the Plant).

7. SIGNS & MARKERS

The Plant has warning signs indicating the presence of H_2S/Poisonous Gas and high pressure gas at the entrance to the Plant. Emergency response phone numbers are posted at the entrance to the Plant. Signs are located at the Plant gate entrance indicating that all visitors are to sign in.

8. FIRST-AID STATION

The first aid station will be located at the Emergency Assembly Area.

FIRST AID KITS are located:

- **Plant Superintendent Office Building,**
- **Maintenance/Safety Office Building, and**
- **Each company vehicle**

9. MEDIA SITE

A. If a Level 2 or 3 Response occurs, the Media Site will be located adjacent to Emergency Assembly Area 3.

B. At no time shall any unescorted representative from the media be allowed any closer to the Plant than the Media Site location, unless approved by the Incident Commander, the Safety Officer, and the Media Relations Officer.

10. EMERGENCY AND SAFETY EQUIPMENT

Refer to **Appendix E and Appendix D** for information pertaining to the Plant's emergency and Safety equipment. In addition, see **Appendix C** for the location of additional H_2S sensors that will be installed outside the Plant boundary as part of the Plant expansion related to the AGI well permit.

V. TRAINING/DRILLS/EDUCATION

A. TRAINING

1. Training on the H_2S Plan
   - Inclusion of local officials and LEPC
   - Public areas and businesses (within the ROE)
   - Those on the Plan distribution list

2. Other Emergency Response Related Training

Anadarko/Western has an extensive safety training program and addresses various aspects of job related hazards. All training records for the Plant are maintained at the Plant. The following is a limited list and summary of the training programs that relate to the H_2S Plan and Emergency Response:

- Plant Orientation Training - All Plant personnel, visitors, and contractors must attend a Plant overview orientation prior to obtaining permission to enter the Plant. A refresher course on this training is required annually for all persons. This training also complies with the requirements of the Anadarko and Plant's Process Safety Management Program and Procedures Manuals.

- Hydrogen Sulfide and Sulfur Dioxide Training – All Plant personnel receive annual refresher training on hydrogen sulfide and sulfur dioxide, which is conducted by Anadarko personnel. If an individual is unable to attend, they may be required to attend a third party training session. Hydrogen sulfide training cards are issued as documentation of this training. All contract employees and visitors are required to have had hydrogen sulfide training and to provide the Plant a copy of their certification card prior to obtaining permission to enter the Plant.

- Respirators - All Plant personnel, with the exception of the Plant Operations Specialist, are trained annually on the proper use of respirators. In addition to the annual training, all Plant personnel with the exception noted above are fit tested annually on the respirators. Except for the Plant Operations Specialist, all Plant personnel must have medical clearance to work in the Plant. Medical clearance is mandatory for H_2S certification. Medical clearance review for work in a H_2S environment is conducted on a bi-annual basis unless the individual has experienced medical problems within that two year interval that requires updating the medical clearance.

- Hazard Communication - All Plant personnel are trained annually on Hazard Communication and SARA Title III Right-to-Know information. The annual training includes, at a minimum, a review of material safety data sheets (MSDS) for those materials that are present at the Plant and labeling.

- Personal Protective Equipment (PPE) - All Plant personnel are trained annually on the Anadarko requirements for personal protective equipment (PPE). The training includes, at a minimum, a review of all the types and levels of personal protective equipment and how to select the correct equipment for the job.

B. EMERGENCY RESPONSE DRILLS

1. The Plant will conduct, at least, a tabletop drill annually. Multiple drills during the year may be scheduled at the discretion of the Plant Superintendent or as part of the Emergency Response Center in The Woodlands.

2. The annual drill will exercise this Plan and include, at a minimum, contacting the entities that are identified as being within the 500-ppm ROE and the Local Emergency Response contacts identified on **Appendix G**. The drills will also include briefing of public officials on issues such as evacuation or shelter-in-place plans

3. Drill training will be documented and those records will be maintained at the Plant. The documentation shall include at a minimum the following:

    a. Description or scope of the drill, including date and time
    b. Attendees and Participant to the drill
    c. Summary of activities and responses
    d. Post drill de-brief and reviews

C. EDUCATION

1. All businesses and residents within the 100 ppm ROE will be educated as to plant alarms, when they will be contacted and what it means to shelter in place.

2. All businesses and or residents that could be asked to evacuate will be advised as to best evacuation routes.

APPENDIX A

WORST CASE SCENARIO

The basis for worst case scenario calculations is as follows:

- 6000 parts per million (ppm) or 0.60 mole percent of hydrogen sulfide in the inlet natural gas stream into the San Juan River Gas Plant; and
- a maximum daily (24 hour) processing volume of 50,000 MMCF.
- The worst case scenario radius of exposure (ROE) also assumes an uncontrolled instantaneous release from the area around the AGI well of the above referenced volume and concentration. Because the Plant is a throughput process plant there is no actual way that the entire throughput volume of the Plant could be released instantaneously as is assumed in the worst case scenario calculations of the ROE in **Appendix B** and shown in **Appendix C**; however, to comply with NMAC 19.15.11, we have used that assumption in our worst case scenario formulas/calculations provided in Appendix B.

It should further be noted that the reason this rate, used as worst case, could not be released over a 24 hour period is the Plant's Emergency Shutdown (ESD) systems that would be activated. The ESD would prevent the flow of gas into the Plant in the event of an emergency. The ESD system is discussed in greater detail in **Appendix E**.

APPENDIX B
RADIUS OF EXPOSURE CALCULATIONS

The formulas for calculating the two ROEs (as specified by the regulations) are as follows:

500-ppm RADIUS OF EXPOSURE CACULATION

$$X=[(0.4546)(\text{hydrogen sulfide conc.})(Q)]^{(0.6258)}$$

Where:
X = Radius of exposure in feet
Hydrogen Sulfide Concentration = Decimal equivalent of mole or volume fraction of hydrogen sulfide in the gaseous mixture
Q = Escape rate expressed in cubic feet per day (corrected for standard conditions of 14.73 psi absolute and 60 degrees Fahrenheit)

a) For existing facilities or operations, the escape rate (Q) is the maximum daily rate of the gaseous mixture produced or handled or the best estimate thereof. For the San Juan River Gas Plant, after the installation of the AGI well, the Company is using for contingency planning purposes an "escape rate" equal to the anticipated (maximum) inlet gas volume of 50,000 MCFD. The (actual) inlet gas volume at the Plant will be somewhat variable and is continuously metered. The Plant records daily inlet gas volumes and prepares a daily volume report. The assumed 50,000 MCFD inlet gas volume has been selected as the "escape rate" because it is the highest anticipated inlet volume that the Plant would handle under its proposed operations and is considered worst case interpretation of the volume of gas. It should be noted that the plan will remain effective as long as the processed volume and H_2S content equate to the same ROE. As addressed below.

As to hydrogen sulfide concentration of the inlet gas, daily monitoring data of current operations indicates variable concentrations, but concentration will not exceed 6000 ppm or 0.60 mole percent. Therefore, 6000 ppm or 0.60 mole percent has been used in the worst case scenario for the expanded operations with the AGI well for contingency planning purposes.
Using:
Q = 50,000,000
H_2S conc = 6000 ppm or 0.60 mole%

$$[(0.4546)*(H_2S \text{ concentration})*(\text{gas volume } (Q))]^{0.6258}$$
$$[(0.4546)*(6000*.000001)*(50,000,000]^{0.6258}$$

500-ppm ROE = 1634 feet

100-ppm RADIUS OF EXPOSURE CALCULATION

$$[(1.589)*(H_2S \text{ concentration})*(\text{gas volume})]^{0.6258}$$
$$[(1.589)*(6000*.000001)*(50,000,000)]^{0.6258}$$

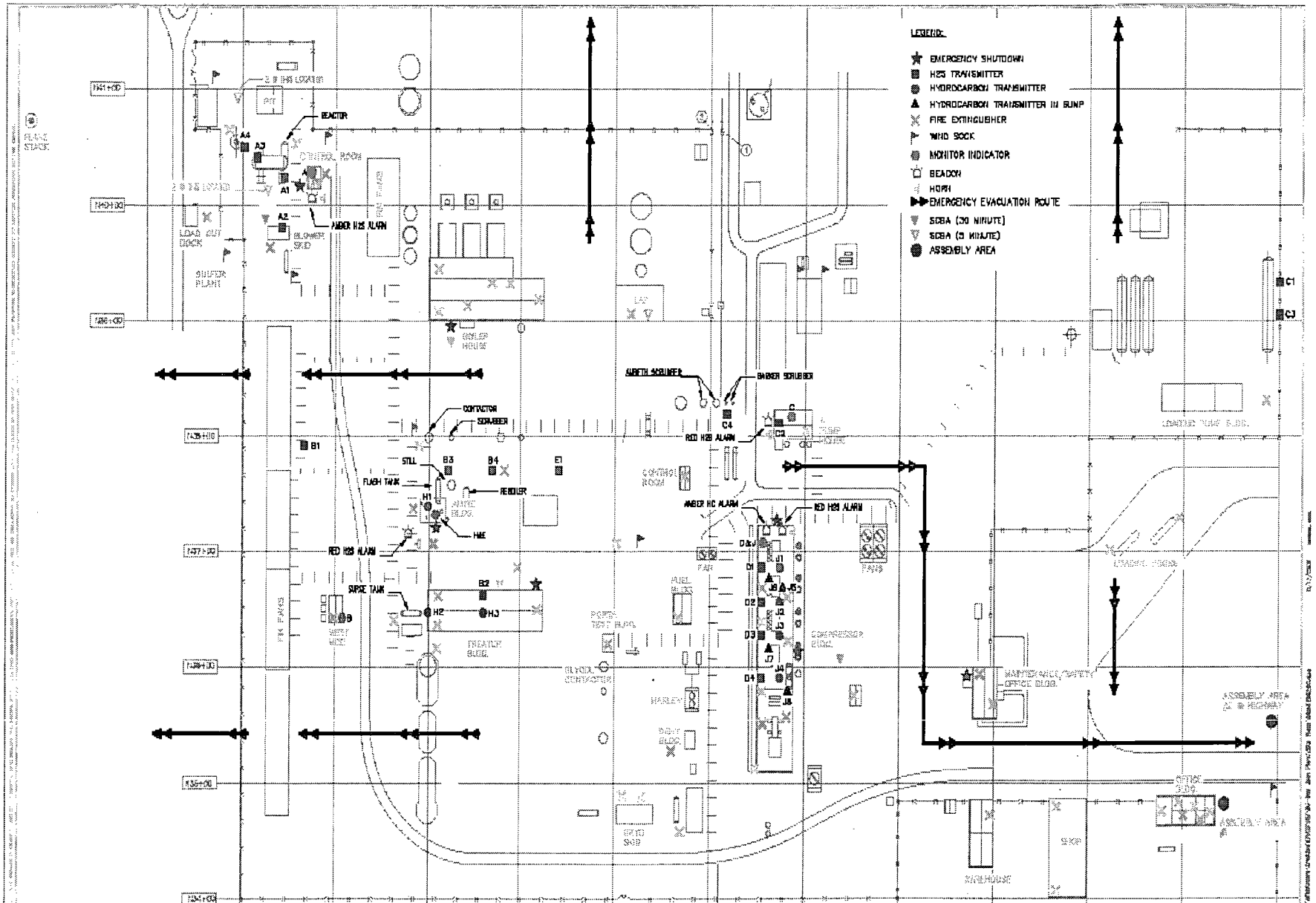
100-ppm ROE = 3576 feet

APPENDIX C

100-PPM AND 500-PPM RADIUS OF EXPOSURE MAP SHOWING LOCATION OF ADDITIONAL OFF-SITE H_2S MONITORS AND LOCATION OF ROADBLOCKS

APPENDIX D

PLANT DIAGRAM WITH EVACUATION ROUTES & EMERGENCY EQUIPMENT LOCATIONS



NOTES:

REFERENCE DRAWINGS	REVISIONS

Western Gas Resources, Inc.

SAN JUAN RIVER PLANT

EMERGENCY ITEMS AND PLACEMENT

SAN JUAN RIVER PLANT

APPENDIX E

DESCRIPTION OF H_2S MONITORING & ALARM SYSTEMS

A. EMERGENCY SHUTDOWN SYSTEM

There are (8) ESD manual stations located at various points in the facility (**Appendix D**). **The Plant ESD can be activated at any time at the direction of the Plant Superintendent or Incident Commander and is to be activated based on this Plan after 20 ppm H_2S has been detected in the Plant and efforts to resolve the issue for 15 minutes have failed.**

When any one of the eight (8) manual stations is activated, the system will be shutdown and the natural gas inlets and outlets will be blocked. The operators are also able to auto close the two (2) main blocks on the incoming gas lines to the Plant. Activating these should allow the Plant to avoid a Level 3 response. Two miles north of the Plant, on the Barker Dome line and the Aneth line, there are isolating block valves (manual) that can prevent further gas flow into the Plant pipeline system. Also, further upstream on the Barker and Aneth lines there are additional isolating block valves at 6 miles and 8 miles upstream on their respective lines. These block values furthest upstream, isolate the entire system from the field gathering lines coming into the Plant.

The proposed acid gas injection facilities will contain emergency shutdown systems in case of surface equipment failure and/or well failure. The ESD system for the proposed facilities and injection well will be further documented in the Plan upon construction.

B. PLANT ALARMS, VISIBLE BEACONS & WIND INDICATORS

1. Colored beacons, horns, and wind directions indicators are located in various locations throughout the Plant and are indicated on **Appendix D**.

2. The audible signal for an emergency response and Plant evacuation is a repeating intermittent alarm that sounds at 10 ppm H_2S. The frequency of this intermittent alarm will increase as the concentration of the H_2S release increases. The alarm will become continuous when the concentration of the H_2S release is 20 ppm or higher. At the initial sound of this intermittent alarm, the Plant operator will put on a SCBA and all personnel in the Plant complex shall immediately proceed in a safe manner to the Emergency Assembly Areas as prescribed by the Emergency Action Plan on page 19 of this Plan.

3. A flashing red beacon signifies an H_2S release of 10 ppm and all personnel in the Plant complex shall immediately proceed in a safe manner to the Emergency Assembly Area 1 located east of the main office. If this area is not determined to be safe all will move to Assembly Area 2 which is on road 6500 at the main gate on the east side of the facility. Evacuation routes and Assembly Area 1 are indicated on **Appendix D**.

4. A routine process alarm will cause a horn to sound. This horn is a wavering siren sound that is used to alert the Plant Operator to return to the Control Room. No emergency response or

evacuation is required when this siren sounds. Flashing beacons are located throughout the Plant and are utilized to assist the Plant Operator in identifying the location of the Plant alarm or Plant upset. Any beacon colors other than red do not identify an emergency response or evacuation.

5. Wind direction indicators are installed throughout the Plant and at the Plant Superintendent Office Building. At least one wind direction indicator can be seen at any location within the Plant complex, as well as, from any point on the perimeter of the Plant. There are 10 windsocks located in the Plant.

6. Additional permanent off-site H_2S monitors will be placed on the perimeter of the Plant coincident with the calculated radii of exposure as shown on **Appendix C**. These monitors will assist Anadarko in appropriate notification of potentially affected entities in the vicinity of the Plant within the calculated 100 ppm radius of exposure. The perimeter monitors give the operators an indication of H_2S leaving the plant boundaries. The perimeter monitors will activate the plant horn and flashing red beacon as described above. A control panel in the Plant control room/operators building indicates which monitor has triggered the alarm be it a plant monitor or perimeter monitor. All perimeter monitors have an external read out of H_2S concentration. Perimeter monitors can only be monitored from the Plant control room or by a walk up visual reading. In the event the control room is evacuated, the plant ESD system will be activated, substantially reducing the ROE, where perimeter monitors can be safely manually read.

C. GAS DETECTION EQUIPMENT

1. The Plant uses the Industrial Scientific Corporation 4200 Series Remote H_2S Sensors. These sensors are a fixed point monitor to detect the presence of hydrogen sulfide in ambient air. The sensors are connected to Allan Bradley/SLC-500 Rockwell Logic Controllers with an output to Moore Micro-Advantage controllers and from here to the operator's PLC. The red flashing beacon is activated at 10 ppm. The horn is activated with an intermittent alarm at 10 ppm and changes to a steady alarm at 20 ppm. The additional off-site sensors shown on **Appendix C** will be of the same type and calibrated as described in this paragraph for the Plant sensors.

2. The fixed hydrogen sulfide monitors are strategically located throughout the Plant to detect an uncontrolled released of hydrogen sulfide. The SRU has 4 sensors labeled A-1 through A-4. The treating Plant area has 4 sensors labeled B-1 through B-4. There are two sensors at the east side of the Plant labeled C-1 and C-3. There is one sensors located at the liquid stabilizer skid labeled E-1. This is the center of the process area. The compressor building has eight methane sensors; these shut the compressors down at 50% LEL. The compressor building also is equipped with fire eyes that will also shut the units down. The Plant operators are able to monitor the ppm level of H_2S of all the Plant sensors on their control/monitor PLC located in the operator's building. These sensors are all located on the plot plan on **Appendix D**. These sensors all have to be acknowledged and will not clear themselves. This requires immediate action for any occurrence or malfunction. The Plant sensors are calibrated quarterly. Proposed perimeter monitors will be calibrated quarterly as well.

3. Hand held gas detection monitors are available to Plant personnel to check specific areas and equipment prior to initiating maintenance or work on the process or equipment.

There are 2 handheld and 9 personal monitors that are used by individuals for special projects and field work. The hand held gas detection devices are BW Technologies 4-gas detectors. The detectors have sensors for oxygen, LEL (explosive hydrocarbon atmospheres), hydrogen sulfide, and carbon dioxide. They indicate the presence H_2S with a beeping sound at 10 ppm. The beeps change in tone as H_2S increases to 20 ppm. The personal monitors are set to alarm (beep) at 10 ppm with the beeps becoming closer together as the H_2S concentration increases to 20 ppm. Both the hand held and personal monitors have digital read outs of H_2S ppm concentration.

D. RESPIRATORS

1. The Plant has 30 minute Self-Contained Breathing Apparatus (SCBA) respirators and 5 minute escape packs strategically located throughout the Plant.

2. The respirator containers are identified in the process area and the locations are identified on **Appendix D.**

3. All Plant personnel with the exception of the Plant Operations Specialist are certified to use the SCBA respirators.

E. FIRE FIGHTING EQUIPMENT

1. The Plant personnel are trained only for insipient stage fire fighting.

2. The fire extinguishers located in the Plant process areas, compressor buildings, process buildings, and company vehicles are typically a 20# Ansul dry chemical fire extinguisher. **See Appendix D.**

3. The Plant does not have a fire water system, but only a utility water system that is not designed for fire fighting.

APPENDIX F

H_2S CONTINGENCY PLAN FLOW DIAGRAM

LEVEL 1 RESPONSE

H_2S DETECTED GREATER THAN 10 PPM &/OR INTERMITTENT ALARM SOUNDS/FLASHING RED BEACONS ACTIVATED

- **OPERATORS PUT ON RESPIRATORS (30 minute SCBA) TO ASSESS & RESOLVE PROBLEM**
  (Operators are allowed under OSHA to work for up to 8 hours in 10ppm H2S environment)
- **ALL OTHERS EVACUATE TO ASSEMBLY AREA 1**
- **NOTIFY PRAXAIR & BHP MINES**

AT ASSEMBLY AREA 1

- **MONITOR H_2S LEVELS AT ASSEMBLY AREA VIA FIXED H2S MONITOR READ OUT OR HAND HELD**
- **OPERATORS WILL SET UP SECONDARY ENTRY TEAMS W/ 30-MIN SCBA TO TRY TO RE-ENTER AND RESOLVE**
- **RE-ENTRY WITH SCBA WILL OCCUR IN 15 MINUTE SHIFTS AT THE DIRECTION OF THE IC UNTIL IC DETERMINES PROBLEM HAS BEEN RESOLVED OR ESD IS ACTIVATED)**

CALL 911 IF INJURY OR DEATH FOR EMERGENCY ASSISTANCE

ONCE RESOLVED & MONITORED LEVELS IN PLANT ARE LESS THAN 10 PPM RETURN TO PLANT

IF H_2S LEVELS AT ASSEMBLY AREA 1 EXCEED 10PPM

EVACUATE TO ASSEMBLY AREA 2

NOTIFY NMOCD WITHIN ONE HOUR MAKE AGENCY REPORTS AS NECESSARY

AT ASSEMBLY AREA 2

- **ESTABLISH ROAD BLOCK OF PLANT ENTRANCE**
- **MONITOR H_2S LEVELS AT ASSEMBLY AREA VIA FIXED H2S MONITOR READ OUT OR HAND HELD**
- **FOLLOW LEVEL 2 RESPONSE ACTIONS**

NOTIFY LEPC AND OTHER PUBLIC OFFICIALS AND EMERGENCY SUPPORT SERVICES

LEVEL 2 RESPONSE

H_2S LEAK DETECTED GREATER THAN 20 PPM &/ CONTINUOUS ALARM SOUNDS/FLASHING RED BEACONS ACTIVATED

- OPERATORS PUT ON RESPIRATORS (30-MIN SCBA) TO ASSESS & RESOLVE PROBLEM

(Operators have 15 minutes to resolve after which they must evacuate to Assembly Area #2 and begin rotational entry to Plant)

- ALL OTHERS EVACUATE TO ASSEMBLY AREA 2
- ESTABLISH ROAD BLOCK TO PLANT ENTRANCE
- EVACUATE PRAXAIR , BHP AND ALL OTHERS WITHIN 500 PPM ROE
- NOTIFY BHP MINES, ALL OTHER BUSINESSES IN THE 100 & 500 PPM ROE.
- NOTIFY LEPC AND OTHER PUBLIC OFFICIALS AND EMERGENCY SUPPORT SERVICES

AT ASSEMBLY AREA #2

- MONITOR H_2S LEVELS AT ASSEMBLY AREA AND MONITOR H2S LEVELS VIA FIXED H2S MONITOR READ OUT OR HAND HELD
- IF MONITORED LEVELS EXCEED 10 PPM EVACUATE TO ASSEMBLY AREA 3 (KIRTLAND ELEMENTARY SCHOOL PARKING LOT)
- RE-ENTRY WITH SCBA WILL OCCUR IN 15 MINUTE SHIFTS AT THE DIRECTION OF THE IC UNTIL IC DETERMINES PROBLEM HAS BEEN RESOLVED OR ESD IS ACTIVATED)

CALL 911
IF INJURY OR DEATH
FOR EMERGENCY ASSISTANCE

ONCE RESOLVED & MONITORED LEVELS IN PLANT ARE LESS THAN 10 PPM RETURN TO PLANT

IF CONSTANT ALARM SOUNDS FOR 15 MINUTES

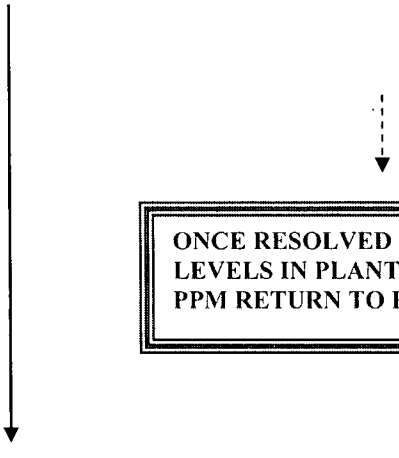
- ACTIVATE PLANT EMERGENCY SHUT DOWN (ESD)
- ACTIVATE FULL H_2S PLAN WITH NOTIFICATIONS & REPORTING (FOLLOW LEVEL 3 RESPONSE)

NOTIFY NMOCD WITHIN <u>ONE HOUR</u>
MAKE OTHER AGENCY REPORTS AS PER H_2S PLAN

LEVEL 3 RESPONSE

WORST CASE SCENERIO AND/OR CATASTROPHIC RELEASE FROM FIRE AND/OR EXPLOSION

- ALL PERSONNEL EVACUATE TO ASSEMBLY AREA 3
- ESTABLISH ROAD BLOCKS AS PER IMMEDIATE ACTION PLAN
- EVACUATE PRAXAIR AND ALL ENTITIES WITHIN 500 PPM ROE
- IMPLEMENT FULL H_2S PLAN WITH ALL NOTIFICATIONS
- NOTIFY LOCAL FIRE, POLICE AND EMERGENCY SERVICES



ONCE RESOLVED & MONITORED LEVELS IN PLANT ARE LESS THAN 10 PPM RETURN TO PLANT

IF CONSTANT ALARM SOUNDS FOR 15 MINUTES

- ACTIVATE PLANT EMERGENCY SHUT DOWN (ESD)
- RE-ENTRY WITH SCBA WILL OCCUR IN 15 MINUTE SHIFTS AT THE DIRECTION OF THE INCIDENT COMMANDER (IC) UNTIL IC DETERMINES PROBLEM HAS BEEN IDENTIFIED OR REPAIRED

APPENDIX G

EMERGENCY CALL LIST

SAN JUAN GAS PLANT EMERGENCY CALL LIST

ENTITIES WITH IN THE 500- PPM ROE

Name	Address	Contact Person	Phone Number
El Paso Natural Gas Warehouse	81 County Road 4900 Bloomfield, NM 87413		800-334-8047 (24 hr)
El Paso Natural Gas Turbine Station	81 County Road 4900 Bloomfield, NM 87413		800-334-8047 (24 hr)
Mid-America Pipeline Co. (Enterprise)	3621 East Main Farmington, NM 87402		505-599-3276 505-599-3277 800-546-3482 (24 hr)
Praxair	101 County Road 6500 Bloomfield, NM 87417		505-598-0549 800-598-0549 (24 hr)
XTO Energy Salty Dog #1	2700 Farmington Ave. Farmington, NM 87401		505-324-1090

While BHP has no active vent shafts within the 500ppm ROE, they will be notified along with others entities contained within the 500ppm ROE to assure that no vents have been activated that would be affected. BHP contact information is below.

BHP Mining	16 Miles West of Farmington, NM San Juan County Road RD6800	Dave Hales, Safety Manager	505-598-2311 505-486-1612

ENTITIES WITH IN THE 100- PPM ROE

Name	Address	Contact Person	Phone Number
San Juan Co. Compaction and Transfer	141 County Rd 6500 Kirtland, NM 87417		505-334-4520
Phil Charlie	2 County Rd 6480 Kirtland, NM 87417		505-860-0602
Jennifer Tsosie	136 County Rd 6500 Kirtland, NM 87417		505-809-5145
San Juan Meats	118 County Rd 6500 Kirtland, NM 87417		505-598-5060
Angel Gonzalez	118 County Rd 6500 Kirtland, NM 87417		505-598-0372
Jamie Gonzalez	118 County Rd 6500 Kirtland, NM 87417		505-598-5129
Glen Hatch	106 County Rd 6500 Kirtland, NM 87417		505-598-1356
San Juan College West	69 County Road 6500 Kirtland, NM 87417		505-598-5897
El Paso Natural Gas Pigging Station	81 County Road 4900 Bloomfield, NM 87413		800-334-8047 (24 hr)
BHP Mining	16 Miles West of Farmington, NM San Juan County Road RD6800	Dave Hales, Safety Manager	505-598-2311 505-486-1612
American Cell Tower	88 Rd 6500 Kirtland, NM 87417		877-518-6937
Central Consolidated School Bus Barn	76 County Rd 6500 Kirtland, NM 87417		505-598-0132
Hank's RV Park	72 County Rd 6500 Kirtland, NM 87417		505-325-7150
San Juan College	69 County Rd 6500 Kirtland, NM 87417		505-598-5897
Later Saints Church	10 County Rd 6523 Kirtland, NM 87417		505-598-5247 505-598-9297
BHP Mine Vent	300 County Rd 6900 Kirtland, NM 87417		505-598-5558
Riverview Golf Course	583 County Rd 6100 Kirtland, NM 87417		505-598-0140

All entities located within the 500 ppm ROE (listed above) are also located within the 100 ppm ROE and must be called when these entities are contacted.

COMPANY INTERNAL NOTIFICATIONS
SAN JUAN RIVER PLANT PERSONNEL

NAME	TITLE	OFFICE No.	CELLULAR No.	HOME No.
Kent McEvers	Plant Superintendent	505-598-5601 ext. 15523	505-860-7208	505-326-4054
Rick Fetch	Plant Foreman	505-598-5601 ext. 15522	505-947-2416	505-324-6441
Arlyn Thorson	Maintenance Foreman	505-598-5601 ext. 15524	505-947-2417	505-326-6718
Bob McClain	Plant Operator	505-598-5601 ext. 15542	505-330-1966	505-325-8715
Brenda Wilson	Sr. Operations Specialist	505-598-5601 ext. 15521		505-325-6525
Andrew Adame	Plant Operator			505-360-7051
Chee Anderson	Plant Operator			505-326-1397
Glen Daniell	Plant Operator		505-860-7483	505-632-9705
Curtis Day	Plant Operator			505-801-4404
Johnny Foster	Plant Operator			505-801-5062
Frank Hale	Plant Operator		505-860-5897	505-598-9091
Bobby James	Plant Operator			505-598-5314
Melvin Jim	Plant Operator			505-368-4733
Charlie Barr	Mechanic		505-324-1100	505-330-2614
Jerry Darnell	Fieldman			505-632-2722
Ted Francis	Fieldman			505-564-2999
Kent Galyon	Fieldman		505-860-1875	970-565-1006
William Golbe	Mechanic		505-215-2517	505-598-9716
Charlie Medders	Mechanic		505-947-7039	505-598-5573
Corwyn Yazzie	Mechanic		505-793-2567	505-327-3286

COMPANY INTERNAL NOTIFICATIONS
CORPORATE PERSONNEL – THE WOODLANDS, TEXAS

NAME	TITLE	OFFICE No.	CELLULAR No.	HOME No.
Mario Reyes	Operations Mgr	832-636-3234	713-816-5006	281-360-1084
Mike Ross	General Mgr	832-636-3431	832-381-0923	281-296-0385
Tony Marques	Engineering Mgr	832-636-7368		
Chuck Johnson	Commercial Develop. Mgr	832-636-7119		

David Ponikvar	S&H Mgr	832-636-3414	281-732-7887	281-374-8334
Julie Betik	Env & Reg Anal	832-636-2609	281-793-7705	281-320-2066
Eric Weaver	EHS Analyst	432-684-2808	432-413-2494	432-756-3493
Jerry Adams	EHS Mgr	832-636-8304	281-731-5931	281-363-4693
Mike Gray	EHS Director	832-636-2454	281-415-6964	936-271-9869

COUNTY & LOCAL LAW ENFORCEMENT

AGENCY	DAYTIME / 24 HR. PHONE No.
Law Enforcement Dispatch	**911**
San Juan County Sheriff	505-334-6622
Farmington Police	505-327-0222
Navajo Tribal Police	505-368-4333
Ute Mountain BIA	303-565-8471
New Mexico Highway Patrol	505-325-7547
New Mexico FBI	505-325-8631
San Juan County LEPC	505-334-1180
BLM Farmington Office	505-599-8900

MEDICAL SERVICES

AGENCY	EMERGENCY SERVICE	PHONE No.
Emergency Dispatch	Fire & Ambulance	**911**
San Juan County Fire Marshall	Fire Department	505-334-9431
San Juan Regional Medical Center	Hospital	505-325-5011
Emergency Trauma Lifeline Service - Farmington		505-325-5602
Dr. Robert C. Rhein	Doctor	505-327-4867
Dr. Ken Crider	Doctor	505-327-4439
San Juan Air Care Farmington	Air Ambulance	800-452-9990

FEDERAL NOTIFICATIONS

AGENCY	DAYTIME / 24 HR. PHONE No.
National Response Center	800-424-8802
EPA Region 8	800-227-8917
OSHA	800-321-6742
OSHA Area Office New Mexico	505-827-4230
DOT	800-424-8802
BLM Farmington	505-599-8900

NEW MEXICO STATE NOTIFICATIONS

AGENCY	DAYTIME / 24 HR. PHONE No.
New Mexico One Call	800-321-2537
New Mexico Oil Conservation Division	505-334-6178
New Mexico Environmental Department	505-476-4300
New Mexico Emergency Response Commission	505-476-9681
New Mexico Public Utilities Commission	505-490-2375
New Mexico State Patrol	505-325-7547

CONTRACTORS

CONTRACTOR	CONTACT	OFFICE No.	CELLULAR No.
Contractors – General			
IMI Construction		505-325-5005	
Weeminuche Construction	Benton Dean	970-565-7430	

Service Companies Supplies			
Noels Inc		505-327-3375	
ESSO Pipe & Supply		505-325-7568	
Air Gas		505-325-6660	
DXP	Steve Martinez	505-326-3333	
DeWees Tool & Supply		505-326-5491	
Emergency Response & Safety Services			
ChemTrec		800-424-9300	
Hands On Safety Service		505-325-4218	
Electrical Services			
Four Corners Electric		505-325-1459	
B&G Electric		505-325-7511	

OTHER PRODUCERS (which may be notified in the event of a Plant shut down)

COMPANY	CONTACT	OFFICE No.	CELLULAR No.
Burr Oil & Gas	Deana	505-325-1701	
Conoco/Burlington	Jerry Lodermilk		505-320-0452
	Renae	505-330-2946	
DJ Simmons Company	John Byrom	505-326-3753	
Elm Ridge Resources	Office	505-334-3476 ext 210	
	Terry Lindeman	972-749-6941	
El Paso Natural Gas		505-632-6000	
	Emergency Number	800-334-8047	
Nacogdoches Oil & Gas	Aaron	936-697-3750	
Resolute Natural Resources	Office	970-564-5200	
	Montezuma Creek	435-651-3682	
	Roger Atcitty		435-444-0001
Rim Southwest Corporation	Thelma Dee	435-651-4391	
XTO Energy Inc.	Office	505-324-1090	
	John Weaver		505-330-3278

OTHER RESOURCES

COMPANY	OFFICE No.	Website
National Weather Service Albuquerque, New Mexico	505-243-0702	
Farmington Four Corners Regional Airport – National Weather Service		*http://weather.noaa.gov/weather/current/KFMN.html*
Additional Weather Sites		www.accuweather.com www.wunderground.com www.weather.com

APPENDIX H

H_2S PLAN DISTRIBUTION LIST

New Mexico Oil & Gas Conservation Division

New Mexico Environment Department

New Mexico Department of Public Safety (Farmington Office)

New Mexico Department of Public Safety (State Office)

Farmington Fire Department

San Juan County Fire Department

San Juan County Sheriff Department

San Juan County Emergency Manager

San Juan County LEPC

Farmington Police

San Juan Regional Medical Center

San Juan Plant Office

Anadarko Petroleum Corporate Office

Anadarko
Petroleum Corporation

H_2S CONTINGENCY PLAN
(Amendment Related to Acid Gas Injection Well)

San Juan River Gas Plant
Kirtland, New Mexico

WESTERN GAS RESOURCES ASSET HOLDING COMPANY, LLC, a wholly owned subsidiary of Anadarko Petroleum Corporation

(October 2009)

10/6/2009

Preface

This amendment addresses the H_2S Contingency Plan to be implemented with the installation of an acid gas injection well and associated equipment at the San Juan River Gas Plant. In that this Plan addresses *proposed* conditions, it should be noted that the Plan and associated appendices will be updated and a revised Plan duly distributed to reflect the *actual* installation of the well, associated injection facilities and additional monitoring where and if applicable.

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Appendix A – Worst Case Scenario for H_2S Release
Appendix B – Calculation for Radius of Exposure
Appendix C – Radius of Exposure (ROE) Map Showing H_2S Monitor and Road Block Locations
Appendix D – Plant Diagram - Evacuation Routes, H_2S Monitoring and Alarm Locations
Appendix E – Description of Emergency Response Equipment
Appendix F – H_2S Contingency Plan - Response Flow Diagram(s)
Appendix G – Emergency Call List
Appendix H – H_2S Plan Distribution List

I. INTRODUCTION

The San Juan River Gas Plant (hereinafter the "Plant") is a natural gas processing plant which handles and/or generates hydrogen sulfide and/or sulfur dioxide; therefore this Hydrogen Sulfide Contingency Plan (the "H_2S Plan" or "the Plan") has been developed: 1) to satisfy the New Mexico Oil Conservation Division Rule 11, 2) to conform with API "Recommended Practices for Oil and Gas Producing and Gas Processing Plant Operations Involving Hydrogen Sulfide," RP 55, and 3) to create a site-specific hydrogen sulfide contingency plan that outlines the emergency response procedures that will be implemented to ensure a coordinated, efficient and immediate action Plan for alerting and protecting operating personnel and the public as well as to prevent or minimize environmental hazards and damage to property. The terms used in this Plan are to be used in the same manner as defined in Title 19 Chapter 15 Part II of the New Mexico Administrative code (19.15.11.7- Definitions) unless otherwise defined herein.

A. PLANT DESCRIPTION & MAP (Figure 1)

The Plant is located in Kirtland, San Juan County, New Mexico and encompasses 300+ acres. It is owned and operated by Western Gas Resources Asset Holding Company LLC, which is a wholly owned subsidiary of Anadarko Petroleum Corporation (hereinafter collectively referred to as the Company).

More specifically, the Plant is located in Section 1, Township 29N, Range 15 W in Kirtland, San Juan County, New Mexico.

1. Its coordinates are:
   Latitude: 36.453 N **Longitude: 108.220 W**

2. Its physical address is:
   99 County Road 6500, Kirtland, New Mexico 87417

3. Its mailing address is:
   P. O. Box 70, Kirtland, New Mexico 87417

4. Driving Directions from Farmington, New Mexico to the Plant:

   From the intersection of US Highway 64 and the La Plata Highway (New Mexico Highway 170), travel west on US Highway 64 approximately 6.2 miles to the intersection of US Hwy 64 and County Road 6500 in Kirtland, New Mexico. Turn right on County Road 6500 and travel north approximately 1.7 mile to the entrance to the San Juan River Gas Plant.

The location of the Plant is illustrated herein on Figure 1.

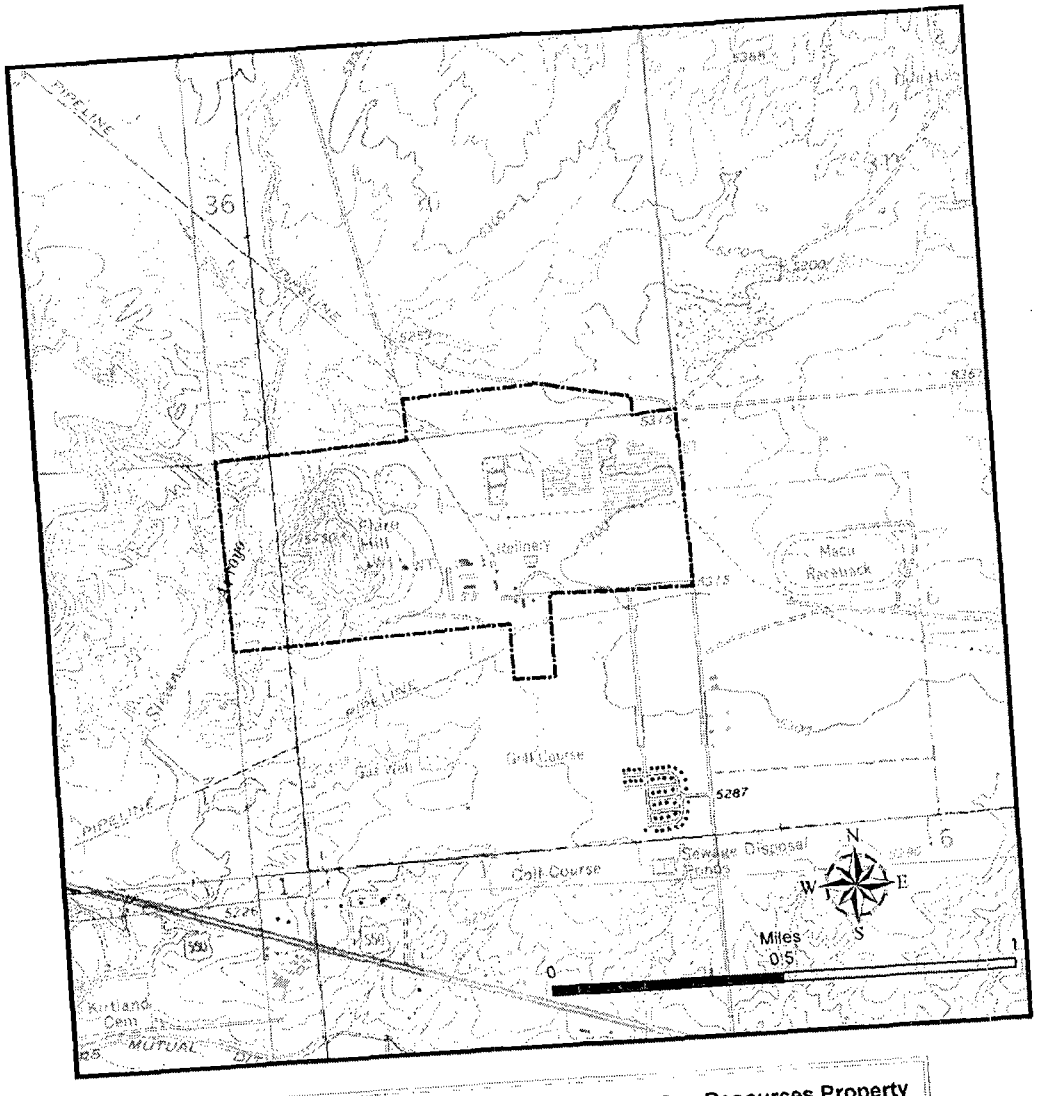


Figure 1 Anadarko San Juan River Plant Location

B. DESCRIPTION OF OPERATIONS

1. The Plant operations include gas processing, conditioning and compression, as well as flow lines and storage tanks. The Plant gathers produced natural gas from San Juan County, New Mexico, as well as, from Southwestern Colorado, Northeastern Arizona, and Southeastern Utah. Once gathered at the Plant, the produced natural gas is compressed; treated in an amine process for the removal of carbon dioxide and hydrogen sulfide; and dehydrated to remove the water content. The processed natural gas is then sold and shipped to various customers.

2. Because the natural gas that is gathered at the Plant contains hydrogen sulfide ("sour gas"), it must be treated or processed to remove these and other impurities. The carbon dioxide and hydrogen sulfide (H_2S) stream that is removed from the natural gas in the amine treating process is then sent to the Claus sulfur recovery unit whereby sulfur is removed, which results in the generation of molten elemental sulfur. Any residual H_2S is routed to an incinerator where it is combusted into sulfur dioxide.

3. The Plant anticipates the need to process a higher volume of natural gas due to the development of additional natural gas resources in the area. This increased processing capacity will necessitate an expansion of the Plant. The Plant predicts an increase in inlet volume to 50 MMCFD with about 6000 ppm H_2S content. The Plant has proposed the installation of an acid gas injection (AGI) well to accommodate disposal of the acid gas stream generated by existing and expanded operations. The expanded operation is expected to generate approximately 3.80 MMCFD of acid gas for disposal. The existing sulfur reduction unit (SRU) currently being used to treat the acid gas will be replaced by the AGI well following approval of the AGI well permit by NMOCD and successful completion of the AGI well.

II. THE PLAN

A. RESPONSIBILITY FOR CONFORMANCE WITH THE H_2S PLAN

It is the responsibility of all personnel on-site to follow the safety and emergency procedures outlined in the Hydrogen Sulfide Contingency Plan (the H_2S Plan) as well as the following documents:

- Anadarko Petroleum Corporation Safety & Health Manual
- Anadarko Petroleum Corporation Emergency Response & Oil Spill Contingency Plan; and
- Anadarko Petroleum Corporation Environmental Policies and Programs.

B. REVISIONS TO THE PLAN

The H_2S Plan will be reviewed annually and revised at this time as necessary to address changes to the Plant facilities, operations, or training requirements, contact information

and the public areas including roads, businesses, or residents potentially affected by the operations of the Plant, specifically those areas within the radii-of-exposure.

C. AVAILABILITY OF THE H_2S PLAN

The H_2S Plan shall be available to all personnel responsible for implementation, regardless of their normal location assignment. A copy of the Plan will be maintained at the Plant in the Plant Superintendent's office and at the Anadarko Corporate Headquarters in The Woodlands, Texas. **See Appendix H for the H_2S Distribution List,** which lists all the additional entities that have been provided a copy of the H_2S Plan.

D. CONTENT OF THE PLAN

At a minimum, the H_2S Plan will contain information regarding: 1) the emergency procedures to be followed in the event of an H_2S or SO_2 release that may pose a threat to the Plant, public or public areas, 2) the characteristics of H_2S and SO_2, 3) a facility description, map and/or drawings, and 4) information regarding training and drills to be conducted related to this Plan.

III. PLAN DESIGN CONSIDERATIONS

A. CHARACTERISTICS OF H_2S, SO_2 AND CARBON DIOXIDE

1. Hydrogen Sulfide (H_2S)

The proposed inlet gas streams into the Plant will contain approximately 6,000 ppm (or 0.60 mole percent) of hydrogen sulfide based on data generated from the sampling of the inlet gas at least three times daily.

Hydrogen sulfide is a colorless, toxic and flammable gas, and has the odor of rotten eggs. Hydrogen sulfide gas is heavier than air.

Hydrogen sulfide presents a significant health hazard by paralyzing the respiratory system resulting in serious injury or death.

Hydrogen Sulfide Properties & Characteristics	
CAS No.	7783-06-4
Molecular Formula	H_2S
Molecular Weight	34.082
TWA	10 ppm
STEL	15 ppm
IDLH	100 ppm
Specific Gravity (air = 1.0)	1.189
Boiling Point	-76.5°F

Freezing Point	-121.8°F
Vapor Pressure	396 psia
Autoignition Temperature	518°F
Lower Flammability Limit	4.3%
Upper Flammability Limit	46.0%
Stability	Stable
pH in water	3
Corrosivity	Reacts with metals, plastics, tissues & nerves

Physical Effects of Hydrogen Sulfide		
Concentration		
ppm	**%**	**Physical Effect**
1	.00010	Can be smelled (rotten egg odor)
10	0.0010	Obvious & unpleasant odor; Permissible Exposure Limit; Safe for 8-hour exposure
15	0.0015	Short Term Exposure Limit (STEL); Safe for 15 minutes of exposure without respirator
50	0.0050	Loss of sense of smell in 15 minutes
100	0.0100	Immediately Dangerous to Life & Health (IDLH); Loss of sense of smell in 3-15 minutes; Stinging in eyes & throat; Altered breathing
200	0.0200	Kills smell rapidly; Stinging in eyes & throat
500	0.0500	Dizziness; Unconscious after short exposure; Need artificial respiration
700	0.0700	Unconscious quickly; death will result if not rescued promptly
1,000	0.1000	Instant unconsciousness; followed by death within minutes

2. Sulfur Dioxide (SO_2)

Sulfur dioxide is produced as a by-product of H_2S combustion at the incinerator. The incinerator unit receives the residual hydrogen sulfide and carbon dioxide stream that is routed from the amine unit.

It is colorless, transparent, and is non-flammable, with a pungent odor associated with burning sulfur.

Sulfur dioxide is heavier than air, but will be picked up by a breeze and carried downwind at elevated temperatures. Sulfur dioxide can be extremely irritating to the eyes and mucous membranes of the upper respiratory tract.

Sulfur Dioxide Properties & Characteristics	
CAS No.	7446-09-5
Molecular Formula	SO_2
Molecular Weight	64.07
TWA	2 ppm
STEL	5 ppm
IDLH	100 ppm
Specific Gravity (air = 1.0)	2.26
Boiling Point	14°F
Freezing Point	-103.9°F
Vapor Pressure	49.1 psia
Autoignition Temperature	N/A
Lower Flammability Limit	N/A
Upper Flammability Limit	N/A
Stability	Stable
Corrosivity	Could form an acid rain in aqueous solutions

Physical Effects of Sulfur Dioxide	
Concentration	**Effect**
1 ppm	Pungent odor, may cause respiratory changes
2 ppm	Permissible exposure limit; Safe for an 8 hour exposure
3-5 ppm	Pungent odor; normally a person can detect sulfur dioxide in this range
5 ppm	Short Term Exposure Limit (STEL); Safe for 15 minutes of exposure
12 ppm	Throat irritation, coughing, chest constriction, eyes tear and burn
100 ppm	Immediately Dangerous To Life & Health (IDLH)
150 ppm	So irritating that it can only be endured for a few minutes
500 ppm	Causes a sense of suffocation, even with first breath
1,000 ppm	Death may result unless rescued promptly.

3. Carbon Dioxide

The proposed inlet gas streams to the Plant will contain approximately 7% carbon dioxide based on the anticipated additional gas to the Plant which will be confirmed with inlet gas monitoring readings. Carbon dioxide gas is colorless, odorless, and non-flammable. Carbon dioxide is heavier than air.

Carbon Dioxide Properties & Characteristics	
CAS No.	124-38-9
Molecular Formula	CO_2
Molecular Weight	44.010
TWA	5,000 ppm
STEL	30,000 ppm
IDLH	40,000 ppm
Specific Gravity (air = 1.0)	1.5197
Boiling Point	-109.12°F
Freezing Point	-69.81°F
Vapor Pressure	830 psia
Autoignition Temperature	N/A
Lower Flammability Limit	N/A
Upper Flammability Limit	N/A
Stability	Stable
pH in saturated solution	3.7
Corrosivity	dry gas is relatively inert & not corrosive; can be corrosive to mild steels in aqueous solutions

Physical Effects of Carbon Dioxide	
Concentration	**Effect**
1.0 %	Breathing rate increases slightly
2.0 %	Breathing rate increases to 50% above normal level. Prolonged exposure can cause headache, tiredness
3.0 %	Breathing rate increases to twice normal rate and becomes labored. Weak narcotic effect. Impaired hearing, headache, increased blood pressure and pulse rate
4 – 5 %	Breathing increases to approximately four times normal rate, symptoms of intoxication become evident, and slight choking may be felt
5 – 10 %	Characteristic sharp odor noticeable. Very labored breathing, headache, visual impairment, and ringing in the ears. Judgment may be impaired, followed within minutes by loss of consciousness
10 – 100 %	Unconsciousness occurs more rapidly above 10% level. Prolonged exposure to high concentrations may eventually result in death from asphyxiation

B. RADII OF EXPOSURE (ROE)

For the existing operations, the "Radius of Exposure" for both 500-ppm and 100-ppm of H_2S gas was determined using the "escape rate", which is calculated using the maximum daily rate of the gaseous mixture that is handled by the Plant. The rates and other variables used to calculate the ROE is discussed in greater detail in **Appendix B - ROE calculations. Also refer to Appendix C - map showing 500-ppm ROE and the 100-ppm ROE.**

500-ppm ROE	**1634 feet**
100-ppm ROE	**3576 feet**

IV. EMERGENCY ACTION PROCEDURES

A. EMERGENCY RESPONSE ORGANIZATION

The Plant uses the Incident Command System (ICS) for emergency response. The ICS structure used is based on the National Interagency Incident Management System (NIIMS), and is consistent with the National Contingency Plan (NCP).

In the event of an accidental release that results in the activation of the H_2S Plan and all personnel have been evacuated out of the affected area, the Plant Superintendent, or his designee, will be the On-Scene Incident Commander (IC in this Plan). The IC will contact and coordinate with Anadarko's management in corporate office. If the severity of the response requires activation of the Emergency Response Center in The Woodlands, Texas office, the ICS structure will be staffed per the Anadarko Southern Region Emergency Response & Oil Spill Contingency Plan Manual. The staffing will not change the H_2S Plan contained herein.

The Plant Superintendent or his designee shall determine:

1) Plant Shutdowns
2) Isolation of pipeline segments
3) Repairs, tests or restarts as required

If an emergency occurs, the Plant Superintendent, or his designee, shall be notified first. The Plant Superintendent, or his designee, shall notify Anadarko's Office in The Woodlands, Texas

B. EMERGENCY RESPONSE

This section explains the procedures and decision to be used in the event of an H_2S release; much of which has been pre-determined to ensure a coordinated, efficient and

immediate action Plan for alerting and protecting operating personnel and the public as well as to prevent or minimize environmental hazards and damage to property.

1. OBJECTIVE

All Plant employees shall be prepared to respond to an H_2S or SO_2 emergency at the Plant. Emergency response actions may be taken for a variety of situations that may occur in the Plant. The Plan is activated in progressive levels based on the concentration of H_2S that has been released. The Plant has three (3) activation levels that are described below and in detail in the Response Flow diagram in **Appendix F**.

Level 1 – Intermittent alarm sounded and/or flashing red beacons activated for H_2S greater than 10 ppm

Level 2 – Continuous alarm sounded and/or flashing red beacons activated for H_2S greater than 20 ppm

Level 3 – Catastrophic release; fire; explosion; a continuous release of maximum volume for 24 hours; or Rule 11 Mandatory Activation for 100 ppm in any defined public area; 500 ppm at any public road; or 100 ppm at a distance greater than 3000 feet from the site or the release. Because the 100 ppm boundary is greater than 3000 ft from the site of release, a Level 3 response would occur before the escape of the 24 hour release volume.

As soon as the Plan has been activated based on the criteria above, the Plant Superintendent, or his designee, should be notified.

2. PLANT EVACUATION AND EMERGENCY ASSEMBLY AREAS

A. Plant evacuation for all visitors and Plant personnel that are not operators begins at the 10 ppm H_2S intermittent alarm and/or flashing red beacon. The Plant operators are to put on the 30-min SCBA and first determine if any personnel are in distress and assist any distressed personnel in evacuating to Emergency Assembly Area 1. Emergency services (911) will be contacted if there are injuries or as otherwise deemed necessary. BHP Mines and Praxair and the unmanned facilities within the 500 ppm radius of exposure (**Appendices C and G)** are also to be notified. The operators will then, wearing the SCBA, investigate the cause of the release. At the sound of the alarm and/or flashing red beacons, all other personnel in the Plant are to stop work, check the prevailing wind direction and immediately proceed along designated evacuation routes and/or upwind to the pre-designated Emergency Assembly Area(s) that are described in **Appendix F**.

Prevailing winds for the area are from the east and evacuation along the designated routes should be upwind. If the designated evacuation route is

downwind of the release (based on the windsock), then all evacuees should proceed upwind to the Emergency Assembly Areas

The Plant evacuation diagram showing evacuation routes and Emergency Assembly Areas is attached in **Appendix D.**

The Emergency Assembly Area 1 is:

Parking Area on the eastside of the Plant Superintendent Office Building (see Appendix C & D)

The Emergency Assembly Area 2 is:

Area at Plant Rd and Hwy 6500 (see Appendix C)

The Emergency Assembly Area 3 is:

Kirtland Elementary School Parking Lot , 30 Road 6446 (see Appendix C)

B. Roll call shall be conducted at the Emergency Assembly Area to assure all personnel have evacuated safely. This facility is a PSM facility and requires all visitors check in before entering the Plant, thus the check-in sheet will be used at the Emergency Assembly Areas to make a full accounting of all personnel and visitors.

3. IMMEDIATE ACTION PLAN/ INITIAL RESPONSE

The following outlines the immediate action Plan that is illustrated by flow diagram in **Appendix F**. This is to be used when responding to an H_2S release. Additional or long term response actions will be determined on a case-by-case basis, if needed, once the Incident Command Center and System is established following the immediate response.

LEVEL 1 RESPONSE

1. The audible signal for a Plant emergency and evacuation is an intermittent horn (repeating off/on) activated when levels of H_2S of 10 ppm are detected. The frequency of this intermittent alarm will increase as the concentration of the H_2S increases. In addition, a flashing red light or beacon will be activated at 10 ppm H_2S. A control panel in the Plant control room establishes which H_2S monitor has activated the alarm and or flashing red beacon, be it a plant monitor or a perimeter monitor. At the initial sound of the intermittent alarm or the flashing red beacon,

each operator (2 per shift) will put on a 30 minute SCBA and all other personnel in the Plant complex shall immediately evacuate the Plant using the evacuation routes to the Emergency Assembly Area 1 (see **Appendix D**). A fixed H_2S perimeter monitor at Emergency Assembly Area 1 has a H_2S concentration read out to assure safety or further evacuation to Assembly Area 2 (>10 ppm). The operators, upon suit up with the SCBA, will first help any persons in distress evacuate to the Emergency Assembly Area. If deemed necessary by the Senior Operator, local emergency response service providers will be contacted by Plant personnel designated by the Senior Operator.

2. All entities within the 500 ppm ROE (see **Appendices C and G**) and BHP Mines will be notified of a release by personnel designated by the Plant Superintendent or his designee. The nature of the release and status of containment will be conveyed. Parties will be advised to report the incident to employees working near the Plant and to alert any third party contractors or service companies working in the Plant vicinity or imminently scheduled to work in the Plant vicinity of the release. All should be instructed to leave the area and not to enter/re-enter area until further notice.

3. Wearing the SCBA, the operator(s) will attempt to fix the cause of the release. OSHA guidelines allow operators to work in areas with 10ppm for up to 8 hours. The H_2S levels at the Emergency Assembly Area 1 will be monitored with a hand held or personal monitor as well as with the fixed monitor.

4. The Senior Operator will set up secondary re-entry team(s) with 30 min. SCBA to re-enter and resolve the situation. Re-entry will occur in 15 minute shifts at the direction of the IC until the problem is resolved or the ESD activated. If H_2S levels in Emergency Assembly Area 1 exceed 10 ppm, evacuate to Emergency Assembly Area 2 and continue to monitor Assembly Area H_2S level. In addition, a fixed H_2S perimeter monitor at Assembly Area 2 has a H_2S concentration read out. If evacuation to Emergency Assembly Area 2 occurs, a road block to the Plant entrance will be established. If release is resolved and monitored levels in the Plant are less than 10 ppm, personnel may re-enter the Plant. BHP, Praxair and the unmanned facilities within the 500 ppm radius of exposure (**Appendices C and G**) will be notified once release is contained and monitored H_2S levels are less than 10 ppm The OCD shall be notified within one hour of any release that activates the Plan. If the release is not resolved and H_2S levels continue to increase, Level 2 Response is indicated.

LEVEL 2 RESPONSE

1. The continuous alarm and indicates the detection of H_2S greater than 20 PPM. Flashing red beacons indicate a H_2S release of 10 ppm or greater and they will continue for a release of 20 ppm or greater. A control panel in the Plant control room establishes which H_2S monitor has activated the alarm and or flashing red beacon, be it a plant monitor or a perimeter monitor. At the initial sound of the

continuous alarm or observance of the flashing red beacons, the operators will immediately put on a 30 minute SCBA and all other personnel in the Plant complex will put on emergency escape packs if they are wearing them and evacuate along with all other personnel using the evacuation routes to the Emergency Assembly Area 2 (see **Appendix C**). With the evacuation to Emergency Assembly Area 2, a road block to the Plant entrance will be established. A fixed H_2S perimeter monitor at Assembly Area 2 has a H_2S concentration read out to assure safety or further evacuation to Assembly Area 3 (>10 ppm). The operators, upon suit up with the SCBA, will first help any persons in distress evacuate to the Emergency Assembly Area. If deemed necessary by the Senior Operator, local emergency response service providers will be contacted by Plant personnel as designated by the Senior Operator.

2. Praxair is trained to evacuate at continuous alarm sounds. Praxair, BHP Mines and all other entities within the 500 ppm ROE (see **Appendices C and G**) will be contacted by phone and notified of release and asked to evacuate, if they have not already. All entities within the 100 ppm ROE (see **Appendices C and G**) will be contacted by phone and notified of release. The nature of the release and status of containment will be conveyed. Depending on release status and prevailing wind conditions, some entities within the 100 ppm ROE may be asked to shelter in place or evacuate Notifications will include but are not limited to the following:

   - Praxair, BHP and all unmanned businesses will be instructed to alert all company personnel, third party contractors and/or services companies working in the area and those imminently scheduled to work in the area, of the release and evacuation status of the Plant. They should be instructed to immediately leave and/or not enter/re-enter the Plant vicinity until further instruction.

   - BHP will be advised to check ventilation shaft status within the 500 and 100 ppm ROE and take internal company pre-emptive safety action(s) as deemed appropriate.

   - Riverview Golf Course will be instructed to clear the course of both employees and golfers until further notice.

   - San Juan College will be notified of the release and depending on prevailing wind conditions may be requested to shelter in place or evacuate.

   - Other entities within the 100 ppm ROE, depending on release status and prevailing wind conditions, will be asked to shelter in place. Those entities will be instructed to close any windows and shut off any air conditioning/heating until further notice. In addition, they will be instructed to contact other employees/residents not currently present to not enter/reenter the area until further instruction.

3. The LEPC and law enforcement will be contacted by phone and notified of the release and status of containment. The Plant Superintendent or his designee will assign personnel notification responsibility.

4. Operator(s) with 30 minute SCBA will assess the release and attempt to resolve it. If after 15 minutes there is no resolution, the operator(s) will activate the ESD and will evacuate to Emergency Assembly Area 2.

5. If monitored H_2S levels at Emergency Assembly Area 2 exceed 10 ppm, evacuate to Emergency Assembly Area 3, Kirtland Elementary School parking lot. If deemed necessary, local emergency response service providers will be contacted by the operator.

   a) Re-entry will occur in full SCBA and in 15 minute shifts at the direction of the IC until IC determines problem has been resolved or additional ESD (pipeline) activated.

   b) If release is resolved and monitored levels of H_2S in the Plant are less than 10 ppm, personnel may return to Plant. The OCD shall be notified within one hour of any release that activates the Plan. All entities previously notified will be informed that the release has been resolved and advised of the current monitored H_2S levels at the Plant.

   c) No resolution requires activation of full H_2S Plan with notifications and reporting as per Plan. If the release is not resolved and/or H_2S levels continue to increase, Level 3 Response is indicated.

LEVEL 3 RESPONSE

1. For H_2S at 20 ppm or greater at Assembly Area 2, repair efforts at Level 2 unsuccessful, worst case scenario, and/or catastrophic release have occurred then implement a Level 3 response.

2. Road blocks will be set up at the intersection of County Road 6500 and County Roads 6446 and 6480. In addition, a roadblock will be set up at the intersection of County Road 6520 and County Road 6527 on the west, and where 6520 turns south on the east. A roadblock will also be set up on the Indian Service Route outside the 100 ppm ROE (approximately 4000 feet north of the Plant) (see **Appendix C**.)

3. All personnel shall have evacuated to Emergency Assembly Area 3, Kirtland Elementary School. Evacuation of all entities within the 500 ppm ROE will have been confirmed. Implement full H_2S Plan with all notifications and public agency involvement. Notifications to all entities within the 100 ppm ROE will include the nature of the release and status of containment. Notifications will include but are not limited to the following:

- All businesses within the 100 ppm ROE will be instructed to immediately alert all company personnel, third party contractors and/or services companies working in the area and those imminently scheduled to work in the area, of the release and evacuation status of the Plant. They will be instructed to immediately leave and/or not enter/reenter the area within the roadblocks until further instruction.
- All other entities (including private residents) within the 100 ppm ROE will be instructed to immediately shelter in place. Those entities will be instructed to close any windows and shut off any air conditioning/heating until further notice. In addition, they will be instructed to contact other employees/residents not currently present to not enter/reenter the area until further instruction.
- BHP will be advised to check ventilation shaft status within the Plant vicinity and take internal company pre-emptive safety action(s) as deemed appropriate.
- Riverview Golf Course will be instructed to immediately clear the course of both employees and golfers and to shelter in place. Those entities will be instructed to close any windows and shut off any air conditioning/heating until further notice. In addition, they will be instructed to contact other employees not currently present to not enter/reenter the area until further instruction.
- San Juan College will be notified of the release and advised to shelter in place. Those entities will be instructed to close any windows and shut off any air conditioning/heating until further notice. In addition, they will be instructed to contact other employees not currently present to not enter/reenter the area until further instruction. Depending on the event circumstances, the IC commander will make a summary judgment, based on but not limited to H_2S concentration and wind direction, whether a safe evacuation should be implemented and advise on evacuation route.

4. If escaping vapors have been ignited, the vapors should be allowed to continue to burn unless the fire endangers personnel, other property, or other equipment.

5. When applicable: Maintain communication with the Plant Superintendent, or his designee, to keep him up-to-date of the situation and the action taken prior to his arrival at the location.

6. Initiate and maintain a Chronological Record of Events log.

7. Within one hour after the activation of the H_2S Plan, begin agency notifications by calling OCD and NRC.

8. Establish media staging area adjacent to Assembly Area 3 and direct all media to it.

9. Once resolved and monitored levels in the Plant and at Assembly Area 2 are less than 10 ppm, roadblocks will be removed, and all entities within the 100 ppm ROE will be allowed to return. All entities previously notified will be informed that the release had been resolved and advised of the current monitored H_2S levels.

10. Agency reports to be submitted as required.

4. EMERGENCY SHUTDOWN SYSTEM

The Plant has an extensive Emergency Shut Down (ESD) system that is located within the Plant and in various locations along the pipelines that feed the Plant. The ESD is designed to prevent a Level 3 response. See **Appendix E** for a more detailed description of the ESD.

5. NOTIFICATIONS AND REPORTS

The Plant has various notification and reporting obligations. Some are related to its state air quality permit that is overseen by NMED as well as well as state and federal spill reporting obligations. In addition to the regulatory obligations noted above, Plant personnel also have internal and external notification and reporting obligations associated with the activation of this Plan.

A. DISCOVERY AND INTERNAL REPORTING

1. All Plant personnel who perform maintenance and/or repair work within the Plant wear H_2S monitoring devices to assist them in detecting the presence of unsafe levels of H_2S. When any Plant personnel while performing such work discover a leak or emission release they are to attempt to resolve the issue as long as H_2S levels remain below 10 ppm. The personal monitoring devices they wear will give off an audible alarm at 10 ppm. These devises are to be worn as low on the body as possible since H_2S is heavier than air and will tend to stand or accumulate in low lying areas. If the response action needed to resolve the issue is more than simply closing a value or stopping a small leak, the Plant personnel shall notify the Plant Superintendent, or his designee and convey, at a minimum, the following information:

- Name, telephone number, and location of person reporting the situation; and
- Type and severity of the emergency; and
- Location of the emergency (area/block, mile markers, latitude & longitude, or building), and the distance to surrounding equipment and/or structures; and
- The cause of the spill or leak, name and quantity of material released, and extent of the affected area including the degree of environmental hazard; and
- Description of injuries and report of damage to property and structures; and
- Initiate and maintain a Chronological Record of Events log. This record should record the time, date, and a summary of the event.

2. If the Plant personnel detect H_2S levels greater than 10 ppm either as a result of his/her personal monitoring device or the Plant intermittent alarm and/or red flashing beacon, Plant operators are to contact their immediate supervisor for assistance and put on the 30-min SCBA so they can attempt to resolve the issue. All non essential persons shall be notified of the release and evacuated from the area. Operators wearing the SCBAs are to first assist any persons requiring assistance during the evacuation, then attempt to resolve the issue. The immediate supervisor is then responsible for notifying the Plant Superintendent or his designee so that the IC system can be implemented and H_2S Plan activated if necessary.

3. Once the Plant Superintendent is contacted, he or his designee is to notify the appropriate Corporate management, EHS personnel, Plant emergency response personnel, and advise them of the existing emergency situation. Corporate management will then conduct the reporting up that is necessary based on the situation.

4. Plant personnel are to advise any contractor, service company, and all others on-site or attempting to enter the Plant that the H_2S Plan has been activated.

B. PUBLIC AWARENESS AND COMMUNICATION

Public awareness and communication is a primary function of the H_2S Plan. The Company has compiled a list of various public, private, state and local contacts that are to be notified at various phases during the activation of the Plan. Refer to the Response Flow diagram in **Appendix F** that indicates when certain entities are to be contacted in event of activation of this Plan. **Appendix G** is a listing of the entities to be contacted and **Appendix H** is a list of community organizations that have received a copy of the Plan. Company will inform all state and local response organizations of its Plan as well as those businesses that fall within its 500-ppm and 100-ppm ROE as illustrated in **Appendix C**.

corporate offices (in the case of unmanned facilities) will be notified if the Plan is activated as per the immediate action Plan.

Within the 500 ppm ROE:

One manned business (Praxair) and four (4) unmanned businesses are located within the 500 ppm radius of exposure (see **Appendix G**). Praxair will be notified immediately if the Plan is activated. The corporate offices of the four unmanned businesses will also be notified immediately if the Plan is activated according to the level specific procedures described above.

Most of the Riverview Golf Course is also located within the 100ppm radius of exposure. Riverview Golf Course will also be notified immediately as described above if the Plan is activated.

6. SITE SECURITY

A. In order to have an accurate listing of all personnel on-site in the event of an emergency, a daily sign-in log sheet shall be utilized. The sign-in log sheet shall include at a minimum the person's name, the company name, the time of arrival, and the time of departure.

B. The Incident Commander shall be responsible to assure that all personnel sign-in upon arrival and sign-out upon departure from the job site.

C. The Incident Commander may at his discretion assign the responsibilities for the daily sign-in log sheet to the individual designated as the Record Keeper or another designee.

D. At the discretion of the Incident Commander, a security coordinator and/or a security team may be established, and the access to the job site restricted.

E. For any evacuation to Emergency Assembly Area 2, a road block at the Plant entrance will be established to prevent further entrance to the Plant.

F. For a Level 3 release a road block would be set up at the intersection of County Road 6500and County Roads 6446 and 6480. In addition, a roadblock would be set up at the intersection of County Road 6520 and County Road 6527 on the west, and where 6520 turns south on the east. A roadblock will also be set up on the Indian Service Route outside the 100 ppm ROE (approximately 4000 feet north of the Plant).

C. PUBLIC AREAS, NEARBY BUSINESSES AND RESIDENTS

The contact information for all residents, businesses and public areas is contained in **Appendix G**. All entities within the 500 ppm and 100 ppm radius of exposure will be contacted by Plant personnel as designated by Plant Superintendent if the Plan is activated and based on response level as described in the Immediate Action Plan and advised of the following:

- The nature and extent of the release/emergency at the Plant and recommendations for protective actions, such as evacuation or shelter-in-place
- Any other event specific information that is necessary to protect the public; and
- Updates as to the status of the release and continued safety measures to be taken, including but not limited to when to evacuate and/or when it is safe to return to the area.

1. Residences or Public Roads:

Public Road 6500 is within the 100 ppm radius of exposure, and portions of Public Roads 6520, 6257 and Cemetery Road are slightly within the southernmost extension of the 100 ppm radius of exposure. Similarly, a small portion of Public Roads 6448 and 6480 are slightly within the eastern portion of the 100 ppm radius of exposure (see **Appendix C**). The specific residences included within the 100 ppm radius of exposure are listed on **Appendix G** along with addresses and contact phone numbers.

2. Businesses or Other Public Areas:

All businesses included in **Appendix G** will be provided with a copy of the H_2S Plan and will be contacted about participation when local emergency response training events or drills occur.

Within the 100 ppm ROE:

The public areas located within the 100 ppm radius of exposure are identified in **Appendix G**.

BHP will be contacted when the Plan is activated to ensure that the out of service vent pipes have not been activated. Currently, there are inactive BHP Mining ventilation pipe ducts within the 100 ppm radius of exposure which have been closed by manual valves.

Additional businesses within the 100 ppm radius of exposure are listed on **Appendix G** and they will be notified if the Plan is activated as per the various levels of the immediate action Plan described above. These businesses or their

7. SIGNS & MARKERS

The Plant has warning signs indicating the presence of H_2S/Poisonous Gas and high pressure gas at the entrance to the Plant. Emergency response phone numbers are posted at the entrance to the Plant. Signs are located at the Plant gate entrance indicating that all visitors are to sign in.

8. FIRST-AID STATION

The first aid station will be located at the Emergency Assembly Area.

FIRST AID KITS are located:

- **Plant Superintendent Office Building,**
- **Maintenance/Safety Office Building, and**
- **Each company vehicle**

9. MEDIA SITE

A. If a Level 2 or 3 Response occurs, the Media Site will be located adjacent to Emergency Assembly Area 3.

B. At no time shall any unescorted representative from the media be allowed any closer to the Plant than the Media Site location, unless approved by the Incident Commander, the Safety Officer, and the Media Relations Officer.

10. EMERGENCY AND SAFETY EQUIPMENT

Refer to **Appendix E and Appendix D** for information pertaining to the Plant's emergency and Safety equipment. In addition, see **Appendix C** for the location of additional H_2S sensors that will be installed outside the Plant boundary as part of the Plant expansion related to the AGI well permit.

V. TRAINING/DRILLS/EDUCATION

A. TRAINING

1. Training on the H_2S Plan
   - Inclusion of local officials and LEPC
   - Public areas and businesses (within the ROE)
   - Those on the Plan distribution list

2. Other Emergency Response Related Training

Anadarko/Western has an extensive safety training program and addresses various aspects of job related hazards. All training records for the Plant are maintained at the Plant. The following is a limited list and summary of the training programs that relate to the H_2S Plan and Emergency Response:

- Plant Orientation Training - All Plant personnel, visitors, and contractors must attend a Plant overview orientation prior to obtaining permission to enter the Plant. A refresher course on this training is required annually for all persons. This training also complies with the requirements of the Anadarko and Plant's Process Safety Management Program and Procedures Manuals.

- Hydrogen Sulfide and Sulfur Dioxide Training – All Plant personnel receive annual refresher training on hydrogen sulfide and sulfur dioxide, which is conducted by Anadarko personnel. If an individual is unable to attend, they may be required to attend a third party training session. Hydrogen sulfide training cards are issued as documentation of this training. All contract employees and visitors are required to have had hydrogen sulfide training and to provide the Plant a copy of their certification card prior to obtaining permission to enter the Plant.

- Respirators - All Plant personnel, with the exception of the Plant Operations Specialist, are trained annually on the proper use of respirators. In addition to the annual training, all Plant personnel with the exception noted above are fit tested annually on the respirators. Except for the Plant Operations Specialist, all Plant personnel must have medical clearance to work in the Plant. Medical clearance is mandatory for H_2S certification. Medical clearance review for work in a H_2S environment is conducted on a bi-annual basis unless the individual has experienced medical problems within that two year interval that requires updating the medical clearance.

- Hazard Communication - All Plant personnel are trained annually on Hazard Communication and SARA Title III Right-to-Know information. The annual training includes, at a minimum, a review of material safety data sheets (MSDS) for those materials that are present at the Plant and labeling.

- Personal Protective Equipment (PPE) - All Plant personnel are trained annually on the Anadarko requirements for personal protective equipment (PPE). The training includes, at a minimum, a review of all the types and levels of personal protective equipment and how to select the correct equipment for the job.

B. EMERGENCY RESPONSE DRILLS

1. The Plant will conduct, at least, a tabletop drill annually. Multiple drills during the year may be scheduled at the discretion of the Plant Superintendent or as part of the Emergency Response Center in The Woodlands.

2. The annual drill will exercise this Plan and include, at a minimum, contacting the entities that are identified as being within the 500-ppm ROE and the Local Emergency Response contacts identified on **Appendix G**. The drills will also include briefing of public officials on issues such as evacuation or shelter-in-place plans

3. Drill training will be documented and those records will be maintained at the Plant. The documentation shall include at a minimum the following:

    a. Description or scope of the drill, including date and time
    b. Attendees and Participant to the drill
    c. Summary of activities and responses
    d. Post drill de-brief and reviews

C. EDUCATION

1. All businesses and residents within the 100 ppm ROE will be educated as to plant alarms, when they will be contacted and what it means to shelter in place.

2. All businesses and or residents that could be asked to evacuate will be advised as to best evacuation routes.

APPENDIX A

WORST CASE SCENARIO

The basis for worst case scenario calculations is as follows:

- 6000 parts per million (ppm) or 0.60 mole percent of hydrogen sulfide in the inlet natural gas stream into the San Juan River Gas Plant; and
- a maximum daily (24 hour) processing volume of 50,000 MMCF.
- The worst case scenario radius of exposure (ROE) also assumes an uncontrolled instantaneous release from the area around the AGI well of the above referenced volume and concentration. Because the Plant is a throughput process plant there is no actual way that the entire throughput volume of the Plant could be released instantaneously as is assumed in the worst case scenario calculations of the ROE in **Appendix B** and shown in **Appendix C**; however, to comply with NMAC 19.15.11, we have used that assumption in our worst case scenario formulas/calculations provided in Appendix B.

It should further be noted that the reason this rate, used as worst case, could not be released over a 24 hour period is the Plant's Emergency Shutdown (ESD) systems that would be activated. The ESD would prevent the flow of gas into the Plant in the event of an emergency. The ESD system is discussed in greater detail in **Appendix E**.

APPENDIX B
RADIUS OF EXPOSURE CALCULATIONS

The formulas for calculating the two ROEs (as specified by the regulations) are as follows:

500-ppm RADIUS OF EXPOSURE CACULATION

$$X=[(0.4546)(\text{hydrogen sulfide conc.})(Q)]^{(0.6258)}$$

Where:
X = Radius of exposure in feet
Hydrogen Sulfide Concentration = Decimal equivalent of mole or volume fraction of hydrogen sulfide in the gaseous mixture
Q = Escape rate expressed in cubic feet per day (corrected for standard conditions of 14.73 psi absolute and 60 degrees Fahrenheit)

a) For existing facilities or operations, the escape rate (Q) is the maximum daily rate of the gaseous mixture produced or handled or the best estimate thereof. For the San Juan River Gas Plant, after the installation of the AGI well, the Company is using for contingency planning purposes an "escape rate" equal to the anticipated (maximum) inlet gas volume of 50,000 MCFD. The (actual) inlet gas volume at the Plant will be somewhat variable and is continuously metered. The Plant records daily inlet gas volumes and prepares a daily volume report. The assumed 50,000 MCFD inlet gas volume has been selected as the "escape rate" because it is the highest anticipated inlet volume that the Plant would handle under its proposed operations and is considered worst case interpretation of the volume of gas. It should be noted that the plan will remain effective as long as the processed volume and H_2S content equate to the same ROE. As addressed below.

As to hydrogen sulfide concentration of the inlet gas, daily monitoring data of current operations indicates variable concentrations, but concentration will not exceed 6000 ppm or 0.60 mole percent. Therefore, 6000 ppm or 0.60 mole percent has been used in the worst case scenario for the expanded operations with the AGI well for contingency planning purposes.
Using:
Q = 50,000,000
H_2S conc = 6000 ppm or 0.60 mole%

$$[(0.4546)*(H_2S \text{ concentration})*(\text{gas volume } (Q))]^{0.6258}$$
$$[(0.4546)*(6000*.000001)*(50,000,000]^{0.6258}$$

500-ppm ROE = 1634 feet

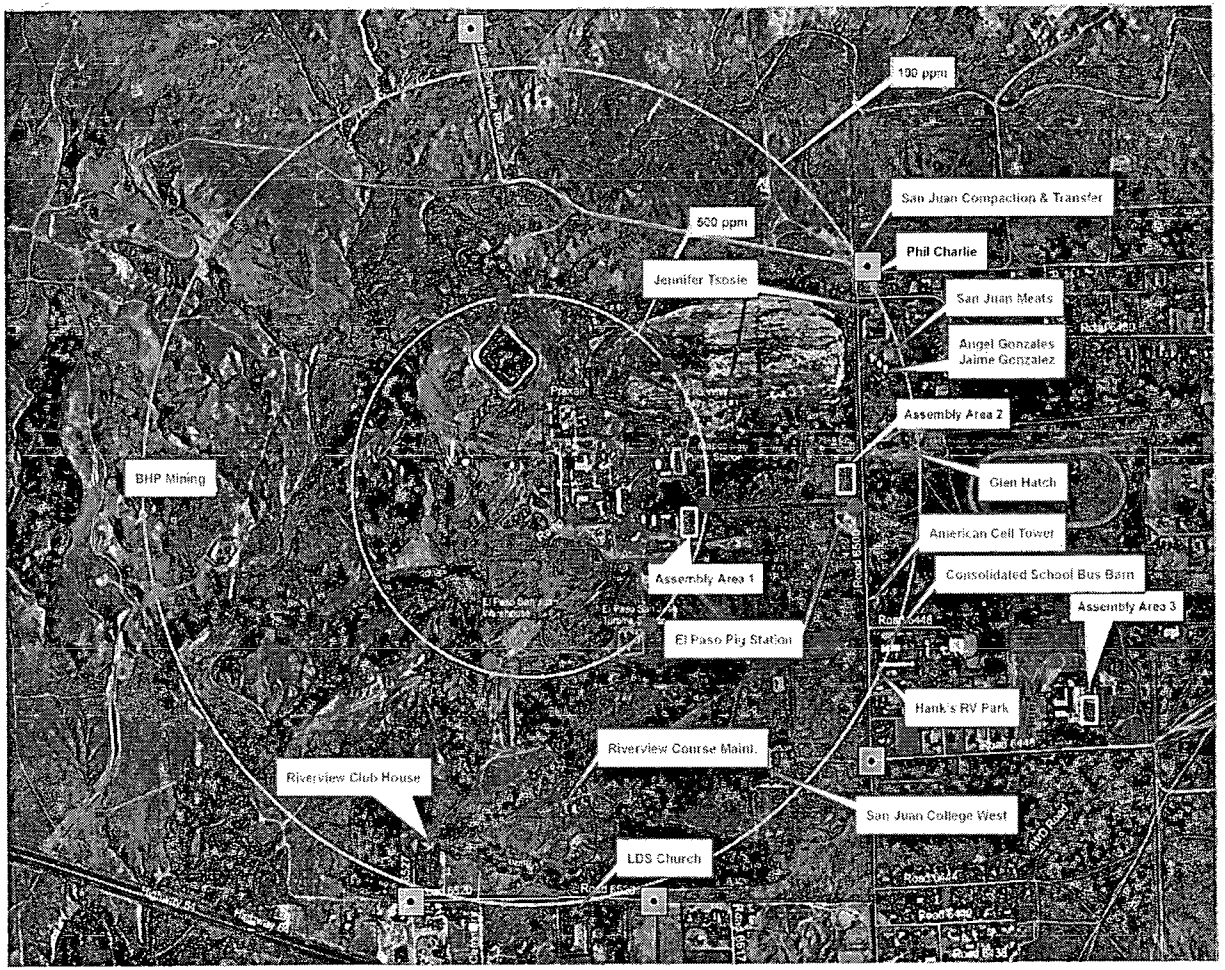
100-ppm RADIUS OF EXPOSURE CALCULATION

$$[(1.589)*(H_2S \text{ concentration})*(\text{gas volume})]^{0.6258}$$
$$[(1.589)*(6000*.000001)*(50,000,000)]^{0.6258}$$

100-ppm ROE = 3576 feet

APPENDIX C

100-PPM AND 500-PPM RADIUS OF EXPOSURE MAP SHOWING LOCATION OF ADDITIONAL OFF-SITE H_2S MONITORS AND LOCATION OF ROADBLOCKS



San Juan River Gas Plant
Hydrogen Sulfide Contingency Plan
Radius of Exposure

PROPOSED OPERATIONS

- ACI West *
- Radius of Exposure
- 1674 ft (500 ppm)
- 3575 ft (100 ppm)
- Assembly Area
- Business

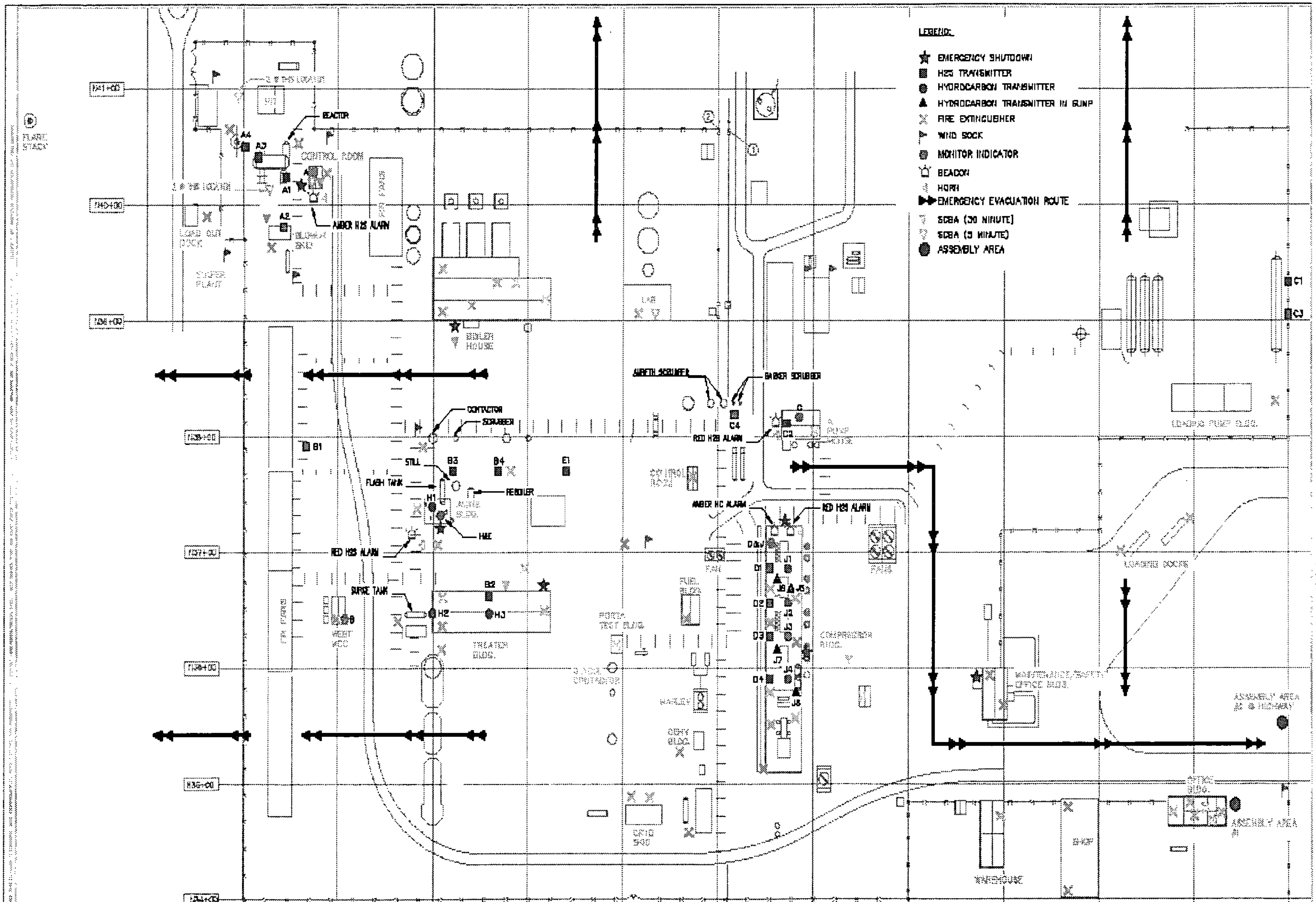
* Based on 50 MMscfd @ 6000 ppm H_2S

- H_2S Monitors
- Road Blocks

Anadarko Petroleum Corporation

APPENDIX D

PLANT DIAGRAM WITH EVACUATION ROUTES & EMERGENCY EQUIPMENT LOCATIONS



NOTES:

REFERENCE DRAWINGS		REVISIONS	
DWG. NO.	TITLE	NO.	DESCRIPTION

Western Gas Resources, Inc.

SAN JUAN RIVER PLANT

EMERGENCY ITEMS AND PLACEMENT

SAN JUAN RIVER PLANT

APPENDIX E

DESCRIPTION OF H_2S MONITORING & ALARM SYSTEMS

A. EMERGENCY SHUTDOWN SYSTEM

There are (8) ESD manual stations located at various points in the facility (**Appendix D**). **The Plant ESD can be activated at any time at the direction of the Plant Superintendent or Incident Commander and is to be activated based on this Plan after 20 ppm H_2S has been detected in the Plant and efforts to resolve the issue for 15 minutes have failed.**

When any one of the eight (8) manual stations is activated, the system will be shutdown and the natural gas inlets and outlets will be blocked. The operators are also able to auto close the two (2) main blocks on the incoming gas lines to the Plant. Activating these should allow the Plant to avoid a Level 3 response. Two miles north of the Plant, on the Barker Dome line and the Aneth line, there are isolating block valves (manual) that can prevent further gas flow into the Plant pipeline system. Also, further upstream on the Barker and Aneth lines there are additional isolating block valves at 6 miles and 8 miles upstream on their respective lines. These block values furthest upstream, isolate the entire system from the field gathering lines coming into the Plant.

The proposed acid gas injection facilities will contain emergency shutdown systems in case of surface equipment failure and/or well failure. The ESD system for the proposed facilities and injection well will be further documented in the Plan upon construction.

B. PLANT ALARMS, VISIBLE BEACONS & WIND INDICATORS

1. Colored beacons, horns, and wind directions indicators are located in various locations throughout the Plant and are indicated on **Appendix D**.

2. The audible signal for an emergency response and Plant evacuation is a repeating intermittent alarm that sounds at 10 ppm H_2S. The frequency of this intermittent alarm will increase as the concentration of the H_2S release increases. The alarm will become continuous when the concentration of the H_2S release is 20 ppm or higher. At the initial sound of this intermittent alarm, the Plant operator will put on a SCBA and all personnel in the Plant complex shall immediately proceed in a safe manner to the Emergency Assembly Areas as prescribed by the Emergency Action Plan on page 19 of this Plan.

3. A flashing red beacon signifies an H_2S release of 10 ppm and all personnel in the Plant complex shall immediately proceed in a safe manner to the Emergency Assembly Area 1 located east of the main office. If this area is not determined to be safe all will move to Assembly Area 2 which is on road 6500 at the main gate on the east side of the facility. Evacuation routes and Assembly Area 1 are indicated on **Appendix D**.

4. A routine process alarm will cause a horn to sound. This horn is a wavering siren sound that is used to alert the Plant Operator to return to the Control Room. No emergency response or evacuation is required when this siren sounds. Flashing beacons are located throughout the Plant and are utilized to

assist the Plant Operator in identifying the location of the Plant alarm or Plant upset. Any beacon colors other than red do not identify an emergency response or evacuation.

5. Wind direction indicators are installed throughout the Plant and at the Plant Superintendent Office Building. At least one wind direction indicator can be seen at any location within the Plant complex, as well as, from any point on the perimeter of the Plant. There are 10 windsocks located in the Plant.

6. Additional permanent off-site H_2S monitors will be placed in the vicinity of the Plant coincident with the calculated radii of exposure as shown on **Appendix C**. These monitors will assist Anadarko in appropriate notification of potentially affected entities in the vicinity of the Plant within the calculated 100 ppm radius of exposure. The perimeter monitors give the operators an indication of H_2S leaving the plant boundaries. The perimeter monitors will activate the plant horn and flashing red beacon as described above. A control panel in the Plant control room/operators building indicates which monitor has triggered the alarm be it a plant monitor or perimeter monitor. All perimeter monitors have an external read out of H_2S concentration. Perimeter monitors can only be monitored from the Plant control room or by a walk up visual reading. In the event the control room is evacuated, the plant ESD system will be activated, substantially reducing the ROE, where perimeter monitors can be safely manually read.

C. GAS DETECTION EQUIPMENT

1. The Plant uses the Industrial Scientific Corporation 4200 Series Remote H_2S Sensors. These sensors are a fixed point monitor to detect the presence of hydrogen sulfide in ambient air. The sensors are connected to Allan Bradley/SLC-500 Rockwell Logic Controllers with an output to Moore Micro-Advantage controllers and from here to the operator's PLC. The red flashing beacon is activated at 10 ppm. The horn is activated with an intermittent alarm at 10 ppm and changes to a steady alarm at 20 ppm. The additional off-site sensors shown on **Appendix C** will be of the same type and calibrated as described in this paragraph for the Plant sensors.

2. The fixed hydrogen sulfide monitors are strategically located throughout the Plant to detect an uncontrolled released of hydrogen sulfide. The SRU has 4 sensors labeled A-1 through A-4. The treating Plant area has 4 sensors labeled B-1 through B-4. There are two sensors at the east side of the Plant labeled C-1 and C-3. There is one sensors located at the liquid stabilizer skid labeled E-1. This is the center of the process area. The compressor building has eight methane sensors; these shut the compressors down at 50% LEL. The compressor building also is equipped with fire eyes that will also shut the units down. The Plant operators are able to monitor the ppm level of H_2S of all the Plant sensors on their control/monitor PLC located in the operator's building. These sensors are all located on the plot plan on **Appendix D**. These sensors all have to be acknowledged and will not clear themselves. This requires immediate action for any occurrence or malfunction. The Plant sensors are calibrated quarterly. Proposed perimeter monitors will be calibrated quarterly as well.

3. Hand held gas detection monitors are available to Plant personnel to check specific areas and equipment prior to initiating maintenance or work on the process or equipment. There are 2 handheld and 9 personal monitors that are used by individuals for special projects and field work. The hand held gas detection devices are BW Technologies 4-gas detectors. The detectors have sensors for oxygen, LEL (explosive hydrocarbon atmospheres), hydrogen sulfide, and carbon dioxide. They indicate the presence H_2S with a beeping sound at 10 ppm. The beeps change in tone as H_2S increases to 20 ppm. The personal monitors are set to alarm (beep) at 10 ppm with the beeps becoming closer together as the H_2S concentration increases to 20 ppm. Both the hand held and personal monitors have digital read outs of H_2S ppm concentration.

D. RESPIRATORS

1. The Plant has 30 minute Self-Contained Breathing Apparatus (SCBA) respirators and 5 minute escape packs strategically located throughout the Plant.

2. The respirator containers are identified in the process area and the locations are identified on **Appendix D.**

3. All Plant personnel with the exception of the Plant Operations Specialist are certified to use the SCBA respirators.

E. FIRE FIGHTING EQUIPMENT

1. The Plant personnel are trained only for insipient stage fire fighting.

2. The fire extinguishers located in the Plant process areas, compressor buildings, process buildings, and company vehicles are typically a 20# Ansul dry chemical fire extinguisher. **See Appendix D.**

3. The Plant does not have a fire water system, but only a utility water system that is not designed for fire fighting.

APPENDIX F

H_2S CONTINGENCY PLAN FLOW DIAGRAM

LEVEL 1 RESPONSE

H_2S DETECTED GREATER THAN 10 PPM &/OR INTERMITTENT ALARM SOUNDS/FLASHING RED BEACONS ACTIVATED

- **OPERATORS PUT ON RESPIRATORS (30 minute SCBA) TO ASSESS & RESOLVE PROBLEM**
  (Operators are allowed under OSHA to work for up to 8 hours in 10ppm H2S environment)
- **ALL OTHERS EVACUATE TO ASSEMBLY AREA 1**
- **NOTIFY PRAXAIR & BHP MINES**

AT ASSEMBLY AREA 1

- **MONITOR H_2S LEVELS AT ASSEMBLY AREA VIA FIXED H2S MONITOR READ OUT OR HAND HELD**
- **OPERATORS WILL SET UP SECONDARY ENTRY TEAMS W/ 30-MIN SCBA TO TRY TO RE-ENTER AND RESOLVE**
- **RE-ENTRY WITH SCBA WILL OCCUR IN 15 MINUTE SHIFTS AT THE DIRECTION OF THE IC UNTIL IC DETERMINES PROBLEM HAS BEEN RESOLVED OR ESD IS ACTIVATED)**

CALL 911 IF INJURY OR DEATH FOR EMERGENCY ASSISTANCE

ONCE RESOLVED & MONITORED LEVELS IN PLANT ARE LESS THAN 10 PPM RETURN TO PLANT

IF H_2S LEVELS AT ASSEMBLY AREA 1 EXCEED 10PPM

EVACUATE TO ASSEMBLY AREA 2

NOTIFY NMOCD WITHIN ONE HOUR MAKE AGENCY REPORTS AS NECESSARY

AT ASSEMBLY AREA 2

- **ESTABLISH ROAD BLOCK OF PLANT ENTRANCE**
- **MONITOR H_2S LEVELS AT ASSEMBLY AREA VIA FIXED H2S MONITOR READ OUT OR HAND HELD**
- **FOLLOW LEVEL 2 RESPONSE ACTIONS**

NOTIFY LEPC AND OTHER PUBLIC OFFICIALS AND EMERGENCY SUPPORT SERVICES

LEVEL 2 RESPONSE

H_2S LEAK DETECTED GREATER THAN 20 PPM &/ CONTINUOUS ALARM SOUNDS/FLASHING RED BEACONS ACTIVATED

- OPERATORS PUT ON RESPIRATORS (30-MIN SCBA) TO ASSESS & RESOLVE PROBLEM

(Operators have 15 minutes to resolve after which they must evacuate to Assembly Area #2 and begin rotational entry to Plant)

- ALL OTHERS EVACUATE TO ASSEMBLY AREA 2
- ESTABLISH ROAD BLOCK TO PLANT ENTRANCE
- EVACUATE PRAXAIRE
- NOTIFY BHP MINES, ALL OTHER BUSINESSES IN THE 100 & 500 PPM ROE.
- NOTIFY LEPC AND OTHER PUBLIC OFFICIALS AND EMERGENCY SUPPORT SERVICES

AT ASSEMBLY AREA #2

- MONITOR H_2S LEVELS AT ASSEMBLY AREA AND MONITOR H2S LEVELS VIA FIXED H2S MONITOR READ OUT OR HAND HELD
- IF MONITORED LEVELS EXCEED 10 PPM EVACUATE TO ASSEMBLY AREA 3 (KIRTLAND ELEMENTARY SCHOOL PARKING LOT)
- RE-ENTRY WITH SCBA WILL OCCUR IN 15 MINUTE SHIFTS AT THE DIRECTION OF THE IC UNTIL IC DETERMINES PROBLEM HAS BEEN RESOLVED OR ESD IS ACTIVATED)

CALL 911
IF INJURY OR DEATH
FOR EMERGENCY ASSISTANCE

ONCE RESOLVED & MONITORED LEVELS IN PLANT ARE LESS THAN 10 PPM RETURN TO PLANT

IF CONSTANT ALARM SOUNDS FOR 15 MINUTES

- ACTIVATE PLANT EMERGENCY SHUT DOWN (ESD)
- ACTIVATE FULL H_2S PLAN WITH NOTIFICATIONS & REPORTING (FOLLOW LEVEL 3 RESPONSE)

NOTIFY NMOCD WITHIN <u>ONE HOUR</u>
MAKE OTHER AGENCY REPORTS AS PER H_2S PLAN

LEVEL 3 RESPONSE

WORST CASE SCENERIO AND/OR CATASTROPHIC RELEASE FROM FIRE AND/OR EXPLOSION

- ALL PERSONNEL EVACUATE TO ASSEMBLY AREA 2 IF MONITORED LEVELS ARE LESS THAN 10 PPM AND MONITOR H2S LEVELS VIA FIXED H2S MONITOR READ OUT OR HAND HELD
- ESTABLISH ROAD BLOCK TO PLANT ENTRANCE
- EVACUATE PRAXAIR AND ALL ENTITIES WITHIN 500 PPM ROE
- IF MONITORED LEVELS AT ASSEMBLY AREA 2 ARE GREATER THAN 10 PPM; EVACUATE TO ASSEMBLY AREA 3 (ELEMENTARY SCHOOL PARKING LOT)
- IMPLEMENT FULL H_2S PLAN WITH ALL NOTIFICATIONS
- NOTIFY LOCAL FIRE, POLICE AND EMERGENCY SERVICES

ONCE RESOLVED & MONITORED LEVELS IN PLANT ARE LESS THAN 10 PPM RETURN TO PLANT

IF CONSTANT ALARM SOUNDS FOR 15 MINUTES

- ACTIVATE PLANT EMERGENCY SHUT DOWN (ESD)
- RE-ENTRY WITH SCBA WILL OCCUR IN 15 MINUTE SHIFTS AT THE DIRECTION OF THE INCIDENT COMMANDER (IC) UNTIL IC DETERMINES PROBLEM HAS BEEN IDENTIFIED OR REPAIRED

APPENDIX G

EMERGENCY CALL LIST

SAN JUAN GAS PLANT EMERGENCY CALL LIST

ENTITIES WITH IN THE 500- PPM ROE

Name	Address	Contact Person	Phone Number
El Paso Natural Gas Warehouse	81 County Road 4900 Bloomfield, NM 87413		800-334-8047 (24 hr)
El Paso Natural Gas Turbine Station	81 County Road 4900 Bloomfield, NM 87413		800-334-8047 (24 hr)
Mid-America Pipeline Co. (Enterprise)	3621 East Main Farmington, NM 87402		505-599-3276 505-599-3277 800-546-3482 (24 hr)
Praxair	101 County Road 6500 Bloomfield, NM 87417		505-598-0549 800-598-0549 (24 hr)
XTO Energy Salty Dog #1	2700 Farmington Ave. Farmington, NM 87401		505-324-1090

While BHP has no active vent shafts within the 500ppm ROE, they will be notified along with others entities contained within the 500ppm ROE to assure that no vents have been activated that would be affected. BHP contact information is below.

BHP Mining	16 Miles West of Farmington, NM San Juan County Road RD6800	Dave Hales, Safety Manager	505-598-2311 505-486-1612

ENTITIES WITH IN THE 100- PPM ROE

Name	Address	Contact Person	Phone Number
San Juan Co. Compaction and Transfer	141 County Rd 6500 Kirtland, NM 87417		505-334-4520
Phil Charlie	2 County Rd 6480 Kirtland, NM 87417		505-860-0602
Jennifer Tsosie	136 County Rd 6500 Kirtland, NM 87417		505-809-5145
San Juan Meats	118 County Rd 6500 Kirtland, NM 87417		505-598-5060
Angel Gonzalez	118 County Rd 6500 Kirtland, NM 87417		505-598-0372
Jamie Gonzalez	118 County Rd 6500 Kirtland, NM 87417		505-598-5129
Glen Hatch	106 County Rd 6500 Kirtland, NM 87417		505-598-1356
San Juan College West	69 County Road 6500 Kirtland, NM 87417		505-598-5897
El Paso Natural Gas Pigging Station	81 County Road 4900 Bloomfield, NM 87413		800-334-8047 (24 hr)
BHP Mining	16 Miles West of Farmington, NM San Juan County Road RD6800	Dave Hales, Safety Manager	505-598-2311 505-486-1612
American Cell Tower	88 Rd 6500 Kirtland, NM 87417		877-518-6937
Central Consolidated School Bus Barn	76 County Rd 6500 Kirtland, NM 87417		505-598-0132
Hank's RV Park	72 County Rd 6500 Kirtland, NM 87417		505-325-7150
San Juan College	69 County Rd 6500 Kirtland, NM 87417		505-598-5897
Later Saints Church	10 County Rd 6523 Kirtland, NM 87417		505-598-5247 505-598-9297
BHP Mine Vent	300 County Rd 6900 Kirtland, NM 87417		505-598-5558
Riverview Golf Course	583 County Rd 6100 Kirtland, NM 87417		505-598-0140

All entities located within the 500 ppm ROE (listed above) are also located within the 100 ppm ROE and must be called when these entities are contacted.

COMPANY INTERNAL NOTIFICATIONS
SAN JUAN RIVER PLANT PERSONNEL

NAME	TITLE	OFFICE No.	CELLULAR No.	HOME No.
Kent McEvers	Plant Superintendent	505-598-5601 ext. 15523	505-860-7208	505-326-4054
Rick Fetch	Plant Foreman	505-598-5601 ext. 15522	505-947-2416	505-324-6441
Arlyn Thorson	Maintenance Foreman	505-598-5601 ext. 15524	505-947-2417	505-326-6718
Bob McClain	Plant Operator	505-598-5601 ext. 15542	505-330-1966	505-325-8715
Brenda Wilson	Sr. Operations Specialist	505-598-5601 ext. 15521		505-325-6525
Andrew Adame	Plant Operator			505-360-7051
Chee Anderson	Plant Operator			505-326-1397
Glen Daniell	Plant Operator		505-860-7483	505-632-9705
Curtis Day	Plant Operator			505-801-4404
Johnny Foster	Plant Operator			505-801-5062
Frank Hale	Plant Operator		505-860-5897	505-598-9091
Bobby James	Plant Operator			505-598-5314
Melvin Jim	Plant Operator			505-368-4733
Charlie Barr	Mechanic		505-324-1100	505-330-2614
Jerry Darnell	Fieldman			505-632-2722
Ted Francis	Fieldman			505-564-2999
Kent Galyon	Fieldman		505-860-1875	970-565-1006
William Golbe	Mechanic		505-215-2517	505-598-9716
Charlie Medders	Mechanic		505-947-7039	505-598-5573
Corwyn Yazzie	Mechanic		505-793-2567	505-327-3286

COMPANY INTERNAL NOTIFICATIONS
CORPORATE PERSONNEL – THE WOODLANDS, TEXAS

NAME	TITLE	OFFICE No.	CELLULAR No.	HOME No.
Mario Reyes	Operations Mgr	832-636-3234	713-816-5006	281-360-1084
Mike Ross	General Mgr	832-636-3431	832-381-0923	281-296-0385
Tony Marques	Engineering Mgr	832-636-7368		
Chuck Johnson	Commercial Develop. Mgr	832-636-7119		

David Ponikvar	S&H Mgr	832-636-3414	281-732-7887	281-374-8334
Julie Betik	Env & Reg Anal	832-636-2609	281-793-7705	281-320-2066
Eric Weaver	EHS Analyst	432-684-2808	432-413-2494	432-756-3493
Jerry Adams	EHS Mgr	832-636-8304	281-731-5931	281-363-4693
Mike Gray	EHS Director	832-636-2454	281-415-6964	936-271-9869

COUNTY & LOCAL LAW ENFORCEMENT

AGENCY	DAYTIME / 24 HR. PHONE No.
Law Enforcement Dispatch	**911**
San Juan County Sheriff	505-334-6622
Farmington Police	505-327-0222
Navajo Tribal Police	505-368-4333
Ute Mountain BIA	303-565-8471
New Mexico Highway Patrol	505-325-7547
New Mexico FBI	505-325-8631
San Juan County LEPC	505-334-1180
BLM Farmington Office	505-599-8900

MEDICAL SERVICES

AGENCY	EMERGENCY SERVICE	PHONE No.
Emergency Dispatch	Fire & Ambulance	**911**
San Juan County Fire Marshall	Fire Department	505-334-9431
San Juan Regional Medical Center	Hospital	505-325-5011
Emergency Trauma Lifeline Service - Farmington		505-325-5602
Dr. Robert C. Rhein	Doctor	505-327-4867
Dr. Ken Crider	Doctor	505-327-4439
San Juan Air Care Farmington	Air Ambulance	800-452-9990

FEDERAL NOTIFICATIONS

AGENCY	DAYTIME / 24 HR. PHONE No.
National Response Center	800-424-8802
EPA Region 8	800-227-8917
OSHA	800-321-6742
OSHA Area Office New Mexico	505-827-4230
DOT	800-424-8802
BLM Farmington	505-599-8900

NEW MEXICO STATE NOTIFICATIONS

AGENCY	DAYTIME / 24 HR. PHONE No.
New Mexico One Call	800-321-2537
New Mexico Oil Conservation Division	505-334-6178
New Mexico Environmental Department	505-476-4300
New Mexico Emergency Response Commission	505-476-9681
New Mexico Public Utilities Commission	505-490-2375
New Mexico State Patrol	505-325-7547

CONTRACTORS

CONTRACTOR	CONTACT	OFFICE No.	CELLULAR No.
Contractors – General			
IMI Construction		505-325-5005	
Weeminuche Construction	Benton Dean	970-565-7430	

Service Companies Supplies			
Noels Inc		505-327-3375	
ESSO Pipe & Supply		505-325-7568	
Air Gas		505-325-6660	
DXP	Steve Martinez	505-326-3333	
DeWees Tool & Supply		505-326-5491	
Emergency Response & Safety Services			
ChemTrec		800-424-9300	
Hands On Safety Service		505-325-4218	
Electrical Services			
Four Corners Electric		505-325-1459	
B&G Electric		505-325-7511	

OTHER PRODUCERS (which may be notified in the event of a Plant shut down)

COMPANY	CONTACT	OFFICE No.	CELLULAR No.
Burr Oil & Gas	Deana	505-325-1701	
Conoco/Burlington	Jerry Lodermilk		505-320-0452
	Renae	505-330-2946	
DJ Simmons Company	John Byrom	505-326-3753	
Elm Ridge Resources	Office	505-334-3476 ext 210	
	Terry Lindeman	972-749-6941	
El Paso Natural Gas		505-632-6000	
	Emergency Number	800-334-8047	
Nacogdoches Oil & Gas	Aaron	936-697-3750	
Resolute Natural Resources	Office	970-564-5200	
	Montezuma Creek	435-651-3682	
	Roger Atcitty		435-444-0001
Rim Southwest Corporation	Thelma Dee	435-651-4391	
XTO Energy Inc.	Office	505-324-1090	
	John Weaver		505-330-3278

OTHER RESOURCES

COMPANY	OFFICE No.	Website
National Weather Service Albuquerque, New Mexico	505-243-0702	
Farmington Four Corners Regional Airport – National Weather Service		*http://weather.noaa.gov/weather/current/KFMN.html*
Additional Weather Sites		www.accuweather.com www.wunderground.com www.weather.com

APPENDIX H

H_2S PLAN DISTRIBUTION LIST

New Mexico Oil & Gas Conservation Division

New Mexico Environment Department

New Mexico Department of Public Safety (Farmington Office)

New Mexico Department of Public Safety (State Office)

Farmington Fire Department

San Juan County Fire Department

San Juan County Sheriff Department

San Juan County Emergency Manager

San Juan County LEPC

Farmington Police

San Juan Regional Medical Center

San Juan Plant Office

Anadarko Petroleum Corporate Office

Anadarko
Petroleum Corporation

H_2S CONTINGENCY PLAN
(Amendment Related to Acid Gas Injection Well)

San Juan River Gas Plant
Kirtland, New Mexico

WESTERN GAS RESOURCES ASSET HOLDING COMPANY, LLC, a wholly owned subsidiary of Anadarko Petroleum Corporation

(October 2009)

10/5/2009

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Appendix H – H_2S Plan Distribution List

I. INTRODUCTION

The San Juan River Gas Plant (hereinafter the "Plant") is a natural gas processing plant which handles and/or generates hydrogen sulfide and/or sulfur dioxide; therefore this Hydrogen Sulfide Contingency Plan (the "H_2S Plan" or "the Plan") has been developed: 1) to satisfy the New Mexico Oil Conservation Division Rule 11, 2) to conform with API "Recommended Practices for Oil and Gas Producing and Gas Processing Plant Operations Involving Hydrogen Sulfide," RP 55, and 3) to create a site-specific hydrogen sulfide contingency plan that outlines the emergency response procedures that will be implemented to ensure a coordinated, efficient and immediate action Plan for alerting and protecting operating personnel and the public as well as to prevent or minimize environmental hazards and damage to property. The terms used in this Plan are to be used in the same manner as defined in Title 19 Chapter 15 Part II of the New Mexico Administrative code (19.15.11.7- Definitions) unless otherwise defined herein.

A. PLANT DESCRIPTION & MAP (Figure 1)

The Plant is located in Kirtland, San Juan County, New Mexico and encompasses 300+ acres. It is owned and operated by Western Gas Resources Asset Holding Company LLC, which is a wholly owned subsidiary of Anadarko Petroleum Corporation (hereinafter collectively referred to as the Company).

More specifically, the Plant is located in Section 1, Township 29N, Range 15 W in Kirtland, San Juan County, New Mexico.

1. Its coordinates are:
   Latitude: 36.453 N **Longitude: 108.220 W**

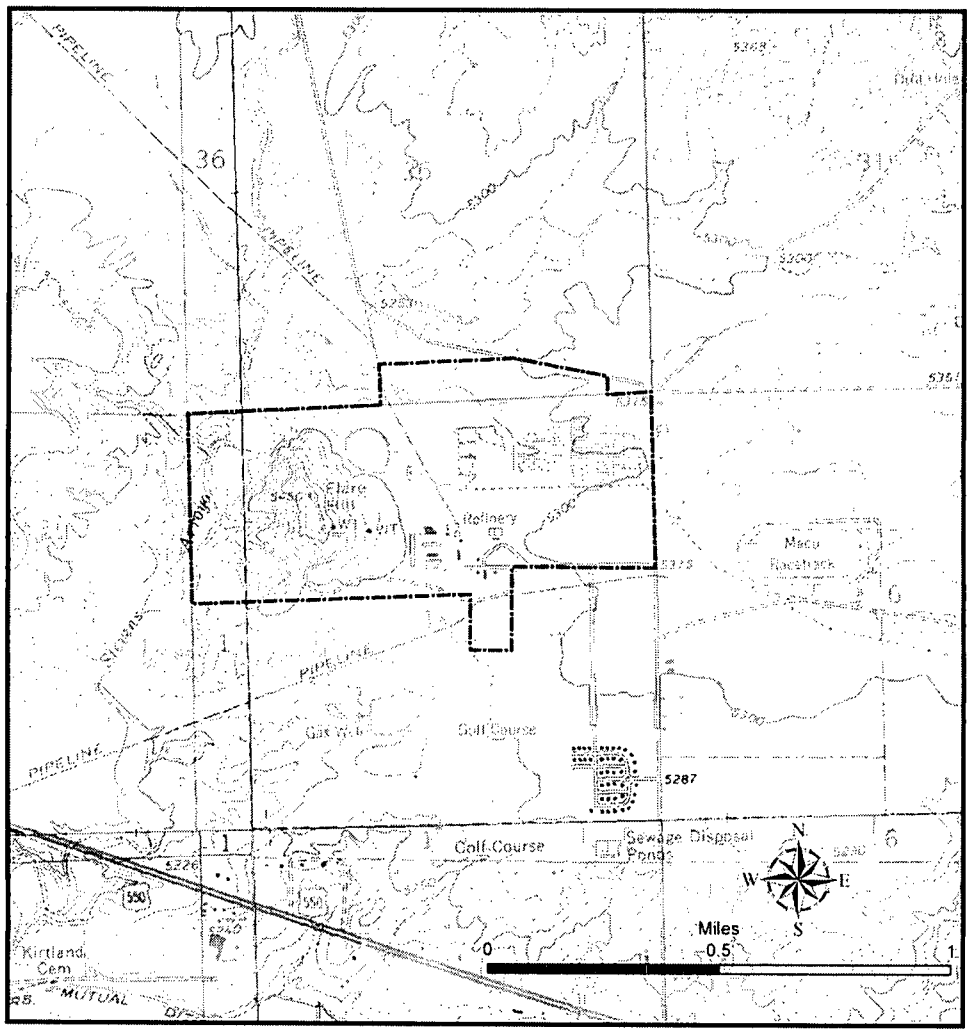
2. Its physical address is:
   99 County Road 6500, Kirtland, New Mexico 87417

3. Its mailing address is:
   P. O. Box 70, Kirtland, New Mexico 87417

4. Driving Directions from Farmington, New Mexico to the Plant:

   From the intersection of US Highway 64 and the La Plata Highway (New Mexico Highway 170), travel west on US Highway 64 approximately 6.2 miles to the intersection of US Hwy 64 and County Road 6500 in Kirtland, New Mexico. Turn right on County Road 6500 and travel north approximately 1.7 mile to the entrance to the San Juan River Gas Plant.

The location of the Plant is illustrated herein on Figure 1.



Approximate Boundaries of Western Gas Resources Property
Anadarko San Juan River Natural Gas Processing Plant

Figure 1 Anadarko San Juan River Plant Location

B. DESCRIPTION OF OPERATIONS

1. The Plant operations include gas processing, conditioning and compression, as well as flow lines and storage tanks. The Plant gathers produced natural gas from San Juan County, New Mexico, as well as, from Southwestern Colorado, Northeastern Arizona, and Southeastern Utah. Once gathered at the Plant, the produced natural gas is compressed; treated in an amine process for the removal of carbon dioxide and hydrogen sulfide; and dehydrated to remove the water content. The processed natural gas is then sold and shipped to various customers.

2. Because the natural gas that is gathered at the Plant contains hydrogen sulfide ("sour gas"), it must be treated or processed to remove these and other impurities. The carbon dioxide and hydrogen sulfide (H_2S) stream that is removed from the natural gas in the amine treating process is then sent to the Claus sulfur recovery unit whereby sulfur is removed, which results in the generation of molten elemental sulfur. Any residual H_2S is routed to an incinerator where it is combusted into sulfur dioxide.

3. The Plant anticipates the need to process a higher volume of natural gas due to the development of additional natural gas resources in the area. This increased processing capacity will necessitate an expansion of the Plant. The Plant predicts an increase in inlet volume to 50 MMCFD with about 6000 ppm H_2S content. The Plant has proposed the installation of an acid gas injection (AGI) well to accommodate disposal of the acid gas stream generated by existing and expanded operations. The expanded operation is expected to generate approximately 3.80 MMCFD of acid gas for disposal. The existing sulfur reduction unit (SRU) currently being used to treat the acid gas will be replaced by the AGI well following approval of the AGI well permit by NMOCD and successful completion of the AGI well.

II. THE PLAN

A. RESPONSIBILITY FOR CONFORMANCE WITH THE H_2S PLAN

It is the responsibility of all personnel on-site to follow the safety and emergency procedures outlined in the Hydrogen Sulfide Contingency Plan (the H_2S Plan) as well as the following documents:

- Anadarko Petroleum Corporation Safety & Health Manual
- Anadarko Petroleum Corporation Emergency Response & Oil Spill Contingency Plan; and
- Anadarko Petroleum Corporation Environmental Policies and Programs.

B. REVISIONS TO THE PLAN

The H_2S Plan will be reviewed annually and revised at this time as necessary to address changes to the Plant facilities, operations, or training requirements, contact information

and the public areas including roads, businesses, or residents potentially affected by the operations of the Plant, specifically those areas within the radii-of-exposure.

C. AVAILABILITY OF THE H_2S PLAN

The H_2S Plan shall be available to all personnel responsible for implementation, regardless of their normal location assignment. A copy of the Plan will be maintained at the Plant in the Plant Superintendent's office and at the Anadarko Corporate Headquarters in The Woodlands, Texas. **See Appendix H for the H_2S Distribution List,** which lists all the additional entities that have been provided a copy of the H_2S Plan.

D. CONTENT OF THE PLAN

At a minimum, the H_2S Plan will contain information regarding: 1) the emergency procedures to be followed in the event of an H_2S or SO_2 release that may pose a threat to the Plant, public or public areas, 2) the characteristics of H_2S and SO_2, 3) a facility description, map and/or drawings, and 4) information regarding training and drills to be conducted related to this Plan.

III. PLAN DESIGN CONSIDERATIONS

A. CHARACTERISTICS OF H_2S, SO_2 AND CARBON DIOXIDE

1. Hydrogen Sulfide (H_2S)

The proposed inlet gas streams into the Plant will contain approximately 6,000 ppm (or 0.60 mole percent) of hydrogen sulfide based on data generated from the sampling of the inlet gas at least three times daily.

Hydrogen sulfide is a colorless, toxic and flammable gas, and has the odor of rotten eggs. Hydrogen sulfide gas is heavier than air.

Hydrogen sulfide presents a significant health hazard by paralyzing the respiratory system resulting in serious injury or death.

Hydrogen Sulfide Properties & Characteristics	
CAS No.	7783-06-4
Molecular Formula	H_2S
Molecular Weight	34.082
TWA	10 ppm
STEL	15 ppm
IDLH	100 ppm
Specific Gravity (air = 1.0)	1.189
Boiling Point	-76.5°F

Freezing Point	-121.8°F
Vapor Pressure	396 psia
Autoignition Temperature	518°F
Lower Flammability Limit	4.3%
Upper Flammability Limit	46.0%
Stability	Stable
pH in water	3
Corrosivity	Reacts with metals, plastics, tissues & nerves

Physical Effects of Hydrogen Sulfide		
Concentration		
ppm	**%**	**Physical Effect**
1	.00010	Can be smelled (rotten egg odor)
10	0.0010	Obvious & unpleasant odor; Permissible Exposure Limit; Safe for 8-hour exposure
15	0.0015	Short Term Exposure Limit (STEL); Safe for 15 minutes of exposure without respirator
50	0.0050	Loss of sense of smell in 15 minutes
100	0.0100	Immediately Dangerous to Life & Health (IDLH); Loss of sense of smell in 3-15 minutes; Stinging in eyes & throat; Altered breathing
200	0.0200	Kills smell rapidly; Stinging in eyes & throat
500	0.0500	Dizziness; Unconscious after short exposure; Need artificial respiration
700	0.0700	Unconscious quickly; death will result if not rescued promptly
1,000	0.1000	Instant unconsciousness; followed by death within minutes

2. Sulfur Dioxide ($S0_2$)

Sulfur dioxide is produced as a by-product of H_2S combustion at the incinerator. The incinerator unit receives the residual hydrogen sulfide and carbon dioxide stream that is routed from the amine unit.

It is colorless, transparent, and is non-flammable, with a pungent odor associated with burning sulfur.

Sulfur dioxide is heavier than air, but will be picked up by a breeze and carried downwind at elevated temperatures. Sulfur dioxide can be extremely irritating to the eyes and mucous membranes of the upper respiratory tract.

Sulfur Dioxide Properties & Characteristics	
CAS No.	7446-09-5
Molecular Formula	SO_2
Molecular Weight	64.07
TWA	2 ppm
STEL	5 ppm
IDLH	100 ppm
Specific Gravity (air = 1.0)	2.26
Boiling Point	14°F
Freezing Point	-103.9°F
Vapor Pressure	49.1 psia
Autoignition Temperature	N/A
Lower Flammability Limit	N/A
Upper Flammability Limit	N/A
Stability	Stable
Corrosivity	Could form an acid rain in aqueous solutions

Physical Effects of Sulfur Dioxide	
Concentration	**Effect**
1 ppm	Pungent odor, may cause respiratory changes
2 ppm	Permissible exposure limit; Safe for an 8 hour exposure
3-5 ppm	Pungent odor; normally a person can detect sulfur dioxide in this range
5 ppm	Short Term Exposure Limit (STEL); Safe for 15 minutes of exposure
12 ppm	Throat irritation, coughing, chest constriction, eyes tear and burn
100 ppm	Immediately Dangerous To Life & Health (IDLH)
150 ppm	So irritating that it can only be endured for a few minutes
500 ppm	Causes a sense of suffocation, even with first breath
1,000 ppm	Death may result unless rescued promptly.

3. Carbon Dioxide

The proposed inlet gas streams to the Plant will contain approximately 7% carbon dioxide based on the anticipated additional gas to the Plant which will be confirmed with inlet gas monitoring readings. Carbon dioxide gas is colorless, odorless, and non-flammable. Carbon dioxide is heavier than air.

Carbon Dioxide Properties & Characteristics	
CAS No.	124-38-9
Molecular Formula	CO_2
Molecular Weight	44.010
TWA	5,000 ppm
STEL	30,000 ppm
IDLH	40,000 ppm
Specific Gravity (air = 1.0)	1.5197
Boiling Point	-109.12°F
Freezing Point	-69.81°F
Vapor Pressure	830 psia
Autoignition Temperature	N/A
Lower Flammability Limit	N/A
Upper Flammability Limit	N/A
Stability	Stable
pH in saturated solution	3.7
Corrosivity	dry gas is relatively inert & not corrosive; can be corrosive to mild steels in aqueous solutions

Physical Effects of Carbon Dioxide	
Concentration	**Effect**
1.0 %	Breathing rate increases slightly
2.0 %	Breathing rate increases to 50% above normal level. Prolonged exposure can cause headache, tiredness
3.0 %	Breathing rate increases to twice normal rate and becomes labored. Weak narcotic effect. Impaired hearing, headache, increased blood pressure and pulse rate
4 – 5 %	Breathing increases to approximately four times normal rate, symptoms of intoxication become evident, and slight choking may be felt

5 – 10 %	Characteristic sharp odor noticeable. Very labored breathing, headache, visual impairment, and ringing in the ears. Judgment may be impaired, followed within minutes by loss of consciousness
10 – 100 %	Unconsciousness occurs more rapidly above 10% level. Prolonged exposure to high concentrations may eventually result in death from asphyxiation

B. RADII OF EXPOSURE (ROE)

For the existing operations, the "Radius of Exposure" for both 500-ppm and 100-ppm of H_2S gas was determined using the "escape rate", which is calculated using the maximum daily rate of the gaseous mixture that is handled by the Plant. The rates and other variables used to calculate the ROE is discussed in greater detail in **Appendix B - ROE calculations. Also refer to Appendix C - map showing 500-ppm ROE and the 100-ppm ROE.**

500-ppm ROE	**1634 feet**
100-ppm ROE	**3576 feet**

IV. EMERGENCY ACTION PROCEDURES

A. EMERGENCY RESPONSE ORGANIZATION

The Plant uses the Incident Command System (ICS) for emergency response. The ICS structure used is based on the National Interagency Incident Management System (NIIMS), and is consistent with the National Contingency Plan (NCP).

In the event of an accidental release that results in the activation of the H_2S Plan and all personnel have been evacuated out of the affected area, the Plant Superintendent, or his designee, will be the On-Scene Incident Commander (IC in this Plan). The IC will contact and coordinate with Anadarko's management in corporate office. If the severity of the response requires activation of the Emergency Response Center in The Woodlands, Texas office, the ICS structure will be staffed per the Anadarko Southern Region Emergency Response & Oil Spill Contingency Plan Manual. The staffing will not change the H_2S Plan contained herein.

The Plant Superintendent or his designee shall determine:

1) Plant Shutdowns
2) Isolation of pipeline segments
3) Repairs, tests or restarts as required

If an emergency occurs, the Plant Superintendent, or his designee, shall be notified first. The Plant Superintendent, or his designee, shall notify Anadarko's Office in The Woodlands, Texas

B. EMERGENCY RESPONSE

This section explains the procedures and decision to be used in the event of an H_2S release; much of which has been pre-determined to ensure a coordinated, efficient and

immediate action Plan for alerting and protecting operating personnel and the public as well as to prevent or minimize environmental hazards and damage to property.

1. OBJECTIVE

All Plant employees shall be prepared to respond to an H_2S or SO_2 emergency at the Plant. Emergency response actions may be taken for a variety of situations that may occur in the Plant. The Plan is activated in progressive levels based on the concentration of H_2S that has been released. The Plant has three (3) activation levels that are described below and in detail in the Response Flow diagram in **Appendix F**.

Level 1 – Intermittent alarm sounded and/or flashing red beacons activated for H_2S greater than 10 ppm

Level 2 – Continuous alarm sounded and/or flashing red beacons activated for H_2S greater than 20 ppm

Level 3 – Catastrophic release; fire; explosion; a continuous release of maximum volume for 24 hours; or Rule 11 Mandatory Activation for 100 ppm in any defined public area; 500 ppm at any public road; or 100 ppm at a distance greater than 3000 feet from the site or the release

As soon as the Plan has been activated based on the criteria above, the Plant Superintendent, or his designee, should be notified.

2. PLANT EVACUATION AND EMERGENCY ASSEMBLY AREAS

A. Plant evacuation for all visitors and Plant personnel that are not operators begins at the 10 ppm H_2S intermittent alarm and/or flashing red beacon. The Plant operators are to put on the 30-min SCBA and first determine if any personnel are in distress and assist any distressed personnel in evacuating to Emergency Assembly Area 1. Emergency services (911) will be contacted if there are injuries or as otherwise deemed necessary. BHP Mines and Praxair and the unmanned facilities within the 500 ppm radius of exposure (**Appendices C and G**) are also to be notified. The operators will then, wearing the SCBA, investigate the cause of the release. At the sound of the alarm and/or flashing red beacons, all other personnel in the Plant are to stop work, check the prevailing wind direction and immediately proceed along designated evacuation routes and/or upwind to the pre-designated Emergency Assembly Area(s) that are described in **Appendix F**.

   Prevailing winds for the area are from the east and evacuation along the designated routes should be upwind. If the designated evacuation route is downwind of the release (based on the windsock), then all evacuees should proceed upwind to the Emergency Assembly Areas

The Plant evacuation diagram showing evacuation routes and Emergency Assembly Areas is attached in **Appendix D.**

The Emergency Assembly Area 1 is:

Parking Area on the eastside of the Plant Superintendent Office Building (see Appendix C & D)

The Emergency Assembly Area 2 is:

Area at Plant Rd and Hwy 6500 (see Appendix C)

The Emergency Assembly Area 3 is:

Kirtland Elementary School Parking Lot , 30 Road 6446 (see Appendix C)

B. Roll call shall be conducted at the Emergency Assembly Area to assure all personnel have evacuated safely. This facility is a PSM facility and requires all visitors check in before entering the Plant, thus the check-in sheet will be used at the Emergency Assembly Areas to make a full accounting of all personnel and visitors.

3. IMMEDIATE ACTION PLAN/ INITIAL RESPONSE

The following outlines the immediate action Plan that is illustrated by flow diagram in **Appendix F**. This is to be used when responding to an H_2S release. Additional or long term response actions will be determined on a case-by-case basis, if needed, once the Incident Command Center and System is established following the immediate response.

LEVEL 1 RESPONSE

1. The audible signal for a Plant emergency and evacuation is an intermittent horn (repeating off/on) activated when levels of H_2S of 10 ppm are detected. The frequency of this intermittent alarm will increase as the concentration of the H_2S increases. In addition, a flashing red light or beacon will be activated at 10 ppm H_2S. At the initial sound of the intermittent alarm or the flashing red beacon, each operator (2 per shift) will put on a 30 minute SCBA and all other personnel in the Plant complex shall immediately evacuate the Plant using the evacuation routes to the Emergency Assembly Area 1 (see **Appendix D**). The operators, upon suit up with the SCBA, will first help any persons in distress evacuate to the Emergency Assembly Area. If deemed necessary by the Senior Operator, local

emergency response service providers will be contacted by Plant personnel designated by the Senior Operator.

2. All entities within the 500 ppm ROE (see **Appendices C and G**) and BHP Mines will be notified of a release by personnel designated by the Plant Superintendent or his designee. The nature of the release and status of containment will be conveyed. Parties will be advised to report the incident to employees working near the Plant and to alert any third party contractors or service companies working in the Plant vicinity or imminently scheduled to work in the Plant vicinity of the release. All should be instructed to leave the area and not to enter/re-enter area until further notice.

3. Wearing the SCBA, the operator(s) will attempt to fix the cause of the release. OSHA guidelines allow operators to work in areas with 10ppm for up to 8 hours. The H_2S levels at the Emergency Assembly Area 1 will be monitored with a hand held or personal monitor.

4. The Senior Operator will set up secondary re-entry team(s) with 30 min. SCBA to re-enter and resolve the situation. Re-entry will occur in 15 minute shifts at the direction of the IC until the problem is resolved or the ESD activated. If H_2S levels in Emergency Assembly Area 1 exceed 10 ppm, evacuate to Emergency Assembly Area 2 and continue to monitor Assembly Area H_2S level. If release is resolved and monitored levels in the Plant are less than 10 ppm, personnel may re-enter the Plant. BHP, Praxair and the unmanned facilities within the 500 ppm radius of exposure (**Appendices C and G**) will be notified once release is contained and monitored H_2S levels are less than 10 ppm The OCD shall be notified within one hour of any release that activates the Plan. If the release is not resolved and H_2S levels continue to increase, Level 2 Response is indicated.

LEVEL 2 RESPONSE

1. The continuous alarm and indicates the detection of H_2S greater than 20 PPM. Flashing red beacons indicate a H_2S release of 10 ppm or greater and they will continue for a release of 20 ppm or greater. At the initial sound of the continuous alarm or observance of the flashing red beacons, the operators will immediately put on a 30 minute SCBA and all other personnel in the Plant complex will put on emergency escape packs if they are wearing them and evacuate along with all other personnel using the evacuation routes to the Emergency Assembly Area 2 (see **Appendix D**). The operators, upon suit up with the SCBA, will first help any persons in distress evacuate to the Emergency Assembly Area. If deemed necessary by the Senior Operator, local emergency response service providers will be contacted by Plant personnel as designated by the Senior Operator.

2. Praxair is trained to evacuate at continuous alarm sounds. Praxair, BHP Mines and all other entities within the 500 ppm ROE (see **Appendices C and G**) will be contacted by phone and notified of release and asked to evacuate, if they have not

already. All entities within the 100 ppm ROE (see **Appendices C and G**) will be contacted by phone and notified of release. The nature of the release and status of containment will be conveyed. Depending on release status and prevailing wind conditions, some entities within the 100 ppm ROE may be asked to evacuate or shelter in place Notifications will include but are not limited to the following:

- Praxair, BHP and all unmanned businesses will be instructed to alert all company personnel, third party contractors and/or services companies working in the area and those imminently scheduled to work in the area, of the release and evacuation status of the Plant. They should be instructed to immediately leave and/or not enter/re-enter the Plant vicinity until further instruction.

- BHP will be advised to check ventilation shaft status within the 500 and 100 ppm ROE and take internal company pre-emptive safety action(s) as deemed appropriate.

- Riverview Golf Course will be instructed to clear the course of both employees and golfers until further notice.

- San Juan College will be notified of the release and depending on prevailing wind conditions may be requested to evacuate or shelter in place.

- Other entities within the 100 ppm ROE, depending on release status and prevailing wind conditions, will be asked to shelter in place. Those entities will be instructed to close any windows and shut off any air conditioning/heating until further notice. In addition, they will be instructed to contact other employees/residents not currently present to not enter/reenter the area until further instruction.

3. The LEPC and law enforcement will be contacted by phone and notified of the release and status of containment. The Plant Superintendent or his designee will assign personnel notification responsibility.

4. Operator(s) with 30 minute SCBA will assess the release and attempt to resolve it. If after 15 minutes there is no resolution, the operator(s) will activate the ESD and will evacuate to Emergency Assembly Area 2.

5. If monitored H_2S levels at Emergency Assembly Area 2 exceed 10 ppm, evacuate to Emergency Assembly Area 3, Kirtland Elementary School parking lot. If deemed necessary, local emergency response service providers will be contacted by the operator.

   a) Re-entry will occur in full SCBA and in 15 minute shifts at the direction of the IC until IC determines problem has been resolved or additional ESD (pipeline) activated.

b) If release is resolved and monitored levels of H_2S in the Plant are less than 10 ppm, personnel may return to Plant. The OCD shall be notified within one hour of any release that activates the Plan. All entities previously notified will be informed that the release has been resolved and advised of the current monitored H_2S levels at the Plant.

c) No resolution requires activation of full H_2S Plan with notifications and reporting as per Plan. If the release is not resolved and/or H_2S levels continue to increase, Level 3 Response is indicated.

LEVEL 3 RESPONSE

1. For H_2S at 20 ppm or greater at Assembly Area 2, repair efforts at Level 2 unsuccessful, worst case scenario, and/or catastrophic release have occurred then implement a Level 3 response.

2. Road blocks will be set up at the intersection of County Road 6500 and County Roads 6446 and 6480. In addition, a roadblock will be set up at the intersection of County Road 6520 and County Road 6527 on the west, and where 6520 turns south on the east. A roadblock will also be set up on the Indian Service Route outside the 100 ppm ROE (approximately 4000 feet north of the Plant) (see **Appendix C**.)

3. All personnel shall have evacuated to Emergency Assembly Area 3, Kirtland Elementary School. Evacuation of all entities within the 500 ppm ROE will have been confirmed. Implement full H_2S Plan with all notifications and public agency involvement. Notifications to all entities within the 100 ppm ROE will include the nature of the release and status of containment. Notifications will include but are not limited to the following:

   - All businesses within the 100 ppm ROE will be instructed to immediately alert all company personnel, third party contractors and/or services companies working in the area and those imminently scheduled to work in the area, of the release and evacuation status of the Plant. They will be instructed to immediately leave and/or not enter/reenter the area within the roadblocks until further instruction.
   - All other entities (including private residents) within the 100 ppm ROE will be instructed to immediately shelter in place. Those entities will be instructed to close any windows and shut off any air conditioning/heating until further notice. In addition, they will be instructed to contact other employees/residents not currently present to not enter/reenter the area until further instruction.
   - BHP will be advised to check ventilation shaft status within the Plant vicinity and take internal company pre-emptive safety action(s) as deemed appropriate.

- Riverview Golf Course will be instructed to immediately clear the course of both employees and golfers and to shelter in place. Those entities will be instructed to close any windows and shut off any air conditioning/heating until further notice. In addition, they will be instructed to contact other employees not currently present to not enter/reenter the area until further instruction.
- San Juan College will be notified of the release and advised to shelter in place. Those entities will be instructed to close any windows and shut off any air conditioning/heating until further notice. In addition, they will be instructed to contact other employees not currently present to not enter/reenter the area until further instruction.

4. If escaping vapors have been ignited, the vapors should be allowed to continue to burn unless the fire endangers personnel, other property, or other equipment.

5. When applicable: Maintain communication with the Plant Superintendent, or his designee, to keep him up-to-date of the situation and the action taken prior to his arrival at the location.

6. Initiate and maintain a Chronological Record of Events log.

7. Within one hour after the activation of the H_2S Plan, begin agency notifications by calling OCD and NRC.

8. Establish media staging area adjacent to Assembly Area 3 and direct all media to it.

9. Once resolved and monitored levels in the Plant and at Assembly Area 2 are less than 10 ppm, roadblocks will be removed, and all entities within the 100 ppm ROE will be allowed to return. All entities previously notified will be informed that the release had been resolved and advised of the current monitored H_2S levels.

10. Agency reports to be submitted as required.

4. EMERGENCY SHUTDOWN SYSTEM

The Plant has an extensive Emergency Shut Down (ESD) system that is located within the Plant and in various locations along the pipelines that feed the Plant. The ESD is designed to prevent a Level 3 response. See **Appendix E** for a more detailed description of the ESD.

5. NOTIFICATIONS AND REPORTS

The Plant has various notification and reporting obligations. Some are related to its state air quality permit that is overseen by NMED as well as well as state and federal spill reporting obligations. In addition to the regulatory obligations noted above, Plant personnel also have internal and external notification and reporting obligations associated with the activation of this Plan.

A. DISCOVERY AND INTERNAL REPORTING

1. All Plant personnel who perform maintenance and/or repair work within the Plant wear H_2S monitoring devices to assist them in detecting the presence of unsafe levels of H_2S. When any Plant personnel while performing such work discover a leak or emission release they are to attempt to resolve the issue as long as H_2S levels remain below 10 ppm. The personal monitoring devices they wear will give off an audible alarm at 10 ppm. These devises are to be worn as low on the body as possible since H_2S is heavier than air and will tend to stand or accumulate in low lying areas. If the response action needed to resolve the issue is more than simply closing a value or stopping a small leak, the Plant personnel shall notify the Plant Superintendent, or his designee and convey, at a minimum, the following information:

    - Name, telephone number, and location of person reporting the situation; and
    - Type and severity of the emergency; and
    - Location of the emergency (area/block, mile markers, latitude & longitude, or building), and the distance to surrounding equipment and/or structures; and
    - The cause of the spill or leak, name and quantity of material released, and extent of the affected area including the degree of environmental hazard; and
    - Description of injuries and report of damage to property and structures; and
    - Initiate and maintain a Chronological Record of Events log. This record should record the time, date, and a summary of the event.

2. If the Plant personnel detect H_2S levels greater than 10 ppm either as a result of his/her personal monitoring device or the Plant intermittent alarm and/or red flashing beacon, Plant operators are to contact their immediate supervisor for assistance and put on the 30-min SCBA so they can attempt to resolve the issue. All non essential persons shall be notified of the release and evacuated from the area. Operators wearing the SCBAs are to first assist any persons requiring assistance during the evacuation, then

attempt to resolve the issue. The immediate supervisor is then responsible for notifying the Plant Superintendent or his designee so that the IC system can be implemented and H_2S Plan activated if necessary.

3. Once the Plant Superintendent is contacted, he or his designee is to notify the appropriate Corporate management, EHS personnel, Plant emergency response personnel, and advise them of the existing emergency situation. Corporate management will then conduct the reporting up that is necessary based on the situation.

4. Plant personnel are to advise any contractor, service company, and all others on-site or attempting to enter the Plant that the H_2S Plan has been activated.

B. PUBLIC AWARENESS AND COMMUNICATION

Public awareness and communication is a primary function of the H_2S Plan. The Company has compiled a list of various public, private, state and local contacts that are to be notified at various phases during the activation of the Plan. Refer to the Response Flow diagram in **Appendix F** that indicates when certain entities are to be contacted in event of activation of this Plan. **Appendix G** is a listing of the entities to be contacted and **Appendix H** is a list of community organizations that have received a copy of the Plan. Company will inform all state and local response organizations of its Plan as well as those businesses that fall within its 500-ppm and 100-ppm ROE as illustrated in **Appendix C**.

C. PUBLIC AREAS, NEARBY BUSINESSES AND RESIDENTS

The contact information for all residents, businesses and public areas is contained in **Appendix G**. All entities within the 500 ppm and 100 ppm radius of exposure will be contacted by Plant personnel as designated by Plant Superintendent if the Plan is activated and based on response level as described in the Immediate Action Plan and advised of the following:

- The nature and extent of the release/emergency at the Plant and recommendations for protective actions, such as evacuation or shelter-in-place
- Any other event specific information that is necessary to protect the public; and
- Updates as to the status of the release and continued safety measures to be taken, including but not limited to when to evacuate and/or when it is safe to return to the area.

1. Residences or Public Roads:

Public Road 6500 is within the 100 ppm radius of exposure, and portions of Public Roads 6520, 6257 and Cemetery Road are slightly within the southernmost

extension of the 100 ppm radius of exposure. Similarly, a small portion of Public Roads 6448 and 6480 are slightly within the eastern portion of the 100 ppm radius of exposure (see **Appendix C**). The specific residences included within the 100 ppm radius of exposure are listed on **Appendix G** along with addresses and contact phone numbers.

2. Businesses or Other Public Areas:

All businesses included in **Appendix G** will be provided with a copy of the H_2S Plan and will be contacted about participation when local emergency response training events or drills occur.

Within the 100 ppm ROE:

The public areas located within the 100 ppm radius of exposure are identified in **Appendix G**.

BHP will be contacted when the Plan is activated to ensure that the out of service vent pipes have not been activated. Currently, there are inactive BHP Mining ventilation pipe ducts within the 100 ppm radius of exposure which have been closed by manual valves.

Additional businesses within the 100 ppm radius of exposure are listed on **Appendix G** and they will be notified if the Plan is activated as per the various levels of the immediate action Plan described above. These businesses or their corporate offices (in the case of unmanned facilities) will be notified if the Plan is activated as per the immediate action Plan.

Within the 500 ppm ROE:

One manned business (Praxair) and four (4) unmanned businesses are located within the 500 ppm radius of exposure (see **Appendix G**). Praxair will be notified immediately if the Plan is activated. The corporate offices of the four unmanned businesses will also be notified immediately if the Plan is activated according to the level specific procedures described above.

Most of the Riverview Golf Course is also located within the 100ppm radius of exposure. Riverview Golf Course will also be notified immediately as described above if the Plan is activated.

6. SITE SECURITY

A. In order to have an accurate listing of all personnel on-site in the event of an emergency, a daily sign-in log sheet shall be utilized. The sign-in log sheet

shall include at a minimum the person's name, the company name, the time of arrival, and the time of departure.

B. The Incident Commander shall be responsible to assure that all personnel sign-in upon arrival and sign-out upon departure from the job site.

C. The Incident Commander may at his discretion assign the responsibilities for the daily sign-in log sheet to the individual designated as the Record Keeper or another designee.

D. At the discretion of the Incident Commander, a security coordinator and/or a security team may be established, and the access to the job site restricted.

E. For a Level 3 release a road block would be set up at the intersection of County Road 6500and County Roads 6446 and 6480. In addition, a roadblock would be set up at the intersection of County Road 6520 and County Road 6527 on the west, and where 6520 turns south on the east. A roadblock will also be set up on the Indian Service Route outside the 100 ppm ROE (approximately 4000 feet north of the Plant).

7. SIGNS & MARKERS

The Plant has warning signs indicating the presence of H_2S/Poisonous Gas and high pressure gas at the entrance to the Plant. Emergency response phone numbers are posted at the entrance to the Plant. Signs are located at the Plant gate entrance indicating that all visitors are to sign in.

8. FIRST-AID STATION

The first aid station will be located at the Emergency Assembly Area.

FIRST AID KITS are located:

- **Plant Superintendent Office Building,**
- **Maintenance/Safety Office Building, and**
- **Each company vehicle**

9. MEDIA SITE

A. If a Level 2 or 3 Response occurs, the Media Site will be located adjacent to Emergency Assembly Area 3.

B. At no time shall any unescorted representative from the media be allowed any closer to the Plant than the Media Site location, unless approved by the Incident Commander, the Safety Officer, and the Media Relations Officer.

10. EMERGENCY AND SAFETY EQUIPMENT

Refer to **Appendix E** for information pertaining to the Plant's emergency and Safety equipment. In addition, see **Appendix C** for the location of additional H_2S sensors that will be installed outside the Plant boundary as part of the Plant expansion related to the AGI well permit.

V. TRAINING AND DRILLS

A. TRAINING

1. Training on the H_2S Plan
   - Inclusion of local officials and LEPC
   - Public areas and businesses (within the ROE)
   - Those on the Plan distribution list

2. Other Emergency Response Related Training

Anadarko/Western has an extensive safety training program and addresses various aspects of job related hazards. All training records for the Plant are maintained at the Plant. The following is a limited list and summary of the training programs that relate to the H_2S Plan and Emergency Response:

- Plant Orientation Training - All Plant personnel, visitors, and contractors must attend a Plant overview orientation prior to obtaining permission to enter the Plant. A refresher course on this training is required annually for all persons. This training also complies with the requirements of the Anadarko and Plant's Process Safety Management Program and Procedures Manuals.

- Hydrogen Sulfide and Sulfur Dioxide Training – All Plant personnel receive annual refresher training on hydrogen sulfide and sulfur dioxide, which is conducted by Anadarko personnel. If an individual is unable to attend, they may be required to attend a third party training session. Hydrogen sulfide training cards are issued as documentation of this training. All contract employees and visitors are required to have had hydrogen sulfide training and to provide the Plant a copy of their certification card prior to obtaining permission to enter the Plant.

- Respirators - All Plant personnel, with the exception of the Plant Operations Specialist, are trained annually on the proper use of respirators. In addition to the annual training, all Plant personnel with the exception noted above are fit tested

annually on the respirators. Except for the Plant Operations Specialist, all Plant personnel must have medical clearance to work in the Plant. Medical clearance is mandatory for H_2S certification. Medical clearance review for work in a H_2S environment is conducted on a bi-annual basis unless the individual has experienced medical problems within that two year interval that requires updating the medical clearance.

- Hazard Communication - All Plant personnel are trained annually on Hazard Communication and SARA Title III Right-to-Know information. The annual training includes, at a minimum, a review of material safety data sheets (MSDS) for those materials that are present at the Plant and labeling.

- Personal Protective Equipment (PPE) - All Plant personnel are trained annually on the Anadarko requirements for personal protective equipment (PPE). The training includes, at a minimum, a review of all the types and levels of personal protective equipment and how to select the correct equipment for the job.

B. EMERGENCY RESPONSE DRILLS

1. The Plant will conduct, at least, a tabletop drill annually. Multiple drills during the year may be scheduled at the discretion of the Plant Superintendent or as part of the Emergency Response Center in The Woodlands.

2. The annual drill will exercise this Plan and include, at a minimum, contacting the entities that are identified as being within the 500-ppm ROE and the Local Emergency Response contacts identified on **Appendix G**. The drills will also include briefing of public officials on issues such as evacuation or shelter-in-place plans

3. Drill training will be documented and those records will be maintained at the Plant. The documentation shall include at a minimum the following:

    a. Description or scope of the drill, including date and time
    b. Attendees and Participant to the drill
    c. Summary of activities and responses
    d. Post drill de-brief and reviews

APPENDIX A

WORST CASE SCENARIO

The basis for worst case scenario calculations is as follows:

- 6000 parts per million (ppm) or 0.60 mole percent of hydrogen sulfide in the inlet natural gas stream into the San Juan River Gas Plant; and
- a maximum daily (24 hour) processing volume of 50,000 MMCF.
- The worst case scenario radius of exposure (ROE) also assumes an uncontrolled instantaneous release from the area around the AGI well of the above referenced volume and concentration. Because the Plant is a throughput process plant there is no actual way that the entire throughput volume of the Plant could be released instantaneously as is assumed in the worst case scenario calculations of the ROE in **Appendix B** and shown in **Appendix C**; however, to comply with NMAC 19.15.11, we have used that assumption in our worst case scenario formulas/calculations provided in Appendix B.

It should further be noted that the reason this rate, used as worst case, could not be released over a 24 hour period is the Plant's Emergency Shutdown (ESD) systems that would be activated. The ESD would prevent the flow of gas into the Plant in the event of an emergency. The ESD system is discussed in greater detail in **Appendix E**.

APPENDIX B
RADIUS OF EXPOSURE CALCULATIONS

The formulas for calculating the two ROEs (as specified by the regulations) are as follows:

500-ppm RADIUS OF EXPOSURE CACULATION

$$X=[(0.4546)(\text{hydrogen sulfide conc.})(Q)]^{(0.6258)}$$

Where:
X = Radius of exposure in feet
Hydrogen Sulfide Concentration = Decimal equivalent of mole or volume fraction of hydrogen sulfide in the gaseous mixture
Q = Escape rate expressed in cubic feet per day (corrected for standard conditions of 14.73 psi absolute and 60 degrees Fahrenheit)

a) For existing facilities or operations, the escape rate (Q) is the maximum daily rate of the gaseous mixture produced or handled or the best estimate thereof. For the San Juan River Gas Plant, after the installation of the AGI well, the Company is using for contingency planning purposes an "escape rate" equal to the anticipated (maximum) inlet gas volume of 50,000 MCFD. The (actual) inlet gas volume at the Plant will be somewhat variable and is continuously metered. The Plant records daily inlet gas volumes and prepares a daily volume report. The assumed 50,000 MCFD inlet gas volume has been selected as the "escape rate" because it is the highest anticipated inlet volume that the Plant would handle under its proposed operations and is considered worst case interpretation of the volume of gas. It should be noted that the plan will remain effective as long as the processed volume and H_2S content equate to the same ROE. As addressed below.

As to hydrogen sulfide concentration of the inlet gas, daily monitoring data of current operations indicates variable concentrations, but concentration will not exceed 6000 ppm or 0.60 mole percent. Therefore, 6000 ppm or 0.60 mole percent has been used in the worst case scenario for the expanded operations with the AGI well for contingency planning purposes.
Using:
Q = 50,000,000
H_2S conc = 6000 ppm or 0.60 mole%

$$[(0.4546)*(H_2S \text{ concentration})*(\text{gas volume } (Q))]^{0.6258}$$
$$[(0.4546)*(6000*.000001)*(50,000,000]^{0.6258}$$

500-ppm ROE = 1634 feet

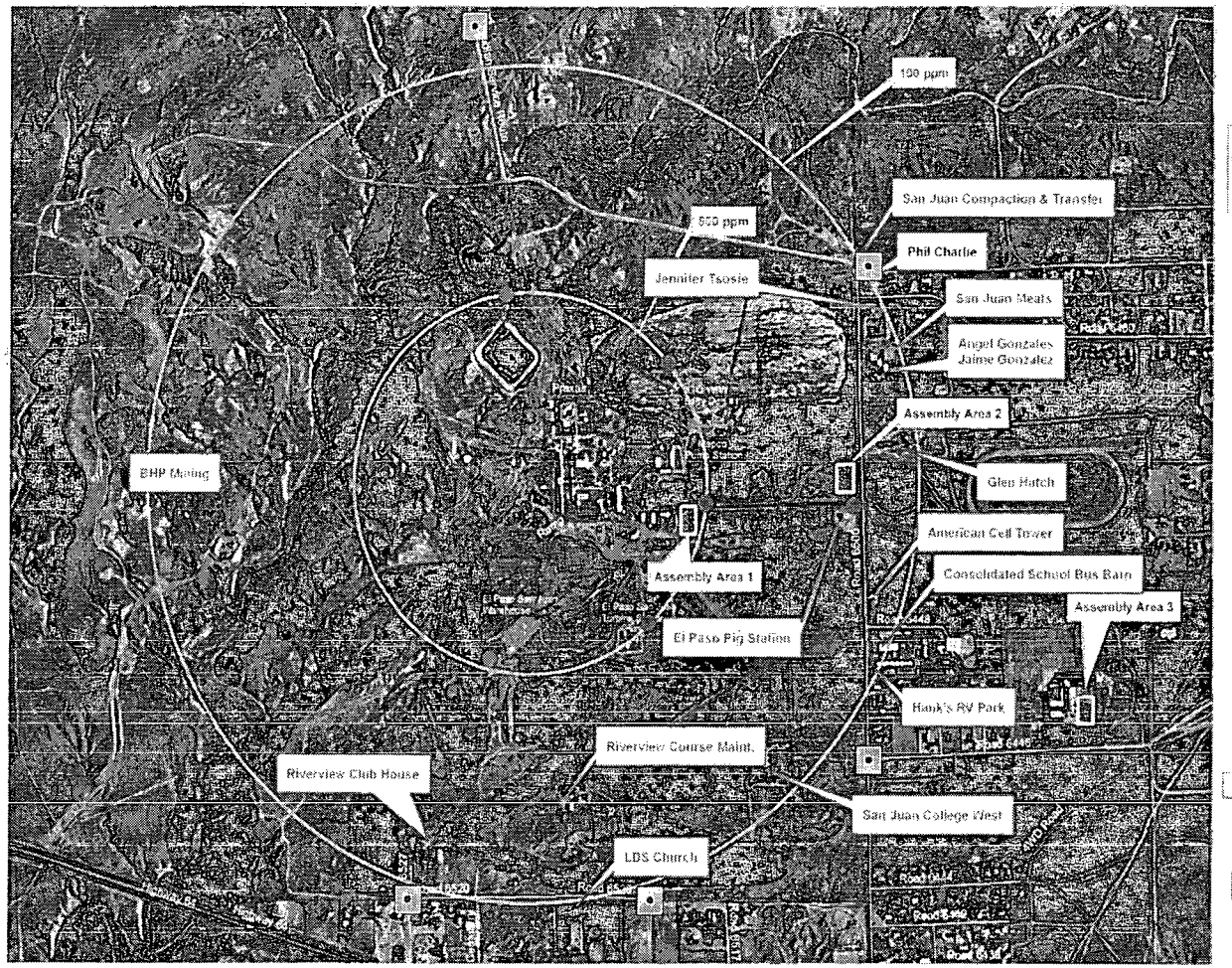
100-ppm RADIUS OF EXPOSURE CALCULATION

$$[(1.589)*(H_2S \text{ concentration})*(\text{gas volume})]^{0.6258}$$
$$[(1.589)*(6000*.000001)*(50,000,000)]^{0.6258}$$

100-ppm ROE = 3576 feet

APPENDIX C

100-PPM AND 500-PPM
RADIUS OF EXPOSURE MAP
SHOWING LOCATION OF ADDITIONAL
OFF-SITE H_2S MONITORS AND
LOCATION OF ROADBLOCKS



San Juan River Gas Plant
Hydrogen Sulfide Contingency Plan
Radius of Exposure

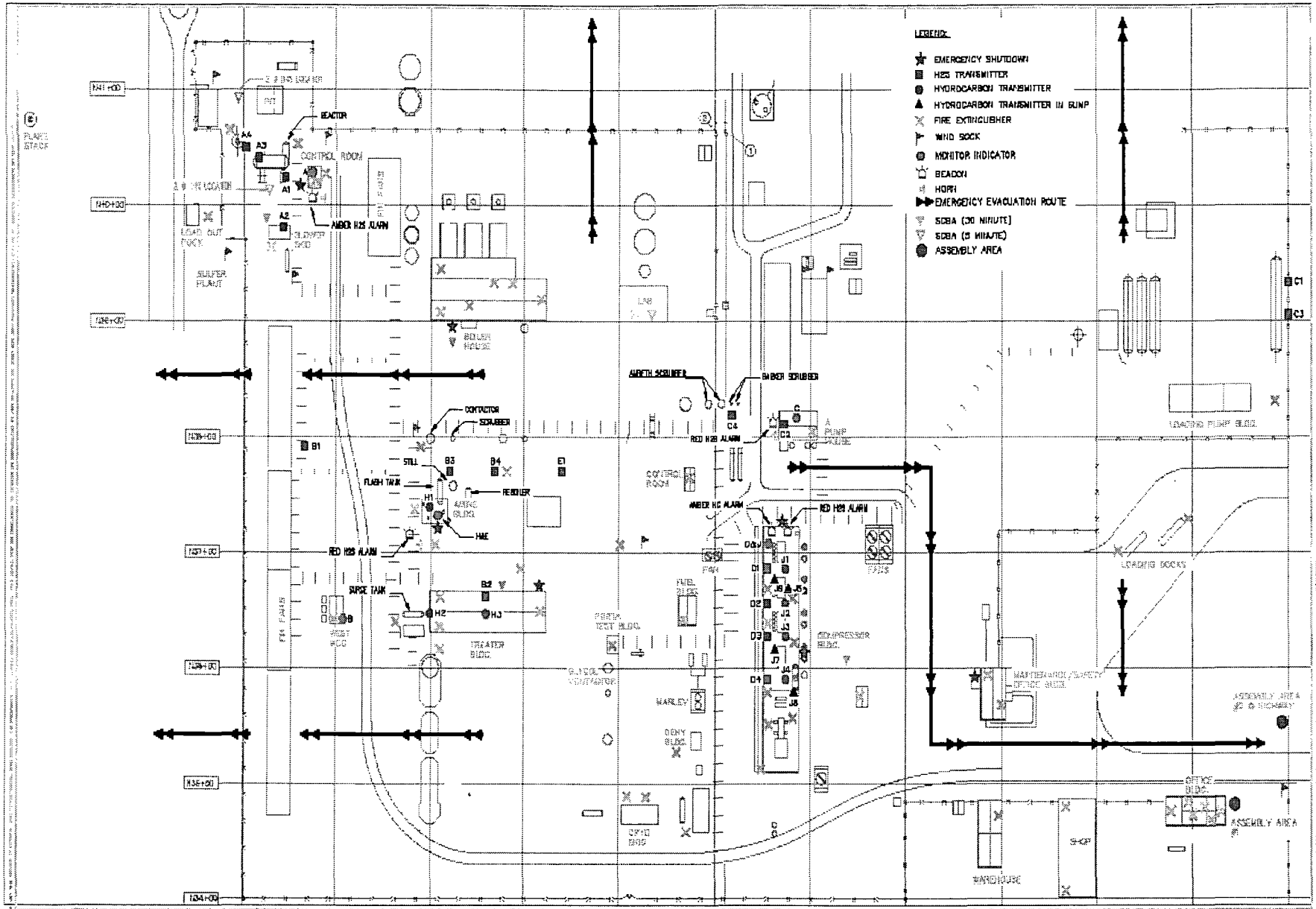
PROPOSED OPERATIONS

- AGI Well *
- Radius of Exposure
  - 1634 ft (500 ppm)
  - 3576 ft (100 ppm)
  - Assembly Area
  - Business

*Based on 50 MMscf @ 10% H_2S

- H_2S Monitors
- Road Blocks

Anadarko Petroleum Corporation



NOTES:

Western Gas Resources, Inc.

SAN JUAN RIVER PLANT

EMERGENCY ITEMS AND PLACEMENT

SAN JUAN RIVER PLANT

APPENDIX D

PLANT DIAGRAM WITH EVACUATION ROUTES & EMERGENCY EQUIPMENT LOCATIONS

APPENDIX E

DESCRIPTION OF H_2S MONITORING & ALARM SYSTEMS

A. EMERGENCY SHUTDOWN SYSTEM

There are (8) ESD manual stations located at various points in the facility (**Appendix D**). **The Plant ESD can be activated at any time at the direction of the Plant Superintendent or Incident Commander and is to be activated based on this Plan after 20 ppm H_2S has been detected in the Plant and efforts to resolve the issue for 15 minutes have failed**.

When any one of the eight (8) manual stations is activated, the system will be shutdown and the natural gas inlets and outlets will be blocked. The operators are also able to auto close the two (2) main blocks on the incoming gas lines to the Plant. Activating these should allow the Plant to avoid a Level 3 response. Two miles north of the Plant, on the Barker Dome line and the Aneth line, there are isolating block valves (manual) that can prevent further gas flow into the Plant pipeline system. Also, further upstream on the Barker and Aneth lines there are additional isolating block valves at 6 miles and 8 miles upstream on their respective lines. These block values furthest upstream, isolate the entire system from the field gathering lines coming into the Plant.

B. PLANT ALARMS, VISIBLE BEACONS & WIND INDICATORS

1. Colored beacons, horns, and wind directions indicators are located in various locations throughout the Plant and are indicated on **Appendix D**.

2. The audible signal for an emergency response and Plant evacuation is a repeating intermittent alarm that sounds at 10 ppm H_2S. The frequency of this intermittent alarm will increase as the concentration of the H_2S release increases. The alarm will become continuous when the concentration of the H_2S release is 20 ppm or higher. At the initial sound of this intermittent alarm, the Plant operator will put on a SCBA and all personnel in the Plant complex shall immediately proceed in a safe manner to the Emergency Assembly Areas as prescribed by the Emergency Action Plan on page 19 of this Plan.

3. A flashing red beacon signifies an H_2S release of 10 ppm and all personnel in the Plant complex shall immediately proceed in a safe manner to the Emergency Assembly Area 1 located east of the main office. If this area is not determined to be safe all will move to Assembly Area 2 which is on road 6500 at the main gate on the east side of the facility. Evacuation routes and Assembly Area 1 are indicated on **Appendix D**.

4. A routine process alarm will cause a horn to sound. This horn is a wavering siren sound that is used to alert the Plant Operator to return to the Control Room. No emergency response or evacuation is required when this siren sounds. Flashing beacons are located throughout the Plant and are utilized to assist the Plant Operator in identifying the location of the Plant alarm or Plant upset. Any beacon colors other than red do not identify an emergency response or evacuation.

5. Wind direction indicators are installed throughout the Plant and at the Plant Superintendent Office Building. At least one wind direction indicator can be seen at any location within the Plant complex, as well as, from any point on the perimeter of the Plant. There are 10 windsocks located in the Plant.

6. Additional permanent off-site H_2S monitors will be placed in the vicinity of the Plant coincident with the calculated radii of exposure as shown on **Appendix C**. These monitors will assist Anadarko in appropriate notification of potentially affected entities in the vicinity of the Plant within the calculated 100 ppm radius of exposure.

C. GAS DETECTION EQUIPMENT

1. The Plant uses the Industrial Scientific Corporation 4200 Series Remote H_2S Sensors. These sensors are a fixed point monitor to detect the presence of hydrogen sulfide in ambient air. The sensors are connected to Allan Bradley/SLC-500 Rockwell Logic Controllers with an output to Moore Micro-Advantage controllers and from here to the operator's PLC. The red flashing beacon is activated at 10 ppm. The horn is activated with an intermittent alarm at 10 ppm and changes to a steady alarm at 20 ppm. The additional off-site sensors shown on **Appendix C** will be of the same type and calibrated as described in this paragraph for the Plant sensors.

2. The fixed hydrogen sulfide monitors are strategically located throughout the Plant to detect an uncontrolled released of hydrogen sulfide. The SRU has 4 sensors labeled A-1 through A-4. The treating Plant area has 4 sensors labeled B-1 through B-4. There are two sensors at the east side of the Plant labeled C-1 and C-3. There is one sensors located at the liquid stabilizer skid labeled E-1. This is the center of the process area. The compressor building has eight methane sensors; these shut the compressors down at 50% LEL. The compressor building also is equipped with fire eyes that will also shut the units down. The Plant operators are able to monitor the ppm level of H_2S of all the Plant sensors on their control/monitor PLC located in the operator's building. These sensors are all located on the plot plan on **Appendix D**. These sensors all have to be acknowledged and will not clear themselves. This requires immediate action for any occurrence or malfunction. The Plant sensors are calibrated quarterly.

3. Hand held gas detection monitors are available to Plant personnel to check specific areas and equipment prior to initiating maintenance or work on the process or equipment. There are 2 handheld and 9 personal monitors that are used by individuals for special projects and field work. The hand held gas detection devices are BW Technologies 4-gas detectors. The detectors have sensors for oxygen, LEL (explosive hydrocarbon atmospheres), hydrogen sulfide, and carbon dioxide. They indicate the presence H_2S with a beeping sound at 10 ppm. The beeps change in tone as H_2S increases to 20 ppm. The personal monitors are set to alarm (beep) at 10 ppm with the beeps becoming closer together as the H_2S concentration increases to 20 ppm. Both the hand held and personal monitors have digital read outs of H_2S ppm concentration.

D. RESPIRATORS

1. The Plant has 30 minute Self-Contained Breathing Apparatus (SCBA) respirators and 5 minute escape packs strategically located throughout the Plant.

2. The respirator containers are identified in the process area and the locations are identified on **Appendix D.**

3. All Plant personnel with the exception of the Plant Operations Specialist are certified to use the SCBA respirators.

E. FIRE FIGHTING EQUIPMENT

1. The Plant personnel are trained only for insipient stage fire fighting.

2. The fire extinguishers located in the Plant process areas, compressor buildings, process buildings, and company vehicles are typically a 20# Ansul dry chemical fire extinguisher. **See Appendix D.**

3. The Plant does not have a fire water system, but only a utility water system that is not designed for fire fighting.

APPENDIX F

H_2S CONTINGENCY PLAN FLOW DIAGRAM

LEVEL 1 RESPONSE

H_2S DETECTED GREATER THAN 10 PPM &/OR INTERMITTENT ALARM SOUNDS/FLASHING RED BEACONS ACTIVATED

- **OPERATORS PUT ON RESPIRATORS (30 minute SCBA) TO ASSESS & RESOLVE PROBLEM (Operators are allowed under OSHA to work for up to 8 hours in 10ppm H2S environment)**
- **ALL OTHERS EVACUATE TO ASSEMBLY AREA 1**
- **NOTIFY PRAXAIR & BHP MINES**

AT ASSEMBLY AREA 1

- **MONITOR H_2S LEVELS AT ASSEMBLY AREA**
- **OPERATORS WILL SET UP SECONDARY ENTRY TEAMS W/ 30-MIN SCBA TO TRY TO RE-ENTER AND RESOLVE**
- **RE-ENTRY WITH SCBA WILL OCCUR IN 15 MINUTE SHIFTS AT THE DIRECTION OF THE IC UNTIL IC DETERMINES PROBLEM HAS BEEN RESOLVED OR ESD IS ACTIVATED)**

CALL 911 IF INJURY OR DEATH FOR EMERGENCY ASSISTANCE

ONCE RESOLVED & MONITORED LEVELS IN PLANT ARE LESS THAN 10 PPM RETURN TO PLANT

IF H_2S LEVELS AT ASSEMBLY AREA 1 EXCEED 10PPM

EVACUATE TO ASSEMBLY AREA 2

NOTIFY NMOCD WITHIN ONE HOUR MAKE AGENCY REPORTS AS NECESSARY

AT ASSEMBLY AREA 2

- **MONITOR H_2S LEVELS AT ASSEMBLY AREA**
- **FOLLOW LEVEL 2 RESPONSE ACTIONS**

NOTIFY LEPC AND OTHER PUBLIC OFFICIALS AND EMERGENCY SUPPORT SERVICES

LEVEL 2 RESPONSE

H_2S LEAK DETECTED GREATER THAN 20 PPM &/ CONTINUOUS ALARM SOUNDS/FLASHING RED BEACONS ACTIVATED

- OPERATORS PUT ON RESPIRATORS (30-MIN SCBA) TO ASSESS & RESOLVE PROBLEM

(Operators have 15 minutes to resolve after which they must evacuate to Assembly Area #2 and begin rotational entry to Plant)

- ALL OTHERS EVACUATE TO ASSEMBLY AREA 2
- EVACUATE PRAXAIRE
- NOTIFY BHP MINES, ALL OTHER BUSINESSES IN THE 100 & 500 PPM ROE.

AT ASSEMBLY AREA #2

- MONITOR H_2S LEVELS AT ASSEMBLY AREA
- IF MONITORED LEVELS EXCEED 10 PPM EVACUATE TO ASSEMBLY AREA 3 (KIRTLAND ELEMENTARY SCHOOL PARKING LOT)
- RE-ENTRY WITH SCBA WILL OCCUR IN 15 MINUTE SHIFTS AT THE DIRECTION OF THE IC UNTIL IC DETERMINES PROBLEM HAS BEEN RESOLVED OR ESD IS ACTIVATED)

CALL 911
IF INJURY OR DEATH
FOR EMERGENCY ASSISTANCE

ONCE RESOLVED & MONITORED LEVELS IN PLANT ARE LESS THAN 10 PPM RETURN TO PLANT

IF CONSTANT ALARM SOUNDS FOR 15 MINUTES

- ACTIVATE PLANT EMERGENCY SHUT DOWN (ESD)
- ACTIVATE FULL H_2S PLAN WITH NOTIFICATIONS & REPORTING (FOLLOW LEVEL 3 RESPONSE)

NOTIFY NMOCD WITHIN <u>ONE HOUR</u>
MAKE OTHER AGENCY REPORTS AS PER H_2S PLAN

LEVEL 3 RESPONSE

WORST CASE SCENERIO AND/OR CATASTROPHIC RELEASE FROM FIRE AND/OR EXPLOSION

- ALL PERSONNEL EVACUATE TO ASSEMBLY AREA 2 IF MONITORED LEVELS ARE LESS THAN 10 PPM
- EVACUATE PRAXAIR AND ALL ENTITIES WITHIN 500 PPM ROE
- IF MONITORED LEVELS AT ASSEMBLY AREA 2 ARE GREATER THAN 10 PPM; EVACUATE TO ASSEMBLY AREA 3 (ELEMENTARY SCHOOL PARKING LOT)
- IMPLEMENT FULL H_2S PLAN WITH ALL NOTIFICATIONS
- NOTIFY LOCAL FIRE, POLICE AND EMERGENCY SERVICES

ONCE RESOLVED & MONITORED LEVELS IN PLANT ARE LESS THAN 10 PPM RETURN TO PLANT

IF CONSTANT ALARM SOUNDS FOR 15 MINUTES

- ACTIVATE PLANT EMERGENCY SHUT DOWN (ESD)
- RE-ENTRY WITH SCBA WILL OCCUR IN 15 MINUTE SHIFTS AT THE DIRECTION OF THE INCIDENT COMMANDER (IC) UNTIL IC DETERMINES PROBLEM HAS BEEN IDENTIFIED OR REPAIRED

APPENDIX G

EMERGENCY CALL LIST

SAN JUAN GAS PLANT EMERGENCY CALL LIST

ENTITIES WITH IN THE 500- PPM ROE

Name	Address	Contact Person	Phone Number
El Paso Natural Gas Warehouse	81 County Road 4900 Bloomfield, NM 87413		800-334-8047 (24 hr)
El Paso Natural Gas Turbine Station	81 County Road 4900 Bloomfield, NM 87413		800-334-8047 (24 hr)
Mid-America Pipeline Co. (Enterprise)	3621 East Main Farmington, NM 87402		505-599-3276 505-599-3277 800-546-3482 (24 hr)
Praxair	101 County Road 6500 Bloomfield, NM 87417		505-598-0549 800-598-0549 (24 hr)
XTO Energy Salty Dog #1	2700 Farmington Ave. Farmington, NM 87401		505-324-1090

While BHP has no active vent shafts within the 500ppm ROE, they will be notified along with others entities contained within the 500ppm ROE to assure that no vents have been activated that would be affected. BHP contact information is below.

BHP Mining	16 Miles West of Farmington, NM San Juan County Road RD6800	Dave Hales, Safety Manager	505-598-2311 505-486-1612

ENTITIES WITH IN THE 100- PPM ROE

Name	Address	Contact Person	Phone Number
San Juan Co. Compaction and Transfer	141 County Rd 6500 Kirtland, NM 87417		505-334-4520
Phil Charlie	2 County Rd 6480 Kirtland, NM 87417		505-860-0602
Jennifer Tsosie	136 County Rd 6500 Kirtland, NM 87417		505-809-5145
San Juan Meats	118 County Rd 6500 Kirtland, NM 87417		505-598-5060
Angel Gonzalez	118 County Rd 6500 Kirtland, NM 87417		505-598-0372
Jamie Gonzalez	118 County Rd 6500 Kirtland, NM 87417		505-598-5129
Glen Hatch	106 County Rd 6500 Kirtland, NM 87417		505-598-1356
San Juan College West	69 County Road 6500 Kirtland, NM 87417		505-598-5897
El Paso Natural Gas Pigging Station	81 County Road 4900 Bloomfield, NM 87413		800-334-8047 (24 hr)
BHP Mining	16 Miles West of Farmington, NM San Juan County Road RD6800	Dave Hales, Safety Manager	505-598-2311 505-486-1612
American Cell Tower	88 Rd 6500 Kirtland, NM 87417		877-518-6937
Central Consolidated School Bus Barn	76 County Rd 6500 Kirtland, NM 87417		505-598-0132
Hank's RV Park	72 County Rd 6500 Kirtland, NM 87417		505-325-7150
San Juan College	69 County Rd 6500 Kirtland, NM 87417		505-598-5897
Later Saints Church	10 County Rd 6523 Kirtland, NM 87417		505-598-5247 505-598-9297
BHP Mine Vent	300 County Rd 6900 Kirtland, NM 87417		505-598-5558
Riverview Golf Course	583 County Rd 6100 Kirtland, NM 87417		505-598-0140

All entities located within the 500 ppm ROE (listed above) are also located within the 100 ppm ROE and must be called when these entities are contacted.

COMPANY INTERNAL NOTIFICATIONS
SAN JUAN RIVER PLANT PERSONNEL

NAME	TITLE	OFFICE No.	CELLULAR No.	HOME No.
Kent McEvers	Plant Superintendent	505-598-5601 ext. 15523	505-860-7208	505-326-4054
Rick Fetch	Plant Foreman	505-598-5601 ext. 15522	505-947-2416	505-324-6441
Arlyn Thorson	Maintenance Foreman	505-598-5601 ext. 15524	505-947-2417	505-326-6718
Bob McClain	Plant Operator	505-598-5601 ext. 15542	505-330-1966	505-325-8715
Brenda Wilson	Sr. Operations Specialist	505-598-5601 ext. 15521		505-325-6525
Andrew Adame	Plant Operator			505-360-7051
Chee Anderson	Plant Operator			505-326-1397
Glen Daniell	Plant Operator		505-860-7483	505-632-9705
Curtis Day	Plant Operator			505-801-4404
Johnny Foster	Plant Operator			505-801-5062
Frank Hale	Plant Operator		505-860-5897	505-598-9091
Bobby James	Plant Operator			505-598-5314
Melvin Jim	Plant Operator			505-368-4733
Charlie Barr	Mechanic		505-324-1100	505-330-2614
Jerry Darnell	Fieldman			505-632-2722
Ted Francis	Fieldman			505-564-2999
Kent Galyon	Fieldman		505-860-1875	970-565-1006
William Golbe	Mechanic		505-215-2517	505-598-9716
Charlie Medders	Mechanic		505-947-7039	505-598-5573
Corwyn Yazzie	Mechanic		505-793-2567	505-327-3286

COMPANY INTERNAL NOTIFICATIONS
CORPORATE PERSONNEL – THE WOODLANDS, TEXAS

NAME	TITLE	OFFICE No.	CELLULAR No.	HOME No.
Mario Reyes	Operations Mgr	832-636-3234	713-816-5006	281-360-1084
Mike Ross	General Mgr	832-636-3431	832-381-0923	281-296-0385
Tony Marques	Engineering Mgr	832-636-7368		
Chuck Johnson	Commercial Develop. Mgr	832-636-7119		

David Ponikvar	S&H Mgr	832-636-3414	281-732-7887	281-374-8334
Julie Bietik	Env & Reg Anal	832-636-2609	281-793-7705	281-320-2066
Eric Weaver	EHS Analyst	432-684-2808	432-413-2494	432-756-3493
Jerry Adams	EHS Mgr	832-636-8304	281-731-5931	281-363-4693
Mike Gray	EHS Director	832-636-2454	281-415-6964	936-271-9869

COUNTY & LOCAL LAW ENFORCEMENT

AGENCY	DAYTIME / 24 HR. PHONE No.
Law Enforcement Dispatch	**911**
San Juan County Sheriff	505-334-6622
Farmington Police	505-327-0222
Navajo Tribal Police	505-368-4333
Ute Mountain BIA	303-565-8471
New Mexico Highway Patrol	505-325-7547
New Mexico FBI	505-325-8631
San Juan County LEPC	505-334-1180
BLM Farmington Office	505-599-8900

MEDICAL SERVICES

AGENCY	EMERGENCY SERVICE	PHONE No.
Emergency Dispatch	Fire & Ambulance	**911**
San Juan County Fire Marshall	Fire Department	505-334-9431
San Juan Regional Medical Center	Hospital	505-325-5011
Emergency Trauma Lifeline Service - Farmington		505-325-5602
Dr. Robert C. Rhein	Doctor	505-327-4867
Dr. Ken Crider	Doctor	505-327-4439
San Juan Air Care Farmington	Air Ambulance	800-452-9990

FEDERAL NOTIFICATIONS

AGENCY	DAYTIME / 24 HR. PHONE No.
National Response Center	800-424-8802
EPA Region 8	800-227-8917
OSHA	800-321-6742
OSHA Area Office New Mexico	505-827-4230
DOT	800-424-8802
BLM Farmington	505-599-8900

NEW MEXICO STATE NOTIFICATIONS

AGENCY	DAYTIME / 24 HR. PHONE No.
New Mexico One Call	800-321-2537
New Mexico Oil Conservation Division	505-334-6178
New Mexico Environmental Department	505-476-4300
New Mexico Emergency Response Commission	505-476-9681
New Mexico Public Utilities Commission	505-490-2375
New Mexico State Patrol	505-325-7547

CONTRACTORS

CONTRACTOR	CONTACT	OFFICE No.	CELLULAR No.
Contractors – General			
IMI Construction		505-325-5005	
Weeminuche Construction	Benton Dean	970-565-7430	

Service Companies Supplies			
Noels Inc		505-327-3375	
ESSO Pipe & Supply		505-325-7568	
Air Gas		505-325-6660	
DXP	Steve Martinez	505-326-3333	
DeWees Tool & Supply		505-326-5491	
Emergency Response & Safety Services			
ChemTrec		800-424-9300	
Hands On Safety Service		505-325-4218	
Electrical Services			
Four Corners Electric		505-325-1459	
B&G Electric		505-325-7511	

OTHER PRODUCERS (which may be notified in the event of a Plant shut down)

COMPANY	CONTACT	OFFICE No.	CELLULAR No.
Burr Oil & Gas	Deana	505-325-1701	
Conoco/Burlington	Jerry Lodermilk		505-320-0452
	Renae	505-330-2946	
DJ Simmons Company	John Byrom	505-326-3753	
Elm Ridge Resources	Office	505-334-3476 ext 210	
	Terry Lindeman	972-749-6941	
El Paso Natural Gas		505-632-6000	
	Emergency Number	800-334-8047	
Nacogdoches Oil & Gas	Aaron	936-697-3750	
Resolute Natural Resources	Office	970-564-5200	
	Montezuma Creek	435-651-3682	
	Roger Atcitty		435-444-0001
Rim Southwest Corporation	Thelma Dee	435-651-4391	
XTO Energy Inc.	Office	505-324-1090	
	John Weaver		505-330-3278

OTHER RESOURCES

COMPANY	OFFICE No.	Website
National Weather Service Albuquerque, New Mexico	505-243-0702	
Farmington Four Corners Regional Airport – National Weather Service		*http://weather.noaa.gov/weather/current/KFMN.html*
Additional Weather Sites		www.accuweather.com www.wunderground.com www.weather.com

APPENDIX H

H_2S PLAN DISTRIBUTION LIST

New Mexico Oil & Gas Conservation Division

New Mexico Environment Department

New Mexico Department of Public Safety (Farmington Office)

New Mexico Department of Public Safety (State Office)

Farmington Fire Department

San Juan County Fire Department

San Juan County Sheriff Department

San Juan County Emergency Manager

San Juan County LEPC

Farmington Police

San Juan Regional Medical Center

San Juan Plant Office

Anadarko Petroleum Corporate Office

ANADARKO PETROLEUM CORPORATION

TEL. 832/ 636-1000
P.O. BOX 1330 • HOUSTON, TEXAS 77251-1330

October 5, 2009

Mr. Brad Jones
Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, NM 87505

RE: H_2S Contingency Plan

Dear Mr. Jones:

Pursuant to NMAC 19.15.11, Western Gas Resources Asset Holding Company LLC, a wholly owned subsidiary of Anadarko Petroleum Corporation respectfully submits the H_2S Contingency Plan Amendment for the San Juan River Gas Plant in regards to the proposed acid gas injection well and subsequent increase in radii of exposure. Upon your approval of the plan, a diskette with the plan will be sent to your attention.

If you have any questions or require additional information, please contact me at (832) 636-2609.

Sincerely,

Julie Betik
Sr. Staff Environmental Analyst

Anadarko
Petroleum Corporation

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H_2S CONTINGENCY PLAN
(Amendment Related to Acid Gas Injection Well)

San Juan River Gas Plant
Kirtland, New Mexico

WESTERN GAS RESOURCES ASSET HOLDING COMPANY, LLC, a wholly owned subsidiary of Anadarko Petroleum Corporation

(October 2009)

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APPENDICES

Appendix A – Worst Case Scenario for H_2S Release
Appendix B – Calculation for Radius of Exposure
Appendix C – Radius of Exposure (ROE) Map Showing H_2S Monitor and Road Block Locations
Appendix D – Plant Diagram - Evacuation Routes, H_2S Monitoring and Alarm Locations
Appendix E – Description of Emergency Response Equipment
Appendix F – H_2S Contingency Plan - Response Flow Diagram(s)
Appendix G – Emergency Call List
Appendix H – H_2S Plan Distribution List

I. INTRODUCTION

The San Juan River Gas Plant (hereinafter the "Plant") is a natural gas processing plant which handles and/or generates hydrogen sulfide and/or sulfur dioxide; therefore this Hydrogen Sulfide Contingency Plan (the "H_2S Plan" or "the Plan") has been developed: 1) to satisfy the New Mexico Oil Conservation Division Rule 11, 2) to conform with API "Recommended Practices for Oil and Gas Producing and Gas Processing Plant Operations Involving Hydrogen Sulfide," RP 55, and 3) to create a site-specific hydrogen sulfide contingency plan that outlines the emergency response procedures that will be implemented to ensure a coordinated, efficient and immediate action Plan for alerting and protecting operating personnel and the public as well as to prevent or minimize environmental hazards and damage to property. The terms used in this Plan are to be used in the same manner as defined in Title 19 Chapter 15 Part II of the New Mexico Administrative code (19.15.11.7- Definitions) unless otherwise defined herein.

A. PLANT DESCRIPTION & MAP (Figure 1)

The Plant is located in Kirtland, San Juan County, New Mexico and encompasses 300+ acres. It is owned and operated by Western Gas Resources Asset Holding Company LLC, which is a wholly owned subsidiary of Anadarko Petroleum Corporation (hereinafter collectively referred to as the Company).

More specifically, the Plant is located in Section 1, Township 29N, Range 15 W in Kirtland, San Juan County, New Mexico.

1. Its coordinates are:
   Latitude: 36.453 N **Longitude: 108.220 W**

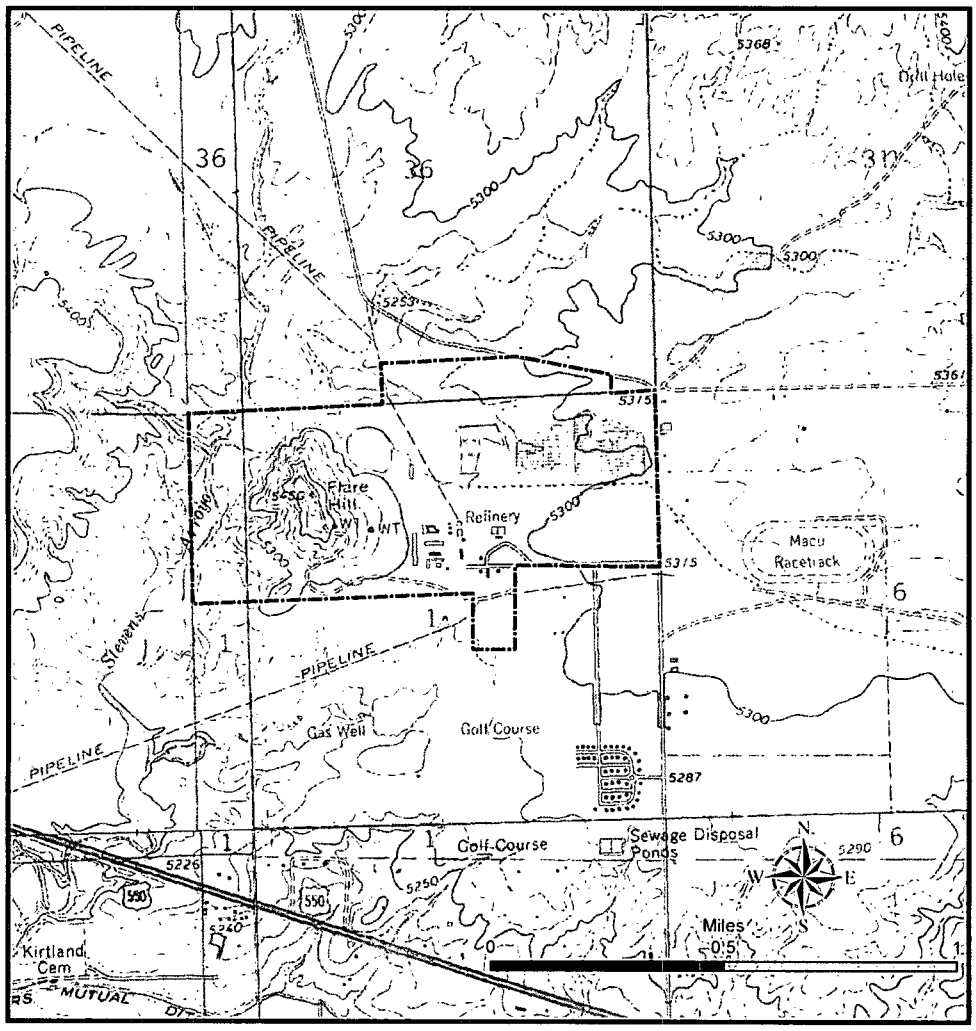
2. Its physical address is:
   99 County Road 6500, Kirtland, New Mexico 87417

3. Its mailing address is:
   P. O. Box 70, Kirtland, New Mexico 87417

4. Driving Directions from Farmington, New Mexico to the Plant:

   From the intersection of US Highway 64 and the La Plata Highway (New Mexico Highway 170), travel west on US Highway 64 approximately 6.2 miles to the intersection of US Hwy 64 and County Road 6500 in Kirtland, New Mexico. Turn right on County Road 6500 and travel north approximately 1.7 mile to the entrance to the San Juan River Gas Plant.

The location of the Plant is illustrated herein on Figure 1.



Approximate Boundaries of Western Gas Resources Property
Anadarko San Juan River Natural Gas Processing Plant

Figure 1 Anadarko San Juan River Plant Location

B. DESCRIPTION OF OPERATIONS

1. The Plant operations include gas processing, conditioning and compression, as well as flow lines and storage tanks. The Plant gathers produced natural gas from San Juan County, New Mexico, as well as, from Southwestern Colorado, Northeastern Arizona, and Southeastern Utah. Once gathered at the Plant, the produced natural gas is compressed; treated in an amine process for the removal of carbon dioxide and hydrogen sulfide; and dehydrated to remove the water content. The processed natural gas is then sold and shipped to various customers.

2. Because the natural gas that is gathered at the Plant contains hydrogen sulfide ("sour gas"), it must be treated or processed to remove these and other impurities. The carbon dioxide and hydrogen sulfide (H_2S) stream that is removed from the natural gas in the amine treating process is then sent to the Claus sulfur recovery unit whereby sulfur is removed, which results in the generation of molten elemental sulfur. Any residual H_2S is routed to an incinerator where it is combusted into sulfur dioxide.

3. The Plant anticipates the need to process a higher volume of natural gas due to the development of additional natural gas resources in the area. This increased processing capacity will necessitate an expansion of the Plant. The Plant predicts an increase in inlet volume to 50 MMCFD with about 6000 ppm H_2S content. The Plant has proposed the installation of an acid gas injection (AGI) well to accommodate disposal of the acid gas stream generated by existing and expanded operations. The expanded operation is expected to generate approximately 3.80 MMCFD of acid gas for disposal. The existing sulfur reduction unit (SRU) currently being used to treat the acid gas will be replaced by the AGI well following approval of the AGI well permit by NMOCD and successful completion of the AGI well.

II. THE PLAN

A. RESPONSIBILITY FOR CONFORMANCE WITH THE H_2S PLAN

It is the responsibility of all personnel on-site to follow the safety and emergency procedures outlined in the Hydrogen Sulfide Contingency Plan (the H_2S Plan) as well as the following documents:

- Anadarko Petroleum Corporation Safety & Health Manual
- Anadarko Petroleum Corporation Emergency Response & Oil Spill Contingency Plan; and
- Anadarko Petroleum Corporation Environmental Policies and Programs.

B. REVISIONS TO THE PLAN

The H_2S Plan will be reviewed annually and revised at this time as necessary to address changes to the Plant facilities, operations, or training requirements, contact information

and the public areas including roads, businesses, or residents potentially affected by the operations of the Plant, specifically those areas within the radii-of-exposure.

C. AVAILABILITY OF THE H_2S PLAN

The H_2S Plan shall be available to all personnel responsible for implementation, regardless of their normal location assignment. A copy of the Plan will be maintained at the Plant in the Plant Superintendent's office and at the Anadarko Corporate Headquarters in The Woodlands, Texas. **See Appendix H for the H_2S Distribution List,** which lists all the additional entities that have been provided a copy of the H_2S Plan.

D. CONTENT OF THE PLAN

At a minimum, the H_2S Plan will contain information regarding: 1) the emergency procedures to be followed in the event of an H_2S or SO_2 release that may pose a threat to the Plant, public or public areas, 2) the characteristics of H_2S and SO_2, 3) a facility description, map and/or drawings, and 4) information regarding training and drills to be conducted related to this Plan.

III. PLAN DESIGN CONSIDERATIONS

A. CHARACTERISTICS OF H_2S, SO_2 AND CARBON DIOXIDE

1. Hydrogen Sulfide (H_2S)

The proposed inlet gas streams into the Plant will contain approximately 6,000 ppm (or 0.60 mole percent) of hydrogen sulfide based on data generated from the sampling of the inlet gas at least three times daily.

Hydrogen sulfide is a colorless, toxic and flammable gas, and has the odor of rotten eggs. Hydrogen sulfide gas is heavier than air.

Hydrogen sulfide presents a significant health hazard by paralyzing the respiratory system resulting in serious injury or death.

Hydrogen Sulfide Properties & Characteristics	
CAS No.	7783-06-4
Molecular Formula	H_2S
Molecular Weight	34.082
TWA	10 ppm
STEL	15 ppm
IDLH	100 ppm
Specific Gravity (air = 1.0)	1.189
Boiling Point	-76.5°F

Freezing Point	-121.8°F
Vapor Pressure	396 psia
Autoignition Temperature	518°F
Lower Flammability Limit	4.3%
Upper Flammability Limit	46.0%
Stability	Stable
pH in water	3
Corrosivity	Reacts with metals, plastics, tissues & nerves

Physical Effects of Hydrogen Sulfide		
Concentration		
ppm	**%**	**Physical Effect**
1	.00010	Can be smelled (rotten egg odor)
10	0.0010	Obvious & unpleasant odor; Permissible Exposure Limit; Safe for 8-hour exposure
15	0.0015	Short Term Exposure Limit (STEL); Safe for 15 minutes of exposure without respirator
50	0.0050	Loss of sense of smell in 15 minutes
100	0.0100	Immediately Dangerous to Life & Health (IDLH); Loss of sense of smell in 3-15 minutes; Stinging in eyes & throat; Altered breathing
200	0.0200	Kills smell rapidly; Stinging in eyes & throat
500	0.0500	Dizziness; Unconscious after short exposure; Need artificial respiration
700	0.0700	Unconscious quickly; death will result if not rescued promptly
1,000	0.1000	Instant unconsciousness; followed by death within minutes

2. Sulfur Dioxide ($S0_2$)

Sulfur dioxide is produced as a by-product of H_2S combustion at the incinerator. The incinerator unit receives the residual hydrogen sulfide and carbon dioxide stream that is routed from the amine unit.

It is colorless, transparent, and is non-flammable, with a pungent odor associated with burning sulfur.

Sulfur dioxide is heavier than air, but will be picked up by a breeze and carried downwind at elevated temperatures. Sulfur dioxide can be extremely irritating to the eyes and mucous membranes of the upper respiratory tract.

Sulfur Dioxide Properties & Characteristics	
CAS No.	7446-09-5
Molecular Formula	SO_2
Molecular Weight	64.07
TWA	2 ppm
STEL	5 ppm
IDLH	100 ppm
Specific Gravity (air = 1.0)	2.26
Boiling Point	14°F
Freezing Point	-103.9°F
Vapor Pressure	49.1 psia
Autoignition Temperature	N/A
Lower Flammability Limit	N/A
Upper Flammability Limit	N/A
Stability	Stable
Corrosivity	Could form an acid rain in aqueous solutions

Physical Effects of Sulfur Dioxide	
Concentration	**Effect**
1 ppm	Pungent odor, may cause respiratory changes
2 ppm	Permissible exposure limit; Safe for an 8 hour exposure
3-5 ppm	Pungent odor; normally a person can detect sulfur dioxide in this range
5 ppm	Short Term Exposure Limit (STEL); Safe for 15 minutes of exposure
12 ppm	Throat irritation, coughing, chest constriction, eyes tear and burn
100 ppm	Immediately Dangerous To Life & Health (IDLH)
150 ppm	So irritating that it can only be endured for a few minutes
500 ppm	Causes a sense of suffocation, even with first breath
1,000 ppm	Death may result unless rescued promptly.

3. Carbon Dioxide

The proposed inlet gas streams to the Plant will contain approximately 7% carbon dioxide based on the anticipated additional gas to the Plant which will be confirmed with inlet gas monitoring readings. Carbon dioxide gas is colorless, odorless, and non-flammable. Carbon dioxide is heavier than air.

Carbon Dioxide Properties & Characteristics	
CAS No.	124-38-9
Molecular Formula	CO_2
Molecular Weight	44.010
TWA	5,000 ppm
STEL	30,000 ppm
IDLH	40,000 ppm
Specific Gravity (air = 1.0)	1.5197
Boiling Point	-109.12°F
Freezing Point	-69.81°F
Vapor Pressure	830 psia
Autoignition Temperature	N/A
Lower Flammability Limit	N/A
Upper Flammability Limit	N/A
Stability	Stable
pH in saturated solution	3.7
Corrosivity	dry gas is relatively inert & not corrosive; can be corrosive to mild steels in aqueous solutions

Physical Effects of Carbon Dioxide	
Concentration	**Effect**
1.0 %	Breathing rate increases slightly
2.0 %	Breathing rate increases to 50% above normal level. Prolonged exposure can cause headache, tiredness
3.0 %	Breathing rate increases to twice normal rate and becomes labored. Weak narcotic effect. Impaired hearing, headache, increased blood pressure and pulse rate
4 – 5 %	Breathing increases to approximately four times normal rate, symptoms of intoxication become evident, and slight choking may be felt

5 – 10 %	Characteristic sharp odor noticeable. Very labored breathing, headache, visual impairment, and ringing in the ears. Judgment may be impaired, followed within minutes by loss of consciousness
10 – 100 %	Unconsciousness occurs more rapidly above 10% level. Prolonged exposure to high concentrations may eventually result in death from asphyxiation

B. RADII OF EXPOSURE (ROE)

For the existing operations, the "Radius of Exposure" for both 500-ppm and 100-ppm of H_2S gas was determined using the "escape rate", which is calculated using the maximum daily rate of the gaseous mixture that is handled by the Plant. The rates and other variables used to calculate the ROE is discussed in greater detail in **Appendix B - ROE calculations. Also refer to Appendix C - map showing 500-ppm ROE and the 100-ppm ROE.**

500-ppm ROE	**1634 feet**
100-ppm ROE	**3576 feet**

IV. EMERGENCY ACTION PROCEDURES

A. EMERGENCY RESPONSE ORGANIZATION

The Plant uses the Incident Command System (ICS) for emergency response. The ICS structure used is based on the National Interagency Incident Management System (NIIMS), and is consistent with the National Contingency Plan (NCP).

In the event of an accidental release that results in the activation of the H_2S Plan and all personnel have been evacuated out of the affected area, the Plant Superintendent, or his designee, will be the On-Scene Incident Commander (IC in this Plan). The IC will contact and coordinate with Anadarko's management in corporate office. If the severity of the response requires activation of the Emergency Response Center in The Woodlands, Texas office, the ICS structure will be staffed per the Anadarko Southern Region Emergency Response & Oil Spill Contingency Plan Manual. The staffing will not change the H_2S Plan contained herein.

The Plant Superintendent or his designee shall determine:

1) Plant Shutdowns
2) Isolation of pipeline segments
3) Repairs, tests or restarts as required

If an emergency occurs, the Plant Superintendent, or his designee, shall be notified first. The Plant Superintendent, or his designee, shall notify Anadarko's Office in The Woodlands, Texas

B. EMERGENCY RESPONSE

This section explains the procedures and decision to be used in the event of an H_2S release; much of which has been pre-determined to ensure a coordinated, efficient and

immediate action Plan for alerting and protecting operating personnel and the public as well as to prevent or minimize environmental hazards and damage to property.

1. OBJECTIVE

All Plant employees shall be prepared to respond to an H_2S or SO_2 emergency at the Plant. Emergency response actions may be taken for a variety of situations that may occur in the Plant. The Plan is activated in progressive levels based on the concentration of H_2S that has been released. The Plant has three (3) activation levels that are described below and in detail in the Response Flow diagram in **Appendix F**.

Level 1 – Intermittent alarm sounded and/or flashing red beacons activated for H_2S greater than 10 ppm

Level 2 – Continuous alarm sounded and/or flashing red beacons activated for H_2S greater than 20 ppm

Level 3 – Catastrophic release; fire; explosion; a continuous release of maximum volume for 24 hours; or Rule 11 Mandatory Activation for 100 ppm in any defined public area; 500 ppm at any public road; or 100 ppm at a distance greater than 3000 feet from the site or the release

As soon as the Plan has been activated based on the criteria above, the Plant Superintendent, or his designee, should be notified.

2. PLANT EVACUATION AND EMERGENCY ASSEMBLY AREAS

A. Plant evacuation for all visitors and Plant personnel that are not operators begins at the 10 ppm H_2S intermittent alarm and/or flashing red beacon. The Plant operators are to put on the 30-min SCBA and first determine if any personnel are in distress and assist any distressed personnel in evacuating to Emergency Assembly Area 1. Emergency services (911) will be contacted if there are injuries or as otherwise deemed necessary. BHP Mines and Praxair and the unmanned facilities within the 500 ppm radius of exposure (**Appendices C and G**) are also to be notified. The operators will then, wearing the SCBA, investigate the cause of the release. At the sound of the alarm and/or flashing red beacons, all other personnel in the Plant are to stop work, check the prevailing wind direction and immediately proceed along designated evacuation routes and/or upwind to the pre-designated Emergency Assembly Area(s) that are described in **Appendix F**.

Prevailing winds for the area are from the east and evacuation along the designated routes should be upwind. If the designated evacuation route is downwind of the release (based on the windsock), then all evacuees should proceed upwind to the Emergency Assembly Areas

The Plant evacuation diagram showing evacuation routes and Emergency Assembly Areas is attached in **Appendix D.**

The Emergency Assembly Area 1 is:

Parking Area on the eastside of the Plant Superintendent Office Building (see Appendix C & D)

The Emergency Assembly Area 2 is:

Area at Plant Rd and Hwy 6500 (see Appendix C)

The Emergency Assembly Area 3 is:

Kirtland Elementary School Parking Lot , 30 Road 6446 (see Appendix C)

B. Roll call shall be conducted at the Emergency Assembly Area to assure all personnel have evacuated safely. This facility is a PSM facility and requires all visitors check in before entering the Plant, thus the check-in sheet will be used at the Emergency Assembly Areas to make a full accounting of all personnel and visitors.

3. IMMEDIATE ACTION PLAN/ INITIAL RESPONSE

The following outlines the immediate action Plan that is illustrated by flow diagram in **Appendix F**. This is to be used when responding to an H_2S release. Additional or long term response actions will be determined on a case-by-case basis, if needed, once the Incident Command Center and System is established following the immediate response.

LEVEL 1 RESPONSE

1. The audible signal for a Plant emergency and evacuation is an intermittent horn (repeating off/on) activated when levels of H_2S of 10 ppm are detected. The frequency of this intermittent alarm will increase as the concentration of the H_2S increases. In addition, a flashing red light or beacon will be activated at 10 ppm H_2S. At the initial sound of the intermittent alarm or the flashing red beacon, each operator (2 per shift) will put on a 30 minute SCBA and all other personnel in the Plant complex shall immediately evacuate the Plant using the evacuation routes to the Emergency Assembly Area 1 (see **Appendix D**). The operators, upon suit up with the SCBA, will first help any persons in distress evacuate to the Emergency Assembly Area. If deemed necessary by the Senior Operator, local

emergency response service providers will be contacted by Plant personnel designated by the Senior Operator.

2. All entities within the 500 ppm ROE (see **Appendices C and G**) and BHP Mines will be notified of a release by personnel designated by the Plant Superintendent or his designee. The nature of the release and status of containment will be conveyed. Parties will be advised to report the incident to employees working near the Plant and to alert any third party contractors or service companies working in the Plant vicinity or imminently scheduled to work in the Plant vicinity of the release. All should be instructed to leave the area and not to enter/re-enter area until further notice.

3. Wearing the SCBA, the operator(s) will attempt to fix the cause of the release. OSHA guidelines allow operators to work in areas with 10ppm for up to 8 hours. The H_2S levels at the Emergency Assembly Area 1 will be monitored with a hand held or personal monitor.

4. The Senior Operator will set up secondary re-entry team(s) with 30 min. SCBA to re-enter and resolve the situation. Re-entry will occur in 15 minute shifts at the direction of the IC until the problem is resolved or the ESD activated. If H_2S levels in Emergency Assembly Area 1 exceed 10 ppm, evacuate to Emergency Assembly Area 2 and continue to monitor Assembly Area H_2S level. If release is resolved and monitored levels in the Plant are less than 10 ppm, personnel may re-enter the Plant. BHP, Praxair and the unmanned facilities within the 500 ppm radius of exposure (**Appendices C and G**) will be notified once release is contained and monitored H_2S levels are less than 10 ppm The OCD shall be notified within one hour of any release that activates the Plan. If the release is not resolved and H_2S levels continue to increase, Level 2 Response is indicated.

LEVEL 2 RESPONSE

1. The continuous alarm and indicates the detection of H_2S greater than 20 PPM. Flashing red beacons indicate a H_2S release of 10 ppm or greater and they will continue for a release of 20 ppm or greater. At the initial sound of the continuous alarm or observance of the flashing red beacons, the operators will immediately put on a 30 minute SCBA and all other personnel in the Plant complex will put on emergency escape packs if they are wearing them and evacuate along with all other personnel using the evacuation routes to the Emergency Assembly Area 2 (see **Appendix D**). The operators, upon suit up with the SCBA, will first help any persons in distress evacuate to the Emergency Assembly Area. If deemed necessary by the Senior Operator, local emergency response service providers will be contacted by Plant personnel as designated by the Senior Operator.

2. Praxair is trained to evacuate at continuous alarm sounds. Praxair, BHP Mines and all other entities within the 500 ppm ROE (see **Appendices C and G**) will be contacted by phone and notified of release and asked to evacuate, if they have not

already. All entities within the 100 ppm ROE (see **Appendices C and G**) will be contacted by phone and notified of release. The nature of the release and status of containment will be conveyed. Depending on release status and prevailing wind conditions, some entities within the 100 ppm ROE may be asked to evacuate or shelter in place Notifications will include but are not limited to the following:

- Praxair, BHP and all unmanned businesses will be instructed to alert all company personnel, third party contractors and/or services companies working in the area and those imminently scheduled to work in the area, of the release and evacuation status of the Plant. They should be instructed to immediately leave and/or not enter/re-enter the Plant vicinity until further instruction.

- BHP will be advised to check ventilation shaft status within the 500 and 100 ppm ROE and take internal company pre-emptive safety action(s) as deemed appropriate.

- Riverview Golf Course will be instructed to clear the course of both employees and golfers until further notice.

- San Juan College will be notified of the release and depending on prevailing wind conditions may be requested to evacuate or shelter in place.

- Other entities within the 100 ppm ROE, depending on release status and prevailing wind conditions, will be asked to shelter in place. Those entities will be instructed to close any windows and shut off any air conditioning/heating until further notice. In addition, they will be instructed to contact other employees/residents not currently present to not enter/reenter the area until further instruction.

3. The LEPC and law enforcement will be contacted by phone and notified of the release and status of containment. The Plant Superintendent or his designee will assign personnel notification responsibility.

4. Operator(s) with 30 minute SCBA will assess the release and attempt to resolve it. If after 15 minutes there is no resolution, the operator(s) will activate the ESD and will evacuate to Emergency Assembly Area 2.

5. If monitored H_2S levels at Emergency Assembly Area 2 exceed 10 ppm, evacuate to Emergency Assembly Area 3, Kirtland Elementary School parking lot. If deemed necessary, local emergency response service providers will be contacted by the operator.

   a) Re-entry will occur in full SCBA and in 15 minute shifts at the direction of the IC until IC determines problem has been resolved or additional ESD (pipeline) activated.

b) If release is resolved and monitored levels of H_2S in the Plant are less than 10 ppm, personnel may return to Plant. The OCD shall be notified within one hour of any release that activates the Plan. All entities previously notified will be informed that the release has been resolved and advised of the current monitored H_2S levels at the Plant.

c) No resolution requires activation of full H_2S Plan with notifications and reporting as per Plan. If the release is not resolved and/or H_2S levels continue to increase, Level 3 Response is indicated.

LEVEL 3 RESPONSE

1. For H_2S at 20 ppm or greater at Assembly Area 2, repair efforts at Level 2 unsuccessful, worst case scenario, and/or catastrophic release have occurred then implement a Level 3 response.

2. Road blocks will be set up at the intersection of County Road 6500 and County Roads 6446 and 6480. In addition, a roadblock will be set up at the intersection of County Road 6520 and County Road 6527 on the west, and where 6520 turns south on the east. A roadblock will also be set up on the Indian Service Route outside the 100 ppm ROE (approximately 4000 feet north of the Plant) (see **Appendix C**.)

3. All personnel shall have evacuated to Emergency Assembly Area 3, Kirtland Elementary School. Evacuation of all entities within the 500 ppm ROE will have been confirmed. Implement full H_2S Plan with all notifications and public agency involvement. Notifications to all entities within the 100 ppm ROE will include the nature of the release and status of containment. Notifications will include but are not limited to the following:

   - All businesses within the 100 ppm ROE will be instructed to immediately alert all company personnel, third party contractors and/or services companies working in the area and those imminently scheduled to work in the area, of the release and evacuation status of the Plant. They will be instructed to immediately leave and/or not enter/reenter the area within the roadblocks until further instruction.
   - All other entities (including private residents) within the 100 ppm ROE will be instructed to immediately shelter in place. Those entities will be instructed to close any windows and shut off any air conditioning/heating until further notice. In addition, they will be instructed to contact other employees/residents not currently present to not enter/reenter the area until further instruction.
   - BHP will be advised to check ventilation shaft status within the Plant vicinity and take internal company pre-emptive safety action(s) as deemed appropriate.

- Riverview Golf Course will be instructed to immediately clear the course of both employees and golfers and to shelter in place. Those entities will be instructed to close any windows and shut off any air conditioning/heating until further notice. In addition, they will be instructed to contact other employees not currently present to not enter/reenter the area until further instruction.
- San Juan College will be notified of the release and advised to shelter in place. Those entities will be instructed to close any windows and shut off any air conditioning/heating until further notice. In addition, they will be instructed to contact other employees not currently present to not enter/reenter the area until further instruction.

4. If escaping vapors have been ignited, the vapors should be allowed to continue to burn unless the fire endangers personnel, other property, or other equipment.

5. When applicable: Maintain communication with the Plant Superintendent, or his designee, to keep him up-to-date of the situation and the action taken prior to his arrival at the location.

6. Initiate and maintain a Chronological Record of Events log.

7. Within one hour after the activation of the H_2S Plan, begin agency notifications by calling OCD and NRC.

8. Establish media staging area adjacent to Assembly Area 3 and direct all media to it.

9. Once resolved and monitored levels in the Plant and at Assembly Area 2 are less than 10 ppm, roadblocks will be removed, and all entities within the 100 ppm ROE will be allowed to return. All entities previously notified will be informed that the release had been resolved and advised of the current monitored H_2S levels.

10. Agency reports to be submitted as required.

4. EMERGENCY SHUTDOWN SYSTEM

The Plant has an extensive Emergency Shut Down (ESD) system that is located within the Plant and in various locations along the pipelines that feed the Plant. The ESD is designed to prevent a Level 3 response. See **Appendix E** for a more detailed description of the ESD.

5. NOTIFICATIONS AND REPORTS

The Plant has various notification and reporting obligations. Some are related to its state air quality permit that is overseen by NMED as well as well as state and federal spill reporting obligations. In addition to the regulatory obligations noted above, Plant personnel also have internal and external notification and reporting obligations associated with the activation of this Plan.

A. DISCOVERY AND INTERNAL REPORTING

1. All Plant personnel who perform maintenance and/or repair work within the Plant wear H_2S monitoring devices to assist them in detecting the presence of unsafe levels of H_2S. When any Plant personnel while performing such work discover a leak or emission release they are to attempt to resolve the issue as long as H_2S levels remain below 10 ppm. The personal monitoring devices they wear will give off an audible alarm at 10 ppm. These devises are to be worn as low on the body as possible since H_2S is heavier than air and will tend to stand or accumulate in low lying areas. If the response action needed to resolve the issue is more than simply closing a value or stopping a small leak, the Plant personnel shall notify the Plant Superintendent, or his designee and convey, at a minimum, the following information:

    - Name, telephone number, and location of person reporting the situation; and
    - Type and severity of the emergency; and
    - Location of the emergency (area/block, mile markers, latitude & longitude, or building), and the distance to surrounding equipment and/or structures; and
    - The cause of the spill or leak, name and quantity of material released, and extent of the affected area including the degree of environmental hazard; and
    - Description of injuries and report of damage to property and structures; and
    - Initiate and maintain a Chronological Record of Events log. This record should record the time, date, and a summary of the event.

2. If the Plant personnel detect H_2S levels greater than 10 ppm either as a result of his/her personal monitoring device or the Plant intermittent alarm and/or red flashing beacon, Plant operators are to contact their immediate supervisor for assistance and put on the 30-min SCBA so they can attempt to resolve the issue. All non essential persons shall be notified of the release and evacuated from the area. Operators wearing the SCBAs are to first assist any persons requiring assistance during the evacuation, then

attempt to resolve the issue. The immediate supervisor is then responsible for notifying the Plant Superintendent or his designee so that the IC system can be implemented and H_2S Plan activated if necessary.

3. Once the Plant Superintendent is contacted, he or his designee is to notify the appropriate Corporate management, EHS personnel, Plant emergency response personnel, and advise them of the existing emergency situation. Corporate management will then conduct the reporting up that is necessary based on the situation.

4. Plant personnel are to advise any contractor, service company, and all others on-site or attempting to enter the Plant that the H_2S Plan has been activated.

B. PUBLIC AWARENESS AND COMMUNICATION

Public awareness and communication is a primary function of the H_2S Plan. The Company has compiled a list of various public, private, state and local contacts that are to be notified at various phases during the activation of the Plan. Refer to the Response Flow diagram in **Appendix F** that indicates when certain entities are to be contacted in event of activation of this Plan. **Appendix G** is a listing of the entities to be contacted and **Appendix H** is a list of community organizations that have received a copy of the Plan. Company will inform all state and local response organizations of its Plan as well as those businesses that fall within its 500-ppm and 100-ppm ROE as illustrated in **Appendix C**.

C. PUBLIC AREAS, NEARBY BUSINESSES AND RESIDENTS

The contact information for all residents, businesses and public areas is contained in **Appendix G**. All entities within the 500 ppm and 100 ppm radius of exposure will be contacted by Plant personnel as designated by Plant Superintendent if the Plan is activated and based on response level as described in the Immediate Action Plan and advised of the following:

- The nature and extent of the release/emergency at the Plant and recommendations for protective actions, such as evacuation or shelter-in-place
- Any other event specific information that is necessary to protect the public; and
- Updates as to the status of the release and continued safety measures to be taken, including but not limited to when to evacuate and/or when it is safe to return to the area.

1. Residences or Public Roads:

Public Road 6500 is within the 100 ppm radius of exposure, and portions of Public Roads 6520, 6257 and Cemetery Road are slightly within the southernmost

extension of the 100 ppm radius of exposure. Similarly, a small portion of Public Roads 6448 and 6480 are slightly within the eastern portion of the 100 ppm radius of exposure (see **Appendix C**). The specific residences included within the 100 ppm radius of exposure are listed on **Appendix G** along with addresses and contact phone numbers.

2. Businesses or Other Public Areas:

All businesses included in **Appendix G** will be provided with a copy of the H_2S Plan and will be contacted about participation when local emergency response training events or drills occur.

Within the 100 ppm ROE:

The public areas located within the 100 ppm radius of exposure are identified in **Appendix G**.

BHP will be contacted when the Plan is activated to ensure that the out of service vent pipes have not been activated. Currently, there are inactive BHP Mining ventilation pipe ducts within the 100 ppm radius of exposure which have been closed by manual valves.

Additional businesses within the 100 ppm radius of exposure are listed on **Appendix G** and they will be notified if the Plan is activated as per the various levels of the immediate action Plan described above. These businesses or their corporate offices (in the case of unmanned facilities) will be notified if the Plan is activated as per the immediate action Plan.

Within the 500 ppm ROE:

One manned business (Praxair) and four (4) unmanned businesses are located within the 500 ppm radius of exposure (see **Appendix G**). Praxair will be notified immediately if the Plan is activated. The corporate offices of the four unmanned businesses will also be notified immediately if the Plan is activated according to the level specific procedures described above.

Most of the Riverview Golf Course is also located within the 100ppm radius of exposure. Riverview Golf Course will also be notified immediately as described above if the Plan is activated.

6. SITE SECURITY

A. In order to have an accurate listing of all personnel on-site in the event of an emergency, a daily sign-in log sheet shall be utilized. The sign-in log sheet

shall include at a minimum the person's name, the company name, the time of arrival, and the time of departure.

B. The Incident Commander shall be responsible to assure that all personnel sign-in upon arrival and sign-out upon departure from the job site.

C. The Incident Commander may at his discretion assign the responsibilities for the daily sign-in log sheet to the individual designated as the Record Keeper or another designee.

D. At the discretion of the Incident Commander, a security coordinator and/or a security team may be established, and the access to the job site restricted.

E. For a Level 3 release a road block would be set up at the intersection of County Road 6500and County Roads 6446 and 6480. In addition, a roadblock would be set up at the intersection of County Road 6520 and County Road 6527 on the west, and where 6520 turns south on the east. A roadblock will also be set up on the Indian Service Route outside the 100 ppm ROE (approximately 4000 feet north of the Plant).

7. SIGNS & MARKERS

The Plant has warning signs indicating the presence of H_2S/Poisonous Gas and high pressure gas at the entrance to the Plant. Emergency response phone numbers are posted at the entrance to the Plant. Signs are located at the Plant gate entrance indicating that all visitors are to sign in.

8. FIRST-AID STATION

The first aid station will be located at the Emergency Assembly Area.

FIRST AID KITS are located:

- **Plant Superintendent Office Building,**
- **Maintenance/Safety Office Building, and**
- **Each company vehicle**

9. MEDIA SITE

A. If a Level 2 or 3 Response occurs, the Media Site will be located adjacent to Emergency Assembly Area 3.

B. At no time shall any unescorted representative from the media be allowed any closer to the Plant than the Media Site location, unless approved by the Incident Commander, the Safety Officer, and the Media Relations Officer.

10. EMERGENCY AND SAFETY EQUIPMENT

Refer to **Appendix E** for information pertaining to the Plant's emergency and Safety equipment. In addition, see **Appendix C** for the location of additional H_2S sensors that will be installed outside the Plant boundary as part of the Plant expansion related to the AGI well permit.

V. TRAINING AND DRILLS

A. TRAINING

1. Training on the H_2S Plan
   - Inclusion of local officials and LEPC
   - Public areas and businesses (within the ROE)
   - Those on the Plan distribution list

2. Other Emergency Response Related Training

Anadarko/Western has an extensive safety training program and addresses various aspects of job related hazards. All training records for the Plant are maintained at the Plant. The following is a limited list and summary of the training programs that relate to the H_2S Plan and Emergency Response:

- Plant Orientation Training - All Plant personnel, visitors, and contractors must attend a Plant overview orientation prior to obtaining permission to enter the Plant. A refresher course on this training is required annually for all persons. This training also complies with the requirements of the Anadarko and Plant's Process Safety Management Program and Procedures Manuals.

- Hydrogen Sulfide and Sulfur Dioxide Training – All Plant personnel receive annual refresher training on hydrogen sulfide and sulfur dioxide, which is conducted by Anadarko personnel. If an individual is unable to attend, they may be required to attend a third party training session. Hydrogen sulfide training cards are issued as documentation of this training. All contract employees and visitors are required to have had hydrogen sulfide training and to provide the Plant a copy of their certification card prior to obtaining permission to enter the Plant.

- Respirators - All Plant personnel, with the exception of the Plant Operations Specialist, are trained annually on the proper use of respirators. In addition to the annual training, all Plant personnel with the exception noted above are fit tested

annually on the respirators. Except for the Plant Operations Specialist, all Plant personnel must have medical clearance to work in the Plant. Medical clearance is mandatory for H_2S certification. Medical clearance review for work in a H_2S environment is conducted on a bi-annual basis unless the individual has experienced medical problems within that two year interval that requires updating the medical clearance.

- Hazard Communication - All Plant personnel are trained annually on Hazard Communication and SARA Title III Right-to-Know information. The annual training includes, at a minimum, a review of material safety data sheets (MSDS) for those materials that are present at the Plant and labeling.

- Personal Protective Equipment (PPE) - All Plant personnel are trained annually on the Anadarko requirements for personal protective equipment (PPE). The training includes, at a minimum, a review of all the types and levels of personal protective equipment and how to select the correct equipment for the job.

B. EMERGENCY RESPONSE DRILLS

1. The Plant will conduct, at least, a tabletop drill annually. Multiple drills during the year may be scheduled at the discretion of the Plant Superintendent or as part of the Emergency Response Center in The Woodlands.

2. The annual drill will exercise this Plan and include, at a minimum, contacting the entities that are identified as being within the 500-ppm ROE and the Local Emergency Response contacts identified on **Appendix G**. The drills will also include briefing of public officials on issues such as evacuation or shelter-in-place plans

3. Drill training will be documented and those records will be maintained at the Plant. The documentation shall include at a minimum the following:

    a. Description or scope of the drill, including date and time
    b. Attendees and Participant to the drill
    c. Summary of activities and responses
    d. Post drill de-brief and reviews

APPENDIX A

WORST CASE SCENARIO

The basis for worst case scenario calculations is as follows:

- 6000 parts per million (ppm) or 0.60 mole percent of hydrogen sulfide in the inlet natural gas stream into the San Juan River Gas Plant; and
- a maximum daily (24 hour) processing volume of 50,000 MMCF.
- The worst case scenario radius of exposure (ROE) also assumes an uncontrolled instantaneous release from the area around the AGI well of the above referenced volume and concentration. Because the Plant is a throughput process plant there is no actual way that the entire throughput volume of the Plant could be released instantaneously as is assumed in the worst case scenario calculations of the ROE in **Appendix B** and shown in **Appendix C**; however, to comply with NMAC 19.15.11, we have used that assumption in our worst case scenario formulas/calculations provided in Appendix B.

It should further be noted that the reason this rate, used as worst case, could not be released over a 24 hour period is the Plant's Emergency Shutdown (ESD) systems that would be activated. The ESD would prevent the flow of gas into the Plant in the event of an emergency. The ESD system is discussed in greater detail in **Appendix E**.

APPENDIX B
RADIUS OF EXPOSURE CALCULATIONS

The formulas for calculating the two ROEs (as specified by the regulations) are as follows:

500-ppm RADIUS OF EXPOSURE CACULATION

$$X=[(0.4546)(\text{hydrogen sulfide conc.})(Q)]^{(0.6258)}$$

Where:
X = Radius of exposure in feet
Hydrogen Sulfide Concentration = Decimal equivalent of mole or volume fraction of hydrogen sulfide in the gaseous mixture
Q = Escape rate expressed in cubic feet per day (corrected for standard conditions of 14.73 psi absolute and 60 degrees Fahrenheit)

a) For existing facilities or operations, the escape rate (Q) is the maximum daily rate of the gaseous mixture produced or handled or the best estimate thereof. For the San Juan River Gas Plant, after the installation of the AGI well, the Company is using for contingency planning purposes an "escape rate" equal to the anticipated (maximum) inlet gas volume of 50,000 MCFD. The (actual) inlet gas volume at the Plant will be somewhat variable and is continuously metered. The Plant records daily inlet gas volumes and prepares a daily volume report. The assumed 50,000 MCFD inlet gas volume has been selected as the "escape rate" because it is the highest anticipated inlet volume that the Plant would handle under its proposed operations and is considered worst case interpretation of the volume of gas. It should be noted that the plan will remain effective as long as the processed volume and H_2S content equate to the same ROE. As addressed below.

As to hydrogen sulfide concentration of the inlet gas, daily monitoring data of current operations indicates variable concentrations, but concentration will not exceed 6000 ppm or 0.60 mole percent. Therefore, 6000 ppm or 0.60 mole percent has been used in the worst case scenario for the expanded operations with the AGI well for contingency planning purposes.
Using:
Q = 50,000,000
H_2S conc = 6000 ppm or 0.60 mole%

$$[(0.4546)*(H_2S \text{ concentration})*(\text{gas volume } (Q))]^{0.6258}$$
$$[(0.4546)*(6000*.000001)*(50,000,000]^{0.6258}$$

500-ppm ROE = 1634 feet

100-ppm RADIUS OF EXPOSURE CALCULATION

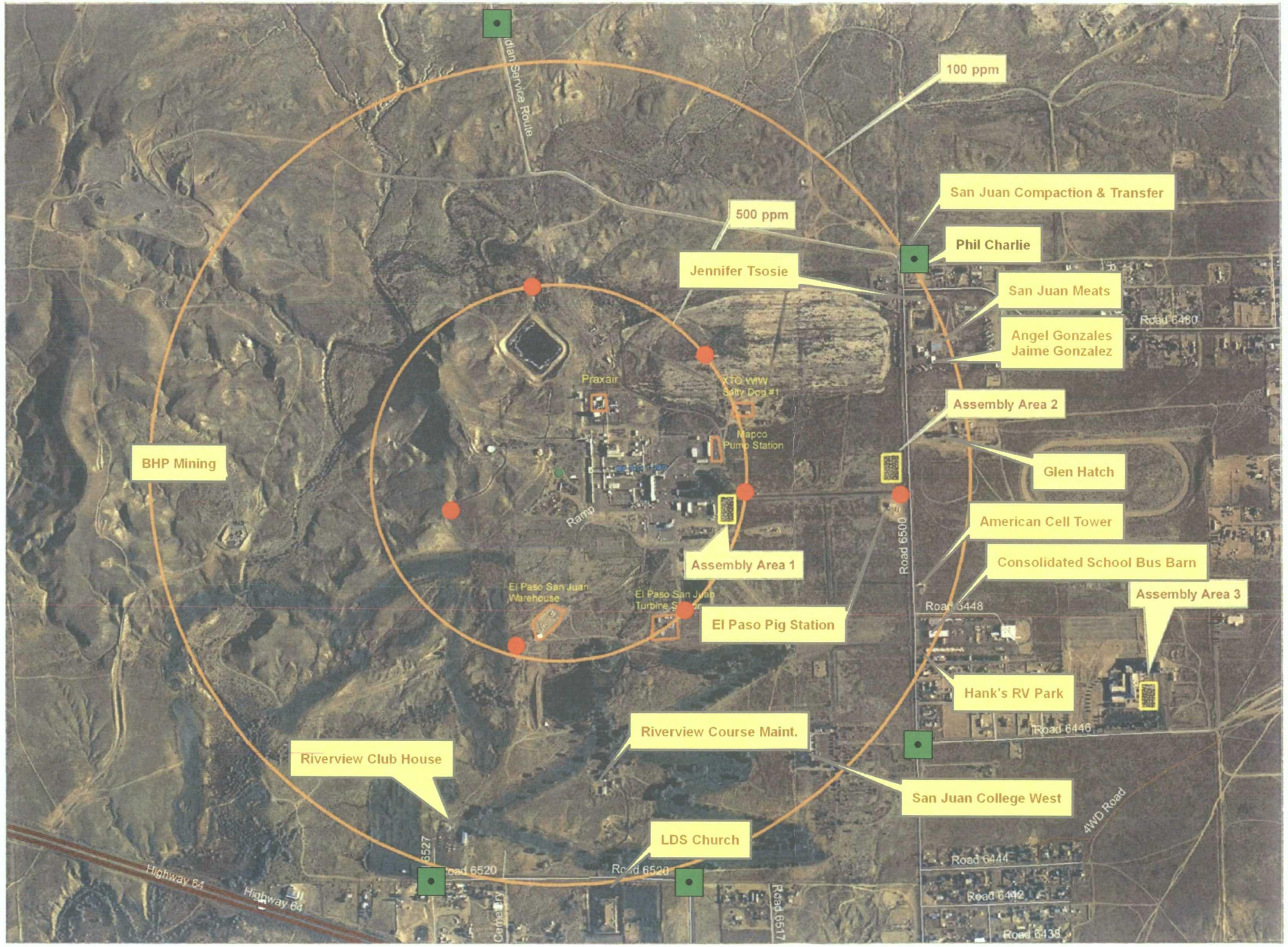
$$[(1.589)*(H_2S \text{ concentration})*(\text{gas volume})]^{0.6258}$$
$$[(1.589)*(6000*.000001)*(50,000,000)]^{0.6258}$$

100-ppm ROE = 3576 feet

APPENDIX C

100-PPM AND 500-PPM
RADIUS OF EXPOSURE MAP
SHOWING LOCATION OF ADDITIONAL
OFF-SITE H_2S MONITORS AND
LOCATION OF ROADBLOCKS

San Juan River Gas Plant
Hydrogen Sulfide Contingency Plan
Radius of Exposure



PROPOSED OPERATIONS

- AGI Well *
- Radius of Exposure
  - 1634 ft (500 ppm)
  - 3576 ft (100 ppm)
  - Assembly Area
  - Business

*Based on 50 MMscfd @ 6000 ppm H_2S

- H_2S Monitors
- Road Blocks

Anadarko Petroleum Corporation

APPENDIX D

PLANT DIAGRAM WITH EVACUATION ROUTES & EMERGENCY EQUIPMENT LOCATIONS

THIS DRAWING AND THE DESIGN IT COVERS ARE CONFIDENTIAL AND REMAIN THE PROPERTY OF WESTERN GAS RESOURCES, INC. AND SHALL NOT BE DISCLOSED TO OTHERS OR REPRODUCED IN ANY MANNER OR USED FOR ANY PURPOSE WHATSOEVER EXCEPT BY WRITTEN PERMISSION BY THE OWNER.

LEGEND:

- EMERGENCY SHUTDOWN
- H2S TRANSMITTER
- HYDROCARBON TRANSMITTER
- HYDROCARBON TRANSMITTER IN SUMP
- FIRE EXTINGUISHER
- WIND SOCK
- MONITOR INDICATOR
- BEACON
- HORN
- EMERGENCY EVACUATION ROUTE
- SCBA (30 MINUTE)
- SCBA (5 MINUTE)
- ASSEMBLY AREA

N41+00 N40+00 N39+00 N38+00 N37+00 N36+00 N35+00 N34+00

FLARE STACK
2 @ THIS LOCATION
PIT
REACTOR
A4 A3 A A1 A2
CONTROL ROOM
AMBER H2S ALARM
LOAD OUT DOCK
BLOWER SKID
SULFER PLANT
FIN FANS
BOILER HOUSE
LAB
CONTACTOR
SCRUBBER
B1
STILL
B3
B4
E1
FLASH TANK
REBOILER
H1
AMINE BLDG.
H&E
RED H2S ALARM
SURGE TANK
B2
H2
H3
B
WEST MCC
TREATER BLDG.
PORTA TEST BLDG.
FUEL BLDG.
FAN
GLYCOL CONTACTOR
MARLEY
DEHY BLDG.
CRYO SKID
AMBETH SCRUBBER
BARKER SCRUBBER
C4
C
C2
A PUMP HOUSE
RED H2S ALARM
CONTROL ROOM
AMBER HC ALARM
RED H2S ALARM
D&J
D1
D2
D3
D4
J1
J6
J5
J2
J3
J7
J4
J8
FANS
COMPRESSOR BLDG.
MAINTENANCE/SAFETY OFFICE BLDG.
LOADING PUMP BLDG.
C1
C3
LOADING DOCKS
ASSEMBLY AREA #2 @ HIGHWAY
OFFICE BLDG.
ASSEMBLY AREA #1
SHOP
WAREHOUSE

NOTES:

10FD0000 FOUNDATION LOCATION PLAN

REFERENCE DRAWINGS			REVISIONS						
DWG. NO.	TITLE		NO.	DESCRIPTION		BY	DATE	CHK.	DATE	APPR.	DATE
			0	ISSUED FOR INFORMATION		SD	10/16/09	DD	10/16/09	MB	10/16/09

Western Gas Resources, Inc.
1099 18th St., Suite 1200 – Denver, CO 80202-1955 (303)-452-5603

SCALE: 1"=40'-0"	DRAWING CREATION	P.EGGERS 7/23/03	EDIT DATE	MB 8/17/09	PLOT DATE	Diederich, Scott 8/18/09

SAN JUAN RIVER PLANT
EMERGENCY ITEMS AND PLACEMENT

SAN JUAN RIVER PLANT
P.O. BOX 70 – KIRTLAND, NM 87417 – (505) 598-6210

FILE NAME: SJPPH2S0200

AFE NO. –

DRAWING NUMBER: SJPP-H2S0200

REV. 0

8/17/2009 Diederich, Scott

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APPENDIX E

DESCRIPTION OF H_2S MONITORING & ALARM SYSTEMS

A. EMERGENCY SHUTDOWN SYSTEM

There are (8) ESD manual stations located at various points in the facility (**Appendix D**). **The Plant ESD can be activated at any time at the direction of the Plant Superintendent or Incident Commander and is to be activated based on this Plan after 20 ppm H_2S has been detected in the Plant and efforts to resolve the issue for 15 minutes have failed.**

When any one of the eight (8) manual stations is activated, the system will be shutdown and the natural gas inlets and outlets will be blocked. The operators are also able to auto close the two (2) main blocks on the incoming gas lines to the Plant. Activating these should allow the Plant to avoid a Level 3 response. Two miles north of the Plant, on the Barker Dome line and the Aneth line, there are isolating block valves (manual) that can prevent further gas flow into the Plant pipeline system. Also, further upstream on the Barker and Aneth lines there are additional isolating block valves at 6 miles and 8 miles upstream on their respective lines. These block values furthest upstream, isolate the entire system from the field gathering lines coming into the Plant.

B. PLANT ALARMS, VISIBLE BEACONS & WIND INDICATORS

1. Colored beacons, horns, and wind directions indicators are located in various locations throughout the Plant and are indicated on **Appendix D**.

2. The audible signal for an emergency response and Plant evacuation is a repeating intermittent alarm that sounds at 10 ppm H_2S. The frequency of this intermittent alarm will increase as the concentration of the H_2S release increases. The alarm will become continuous when the concentration of the H_2S release is 20 ppm or higher. At the initial sound of this intermittent alarm, the Plant operator will put on a SCBA and all personnel in the Plant complex shall immediately proceed in a safe manner to the Emergency Assembly Areas as prescribed by the Emergency Action Plan on page 19 of this Plan.

3. A flashing red beacon signifies an H_2S release of 10 ppm and all personnel in the Plant complex shall immediately proceed in a safe manner to the Emergency Assembly Area 1 located east of the main office. If this area is not determined to be safe all will move to Assembly Area 2 which is on road 6500 at the main gate on the east side of the facility. Evacuation routes and Assembly Area 1 are indicated on **Appendix D**.

4. A routine process alarm will cause a horn to sound. This horn is a wavering siren sound that is used to alert the Plant Operator to return to the Control Room. No emergency response or evacuation is required when this siren sounds. Flashing beacons are located throughout the Plant and are utilized to assist the Plant Operator in identifying the location of the Plant alarm or Plant upset. Any beacon colors other than red do not identify an emergency response or evacuation.

5. Wind direction indicators are installed throughout the Plant and at the Plant Superintendent Office Building. At least one wind direction indicator can be seen at any location within the Plant complex, as well as, from any point on the perimeter of the Plant. There are 10 windsocks located in the Plant.

6. Additional permanent off-site H_2S monitors will be placed in the vicinity of the Plant coincident with the calculated radii of exposure as shown on **Appendix C**. These monitors will assist Anadarko in appropriate notification of potentially affected entities in the vicinity of the Plant within the calculated 100 ppm radius of exposure.

C. GAS DETECTION EQUIPMENT

1. The Plant uses the Industrial Scientific Corporation 4200 Series Remote H_2S Sensors. These sensors are a fixed point monitor to detect the presence of hydrogen sulfide in ambient air. The sensors are connected to Allan Bradley/SLC-500 Rockwell Logic Controllers with an output to Moore Micro-Advantage controllers and from here to the operator's PLC. The red flashing beacon is activated at 10 ppm. The horn is activated with an intermittent alarm at 10 ppm and changes to a steady alarm at 20 ppm. The additional off-site sensors shown on **Appendix C** will be of the same type and calibrated as described in this paragraph for the Plant sensors.

2. The fixed hydrogen sulfide monitors are strategically located throughout the Plant to detect an uncontrolled released of hydrogen sulfide. The SRU has 4 sensors labeled A-1 through A-4. The treating Plant area has 4 sensors labeled B-1 through B-4. There are two sensors at the east side of the Plant labeled C-1 and C-3. There is one sensors located at the liquid stabilizer skid labeled E-1. This is the center of the process area. The compressor building has eight methane sensors; these shut the compressors down at 50% LEL. The compressor building also is equipped with fire eyes that will also shut the units down. The Plant operators are able to monitor the ppm level of H_2S of all the Plant sensors on their control/monitor PLC located in the operator's building. These sensors are all located on the plot plan on **Appendix D**. These sensors all have to be acknowledged and will not clear themselves. This requires immediate action for any occurrence or malfunction. The Plant sensors are calibrated quarterly.

3. Hand held gas detection monitors are available to Plant personnel to check specific areas and equipment prior to initiating maintenance or work on the process or equipment. There are 2 handheld and 9 personal monitors that are used by individuals for special projects and field work. The hand held gas detection devices are BW Technologies 4-gas detectors. The detectors have sensors for oxygen, LEL (explosive hydrocarbon atmospheres), hydrogen sulfide, and carbon dioxide. They indicate the presence H_2S with a beeping sound at 10 ppm. The beeps change in tone as H_2S increases to 20 ppm. The personal monitors are set to alarm (beep) at 10 ppm with the beeps becoming closer together as the H_2S concentration increases to 20 ppm. Both the hand held and personal monitors have digital read outs of H_2S ppm concentration.

D. RESPIRATORS

1. The Plant has 30 minute Self-Contained Breathing Apparatus (SCBA) respirators and 5 minute escape packs strategically located throughout the Plant.

2. The respirator containers are identified in the process area and the locations are identified on **Appendix D.**

3. All Plant personnel with the exception of the Plant Operations Specialist are certified to use the SCBA respirators.

E. FIRE FIGHTING EQUIPMENT

1. The Plant personnel are trained only for insipient stage fire fighting.

2. The fire extinguishers located in the Plant process areas, compressor buildings, process buildings, and company vehicles are typically a 20# Ansul dry chemical fire extinguisher. **See Appendix D.**

3. The Plant does not have a fire water system, but only a utility water system that is not designed for fire fighting.

APPENDIX F

H_2S CONTINGENCY PLAN FLOW DIAGRAM

LEVEL 1 RESPONSE

H_2S DETECTED GREATER THAN 10 PPM
&/OR INTERMITTENT ALARM SOUNDS/FLASHING RED BEACONS ACTIVATED

- **OPERATORS PUT ON RESPIRATORS (30 minute SCBA) TO ASSESS & RESOLVE PROBLEM**
  (Operators are allowed under OSHA to work for up to 8 hours in 10ppm H2S environment)
- **ALL OTHERS EVACUATE TO ASSEMBLY AREA 1**
- **NOTIFY PRAXAIR & BHP MINES**

AT ASSEMBLY AREA 1

- **MONITOR H_2S LEVELS AT ASSEMBLY AREA**
- **OPERATORS WILL SET UP SECONDARY ENTRY TEAMS W/ 30-MIN SCBA TO TRY TO RE-ENTER AND RESOLVE**
- **RE-ENTRY WITH SCBA WILL OCCUR IN 15 MINUTE SHIFTS AT THE DIRECTION OF THE IC UNTIL IC DETERMINES PROBLEM HAS BEEN RESOLVED OR ESD IS ACTIVATED)**

CALL 911
IF INJURY OR DEATH
FOR EMERGENCY ASSISTANCE

ONCE RESOLVED & MONITORED LEVELS IN PLANT ARE LESS THAN 10 PPM RETURN TO PLANT

IF H_2S LEVELS AT ASSEMBLY AREA 1 EXCEED 10PPM

EVACUATE TO ASSEMBLY AREA 2

NOTIFY NMOCD WITHIN <u>ONE HOUR</u> MAKE AGENCY REPORTS AS NECESSARY

AT ASSEMBLY AREA 2

- **MONITOR H_2S LEVELS AT ASSEMBLY AREA**
- **FOLLOW LEVEL 2 RESPONSE ACTIONS**

NOTIFY LEPC AND OTHER PUBLIC OFFICIALS AND EMERGENCY SUPPORT SERVICES

LEVEL 2 RESPONSE

H_2S LEAK DETECTED GREATER THAN 20 PPM &/ CONTINUOUS ALARM SOUNDS/FLASHING RED BEACONS ACTIVATED

- **OPERATORS PUT ON RESPIRATORS (30-MIN SCBA) TO ASSESS & RESOLVE PROBLEM**

(Operators have 15 minutes to resolve after which they must evacuate to Assembly Area #2 and begin rotational entry to Plant)

- **ALL OTHERS EVACUATE TO ASSEMBLY AREA 2**
- **EVACUATE PRAXAIRE**
- **NOTIFY BHP MINES, ALL OTHER BUSINESSES IN THE 100 & 500 PPM ROE.**

AT ASSEMBLY AREA #2

- **MONITOR H_2S LEVELS AT ASSEMBLY AREA**
- **IF MONITORED LEVELS EXCEED 10 PPM EVACUATE TO ASSEMBLY AREA 3 (KIRTLAND ELEMENTARY SCHOOL PARKING LOT)**
- **RE-ENTRY WITH SCBA WILL OCCUR IN 15 MINUTE SHIFTS AT THE DIRECTION OF THE IC UNTIL IC DETERMINES PROBLEM HAS BEEN RESOLVED OR ESD IS ACTIVATED)**

CALL 911 IF INJURY OR DEATH FOR EMERGENCY ASSISTANCE

ONCE RESOLVED & MONITORED LEVELS IN PLANT ARE LESS THAN 10 PPM RETURN TO PLANT

IF CONSTANT ALARM SOUNDS FOR 15 MINUTES

- **ACTIVATE PLANT EMERGENCY SHUT DOWN (ESD)**
- **ACTIVATE FULL H_2S PLAN WITH NOTIFICATIONS & REPORTING (FOLLOW LEVEL 3 RESPONSE)**

NOTIFY NMOCD WITHIN ONE HOUR MAKE OTHER AGENCY REPORTS AS PER H_2S PLAN

LEVEL 3 RESPONSE

WORST CASE SCENERIO AND/OR CATASTROPHIC RELEASE FROM FIRE AND/OR EXPLOSION

- **ALL PERSONNEL EVACUATE TO ASSEMBLY AREA 2 IF MONITORED LEVELS ARE LESS THAN 10 PPM**
- **EVACUATE PRAXAIR AND ALL ENTITIES WITHIN 500 PPM ROE**
- **IF MONITORED LEVELS AT ASSEMBLY AREA 2 ARE GREATER THAN 10 PPM; EVACUATE TO ASSEMBLY AREA 3 (ELEMENTARY SCHOOL PARKING LOT)**
- **IMPLEMENT FULL H_2S PLAN WITH ALL NOTIFICATIONS**
- **NOTIFY LOCAL FIRE, POLICE AND EMERGENCY SERVICES**

ONCE RESOLVED & MONITORED LEVELS IN PLANT ARE LESS THAN 10 PPM RETURN TO PLANT

IF CONSTANT ALARM SOUNDS FOR 15 MINUTES

- **ACTIVATE PLANT EMERGENCY SHUT DOWN (ESD)**
- **RE-ENTRY WITH SCBA WILL OCCUR IN 15 MINUTE SHIFTS AT THE DIRECTION OF THE INCIDENT COMMANDER (IC) UNTIL IC DETERMINES PROBLEM HAS BEEN IDENTIFIED OR REPAIRED**

APPENDIX G

EMERGENCY CALL LIST

SAN JUAN GAS PLANT EMERGENCY CALL LIST

ENTITIES WITH IN THE 500- PPM ROE

Name	Address	Contact Person	Phone Number
El Paso Natural Gas Warehouse	81 County Road 4900 Bloomfield, NM 87413		800-334-8047 (24 hr)
El Paso Natural Gas Turbine Station	81 County Road 4900 Bloomfield, NM 87413		800-334-8047 (24 hr)
Mid-America Pipeline Co. (Enterprise)	3621 East Main Farmington, NM 87402		505-599-3276 505-599-3277 800-546-3482 (24 hr)
Praxair	101 County Road 6500 Bloomfield, NM 87417		505-598-0549 800-598-0549 (24 hr)
XTO Energy Salty Dog #1	2700 Farmington Ave. Farmington, NM 87401		505-324-1090

While BHP has no active vent shafts within the 500ppm ROE, they will be notified along with others entities contained within the 500ppm ROE to assure that no vents have been activated that would be affected. BHP contact information is below.

BHP Mining	16 Miles West of Farmington, NM San Juan County Road RD6800	Dave Hales, Safety Manager	505-598-2311 505-486-1612

ENTITIES WITH IN THE 100- PPM ROE

Name	Address	Contact Person	Phone Number
San Juan Co. Compaction and Transfer	141 County Rd 6500 Kirtland, NM 87417		505-334-4520
Phil Charlie	2 County Rd 6480 Kirtland, NM 87417		505-860-0602
Jennifer Tsosie	136 County Rd 6500 Kirtland, NM 87417		505-809-5145
San Juan Meats	118 County Rd 6500 Kirtland, NM 87417		505-598-5060
Angel Gonzalez	118 County Rd 6500 Kirtland, NM 87417		505-598-0372
Jamie Gonzalez	118 County Rd 6500 Kirtland, NM 87417		505-598-5129
Glen Hatch	106 County Rd 6500 Kirtland, NM 87417		505-598-1356
San Juan College West	69 County Road 6500 Kirtland, NM 87417		505-598-5897
El Paso Natural Gas Pigging Station	81 County Road 4900 Bloomfield, NM 87413		800-334-8047 (24 hr)
BHP Mining	16 Miles West of Farmington, NM San Juan County Road RD6800	Dave Hales, Safety Manager	505-598-2311 505-486-1612
American Cell Tower	88 Rd 6500 Kirtland, NM 87417		877-518-6937
Central Consolidated School Bus Barn	76 County Rd 6500 Kirtland, NM 87417		505-598-0132
Hank's RV Park	72 County Rd 6500 Kirtland, NM 87417		505-325-7150
San Juan College	69 County Rd 6500 Kirtland, NM 87417		505-598-5897
Later Saints Church	10 County Rd 6523 Kirtland, NM 87417		505-598-5247 505-598-9297
BHP Mine Vent	300 County Rd 6900 Kirtland, NM 87417		505-598-5558
Riverview Golf Course	583 County Rd 6100 Kirtland, NM 87417		505-598-0140

All entities located within the 500 ppm ROE (listed above) are also located within the 100 ppm ROE and must be called when these entities are contacted.

COMPANY INTERNAL NOTIFICATIONS
SAN JUAN RIVER PLANT PERSONNEL

NAME	TITLE	OFFICE No.	CELLULAR No.	HOME No.
Kent McEvers	Plant Superintendent	505-598-5601 ext. 15523	505-860-7208	505-326-4054
Rick Fetch	Plant Foreman	505-598-5601 ext. 15522	505-947-2416	505-324-6441
Arlyn Thorson	Maintenance Foreman	505-598-5601 ext. 15524	505-947-2417	505-326-6718
Bob McClain	Plant Operator	505-598-5601 ext. 15542	505-330-1966	505-325-8715
Brenda Wilson	Sr. Operations Specialist	505-598-5601 ext. 15521		505-325-6525
Andrew Adame	Plant Operator			505-360-7051
Chee Anderson	Plant Operator			505-326-1397
Glen Daniell	Plant Operator		505-860-7483	505-632-9705
Curtis Day	Plant Operator			505-801-4404
Johnny Foster	Plant Operator			505-801-5062
Frank Hale	Plant Operator		505-860-5897	505-598-9091
Bobby James	Plant Operator			505-598-5314
Melvin Jim	Plant Operator			505-368-4733
Charlie Barr	Mechanic		505-324-1100	505-330-2614
Jerry Darnell	Fieldman			505-632-2722
Ted Francis	Fieldman			505-564-2999
Kent Galyon	Fieldman		505-860-1875	970-565-1006
William Golbe	Mechanic		505-215-2517	505-598-9716
Charlie Medders	Mechanic		505-947-7039	505-598-5573
Corwyn Yazzie	Mechanic		505-793-2567	505-327-3286

COMPANY INTERNAL NOTIFICATIONS
CORPORATE PERSONNEL – THE WOODLANDS, TEXAS

NAME	TITLE	OFFICE No.	CELLULAR No.	HOME No.
Mario Reyes	Operations Mgr	832-636-3234	713-816-5006	281-360-1084
Mike Ross	General Mgr	832-636-3431	832-381-0923	281-296-0385
Tony Marques	Engineering Mgr	832-636-7368		
Chuck Johnson	Commercial Develop. Mgr	832-636-7119		

David Ponikvar	S&H Mgr	832-636-3414	281-732-7887	281-374-8334
Julie Betik	Env & Reg Anal	832-636-2609	281-793-7705	281-320-2066
Eric Weaver	EHS Analyst	432-684-2808	432-413-2494	432-756-3493
Jerry Adams	EHS Mgr	832-636-8304	281-731-5931	281-363-4693
Mike Gray	EHS Director	832-636-2454	281-415-6964	936-271-9869

COUNTY & LOCAL LAW ENFORCEMENT

AGENCY	DAYTIME / 24 HR. PHONE No.
Law Enforcement Dispatch	**911**
San Juan County Sheriff	505-334-6622
Farmington Police	505-327-0222
Navajo Tribal Police	505-368-4333
Ute Mountain BIA	303-565-8471
New Mexico Highway Patrol	505-325-7547
New Mexico FBI	505-325-8631
San Juan County LEPC	505-334-1180
BLM Farmington Office	505-599-8900

MEDICAL SERVICES

AGENCY	EMERGENCY SERVICE	PHONE No.
Emergency Dispatch	Fire & Ambulance	**911**
San Juan County Fire Marshall	Fire Department	505-334-9431
San Juan Regional Medical Center	Hospital	505-325-5011
Emergency Trauma Lifeline Service - Farmington		505-325-5602
Dr. Robert C. Rhein	Doctor	505-327-4867
Dr. Ken Crider	Doctor	505-327-4439
San Juan Air Care Farmington	Air Ambulance	800-452-9990

FEDERAL NOTIFICATIONS

AGENCY	DAYTIME / 24 HR. PHONE No.
National Response Center	800-424-8802
EPA Region 8	800-227-8917
OSHA	800-321-6742
OSHA Area Office New Mexico	505-827-4230
DOT	800-424-8802
BLM Farmington	505-599-8900

NEW MEXICO STATE NOTIFICATIONS

AGENCY	DAYTIME / 24 HR. PHONE No.
New Mexico One Call	800-321-2537
New Mexico Oil Conservation Division	505-334-6178
New Mexico Environmental Department	505-476-4300
New Mexico Emergency Response Commission	505-476-9681
New Mexico Public Utilities Commission	505-490-2375
New Mexico State Patrol	505-325-7547

CONTRACTORS

CONTRACTOR	CONTACT	OFFICE No.	CELLULAR No.
Contractors – General			
IMI Construction		505-325-5005	
Weeminuche Construction	Benton Dean	970-565-7430	

Service Companies Supplies			
Noels Inc		505-327-3375	
ESSO Pipe & Supply		505-325-7568	
Air Gas		505-325-6660	
DXP	Steve Martinez	505-326-3333	
DeWees Tool & Supply		505-326-5491	
Emergency Response & Safety Services			
ChemTrec		800-424-9300	
Hands On Safety Service		505-325-4218	
Electrical Services			
Four Corners Electric		505-325-1459	
B&G Electric		505-325-7511	

OTHER PRODUCERS (which may be notified in the event of a Plant shut down)

COMPANY	CONTACT	OFFICE No.	CELLULAR No.
Burr Oil & Gas	Deana	505-325-1701	
Conoco/Burlington	Jerry Lodermilk		505-320-0452
	Renae	505-330-2946	
DJ Simmons Company	John Byrom	505-326-3753	
Elm Ridge Resources	Office	505-334-3476 ext 210	
	Terry Lindeman	972-749-6941	
El Paso Natural Gas		505-632-6000	
	Emergency Number	800-334-8047	
Nacogdoches Oil & Gas	Aaron	936-697-3750	
Resolute Natural Resources	Office	970-564-5200	
	Montezuma Creek	435-651-3682	
	Roger Atcitty		435-444-0001
Rim Southwest Corporation	Thelma Dee	435-651-4391	
XTO Energy Inc.	Office	505-324-1090	
	John Weaver		505-330-3278

OTHER RESOURCES

COMPANY	OFFICE No.	Website
National Weather Service Albuquerque, New Mexico	505-243-0702	
Farmington Four Corners Regional Airport – National Weather Service		*http://weather.noaa.gov/weather/current/KFMN.html*
Additional Weather Sites		www.accuweather.com www.wunderground.com www.weather.com

APPENDIX H

H_2S PLAN DISTRIBUTION LIST

New Mexico Oil & Gas Conservation Division

New Mexico Environment Department

New Mexico Department of Public Safety (Farmington Office)

New Mexico Department of Public Safety (State Office)

Farmington Fire Department

San Juan County Fire Department

San Juan County Sheriff Department

San Juan County Emergency Manager

San Juan County LEPC

Farmington Police

San Juan Regional Medical Center

San Juan Plant Office

Anadarko Petroleum Corporate Office

ANADARKO PETROLEUM CORPORATION

TEL. 832/ 636-1000
P.O. BOX 1330 • HOUSTON, TEXAS 77251-1330

RECEIVED OCD
2009 SEP 10 A 11:40

Anadarko

September 9, 2009

Mr. Brad Jones
Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, NM 87505

RE: H_2S Contingency Plan

Dear Mr. Jones:

Pursuant to NMAC 19.15.11, Western Gas Resources Asset Holding Company LLC, a wholly owned subsidiary of Anadarko Petroleum Corporation respectfully submits the H_2S Contingency Plan (revision 2) for the San Juan River Gas Plant located in Section 1, Township 29 North, Range 15 West, San Juan County New Mexico. The plan, submitted on the enclosed CD, reflects current operations at the San Juan River Gas Plant. Draft amendment(s) to the plan in regard to the installation of an acid gas injection well and the anticipated increase in radius of exposure will be submitted on a timely basis for OCD review.

If you have any questions or require additional information, please contact me at (832) 636-2609.

Sincerely,

Julie Betik
Sr. Staff Environmental Analyst

Anadarko Petroleum Corporation
RECEIVED OCD
2009 SEP 10 A 11:4

H_2S CONTINGENCY PLAN

San Juan River Gas Plant
Kirtland, New Mexico

WESTERN GAS RESOURCES ASSET HOLDING COMPANY, LLC, a wholly owned subsidiary of Anadarko Petroleum Corporation

(SEPTEMBER 2009)

TABLE OF CONTENTS

APPENDICES

I. INTRODUCTION

The San Juan River Gas Plant (hereinafter the "Plant") is a natural gas processing plant which handles and/or generates hydrogen sulfide and/or sulfur dioxide; therefore this Hydrogen Sulfide Contingency Plan (the "H_2S Plan" or "the Plan") has been developed: 1) to satisfy the New Mexico Oil Conservation Division Rule 11, 2) to conform with API "Recommended Practices for Oil and Gas Producing and Gas Processing Plant Operations Involving Hydrogen Sulfide," RP 55, and 3) to create a site-specific hydrogen sulfide contingency plan that outlines the emergency response procedures that will implemented to ensure a coordinated, efficient and immediate action plan for alerting and protecting operating personnel and the public as well as to prevent or minimize environmental hazards and damage to property. The terms used in this Plan are to be used in the same manner as defined in Title 19 Chapter 15 Part II of the New Mexico Administrative code (19.15.11.7- Definitions) unless otherwise defined herein.

A. PLANT DESCRIPTION & MAP (Figure 1)

The Plant is located in Kirtland, San Juan County, New Mexico and encompasses 300+ acres. It is owned and operated by Western Gas Resources Asset Holding Company LLC, which is a wholly owned subsidiary of Anadarko Petroleum Corporation (hereinafter collectively referred to as the Company).

More specifically, the Plant is located in Section 1, Township 29 S, Range 15 W in Kirtland, San Juan County, New Mexico.

1. Its coordinates are:
   Latitude: 36.453 N **Longitude: 108.220 W** .

2. Its physical address is:
   99 County Road 6500, Kirtland, New Mexico 87417

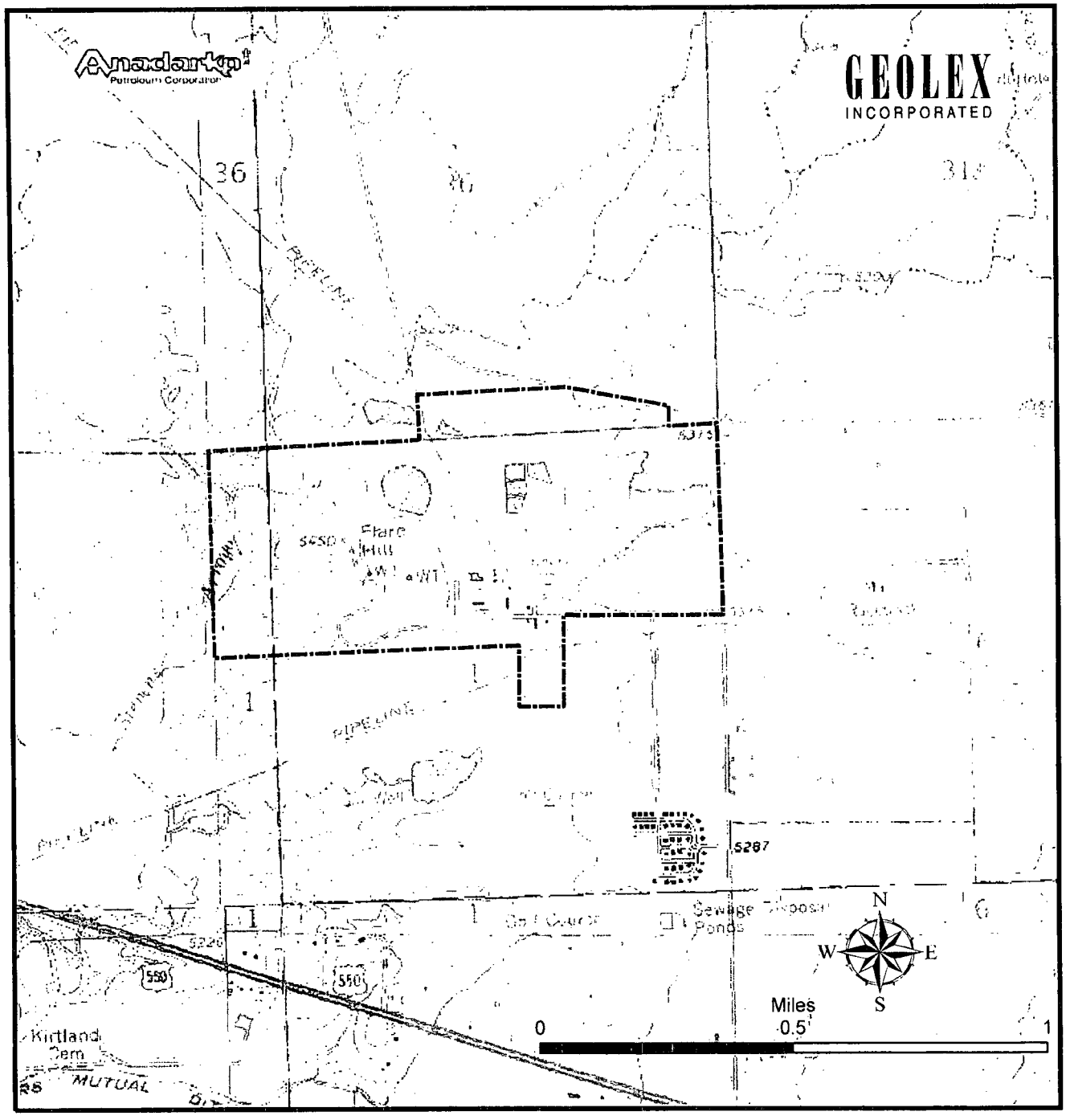
3. Its mailing address is:
   P. O. Box 70, Kirtland, New Mexico 87417

4. Driving Directions from Farmington, New Mexico to the Plant:

   From the intersection of US Highway 64 and the LaPlata Highway (New Mexico Highway 170), travel west on US Highway 64 approximately 6.2 miles to the intersection of US Hwy 64 and County Road 6500 in Kirtland, New Mexico. Turn right on County Road 6500 and travel north approximately 1.7 mile to the entrance to the San Juan River Gas Plant.

The location of the Plant is illustrated herein on Figure 1.

Figure 1



Approximate Boundaries of Western Gas Resources Property
Anadarko San Juan River Natural Gas Processing Plant

Anadarko Petroleum Corporation

GEOLEX® INCORPORATED

B. DESCRIPTION OF OPERATIONS

1. The Plant operations include gas processing, conditioning and compression, as well as flow lines and storage tanks. The Plant gathers produced natural gas from San Juan County, New Mexico, as well as, from Southwestern Colorado, Northeastern Arizona, and Southeastern Utah. Once gathered at the Plant, the produced natural gas is compressed; treated in an amine process for the removal of carbon dioxide and hydrogen sulfide; and dehydrated to remove the water content. The processed natural gas is then sold and shipped to various customers.

2. Because the natural gas that gathered at the Plant contains hydrogen sulfide ("sour gas"), it must be treated or processed to remove these and other impurities. The carbon dioxide and hydrogen sulfide (H_2S) stream that is removed from the natural gas in the amine treating process is then sent to the Claus sulfur recovery unit whereby sulfur is removed, which results in the generation of molten elemental sulfur. Any residual H_2S is routed to an incinerator where it is combusted into sulfur dioxide.

II. THE PLAN

A. RESPONSIBILITY FOR CONFORMANCE WITH THE H_2S PLAN

It is the responsibility of all personnel on-site to follow the safety and emergency procedures outlined in the Hydrogen Sulfide Contingency Plan (the H_2S Plan) as well as the following documents:

- Anadarko Petroleum Corporation Safety & Health Manual
- Anadarko Petroleum Corporation Emergency Response & Oil Spill Contingency Plan; and
- Anadarko Petroleum Corporation Environmental Policies and Programs.

B. REVISIONS TO THE PLAN

The H_2S Plan will be reviewed annually and revised at this time as necessary to address changes to the Plant facilities, operations, or training requirements, contact information and the public areas including roads, businesses, or residents potentially affected by the operations of the Plant, specifically those areas within the radii-of-exposure.

C. AVAILABILITY OF THE H_2S PLAN

The H_2S Plan shall be available to all personnel responsible for implementation, regardless of their normal location assignment. A copy of the Plan will be maintained at the Plant in the Plant Superintendent's office and at the Anadarko Corporate Headquarters in The Woodlands, Texas. **See Appendix H for the H_2S Distribution List,** which lists all the additional entities that have been provided a copy of the H_2S Plan.

D. CONTENT OF THE PLAN

At a minimum, the H_2S Plan will contain information regarding: 1) the emergency procedures to be followed in the event of an H_2S or SO_2 release that may pose a threat to the Plant, public or public areas, 2) the characteristics of H_2S and SO_2, 3) a facility description, map and/or drawings, and 4) information regarding training and drills to be conducted related to this Plan.

III. PLAN DESIGN CONSIDERATIONS

A. CHARACTERISTICS OF H_2S, SO_2 AND CARBON DIOXIDE

1. Hydrogen Sulfide (H_2S)

The current inlet gas streams into the Plant contain approximately 3,500 ppm (or 0.35 mole percent) of hydrogen sulfide based on data generated from the sampling of the inlet gas at least three times daily.

Hydrogen sulfide is a colorless, toxic and flammable gas, and has the odor of rotten eggs. Hydrogen sulfide gas is heavier than air.

Hydrogen sulfide presents a significant health hazard by paralyzing the respiratory system resulting in serious injury or death.

Hydrogen Sulfide Properties & Characteristics	
CAS No.	7783-06-4
Molecular Formula	H_2S
Molecular Weight	34.082
TWA	10 ppm
STEL	15 ppm
IDLH	100 ppm
Specific Gravity (air = 1.0)	1.189
Boiling Point	-76.5°F
Freezing Point	-121.8°F
Vapor Pressure	396 psia
Autoignition Temperature	518°F
Lower Flammability Limit	4.3%
Upper Flammability Limit	46.0%
Stability	Stable
pH in water	3
Corrosivity	Reacts with metals, plastics, tissues & nerves

Physical Effects of Hydrogen Sulfide		
Concentration		
ppm	%	Physical Effect
1	.00010	Can be smelled (rotten egg odor)
10	0.0010	Obvious & unpleasant odor; Permissible Exposure Limit; Safe for 8-hour exposure
15	0.0015	Short Term Exposure Limit (STEL); Safe for 15 minutes of exposure without respirator
50	0.0050	Loss of sense of smell in 15 minutes
100	0.0100	Immediately Dangerous to Life & Health (IDLH); Loss of sense of smell in 3-15 minutes; Stinging in eyes & throat; Altered breathing
200	0.0200	Kills smell rapidly; Stinging in eyes & throat
500	0.0500	Dizziness; Unconscious after short exposure; Need artificial respiration
700	0.0700	Unconscious quickly; death will result if not rescued promptly
1,000	0.1000	Instant unconsciousness; followed by death within minutes

2. Sulfur Dioxide ($S0_2$)

Sulfur dioxide is produced as a by-product of H_2S combustion at the incinerator. The incinerator unit receives the residual hydrogen sulfide and carbon dioxide stream that is routed from the amine unit.

It is colorless, transparent, and is non-flammable, with a pungent odor associated with burning sulfur.

Sulfur dioxide is heavier than air, but will be picked up by a breeze and carried downwind at elevated temperatures. Sulfur dioxide can be extremely irritating to the eyes and mucous membranes of the upper respiratory tract.

Sulfur Dioxide Properties & Characteristics	
CAS No.	7446-09-5
Molecular Formula	SO_2
Molecular Weight	64.07
TWA	2 ppm
STEL	5 ppm
IDLH	100 ppm
Specific Gravity (air = 1.0)	2.26
Boiling Point	14°F
Freezing Point	-103.9°F
Vapor Pressure	49.1 psia
Autoignition Temperature	N/A
Lower Flammability Limit	N/A
Upper Flammability Limit	N/A
Stability	Stable
Corrosivity	Could form an acid rain in aqueous solutions

Physical Effects of Sulfur Dioxide	
Concentration	**Effect**
1 ppm	Pungent odor, may cause respiratory changes
2 ppm	Permissible exposure limit; Safe for an 8 hour exposure
3-5 ppm	Pungent odor; normally a person can detect sulfur dioxide in this range
5 ppm	Short Term Exposure Limit (STEL); Safe for 15 minutes of exposure
12 ppm	Throat irritation, coughing, chest constriction, eyes tear and burn
100 ppm	Immediately Dangerous To Life & Health (IDLH)
150 ppm	So irritating that it can only be endured for a few minutes
500 ppm	Causes a sense of suffocation, even with first breath
1,000 ppm	Death may result unless rescued promptly.

3. Carbon Dioxide

The current inlet gas streams to the Plant contain approximately 3% carbon dioxide based on continuous inlet gas monitoring readings.

Carbon dioxide gas is colorless, odorless, and non-flammable. Carbon dioxide is heavier than air.

Carbon Dioxide Properties & Characteristics	
CAS No.	124-38-9
Molecular Formula	CO_2
Molecular Weight	44.010
TWA	5,000 ppm
STEL	30,000 ppm
IDLH	40,000 ppm
Specific Gravity (air = 1.0)	1.5197
Boiling Point	-109.12°F
Freezing Point	-69.81°F
Vapor Pressure	830 psia
Autoignition Temperature	N/A
Lower Flammability Limit	N/A
Upper Flammability Limit	N/A
Stability	Stable
pH in saturated solution	3.7
Corrosivity	dry gas is relatively inert & not corrosive; can be corrosive to mild steels in aqueous solutions

Physical Effects of Carbon Dioxide	
Concentration	**Effect**
1.0 %	Breathing rate increases slightly
2.0 %	Breathing rate increases to 50% above normal level. Prolonged exposure can cause headache, tiredness
3.0 %	Breathing rate increases to twice normal rate and becomes labored. Weak narcotic effect. Impaired hearing, headache, increased blood pressure and pulse rate
4 – 5 %	Breathing increases to approximately four times normal rate, symptoms of intoxication become evident, and slight choking may be felt
5 – 10 %	Characteristic sharp odor noticeable. Very labored breathing, headache, visual impairment, and ringing in the ears. Judgment may be impaired, followed within minutes by loss of consciousness
10 – 100 %	Unconsciousness occurs more rapidly above 10% level. Prolonged exposure to high concentrations may eventually result in death from asphyxiation

B. RADII OF EXPOSURE (ROE)

For the existing operations, the "Radius of Exposure" for both 500-ppm and 100-ppm of H_2S gas was determined using the "escape rate", which is calculated using the maximum daily rate of the gaseous mixture that is handled by the Plant. The rates and other variables used to calculate the ROE is discussed in greater detail in **Appendix B - ROE calculations. Also refer to Appendix C - map showing 500-ppm ROE and the 100-ppm ROE.**

500-ppm ROE	**933 feet**
100-ppm ROE	**2,042 feet**

IV. EMERGENCY ACTION PROCEDURES

A. EMERGENCY RESPONSE ORGANIZATION

The Plant uses the Incident Command System (ICS) for emergency response. The ICS structure used is based on the National Interagency Incident Management System (NIIMS), and is consistent with the National Contingency Plan (NCP).

In the event of an accidental release that results in the activation of the H_2S Plan and all personnel have been evacuated out of the affected area, the Plant Superintendent, or his designee, will be the On-Scene Incident Commander (IC in this Plan). The IC will contact and coordinate with Anadarko's management in corporate office. If the severity of the response requires activation of the Emergency Response Center in The Woodlands, Texas office, the ICS structure will be staffed per the Anadarko Southern Region Emergency Response & Oil Spill Contingency Plan Manual. The staffing will not change the H_2S Plan contained herein.

The Plant Superintendent or his designee shall determine:

1) Plant Shutdowns
2) Isolation of pipeline segments
3) Repairs, tests or restarts as required

If an emergency occurs, the Plant Superintendent, or his designee, shall be notified first. The Plant Superintendent, or his designee, shall notify Anadarko's Office in The Woodlands, Texas

B. EMERGENCY RESPONSE

This section explains the procedures and decision to be used in the event of an H_2S release; much of which has been pre-determined to ensure a coordinated, efficient and

immediate action plan for alerting and protecting operating personnel and the public as well as to prevent or minimize environmental hazards and damage to property.

1. OBJECTIVE

All Plant employees shall be prepared to respond to an H_2S or SO_2 emergency at the Plant. Emergency response actions may be taken for a variety of situations that may occur in the Plant. The Plan is activated in progressive levels based on the concentration of H_2S that has been released. The Plant has three (3) activation levels that are described below and in detail in the Response Flow diagram in Appendix F.

Level 1 – Intermittent alarm sounded and/or flashing red beacons activated for H_2S greater than 10 ppm

Level 2 – Continuous alarm sounded and/or flashing red beacons activated for H_2S greater than 20 ppm

Level 3 – Catastrophic release; fire; explosion; a continuous release of maximum volume for 24 hours; or Rule 11 Mandatory Activation for 100 ppm in any defined public area; 500 ppm at any public road; or 100 ppm at a distance greater than 3000 feet from the site or the release

As soon as the Plan has been activated based on the criteria above, the Plant Superintendent, or his designee, should be notified.

2. PLANT EVACUATION AND EMERGENCY ASSEMBLY AREAS

A. Plant evacuation for all visitors and Plant personnel that are not operators begins at the 10 ppm H_2S intermittent alarm and/or flashing red beacon. The Plant operators are to put on the 30-min SCBA and first determine if any personnel are in distress and assist any distressed personnel evacuate to Emergency Assembly Area 1. Emergency services (911) will be contacted if there are injuries or as otherwise deemed necessary. BHP Mines and Praxair are also to be notified. The operators will then, wearing the SCBA, investigate the cause of the release. At the sound of the alarm and/or flashing red beacons, all other personnel in the Plant are to stop work, check the prevailing wind direction and immediately proceed along designated evacuation routes and/or upwind to the pre-designated Emergency Assembly Area(s) that are described in **Appendix F**.

   Prevailing winds for the area are from the east and evacuation along the designated routes should be upwind. If the designated evacuation route is downwind of the release (based on the windsock), then all evacuees should proceed upwind to the Emergency Assembly Areas

The Plant evacuation diagram showing evacuation routes and Emergency Assembly Areas is attached in **Appendix D.**

The Emergency Assembly Area 1 is:

Parking Area on the eastside of the Plant Superintendent Office Building (see Appendix C & D)

The Emergency Assembly Area 2 is:

Area at Plant Rd and Hwy 6500 (see Appendix C)

The Emergency Assembly Area 3 is:

Kirtland Elementary School Parking Lot , 30 Road 6446 (see Appendix C)

B. Roll call shall be conducted at the Emergency Assembly Area to assure all personnel have evacuated safely. This facility is a PSM facility and requires all visitors check in before entering the Plant, thus the check-in sheet will be used at the Emergency Assembly Areas to make a full accounting of all personnel and visitors.

3. IMMEDIATE ACTION PLAN/ INITIAL RESPONSE

The following outlines the immediate action plan that is illustrated by flow diagram in **Appendix F**. This is to be used when responding to an H_2S release. Additional or long term response actions will be determined on a case-by-case basis, if needed, once the Incident Command Center and System is established following the immediate response.

LEVEL 1 RESPONSE

1. The audible signal for a Plant emergency and evacuation is an intermittent horn (repeating off/on) activated when levels of H_2S of 10 ppm are detected. The frequency of this intermittent alarm will increase as the concentration of the H_2S increases. In addition, a flashing red light or beacon will be activated at 10 ppm H_2S. At the initial sound of the intermittent alarm or the flashing red beacon, each operator (2 per shift) will put on a 30 minute SCBA and all other personnel in the Plant complex shall immediately evacuate the Plant using the evacuation routes to the Emergency Assembly Area 1 (see **Appendix D**). The operators, upon suit up with the SCBA, will first help any persons in distress evacuate to the Emergency Assembly Area. If deemed necessary by the Senior Operator, local

emergency response service providers will be contacted by Plant personnel designated by the Senior Operator.

2. BHP Mines and Praxair will be notified of a release by personnel designated by the Plant Superintendent or his designee.

3. Wearing the SCBA, the operator(s) will attempt to fix the cause of the release. OSHA guidelines allow operators to work in areas with 10ppm for up to 8 hours. The H_2S levels at the Emergency Assembly Area 1 will be monitored with a hand held or personal monitor.

4. The Senior Operator will set up secondary re-entry team(s) with 30 min. SCBA to re-enter and resolve the situation. Re-entry will occur in 15 minute shifts at the direction of the IC until the problem is resolved or the ESD activated. If H_2S levels in Emergency Assembly Area 1 exceed 10 ppm, evacuate to Emergency Assembly Area 2 and continue to monitor Assembly Area H_2S level. If release is resolved and monitored levels in the Plant are less than 10 ppm, personnel may re-enter to Plant. The OCD shall be notified within one hour of any release that activates the Plan. If the release is not resolved and H_2S levels continue to increase, Level 2 Response is indicated.

LEVEL 2 RESPONSE

1. The continuous alarm and indicates the detection of H_2S greater than 20 PPM. Flashing red beacons indicate a H_2S release of 10 ppm or greater and they will continue for a release of 20 ppm or greater. At the initial sound of the continuous alarm or observance of the flashing red beacons, the operators will immediately put on a 30 minute SCBA and all other personnel in the Plant complex will put on emergency escape packs if they are wearing them and evacuate along with all other personnel using the evacuation routes to the Emergency Assembly Area 2 (see **Appendix D**). The operators, upon suit up with the SCBA, will first help any persons in distress evacuate to the Emergency Assembly Area. If deemed necessary by the Senior Operator, local emergency response service providers will be contacted by Plant personnel as designated by the Senior Operator.

2. Praxair is trained to evacuate at continuous alarm sounds. Praxair, BHP Mines and other non-manned businesses will be contacted by phone and notified of release and asked to evacuate, if they have not already. All entities within the 100 ppm ROE will be contacted by phone and notified of release. The LEPC and law enforcement will be contacted by phone and notified of the release. The Plant Superintendent or his designee will assign personnel notification responsibility.

3. Operator(s) with 30 minute SCBA to assess and attempt to resolve. After 15 minutes and no resolution, the operator(s) will activate the ESD and will evacuate to Emergency Assembly Area 2.

4. If monitored H_2S levels at Emergency Assembly Area 2 exceed 10 ppm, evacuate to Emergency Assembly Area 3, Kirtland Elementary School parking lot. If deemed necessary, local emergency response service providers will be contacted by the operator.

   a) Re-entry will occur in full SCBA and in 15 minute shifts at the direction of the IC until IC determines problem has been resolved or additional ESD (pipeline) activated.

   b) If release is resolved and monitored levels of H_2S in the Plant are less than 10 ppm, personnel may return to Plant. The OCD shall be notified within one hour of any release that activates the Plan.

   c) No resolution requires activation of full H_2S Plan with notifications and reporting as per Plan. If the release is not resolved and/or H_2S levels continue to increase, Level 3 Response is indicated.

LEVEL 3 RESPONSE

1. For H_2S at 20 ppm or greater at Assembly Area 2, repair efforts at Level 2 unsuccessful , worst case scenario, and/or catastrophic release have occurred then implement a Level 3 response.

2. All personnel shall have evacuated to Emergency Assembly Area 3, Kirtland Elementary School. Implement full H_2S plan with all notifications and public agency involvement.

3. Notification of BHP mines and evacuation of Praxair.

4. If escaping vapors have been ignited, the vapors should be allowed to continue to burn unless the fire endangers personnel, other property, or other equipment.

5. When applicable: Maintain communication with the Plant Superintendent, or his designee, to keep him up-to-date of the situation and the action taken prior to his arrival at the location.

6. Initiate and maintain a Chronological Record of Events log.

7. Within one hour after the activation of the H_2S Plan, begin agency notifications by calling OCD and NRC.

8. Establish media staging area adjacent to Assembly Area 3 and direct all media to it.

9. Once resolved and monitored levels in Plant are less than 10 ppm, return to Plant. Agency reports to be submitted as required.

4. EMERGENCY SHUTDOWN SYSTEM

The Plant has an extensive Emergency Shut Down (ESD) system that is located within the Plant and in various locations along the pipelines that feed the Plant. The ESD is designed to prevent a Level 3 response. See **Appendix E** for a more detailed description of the ESD.

5. NOTIFICATIONS AND REPORTS

The Plant has various notification and reporting obligations. Some are related to its state air quality permit that is overseen by NMED as well as well as state and federal spill reporting obligations. In addition to the regulatory obligations noted above, Plant personnel also have internal and external notification and reporting obligations associated with the activation of this Plan.

A. DISCOVERY AND INTERNAL REPORTING

1. All Plant personnel who perform maintenance and/or repair work within the Plant wear H_2S monitoring devices to assist them in detecting the presence of unsafe levels of H_2S. When any Plant personnel while performing such work discovers a leak or emission release they are to attempt to resolve the issue as long as H_2S levels remain below 10 ppm. The personal monitoring devices they wear will give off an audible alarm at 10 ppm. These devises are to be worn as low on the body as possible since H_2S is heavier than air and will tend to stand or accumulate in low lying areas. If the response action needed to resolve the issue is more than simply closing a value or stopping a small leak, the Plant personnel shall notify the Plant Superintendent, or his designee and convey, at a minimum, the following information:

    - Name, telephone number, and location of person reporting the situation; and
    - Type and severity of the emergency; and
    - Location of the emergency (area/block, mile markers, latitude & longitude, or building), and the distance to surrounding equipment and/or structures; and
    - The cause of the spill or leak, name and quantity of material released, and extent of the affected area including the degree of environmental hazard; and
    - Description of injuries and report of damage to property and structures; and
    - Initiate and maintain a Chronological Record of Events log. This record should record the time, date, and a summary of the event.

2. If the Plant personnel detects H_2S levels greater than 10 ppm either as a result of his/her personal monitoring device or the Plant intermittent alarm and/or red flashing beacon, Plant operators are to contact their immediate supervisor for assistance and put on the 30-min SCBA so they can attempt to resolve the issue. All non essential persons shall be notified of the release and evacuated from the area. Operators wearing the SCBAs are to first assist any persons requiring assistance during the evacuation, then attempt to resolve the issue. The immediate supervisor is then responsible for notifying the Plant Superintendent or his designee so that the IC system can be implemented and H_2S Plan activated if necessary.

3. Once the Plant Superintendent is contacted, he or his designee is to notify the appropriate Corporate management, EHS personnel, Plant emergency response personnel, and advise them of the existing emergency situation. Corporate management will then conduct the reporting up that is necessary based on the situation.

4. Plant personnel are to advise any contractor, service company, and all others on-site or attempting to enter the Plant that the H_2S Plan has been activated.

B. PUBLIC AWARENESS AND COMMUNICATION

Public awareness and communication is a primary function of the H_2S Plan. Company has compiled a list of various public, private, state, local contacts that are to be notified at various phases during the activation of the Plan. Refer to the Response Flow diagram in **Appendix F** that indicates when certain entities are to be contacted in event of activation of this Plan. **Appendix G** is a listing of the entities to be contacted and **Appendix H** is a list of community organizations that have received a copy of the Plan. Company will inform all state and local response organizations on its Plan as well as those businesses that fall within its 500-ppm and 100-ppm ROE as illustrated in **Appendix C**.

C. PUBLIC AREAS, NEARBY BUSINESSES AND RESIDENTS

The contact information for all residents, businesses and public areas is contained in **Appendix G**. **All** businesses and public places within the 500 ppm and 100 ppm radius of exposure will be contacted by Plant personnel as designated by Plant Superintendent if the Plan is activated and based on response level as described in the Immediate Action Plan and advised of the following:

- The nature and extent of the release/emergency at the Plant Recommendations for protective actions, such as evacuation or shelter-in-place
- Any other event specific information that is necessary to protect the public

- Updates as to the status of the release and continued safety measures to be taken, including but not limited to when to evacuate and/or when it is safe to return to the area.

1. Residences or Public roads:

There are no residences or public roads located within 500 ppm or the 100 ppm radius of exposures.

2. Businesses or Other Public Areas:

All businesses on this list will be provided with a copy of the H_2S Plan and will be contacted about participation when local emergency response training events or drills occur.

Within the 100 ppm ROE:
There is **one** public area (a portion of the Riverview Golf Course) that is located within the 100 ppm radius of exposure.

BHP will be contacted when the Plan is activated to ensure that the out of service vent pipes have not been activated. Currently, no operating BHP Mining ventilation pipe ducts are within the 100 ppm ROE; however, out of service ventilation pipe ducts do exist and have been closed by manual valve.

Three unmanned businesses are located within the 100 ppm ROE (XTO, El Paso Natural Gas and Mapco Enterprises). Their corporate offices will be notified if the Plan is activated.

Within the 500 ppm ROE:
There is one additional manned business (Praxair) within the 500-ppm ROE. Praxair is to be notified if the Plan is activated.

6. SITE SECURITY

A. In order to have an accurate listing of all personnel on-site in the event of an emergency, a daily sign-in log sheet shall be utilized. The sign-in log sheet shall include at a minimum the person's name, the company name, the time of arrival, and the time of departure.

B. The Incident Commander shall be responsible to assure that all personnel sign-in upon arrival and sign-out upon departure from the job site.

C. The Incident Commander may at his discretion assign the responsibilities for the daily sign-in log sheet to the individual designated as the Record Keeper or another designee.

D. At the discretion of the Incident Commander, a security coordinator and/or a security team may be established, and the access to the job site restricted.

E. For a Level 3 release a road block would be set up at the entrance to the Plant at County Road 6500.

7. SIGNS & MARKERS

The Plant has warning signs indicating the presence of H_2S/Poisonous Gas and high pressure gas at the entrance to the Plant. Emergency response phone numbers are posted at the entrance to the Plant. Signs are located at the Plant gate entrance indicating that all visitors are to sign in.

8. FIRST-AID STATION

The first aid station will be located at the Emergency Assembly Area.

FIRST AID KITS are located:

- **Plant Superintendent Office Building,**
- **Maintenance/Safety Office Building, and**
- **Each company vehicle**

9. MEDIA SITE

A. If a Level 2 or 3 Response occurs, the Media Site will be located adjacent to Emergency Assembly Area 2, except for Level 3 response in which case it will be located adjacent to Emergency Assembly Area 3.

B. At no time shall any unescorted representative from the media be allowed any closer to the Plant than the Media Site location, unless approved by the Incident Commander, the Safety Officer, and the Media Relations Officer.

10. EMERGENCY AND SAFETY EQUIPMENT

Refer to **Appendix E** for information pertaining to the Plant's emergency and Safety equipment.

IV. TRAINING AND DRILLS

A. TRAINING

1. Training on the H_2S Plan
   - Inclusion of local officials and LEPC
   - Public areas and businesses (within the ROE)
   - Those on the Plan distribution list

2. Other Emergency Response Related Training

Anadarko/Western has an extensive safety training program and addresses various aspects of job related hazards. All training records for the Plant are maintained at the Plant. The following is a limited list and summary of the training programs that relate to the H2S Plan and Emergency Response:

- Plant Orientation Training - All Plant personnel, visitors, and contractors must attend a Plant overview orientation prior to obtaining permission to enter the Plant. A refresher course on this training is required annually for all persons. This training also complies with the requirements of the Anadarko and Plant's Process Safety Management Program and Procedures Manuals.

- Hydrogen Sulfide and Sulfur Dioxide Training – All Plant personnel receive annual refresher training on hydrogen sulfide and sulfur dioxide, which is conducted by Anadarko personnel. If an individual is unable to attend, they may be required to attend a third party training session. Hydrogen sulfide training cards are issued as documentation of this training. All contract employees and visitors are required to have had hydrogen sulfide training and to provide the Plant a copy of their certification card prior to obtaining permission to enter the Plant.

- Respirators - All Plant personnel, with the exception of the Plant Operations Specialist, are trained annually on the proper use of respirators. In addition to the annual training, all Plant personnel with the exception noted above are fit tested annually on the respirators. Except for the Plant Operations Specialist, all Plant personnel must have medical clearance to work in the Plant. Medical clearance is mandatory for H_2S certification. Medical clearance review for work in a H_2S environment is conducted on a bi-annual basis unless the individual has experienced medical problems within that two year interval that requires updating the medical clearance.

- Hazard Communication - All Plant personnel are trained annually on Hazard Communication and SARA Title III Right-to-Know information. The annual training includes, at a minimum, a review of material safety data sheets (MSDS) for those materials that are present at the Plant and labeling.

- Personal Protective Equipment (PPE) - All Plant personnel are trained annually on the Anadarko requirements for personal protective equipment (PPE). The training includes, at a minimum, a review of all the types and levels of personal protective equipment and how to select the correct equipment for the job.

B. EMERGENCY RESPONSE DRILLS

1. The Plant will conduct, at least, a tabletop drill annually. Multiple drills during the year may be scheduled at the discretion of the Plant Superintendent or as part of the Emergency Response Center in The Woodlands.

2. The annual drill will exercise this Plan and include, at a minimum, contacting the entities that are identified as being within the 500-ppm ROE and the Local Emergency Response contacts identified on **Appendix G**. The drills will also include briefing of public officials on issues such as evacuation or shelter-in-place plans even though the current ROE will not require evacuations or shelter in place.

3. Drill training will be documented and those records will be maintained at the Plant. The documentation shall include at a minimum the following:

    a. Description or scope of the drill, including date and time
    b. Attendees and Participant to the drill
    c. Summary of activities and responses
    d. Post drill de-brief and reviews

APPENDIX A

WORST CASE SCENARIO

The basis for worst case calculations is 3500 parts per million (ppm) or 0.35 mole percent of hydrogen sulfide in the inlet gas to the San Juan River Gas Plant and a maximum daily (24 hour) processing volume of 35,000 Mscf. The ROE assumes an uncontrolled instantaneous release from the area around the amine contact towers of the referenced volume and concentration. Calculations using the ROE formula pursuant to NMAC 19.15.11 are provided in **Appendix B**.

It should be noted that this rate, though used as worst case, would unlikely be released due to the Plant emergency shut down (ESD) systems that when activated shuts down the Plant. ESD valves on the inlet receivers to the Plant act as secondary control to prevent gas from entering the Plant. In addition, each inlet pipeline (Aneth and Barker) have ESD valves 2 miles from the Plant as well as ESD valves another 6 and 8 miles down respectively.

APPENDIX B

RADIUS OF EXPOSURE CALCULATIONS

The formulas for calculating the two ROEs (as specified by the regulations) are as follows:

500-ppm RADIUS OF EXPOSURE CACULATION

$$X=[(0.4546)(\text{hydrogen sulfide conc.})(Q)]^{(0.6258)}$$

Where:
X = Radius of exposure in feet
Hydrogen Sulfide Conc = Decimal equivalent of mole or volume fraction of hydrogen sulfide in the gaseous mixture
Q = Escape rate expressed in cubic feet per day (corrected for standard conditions of 14.73 psi absolute and 60 degrees Fahrenheit)

a) For existing facilities or operations, the escape rate (Q) is the maximum daily rate of the gaseous mixture produced or handled or the best estimate thereof. For the San Juan River Gas Plant the Company is using for contingency planning purposes an "escape rate" equal to the inlet gas volume of 35,000 MCFD. The inlet gas volume at the Plant is somewhat variable and is continuously metered. The Plant records daily inlet gas volumes and prepares a daily volume report. 35,000 MCFD has been selected as the escape rate since it is the highest volume that the Plant would handle under its current operations and is considered worst case interpretation of the volume of gas.

   As to hydrogen sulfide concentration of the inlet gas, daily monitoring data indicates variable concentrations, however 3500 ppm (0.35 mole percent) is a worst case scenario. Thus, the Plant has used a hydrogen sulfide concentration of 3500 ppm for its contingency planning purposes.
   Using:
   Q = 35,000,000
   H_2S conc = 3500 ppm or 0.35 mole%

$$[(0.4546)*(H_2S \text{ concentration})*(\text{gas volume } (Q))]^{0.6258}$$
$$[(0.4546)*(3500*.000001)*(35,000,000)]^{0.6258}$$

500-ppm ROE = 933 feet

100-ppm RADIUS OF EXPOSURE CALCULATION

$$[(1.589)*(H_2S \text{ concentration})*(\text{gas volume})]^{0.6258}$$

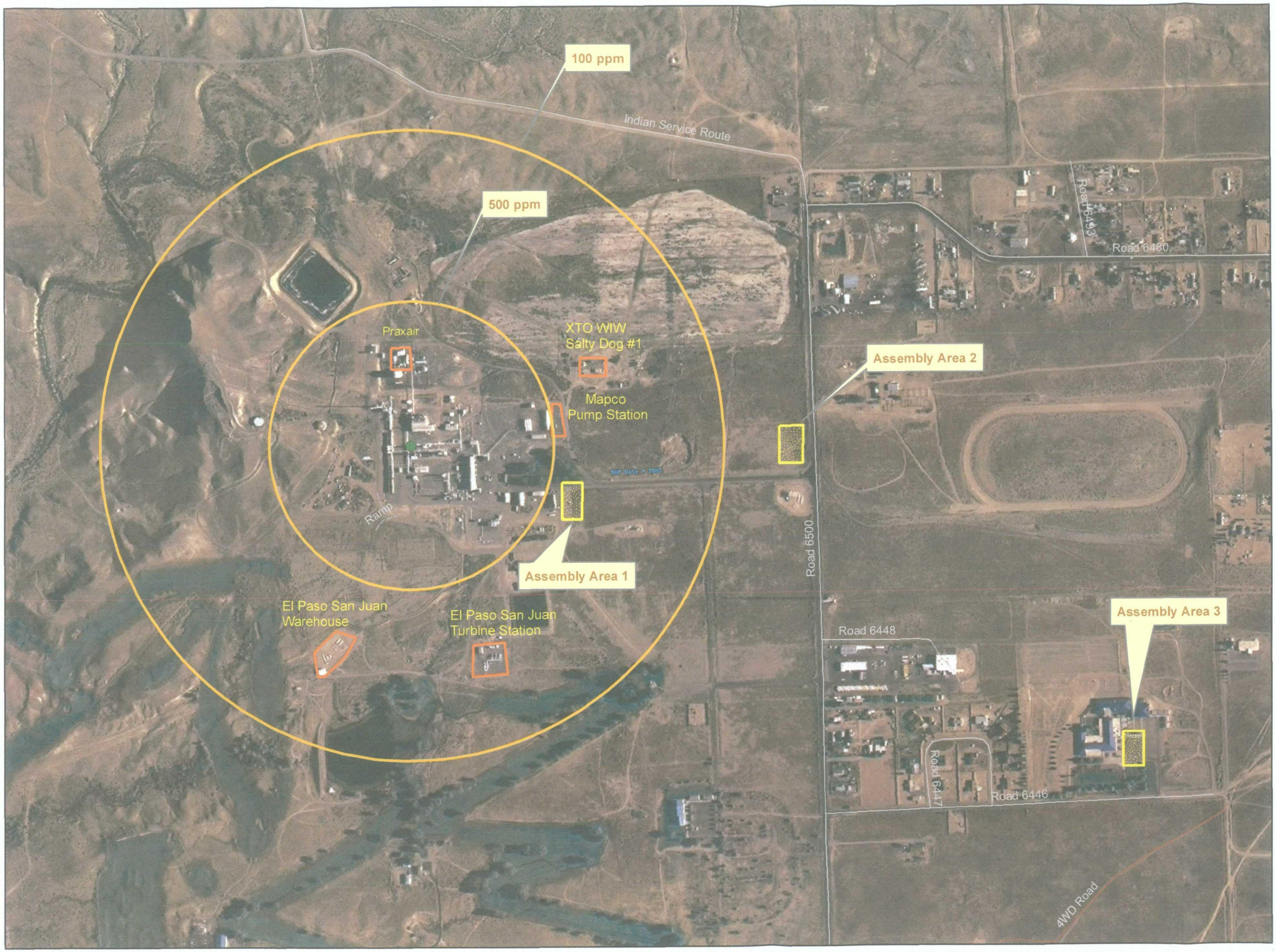
$$[(1.589)*(3500*.000001)*(35{,}000{,}000)]^{0.6258}$$

100-ppm ROE = 2,042 feet

APPENDIX C

100-PPM AND 500-PPM RADIUS OF EXPOSURE MAP

San Juan River Gas Plant
Hydrogen Sulfide Contingency Plan
Radius of Exposure



CURRENT OPERATIONS

- Amine Tower *

Radius of Exposure

- 933 ft (500 ppm)
- 2042 ft (100 ppm)
- Assembly Area
- Business

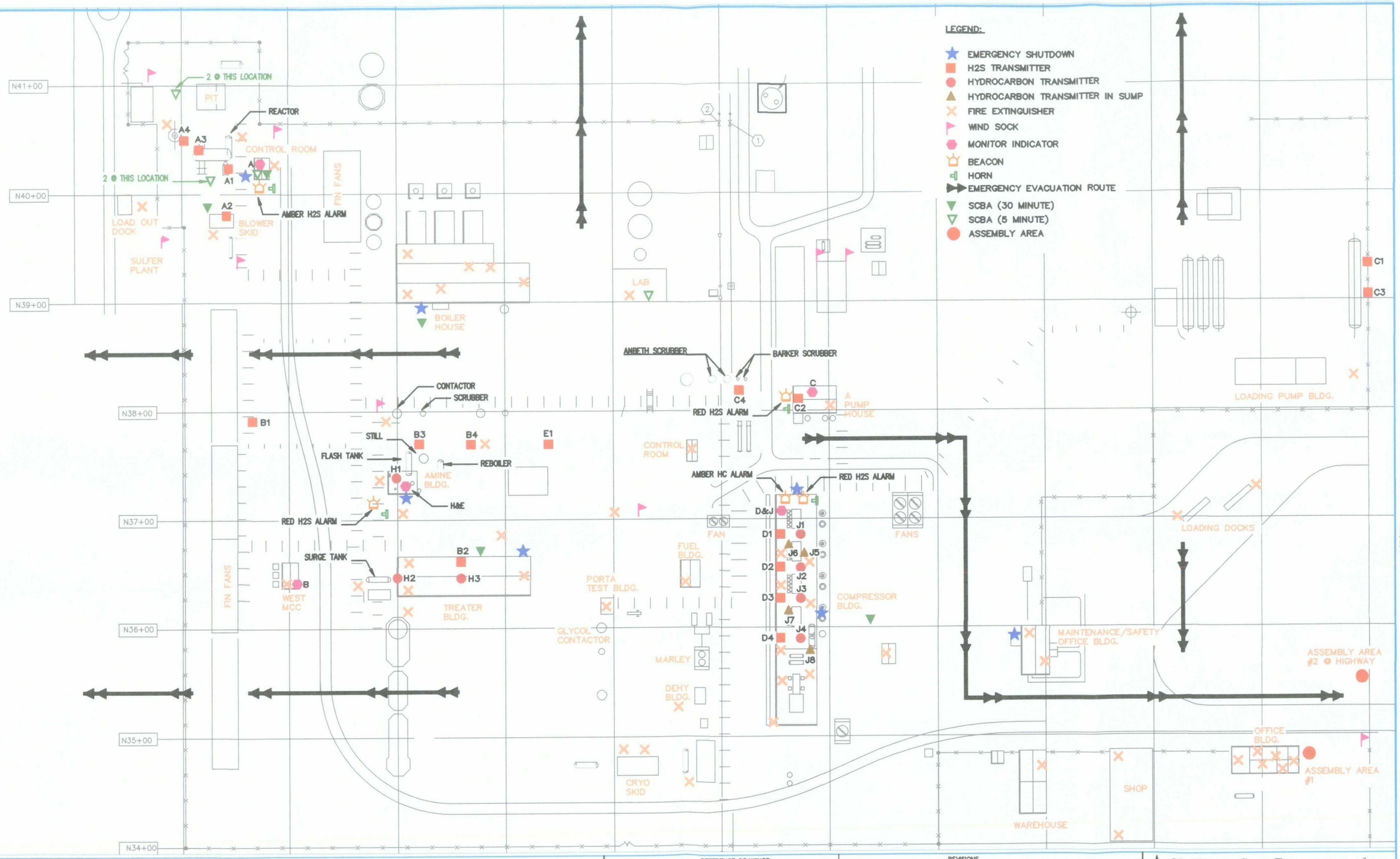
*Based on 35 MMscfd @ 3500 ppm H_2S

Anadarko
Petroleum Corporation

APPENDIX D

PLANT DIAGRAM WITH EVACUATION ROUTES & EMERGENCY EQUIPMENT LOCATIONS

THIS DRAWING AND THE DESIGN IT COVERS ARE CONFIDENTIAL AND REMAIN THE PROPERTY OF WESTERN GAS RESOURCES, INC. AND SHALL NOT BE DISCLOSED TO OTHERS OR REPRODUCED IN ANY MANNER OR USED FOR ANY PURPOSE WHATSOEVER EXCEPT BY WRITTEN PERMISSION BY THE OWNER.



NOTES:

XXFD0000 FOUNDATION LOCATION PLAN

REFERENCE DRAWINGS			REVISIONS						
DWG. NO.	TITLE		NO.	DESCRIPTION		BY	DATE	CHK.	DATE	APPR.	DATE
			0	ISSUED FOR INFORMATION		SID	8/17/09	JD	8/17/09	MB	8/17/09

Western Gas Resources, Inc.
1099 18th St., Suite 1200 – Denver, CO 80202-1955 (303)-452-5603

SCALE: 1"=40'-0"	DRAWING CREATION	P. ROGERS 7/23/09	EDIT DATE	MB 8/17/09	PLOT DATE	Diederich, Scott 8/18/09

SAN JUAN RIVER PLANT
EMERGENCY ITEMS AND PLACEMENT

SAN JUAN RIVER PLANT
P.O. BOX 70 – KIRTLAND, NM 87417 – (505) 598-6210

FILE NAME: SJPPH2S0200

APP. NO. –

DRAWING NUMBER **SJPP-H2S0200**

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8/17/2009 Diederich, Scott

APPENDIX E

DESCRIPTION OF H_2S MONITORING & ALARM SYSTEMS

A. EMERGENCY SHUTDOWN SYSTEM

There are (8) ESD manual stations located at various points in the facility (Appendix D). **The Plant ESD can be activated at any time at the direction of the Plant Superintendent or Incident Commander and is to be activated based on this Plan after 20 ppm H_2S has been detected in the Plant and efforts to resolve the issue for 15 minutes have failed.**

When anyone of the eight (8) manual stations are activated, the system will be shutdown and the natural gas inlets and outlets will be blocked. The operators are also able to auto close the two (2) main blocks on the incoming gas lines to the Plant. Activating these should allow the Plant to avoid a Level 3 response. Two miles north of the Plant on the Barker Dome line and the Aneth line, there are isolating block valves (manual) that can prevent further gas flow into the Plant pipeline system. Also, further upstream on the Barker and Aneth lines there are additional isolating block valves at 6 miles and 8 miles upstream on their respective lines. These block values furthest upstream, isolate the entire system from the field gathering lines coming into the Plant.

B. PLANT ALARMS, VISIBLE BEACONS & WIND INDICATORS

1. Colored beacons, horns, and wind directions indicators are located in various locations throughout the Plant and are indicated on **Appendix D**.

2. The audible signal for an emergency response and Plant evacuation is a repeating intermittent alarm that sounds at 10 ppm H_2S. The frequency of this intermittent alarm will increase as the concentration of the H_2S release increases. The alarm will become continuous when the concentration of the H_2S release is 20 ppm or higher. At the initial sound of this intermittent alarm, the Plant operator will put on a SCBA and all personnel in the Plant complex shall immediately proceed in a safe manner to the Emergency Assembly Areas as prescribed by the Emergency Action Plan on page 19 of this Plan.

3. A flashing red beacon signifies an H_2S release of 10 ppm and all personnel in the Plant complex shall immediately proceed in a safe manner to the Emergency Assembly Area 1 located east of the main office. If this area is not determined to be safe all will move to Assembly Area 2 which is on road 6500 at the main gate on the east side of the facility. Evacuation routes and Assembly Area 1 are indicated on **Appendix D**.

4. A routine process alarm will cause a horn to sound. This horn is a wavering siren sound that is used to alert the Plant Operator to return to the Control Room. No emergency response or evacuation is required when this siren sounds. Flashing beacons are located throughout the Plant and are utilized to assist the Plant Operator in identifying the location of the Plant alarm or Plant upset. Any beacon colors other than red do not identify an emergency response or evacuation.

5. Wind direction indicators are installed throughout the Plant and at the Plant Superintendent Office Building. At least one wind direction indicator can be seen at any location within the Plant complex, as well as, from any point on the perimeter of the Plant. There are 10 windsocks located in the Plant.

C. GAS DETECTION EQUIPMENT

1. The Plant uses the Industrial Scientific Corporation 4200 Series Remote H_2S Sensors. These sensors are a fixed point monitor to detect the presence of hydrogen sulfide in ambient air. The sensors are connected to Allan Bradley/SLC-500 Rockwell Logic Controllers with an output to Moore Micro-Advantage controllers and from here to the operators PLC. The red flashing beacon is activated at 10 ppm. The horn is activated with an intermittent alarm at 10 ppm and changes to a steady alarm at 20 ppm.

2. The fixed hydrogen sulfide monitors are strategically located throughout the Plant to detect an uncontrolled released of hydrogen sulfide. The SRU has 4 sensors labeled A-1 through A-4. The treating plant area has 4 sensors labeled B-1 through B-4. There are two sensors at the east side of the Plant labeled C-1 and C-3. There is one sensors located at the liquid stabilizer skid labeled E-1. This is the center of the process area. The compressor building has eight methane sensors, these shut the compressors down at 50% LEL. The compressor building also is equipped with fire eyes that will also shut the units down. The Plant operators are able to monitor the ppm level of H_2S of all the Plant sensors on their control/monitor PLC located in the operators building. These sensors are all located on the plot plan on **Appendix D**. These sensors all have to be acknowledged and will not clear themselves. This requires immediate action for any occurrence or malfunction. The Plant sensors are calibrated quarterly.

3. Hand held gas detection monitors are available to plant personnel to check specific areas and equipment prior to initiating maintenance or work on the process or equipment. There are 2 handheld and 9 personal monitors that are used by individuals for special projects and field work. The hand held gas detection devices are BW Technologies 4-gas detectors. The detectors have sensors for oxygen, LEL (explosive hydrocarbon atmospheres), hydrogen sulfide, and carbon dioxide. They indicate the presence H_2S with a beeping sound at 10 ppm. The beeps change in tone as H_2S increases to 20 ppm. The personal monitors are set to alarm (beep) at 10 ppm with the beeps becoming closer together as the H_2S concentration increases to 20 ppm. Both the hand held and personal monitors have digital read outs of H_2S ppm concentration.

D. RESPIRATORS

1. The Plant has 30 minute Self-Contained Breathing Apparatus (SCBA) respirators and 5 minute escape packs strategically located throughout the Plant.

2. The respirator containers are identified in the process area and the locations are identified on **Appendix D.**

3. All Plant personnel with the exception of the Plant Operations Specialist are certified to use the SCBA respirators.

E. FIRE FIGHTING EQUIPMENT

1. The Plant personnel are trained only for insipient stage fire fighting.

2. The fire extinguishers located in the Plant process areas, compressor buildings, process buildings, and company vehicles are typically a 20# Ansul dry chemical fire extinguisher. **See Appendix D.**

3. The Plant does not have a fire water system, but only a utility water system that is not designed for fire fighting.

APPENDIX F

H_2S CONTINGENCY PLAN FLOW DIAGRAM

LEVEL 1 RESPONSE

H_2S DETECTED GREATER THAN 10 PPM
&/OR INTERMITTENT ALARM SOUNDS/FLASHING RED BEACONS ACTIVATED

- **OPERATORS PUT ON RESPIRATORS (30 minute SCBA) TO ASSESS & RESOLVE PROBLEM.**
  (Operators are allowed under OSHA to work for up to 8 hours in 10ppm H2S environment)
- **ALL OTHERS EVACUATE TO ASSEMBLY AREA 1**
- **NOTIFY PRAXAIR & BHP MINES**

AT ASSEMBLY AREA 1

- **MONITOR H_2S LEVELS AT ASSEMBLY AREA**
- **OPERATORS WILL SET UP SECONDARY ENTRY TEAMS W/ 30-MIN SCBA TO TRY TO RE-ENTER AND RESOLVE**
- **RE-ENTRY WITH SCBA WILL OCCUR IN 15 MINUTE SHIFTS AT THE DIRECTION OF THE IC UNTIL IC DETERMINES PROBLEM HAS BEEN RESOLVED OR ESD IS ACTIVATED)**

CALL 911
IF INJURY OR DEATH
FOR EMERGENCY ASSISTANCE

ONCE RESOLVED & MONITORED LEVELS IN PLANT ARE LESS THAN 10 PPM RETURN TO PLANT

IF H_2S LEVELS AT ASSEMBLY AREA 1 EXCEED 10PPM

EVACUATE TO ASSEMBLY AREA 2

NOTIFY NMOCD WITHIN ONE HOUR
MAKE AGENCY REPORTS AS NECESSARY

AT ASSEMBLY AREA 2

- **MONITOR H_2S LEVELS AT ASSEMBLY AREA**
- **FOLLOW LEVEL 2 RESPONSE ACTIONS**

NOTIFY LEPC AND OTHER PUBLIC OFFICIALS AND EMERGENCY SUPPORT SERVICES

LEVEL 2 RESPONSE

H_2S LEAK DETECTED GREATER THAN 20 PPM &/ CONTINUOUS ALARM SOUNDS/FLASHING RED BEACONS ACTIVATED

- **OPERATORS PUT ON RESPIRATORS (30-MIN SCBA) TO ASSESS & RESOLVE PROBLEM**

(Operators have 15 minutes to resolve after which they must evacuate to Assembly Area #2 and begin rotational entry to Plant)

- **ALL OTHERS EVACUATE TO ASSEMBLY AREA 2**
- **EVACUATE PRAXAIRE**
- **NOTIFY BHP MINES, ALL OTHER BUSINESSES IN THE 100 & 500 PPM ROE**

AT ASSEMBLY AREA #2

- **MONITOR H_2S LEVELS AT ASSEMBLY AREA**
- **IF MONITORED LEVELS EXCEED 10 PPM EVACUATE TO ASSEMBLY AREA 3 (KIRTLAND ELEMENTARY SCHOOL PARKING LOT)**
- **RE-ENTRY WITH SCBA WILL OCCUR IN 15 MINUTE SHIFTS AT THE DIRECTION OF THE IC UNTIL IC DETERMINES PROBLEM HAS BEEN RESOLVED OR ESD IS ACTIVATED)**

CALL 911
IF INJURY OR DEATH
FOR EMERGENCY ASSISTANCE

ONCE RESOLVED & MONITORED LEVELS IN PLANT ARE LESS THAN 10 PPM RETURN TO PLANT

IF CONSTANT ALARM SOUNDS FOR 15 MINUTES

- **ACTIVATE PLANT EMERGENCY SHUT DOWN (ESD)**
- **ACTIVATE FULL H_2S PLAN WITH NOTIFICATIONS & REPORTING (FOLLOW LEVEL 3 RESPONSE)**

NOTIFY NMOCD WITHIN <u>ONE HOUR</u>
MAKE OTHER AGENCY REPORTS AS PER H_2S PLAN

LEVEL 3 RESPONSE

WORST CASE SCENERIO AND/OR CATASTROPHIC RELEASE FROM FIRE AND/OR EXPLOSION

- **ALL PERSONNEL EVACUATE TO ASSEMBLY AREA 2 IF MONITORED LEVELS ARE LESS THAN 10 PPM**
- **EVACUATE PRAXAIR**
- **IF MONITORED LEVELS AT ASSEMBLY AREA 2 ARE GREATER THAN 10 PPM; EVACUATE TO ASSEMBLY AREA 3 (ELEMENTARY SCHOOL PARKING LOT)**
- **IMPLEMENT FULL H_2S PLAN WITH ALL NOTIFICATIONS**
- **NOTIFY LOCAL FIRE, POLICE AND EMERGENCY SERVICES**

ONCE RESOLVED & MONITORED LEVELS IN PLANT ARE LESS THAN 10 PPM RETURN TO PLANT

IF CONSTANT ALARM SOUNDS FOR 15 MINUTES

- **ACTIVATE PLANT EMERGENCY SHUT DOWN (ESD)**
- **RE-ENTRY WITH SCBA WILL OCCUR IN 15 MINUTE SHIFTS AT THE DIRECTION OF THE INCIDENT COMMANDER (IC) UNTIL IC DETERMINES PROBLEM HAS BEEN IDENTIFIED OR REPAIRED**

APPENDIX G

EMERGENCY CALL LIST

SAN JUAN GAS PLANT EMERGENCY CALL LIST

ENTITIES WITH IN THE 100- PPM ROE

Name	Address	**Contact Person**	Phone Number
Riverview Golf Course	583 County Rd 6100 Kirtland, NM 87417		505-598-0140
BHP Mining	16 Miles West of Farmington, NM San Juan County Road RD6800	Dave Hales, Safety Manager	505-598-2311 505-486-1612
El Paso Natural Gas	81 County Road 4900 Bloomfield, NM 87413		800-334-8047 (24 hr)
Mid-America Pipeline Co. (Enterprise)	3621 East Main Farmington, NM 87402		505-599-3276 505-599-3277 800-546-3482 (24 hr)
Praxair	101 County Road 6500 Bloomfield, NM 87417		505-598-0549 800-598-0549 (24 hr)
XTO Energy	2700 Farmington Ave. Farmington, NM 87401		505-324-1090
San Juan College West*	69 County Road 6500 Kirtland, NM 87417		505-598-5897

*Note: The San Juan College West is not within the 100-ppm ROE but is approximately 468 ft outside the 100-ppm radius of exposure. Due to the near proximity, the San Juan College West will be included in this contingency plan.

ENTITIES WITH IN THE 500- PPM ROE

Name	Address	**Contact Person**	Phone Number
Praxair	101 County Rd 6500 Bloomfield, NM 87417		505-598-0549 800-598-0549 (24 hr)

A. COMPANY INTERNAL NOTIFICATIONS
SAN JUAN RIVER PLANT PERSONNEL

NAME	TITLE	OFFICE No.	CELLULAR No.	HOME No.
Kent McEvers	Plant Superintendent	505-598-5601 ext. 15523	505-860-7208	505-326-4054
Rick Fetch	Plant Foreman	505-598-5601 ext. 15522	505-947-2416	505-324-6441
Arlyn Thorson	Maintenance Foreman	505-598-5601 ext. 15524	505-947-2417	505-326-6718
Bob McClain	Plant Operator	505-598-5601 ext. 15542	505-330-1966	505-325-8715
Brenda Wilson	Sr. Operations Specialist	505-598-5601 ext. 15521		505-325-6525
Andrew Adame	Plant Operator			505-360-7051
Chee Anderson	Plant Operator			505-326-1397
Glen Daniell	Plant Operator		505-860-7483	505-632-9705
Curtis Day	Plant Operator			505-801-4404
Johnny Foster	Plant Operator			505-801-5062
Frank Hale	Plant Operator		505-860-5897	505-598-9091
Bobby James	Plant Operator			505-598-5314
Melvin Jim	Plant Operator			505-368-4733
Charlie Barr	Mechanic		505-324-1100	505-330-2614
Jerry Darnell	Fieldman			505-632-2722
Ted Francis	Fieldman			505-564-2999
Kent Galyon	Fieldman		505-860-1875	970-565-1006
William Golbe	Mechanic		505-215-2517	505-598-9716
Charlie Medders	Mechanic		505-947-7039	505-598-5573
Corwyn Yazzie	Mechanic		505-793-2567	505-327-3286

B. COMPANY INTERNAL NOTIFICATIONS
CORPORATE PERSONNEL – THE WOODLANDS, TEXAS

NAME	TITLE	OFFICE No.	CELLULAR No.	HOME No.
Mario Reyes	Operations Mgr	832-636-3234	713-816-5006	281-360-1084
Mike Ross	General Mgr	832-636-3431	832-381-0923	281-296-0385
Tony Marques	Engineering Mgr	832-636-7368		
Chuck Johnson	Commercial Develop. Mgr	832-636-7119		

David Ponikvar	S&H Mgr	832-636-3414	281-732-7887	281-374-8334
Julie Betik	Env & Reg Anal	832-636-2609	281-793-7705	281-320-2066
Eric Weaver	EHS Analyst	432-684-2808	432-413-2494	432-756-3493
Jerry Adams	EHS Mgr	832-636-8304	281-731-5931	281-363-4693
Mike Gray	EHS Director	832-636-2454	281-415-6964	936-271-9869

C. COUNTY & LOCAL LAW ENFORCEMENT

AGENCY	DAYTIME / 24 HR. PHONE No.
Law Enforcement Dispatch	**911**
San Juan County Sheriff	505-334-6622
Farmington Police	505-327-0222
Navajo Tribal Police	505-368-4333
Ute Mountain BIA	303-565-8471
New Mexico Highway Patrol	505-325-7547
New Mexico FBI	505-325-8631
San Juan County LEPC	505-334-1180
BLM Farmington Office	505-599-8900

D. MEDICAL SERVICES

AGENCY	EMERGENCY SERVICE	PHONE No.
Emergency Dispatch	Fire & Ambulance	**911**
San Juan County Fire Marshall	Fire Department	505-334-9431
San Juan Regional Medical Center	Hospital	505-325-5011
Emergency Trauma Lifeline Service - Farmington		505-325-5602
Dr. Robert C. Rhein	Doctor	505-327-4867
Dr. Ken Crider	Doctor	505-327-4439
San Juan Air Care Farmington	Air Ambulance	800-452-9990

E. FEDERAL NOTIFICATIONS

AGENCY	DAYTIME / 24 HR. PHONE No.
National Response Center	800-424-8802
EPA Region 8	800-227-8917
OSHA	800-321-6742
OSHA Area Office New Mexico	505-827-4230
DOT	800-424-8802
BLM Farmington	505-599-8900

F. NEW MEXICO STATE NOTIFICATIONS

AGENCY	DAYTIME / 24 HR. PHONE No.
New Mexico One Call	800-321-2537
New Mexico Oil Conservation Division	505-334-6178
New Mexico Environmental Department	505-476-4300
New Mexico Emergency Response Commission	505-476-9681
New Mexico Public Utilities Commission	505-490-2375
New Mexico State Patrol	505-325-7547

G. CONTRACTORS

CONTRACTOR	CONTACT	OFFICE No.	CELLULAR No.
Contractors - General			
IMI Construction		505-325-5005	
Weeminuche Construction	Benton Dean	970-565-7430	

Service Companies Supplies			
Noels Inc		505-327-3375	
ESSO Pipe & Supply		505-325-7568	
Air Gas		505-325-6660	
DXP	Steve Martinez	505-326-3333	
DeWees Tool & Supply		505-326-5491	
Emergency Response & Safety Services			
ChemTrec		800-424-9300	
Hands On Safety Service		505-325-4218	
Electrical Services			
Four Corners Electric		505-325-1459	
B&G Electric		505-325-7511	

H. OTHER PRODUCERS

COMPANY	CONTACT	OFFICE No.	CELLULAR No.
Burr Oil & Gas	Deana	505-325-1701	
Conoco/Burlington	Jerry Lodermilk		505-320-0452
	Renae	505-330-2946	
DJ Simmons Company	John Byrom	505-326-3753	
Elm Ridge Resources	Office	505-334-3476 ext 210	
	Terry Lindeman	972-749-6941	
El Paso Natural Gas		505-632-6000	
	Emergency Number	800-334-8047	
Nacogdoches Oil & Gas	Aaron	936-697-3750	
Resolute Natural Resources	Office	970-564-5200	
	Montezuma Creek	435-651-3682	
	Roger Atcitty		435-444-0001
Rim Southwest Corporation	Thelma Dee	435-651-4391	
XTO Energy Inc.	Office	505-324-1090	
	John Weaver		505-330-3278

I. OTHER RESOURCES

COMPANY	OFFICE No.	Website
National Weather Service Albuquerque, New Mexico	505-243-0702	
Farmington Four Corners Regional Airport – National Weather Service		*http://weather.noaa.gov/weather/current/KFMN.html*
Additional Weather Sites		www.accuweather.com www.wunderground.com www.weather.com

APPENDIX H

H_2S PLAN DISTRIBUTION LIST

New Mexico Oil & Gas Conservation Division

New Mexico Environment Department

New Mexico Department of Public Safety (Farmington Office)

New Mexico Department of Public Safety (State Office)

Farmington Fire Department

San Juan County Fire Department

San Juan County Sheriff Department

San Juan County Emergency Manager

San Juan County LEPC

Farmington Police

San Juan Regional Medical Center

San Juan Plant Office

Anadarko Petroleum Corporate Office

ANADARKO PETROLEUM CORPORATION

TEL. 832/ 636-1000
P.O. BOX 1330 • HOUSTON, TEXAS 77251-1330

Anadarko

August 19, 2009

Mr. Brad Jones
Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, NM 87505

RE: H_2S Contingency Plan

RECEIVED OCD
2009 AUG 26 P 3:1

Dear Mr. Jones:

Pursuant to NMAC 19.15.11, Western Gas Resources Asset Holding Company LLC, a wholly owned subsidiary of Anadarko Petroleum Corporation respectfully submits the H_2S Contingency Plan (revision 1) for the San Juan River Gas Plant located in Section 1, Township 29 North, Range 15 West, San Juan County New Mexico. The plan, submitted on the enclosed CD, reflects current operations at the San Juan River Gas Plant. Draft amendment(s) to the plan in regard to the installation of an acid gas injection well and the anticipated increase in radius of exposure will be submitted on a timely basis for OCD review.

If you have any questions or require additional information, please contact me at (832) 636-2609.

Sincerely,

Julie Betik
Sr. Staff Environmental Analyst

Anadarko
Petroleum Corporation

H_2S CONTINGENCY PLAN

San Juan River Gas Plant
Kirtland, New Mexico

RECEIVED OCD
2009 AUG 20 P 3:15

WESTERN GAS RESOURCES ASSET HOLDING COMPANY, LLC, a wholly owned subsidiary of Anadarko Petroleum Corporation

(AUGUST 2009)

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APPENDICES

Appendix A – Worst Case Scenario for H_2S Release
Appendix B – Calculation for Radius of Exposure
Appendix C – Radius of Exposure (ROE) Map
Appendix D – Plant Diagram - Evacuation Routes, H_2S Monitoring and Alarm Locations
Appendix E – Description of Emergency Response Equipment
Appendix F – H_2S Contingency Plan - Response Flow Diagram(s)
Appendix G – Emergency Call List
Appendix H – H_2S Plan Distribution List

I. INTRODUCTION

The San Juan River Gas Plant (hereinafter the "Plant") is a natural gas processing plant which handles and/or generates hydrogen sulfide and/or sulfur dioxide; therefore this Hydrogen Sulfide Contingency Plan (the "H_2S Plan" or "the Plan") has been developed: 1) to satisfy the New Mexico Oil Conservation Division Rule 11, 2) to conform with API "Recommended Practices for Oil and Gas Producing and Gas Processing Plant Operations Involving Hydrogen Sulfide," RP 55, and 3) to create a site-specific hydrogen sulfide contingency plan that outlines the emergency response procedures that will implemented to ensure a coordinated, efficient and immediate action plan for alerting and protecting operating personnel and the public as well as to prevent or minimize environmental hazards and damage to property. The terms used in this Plan are to be used in the same manner as defined in Title 19 Chapter 15 Part II of the New Mexico Administrative code (19.15.11.7- Definitions) unless otherwise defined herein.

A. PLANT DESCRIPTION & MAP (Figure 1)

The Plant is located in Kirtland, San Juan County, New Mexico and encompasses 300+ acres. It is owned and operated by Western Gas Resources Asset Holding Company LLC, which is a wholly owned subsidiary of Anadarko Petroleum Corporation (hereinafter collectively referred to as the Company).

More specifically, the Plant is located in Section 1, Township 29 S, Range 15 W in Kirtland, San Juan County, New Mexico.

1. Its coordinates are:
   Latitude: 36.453 N **Longitude: 108.220 W**

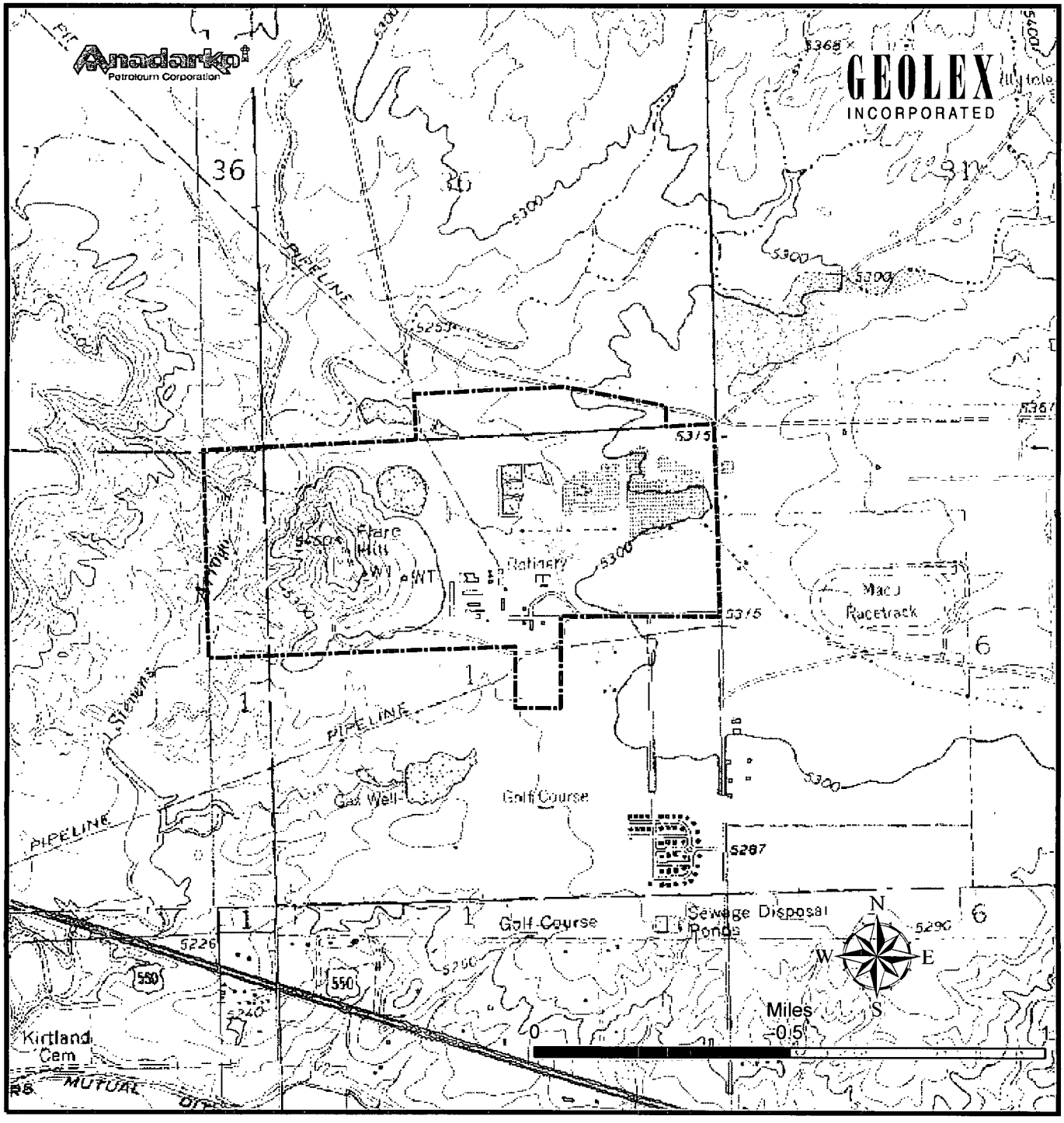
2. Its physical address is:
   99 County Road 6500, Kirtland, New Mexico 87417

3. Its mailing address is:
   P. O. Box 70, Kirtland, New Mexico 87417

4. Driving Directions from Farmington, New Mexico to the Plant:

   From the intersection of US Highway 64 and the LaPlata Highway (New Mexico Highway 170), travel west on US Highway 64 approximately 6.2 miles to the intersection of US Hwy 64 and County Road 6500 in Kirtland, New Mexico. Turn right on County Road 6500 and travel north approximately 1.7 mile to the entrance to the San Juan River Gas Plant.

The location of the Plant is illustrated herein on Figure 1.



Approximate Boundaries of Western Gas Resources Property
Anadarko San Juan River Natural Gas Processing Plant

Anadarko
Petroleum Corporation

GEOLEX®
INCORPORATED

B. DESCRIPTION OF OPERATIONS

1. The Plant operations include gas processing, conditioning and compression, as well as flow lines and storage tanks. The Plant gathers produced natural gas from San Juan County, New Mexico, as well as, from Southwestern Colorado, Northeastern Arizona, and Southeastern Utah. Once gathered at the Plant, the produced natural gas is compressed; treated in an amine process for the removal of carbon dioxide and hydrogen sulfide; and dehydrated to remove the water content. The processed natural gas is then sold and shipped to various customers.

2. Because the natural gas that gathered at the Plant contains hydrogen sulfide ("sour gas"), it must be treated or processed to remove these and other impurities. The carbon dioxide and hydrogen sulfide (H_2S) stream that is removed from the natural gas in the amine treating process is then sent to the Claus sulfur recovery unit whereby sulfur is removed, which results in the generation of molten elemental sulfur. Any residual H_2S is routed to an incinerator where it is combusted into sulfur dioxide.

II. THE PLAN

A. RESPONSIBILITY FOR CONFORMANCE WITH THE H_2S PLAN

It is the responsibility of all personnel on-site to follow the safety and emergency procedures outlined in the Hydrogen Sulfide Contingency Plan (the H_2S Plan) as well as the following documents:

- Anadarko Petroleum Corporation Safety & Health Manual
- Anadarko Petroleum Corporation Emergency Response & Oil Spill Contingency Plan; and
- Anadarko Petroleum Corporation Environmental Policies and Programs.

B. REVISIONS TO THE PLAN

The H_2S Plan will be reviewed annually and revised at this time as necessary to address changes to the Plant facilities, operations, or training requirements, contact information and the public areas including roads, businesses, or residents potentially affected by the operations of the Plant, specifically those areas within the radii-of-exposure.

C. AVAILABILITY OF THE H_2S PLAN

The H_2S Plan shall be available to all personnel responsible for implementation, regardless of their normal location assignment. A copy of the Plan will be maintained at the Plant in the Plant Superintendent's office and at the Anadarko Corporate Headquarters in The Woodlands, Texas. **See Appendix H for the H_2S Distribution List, which** lists all the additional entities that have been provided a copy of the H_2S Plan.

D. CONTENT OF THE PLAN

At a minimum, the H_2S Plan will contain information regarding: 1) the emergency procedures to be followed in the event of an H_2S or SO_2 release that may pose a threat to the Plant, public or public areas, 2) the characteristics of H_2S and SO_2, 3) a facility description, map and/or drawings, and 4) information regarding training and drills to be conducted related to this Plan.

III. PLAN DESIGN CONSIDERATIONS

A. CHARACTERISTICS OF H_2S, SO_2 AND CARBON DIOXIDE

1. Hydrogen Sulfide (H_2S)

The current inlet gas streams into the Plant contain approximately 3,500 ppm (or 0.35 mole percent) of hydrogen sulfide based on data generated from the sampling of the inlet gas at least three times daily.

Hydrogen sulfide is a colorless, toxic and flammable gas, and has the odor of rotten eggs. Hydrogen sulfide gas is heavier than air.

Hydrogen sulfide presents a significant health hazard by paralyzing the respiratory system resulting in serious injury or death.

Hydrogen Sulfide Properties & Characteristics	
CAS No.	7783-06-4
Molecular Formula	H_2S
Molecular Weight	34.082
TWA	10 ppm
STEL	15 ppm
IDLH	100 ppm
Specific Gravity (air = 1.0)	1.189
Boiling Point	-76.5°F
Freezing Point	-121.8°F
Vapor Pressure	396 psia
Autoignition Temperature	518°F
Lower Flammability Limit	4.3%
Upper Flammability Limit	46.0%
Stability	Stable
pH in water	3
Corrosivity	Reacts with metals, plastics, tissues & nerves

Physical Effects of Hydrogen Sulfide		
Concentration		
ppm	**%**	**Physical Effect**
1	.00010	Can be smelled (rotten egg odor)
10	0.0010	Obvious & unpleasant odor; Permissible Exposure Limit; Safe for 8-hour exposure
15	0.0015	Short Term Exposure Limit (STEL); Safe for 15 minutes of exposure without respirator
50	0.0050	Loss of sense of smell in 15 minutes
100	0.0100	Immediately Dangerous to Life & Health (IDLH); Loss of sense of smell in 3-15 minutes; Stinging in eyes & throat; Altered breathing
200	0.0200	Kills smell rapidly; Stinging in eyes & throat
500	0.0500	Dizziness; Unconscious after short exposure; Need artificial respiration
700	0.0700	Unconscious quickly; death will result if not rescued promptly
1,000	0.1000	Instant unconsciousness; followed by death within minutes

2. Sulfur Dioxide ($S0_2$)

Sulfur dioxide is produced as a by-product of H_2S combustion at the incinerator. The incinerator unit receives the residual hydrogen sulfide and carbon dioxide stream that is routed from the amine unit.

It is colorless, transparent, and is non-flammable, with a pungent odor associated with burning sulfur.

Sulfur dioxide is heavier than air, but will be picked up by a breeze and carried downwind at elevated temperatures. Sulfur dioxide can be extremely irritating to the eyes and mucous membranes of the upper respiratory tract.

Sulfur Dioxide Properties & Characteristics	
CAS No.	7446-09-5
Molecular Formula	SO_2
Molecular Weight	64.07
TWA	2 ppm
STEL	5 ppm
IDLH	100 ppm
Specific Gravity (air = 1.0)	2.26
Boiling Point	-14°F
Freezing Point	-103.9°F
Vapor Pressure	49.1 psia
Autoignition Temperature	N/A
Lower Flammability Limit	N/A
Upper Flammability Limit	N/A
Stability	Stable
Corrosivity	Could form an acid rain in aqueous solutions

Physical Effects of Sulfur Dioxide	
Concentration	**Effect**
1 ppm	Pungent odor, may cause respiratory changes
2 ppm	Permissible exposure limit; Safe for an 8 hour exposure
3-5 ppm	Pungent odor; normally a person can detect sulfur dioxide in this range
5 ppm	Short Term Exposure Limit (STEL); Safe for 15 minutes of exposure
12 ppm	Throat irritation, coughing, chest constriction, eyes tear and burn
100 ppm	Immediately Dangerous To Life & Health (IDLH)
150 ppm	So irritating that it can only be endured for a few minutes
500 ppm	Causes a sense of suffocation, even with first breath
1,000 ppm	Death may result unless rescued promptly.

3. Carbon Dioxide

The current inlet gas streams to the Plant contain approximately 3% carbon dioxide based on continuous inlet gas monitoring readings.

Carbon dioxide gas is colorless, odorless, and non-flammable. Carbon dioxide is heavier than air.

Carbon Dioxide Properties & Characteristics	
CAS No.	124-38-9
Molecular Formula	CO_2
Molecular Weight	44.010
TWA	5,000 ppm
STEL	30,000 ppm
IDLH	40,000 ppm
Specific Gravity (air = 1.0)	1.5197
Boiling Point	-109.12°F
Freezing Point	-69.81°F
Vapor Pressure	830 psia
Autoignition Temperature	N/A
Lower Flammability Limit	N/A
Upper Flammability Limit	N/A
Stability	Stable
pH in saturated solution	3.7
Corrosivity	dry gas is relatively inert & not corrosive; can be corrosive to mild steels in aqueous solutions

Physical Effects of Carbon Dioxide	
Concentration	**Effect**
1.0 %	Breathing rate increases slightly
2.0 %	Breathing rate increases to 50% above normal level. Prolonged exposure can cause headache, tiredness
3.0 %	Breathing rate increases to twice normal rate and becomes labored. Weak narcotic effect. Impaired hearing, headache, increased blood pressure and pulse rate
4 – 5 %	Breathing increases to approximately four times normal rate, symptoms of intoxication become evident, and slight choking may be felt
5 – 10 %	Characteristic sharp odor noticeable. Very labored breathing, headache, visual impairment, and ringing in the ears. Judgment may be impaired, followed within minutes by loss of consciousness
10 – 100 %	Unconsciousness occurs more rapidly above 10% level. Prolonged exposure to high concentrations may eventually result in death from asphyxiation

B. RADII OF EXPOSURE (ROE)

For the existing operations, the "Radius of Exposure" for both 500-ppm and 100-ppm of H_2S gas was determined using the "escape rate", which is calculated using the maximum daily rate of the gaseous mixture that is handled by the Plant. The rates and other variables used to calculate the ROE is discussed in greater detail in **Appendix B - ROE calculations. Also refer to Appendix C - map showing 500-ppm ROE and the 100-ppm ROE.**

500-ppm ROE	**933 feet**
100-ppm ROE	**2,042 feet**

IV. EMERGENCY ACTION PROCEDURES

A. EMERGENCY RESPONSE ORGANIZATION

The Plant uses the Incident Command System (ICS) for emergency response. The ICS structure used is based on the National Interagency Incident Management System (NIIMS), and is consistent with the National Contingency Plan (NCP).

In the event of an accidental release that results in the activation of the H_2S Plan and all personnel have been evacuated out of the affected area, the Plant Superintendent, or his designee, will be the On-Scene Incident Commander (IC in this Plan). The IC will contact and coordinate with Anadarko's management in corporate office. If the severity of the response requires activation of the Emergency Response Center in The Woodlands, Texas office, the ICS structure will be staffed per the Anadarko Southern Region Emergency Response & Oil Spill Contingency Plan Manual. The staffing will not change the H_2S Plan contained herein.

The Plant Superintendent or his designee shall determine:

1) Plant Shutdowns
2) Isolation of pipeline segments
3) Repairs, tests or restarts as required

If an emergency occurs, the Plant Superintendent, or his designee, shall be notified first. The Plant Superintendent, or his designee, shall notify Anadarko's Office in The Woodlands, Texas

B. EMERGENCY RESPONSE

This section explains the procedures and decision to be used in the event of an H_2S release. Much of which has been pre-determined to ensure a coordinated, efficient and immediate action plan for alerting and protecting operating personnel and the public as well as to prevent or minimize environmental hazards and damage to property.

1. OBJECTIVE

All Plant employees shall be prepared to respond to an H_2S or SO_2 emergency at the Plant. Emergency response actions may be taken for a variety of situations that may occur in the Plant. This Plan establishes three (3) levels of response, based, primarily on the concentration of H_2S that has been released.

Briefly those levels are:

Level 1 – detection of H_2S greater than 10 ppm and/or intermittent alarm sounded

Level 2 – detection of H_2S greater than 20 ppm and/or continuous alarm sounded

Level 3 – Catastrophic release, continuous release of maximum volume for 24 hours, fire or explosion

2. PLANT EVACUATION AND EMERGENCY ASSEMBLY AREAS

A. Plant evacuation for all visitors and Plant personnel that are not operators begins at the 10 ppm H_2S alarm. The Plant operators are to put on the 30-min SCBA and investigate while all other personnel in the Plant stop work and immediately proceed along designated evacuation routes to the pre-designated emergency assembly area(s) that are described below.

In the event of an alarm indicating the need to evacuate the Plant, all evacuees are to proceed upwind to the Emergency Assembly Areas as prescribed in the flow diagram in Appendix F.

The Plant evacuation diagram showing evacuation routes and Emergency Assembly Areas is attached in **Appendix D.**

The Emergency Assembly Area 1 is:

Parking Area on the eastside of the Plant Superintendent Office Building (see Appendix C & D)

The Emergency Assembly Area 2 is:

Area at Plant Rd and Hwy 6500
(see Appendix C)

The Emergency Assembly Area 3 is:

Kirtland Elementary School Parking Lot , 30 Road 6446
(see Appendix C)

B. Roll call shall be conducted at the Emergency Assembly Area to assure all personnel have evacuated safely. This facility is a PSM facility and requires all visitors check in before entering the Plant. This check-in sheet will be used at the Emergency Assembly Areas to make a full accounting of all personnel and visitors.

3. EMERGENCY SHUTDOWN SYSTEM

The Plant has an extensive Emergency Shut Down system that is located within the plant and in various locations along the pipelines that feed the Plant. The ESD is deigned to prevent a Level 3 response. See Appendix E for a more detailed description of the ESD.

4. PLAN ACTIVATION

The Plan is activated in progressive levels based on the concentration of H_2S that has been released. The Plant has three (3) activation levels that are described below and in detail in the Response Flow diagram in Appendix F.

Level 1 –Intermittent alarm sounded and/or H_2S greater than 10 ppm

Level 2 – H_2S greater than 20 ppm and/or continuous alarm sounded

Level 3 –Catastrophic release; fire; explosion; a continuous release of maximum volume for 24 hours; or Rule 11 Mandatory Activation by 100 ppm in any defined public area; 500 ppm at any public road; or 100 ppm at a distance greater than 3000 feet from the site or the release

As soon as this determination has been made that there has been a release that meets the criteria above, the Plant Superintendent or his designee should be notified and the Plant Superintendent or his designee will activate the H_2S Contingency Plan.

5. NOTIFICATIONS AND REPORTS

The Plant has various notification and reporting obligations. Some are related to its state air quality permit that is overseen by NMED as well as well as state and federal spill reporting obligations. In addition to the regulatory obligations noted above, Plant personnel also have internal and external notification and reporting obligations associated with the activation of this Plan.

A. DISCOVERY AND INTERNAL REPORTING

1. All Plant personnel who perform maintenance and /or repair work within the plant wear H_2S monitoring devices to assist them in detecting the presence of unsafe levels of H_2S. When any Plant personnel while performing such work discovers a leak, release of emission event they are to attempt to resolve the issue as long as H_2S levels remain below 10 ppm. The personal monitoring devices they wear will give off an audible alarm at 10 ppm. These devises are to be worn as low on the body as possible since H_2S is heavier than air and will tend to stand or accumulate in low lying areas. If the response action needed to resolve the issue is more than simply closing a value or stopping a small leak, the Plant personnel shall notify the Plant Superintendent, or his designee and convey, at a minimum, the following information:

    - Name, telephone number, and location of person reporting the situation; and
    - Type and severity of the emergency; and
    - Location of the emergency (area/block, mile markers, latitude & longitude, or building), and the distance to surrounding equipment and/or structures; and
    - The cause of the spill or leak, name and quantity of material released, and extent of the affected area including the degree of environmental hazard; and
    - Description of injuries and report of damage to property and structures; and
    - Initiate and maintain a Chronological Record of Events log. This record should record the time, date, and a summary of the event.

2. If the Plant personnel detects H_2S levels of greater than 10 ppm either as a result of his/her personal monitoring device or the Plant intermittent alarm sounds, Plant operators are to contact their immediate supervisor for assistance and put on the 30-min SCBA so they can attempt to resolve the issue. The immediate supervisor is then responsible for notifying the Plant Superintendent or his designee so that the IC system can be implemented if necessary.

3. Once the Plant Superintendent is contacted, he or his designee is to notify the appropriate Corporate management, EHS personnel, Plant emergency response personnel, and advise them of the existing emergency situation and determine what level, if any, response is required. Corporate management will then conduct the reporting up that is necessary based on the situation.

4. Plant personnel are to advise any contractor, service company, and all others on-site or entering the Plant of the situation and whether the H_2S Plan has been activated.

B. PUBLIC AWARENESS AND COMMUNICATION

Public awareness and communication is a primary function of the H_2S Plan. Company has compiled a list of various public, private, state, local contacts that are to be notified at various phases during the activation of the Plan. Refer to the Flow diagram in Appendix F that indicates when certain entities are to be contacted in event of activation of this Plan. Appendix G is a listing of the entities to be contacted and Appendix H is a list of community organizations that have received a copy of the Plan. Company will inform all state and local response organizations on its Plan as well as those businesses that fall within its 500-ppm and 100-ppm ROE as illustrated in Appendix C.

C. PUBLIC AREAS, NEARBY BUSINESSES AND RESIDENTS

The contact information for all residents, businesses and public areas is contained in **Appendix G**. **All** businesses and public places within the 500 ppm and 100 ppm radius of exposure will be contacted by plant employee as designated by Plant Superintendent at the time of the incident, if the H_2S Plan is activated and advised of the following:

- The nature and extent of the release/emergency at the Plant
- How the alerts and alarms identify an emergency
- Recommendations for protective actions, such as evacuation or shelter-in-place
- Any other event specific information that is necessary to protect the public

1. RESIDENCES OR PUBLIC ROADS:

There are no residences or public roads located within 500 ppm or the 100 ppm radius of exposures.

2. BUSINESSES OR OTHER PUBLIC AREAS:

All businesses on this list will be provided with a copy of the H_2S Plan and will be contacted about participation when local emergency response training events or drills occur.

Within the 100 ppm ROE:
There is **one** public area (a portion of the Riverview Golf Course) that is located within the 100 ppm radius of exposure. No operating BHP Mining ventilation pipe ducts are within the 100 ppm ROE. However, out of service ventilation pipe ducts do exist but are closed by manual valve and are not in use. Because of the ventilation pipe duct presence, BHP will be contacted when the Plan is activated. Three unmanned businesses are located within the 100 ppm ROE (XTO, El Paso Natural Gas and Mapco Enterprises)

Within the 500 ppm ROE:
There is one manned business (Praxair) within the 500-ppm ROE.

6. SITE SECURITY

1) In order to have an accurate listing of all personnel on-site in the event of an emergency, a daily sign-in log sheet shall be utilized. The sign-in log sheet shall include at a minimum the person's name, the company name, the time of arrival, and the time of departure.

2) The Incident Commander shall be responsible to assure that all personnel sign-in upon arrival and sign-out upon departure from the job site.

3) The Incident Commander may at his discretion assign the responsibilities for the daily sign-in log sheet to the individual designated as the Record Keeper or another designee.

4) At the discretion of the Incident Commander, a security coordinator and/or a security team may be established, and the access to the job site restricted.

5) For a level 3 release a road block would be set up at the entrance to the plant at County Road 6500.

7. SIGNS & MARKERS

The Plant has warning signs indicating the presence of H_2S and high pressure gas at the entrance to the Plant. Emergency response phone numbers are posted at the entrance to the plant. Signs are located at the plant gate entrance indicating that all visitors are to sign in.

8. FIRST-AID STATION

The first aid station will be located at the Emergency Assembly Area.

FIRST AID KITS are located:

- **Plant Superintendent Office Building,**
- **Maintenance/Safety Office Building, and**
- **Each company vehicle.**

9. MEDIA SITE

1) If necessary, the Media Site will be located adjacent to Emergency Assembly Area 2, except for Level 3 response in which case it will be located adjacent to Emergency Assembly Area 3.

2) At no time shall any unescorted representative from the media be allowed any closer to the plant complex than the Media Site location, unless approved by the Incident Commander, the Safety Officer, and the Media Relations Officer.

10. EMERGENCY AND SAFETY EQUIPMENT

Refer to **Appendix E** for information pertaining to the Plant's emergency and Safety equipment.

C. IMMEDIATE ACTION PLAN/ INITIAL RESPONSE

The following outlines the immediate action plan that is illustrated by flow diagram in **Appendix F**. This is to be used when responding to an H_2S release. Additional or long term response actions will be determined on a case-by-case basis, if needed, once the Incident Command Center and System is established following the immediate response.

LEVEL 1 RESPONSE

1. The audible signal for an emergency response and plant evacuation is a repeating on/off horn (referred to as the intermittent alarm) activated at 10 ppm H_2S. The frequency of this intermittent alarm will increase as the concentration of the H_2S release increases. At the initial sound of this horn, each operator (2 per shift) will put on a 30 minute SCBA and all other personnel in the plant complex shall immediately evacuate the Plant using the evacuation routes to the emergency assembly area 1 (see Appendix D). If deemed necessary by the Senior Operator, local emergency response service providers will be contacted by Plant personnel as designated by the senior operator. Wearing the SCBA, the operator(s) will attempt to rectify the release. OSHA guidelines allow operators to work in areas with 10ppm for up to 8 hours. The

H_2S levels at the Emergency Assembly Area 1 will be monitored with a hand held or personal monitor.

2. Senior Operator will set up secondary entry team with 30 min. SCBA to re-enter and resolve. Re-entry will occur in 15 minute shifts at the direction of the IC until problem resolved or ESD activated. If H_2S levels in Emergency Assembly Area #1 exceed 10 ppm, evacuate to Emergency Assembly Area #2 and continue to monitor assembly area H_2S level. If release is resolved and monitored levels in the plant are less than 10 ppm, personnel may return to plant. If the release is of a reportable quantity, the OCD shall be notified within one hour of the release. If the release is not resolved and H_2S levels continue to increase, Level 2 Response is indicated.

LEVEL 2 RESPONSE

1. Continuous alarm sounds and indicates greater than 20 PPM H_2S release. At the initial sound of this horn, the operators will immediately put on a 30 minute SCBA and all other personnel in the plant complex will put on emergency escape packs if they are wearing them and evacuate along with all other personnel using the evacuation routes to the emergency assembly area 2 (see Appendix D).

2. Operator(s) with 30 minute SCBA to assess and attempt to resolve. After 15 minutes and no resolution, the operator will activate the ESD and will evacuate to Emergency Assembly Area 2.

3. Praxaire is trained to evacuate at a continuous alarm sounds. BHP Mines and other non-manned businesses will be contacted by phone and notified of release.

4. If monitored H_2S levels at Emergency Assembly Area 2 exceed 10 ppm, evacuate to Emergency Assembly Area 3, Kirtland Elementary School parking lot. If deemed necessary, local emergency response service providers will be contacted by the operator.

    a) Re-entry will occur in 15 minute shifts at the direction of the IC until IC determines problem has been resolved or additional ESD (pipeline) activated.

    b) If release is resolved and monitored levels in the plant are less than 10 ppm, personnel may return to Plant. If the release is of a reportable quantity, the OCD shall be notified with one hour of the release. No resolution indicates activation of full H_2S plan with notifications and reporting as per plan. If the release is not resolved and/or H_2S levels continue to increase, Level 3 Response is indicated.

LEVEL 3 RESPONSE

1. If isolation and/or repair of Level 2 release has been unsuccessful, worst case scenario, and/or catastrophic release have occurred then implement a Level 3 response.

2. All personnel shall have evacuated to Emergency Assembly Area 3, Kirtland Elementary School. Implement full H_2S plan with all notifications and public agency involvement.

3. If escaping vapors have been ignited, the vapors should be allowed to continue to burn unless the fire endangers personnel, other property, or other equipment.

4. When applicable: Maintain communication with the Plant Superintendent, or his designee, to keep him up-to-date of the situation and the action taken prior to his arrival at the location.

5. Initiate and maintain a Chronological Record of Events log.

6. Within one hour after the activation of the H_2S Plan, begin agency notifications by calling OCD and NRC.

7. Establish media staging area adjacent to Assembly Area 3 and direct all media to it.

8. Once resolved and monitored levels in plant are less than 10 ppm, return to plant. Agency reports to be submitted as required.

IV. TRAINING AND DRILLS

A. TRAINING

1. Training on the H_2S Plan
   - Inclusion of local officials and LEPC
   - Public areas and businesses (within the ROE)
   - Those on the Plan distribution list

2. Other Emergency Response Related Training

Anadarko/Western has an extensive safety training program and addresses various aspects of job related hazards. All training records for the Plant are maintained at the Plant. The following is a limited list and summary of the training programs that relate to the H2S Plan and Emergency Response:

- Plant Orientation Training - All Plant personnel, visitors, and contractors must attend a Plant overview orientation prior to obtaining permission to enter the

Plant. A refresher course on this training is required annually for all persons. This training also complies with the requirements of the Anadarko and Plant's Process Safety Management Program and Procedures Manuals.

- Hydrogen Sulfide and Sulfur Dioxide Training – All Plant personnel receive annual refresher training on hydrogen sulfide and sulfur dioxide, which is conducted by Anadarko personnel. If an individual is unable to attend, they may be required to attend a third party training session. Hydrogen sulfide training cards are issued as documentation of this training. All contract employees and visitors are required to have had hydrogen sulfide training and to provide the Plant a copy of their certification card prior to obtaining permission to enter the plant.

- Respirators - All Plant personnel, with the exception of the Plant Operations Specialist, are trained annually on the proper use of respirators. In addition to the annual training, all Plant personnel with the exception noted above are fit tested annually on the respirators. Except for the Plant Operations Specialist, all Plant personnel must have medical clearance to work in the Plant. Medical clearance is mandatory for H_2S certification. Medical clearance review for work in a H_2S environment is conducted on a bi-annual basis unless the individual has experienced medical problems within that two year interval that requires updating the medical clearance.

- Hazard Communication - All Plant personnel are trained annually on Hazard Communication and SARA Title III Right-to-Know information. The annual training includes, at a minimum, a review of material safety data sheets (MSDS) for those materials that are present at the Plant and labeling.

- Personal Protective Equipment (PPE) - All Plant personnel are trained annually on the Anadarko requirements for personal protective equipment (PPE). The training includes, at a minimum, a review of all the types and levels of personal protective equipment and how to select the correct equipment for the job.

B. EMERGENCY RESPONSE DRILLS

1. The Plant will conduct, at least, a tabletop drill annually. Multiple drills during the year may be scheduled at the discretion of the Plant Superintendent or as part of the Emergency Response Center in The Woodlands.

2. The annual drill will exercise this Plan and include, at a minimum, contacting the entities that are identified as being within the 500-ppm ROE and the Local Emergency Response contacts identified on **Appendix G**. The drills will also include briefing of public officials on issues such as evacuation or shelter-in-place plans even though the current ROE will not require evacuations or shelter in place.

3. Drill training will be documented and those records will be maintained at the Plant. The documentation shall include at a minimum the following:

    a. Description or scope of the drill, including date and time
    b. Attendees and Participant to the drill
    c. Summary of activities and responses
    d. Post drill de-brief and reviews

APPENDIX A

WORST CASE SCENARIO

The basis for worst case calculations is 3500 parts per million (ppm) or 0.35 mole percent of hydrogen sulfide in the inlet gas to the San Juan River Gas Plant and a maximum daily (24 hour) processing volume of 35,000 Mscf. The ROE assumes an uncontrolled instantaneous release from the area around the amine contact towers of the referenced volume and concentration. Calculations using the ROE formula pursuant to NMAC 19.15.11 are provided in **Appendix B**.

It should be noted that this rate, though used as worst case, would unlikely be released due to the plant emergency shut down (ESD) systems that when activated shuts down the plant. ESD valves on the inlet receivers to the plant act as secondary control to prevent gas from entering the plant. In addition, each inlet pipeline (Aneth and Barker) have ESD valves 2 miles from the plant as well as ESD valves another 6 and 8 miles down respectively.

APPENDIX B

RADIUS OF EXPOSURE CALCULATIONS

The formulas for calculating the two ROEs (as specified by the regulations) are as follows:

500-ppm RADIUS OF EXPOSURE CACULATION

$$X=[(0.4546)(\text{hydrogen sulfide conc.})(Q)]^{(0.6258)}$$

Where:
X = Radius of exposure in feet
Hydrogen Sulfide Conc = Decimal equivalent of mole or volume fraction of hydrogen sulfide in the gaseous mixture
Q = Escape rate expressed in cubic feet per day (corrected for standard conditions of 14.73 psi absolute and 60 degrees Fahrenheit)

a) For existing facilities or operations, the escape rate (Q) is the maximum daily rate of the gaseous mixture produced or handled or the best estimate thereof. For the San Juan River Gas Plant the Company is using for contingency planning purposes an "escape rate" equal to the inlet gas volume of 35,000 MCFD. The inlet gas volume at the Plant is somewhat variable and is continuously metered. The Plant records daily inlet gas volumes and prepares a daily volume report. 35,000 MCFD has been selected as the escape rate since it is the highest volume that the Plant would handle under its current operations and is considered worst case interpretation of the volume of gas.

   As to hydrogen sulfide concentration of the inlet gas, daily monitoring data indicates variable concentrations, however 3500 ppm (0.35 mole percent) is a worst case scenario. Thus, the Plant has used a hydrogen sulfide concentration of 3500 ppm for its contingency planning purposes.
   Using:
   Q = 35,000,000
   H_2S conc = 3500 ppm or 0.35 mole%

$$[(0.4546)*(H_2S \text{ concentration})*(\text{gas volume } (Q))]^{0.6258}$$
$$[(0.4546)*(3500*.000001)*(35{,}000{,}000)]^{0.6258}$$

500-ppm ROE = 933 feet

100-ppm RADIUS OF EXPOSURE CALCULATION

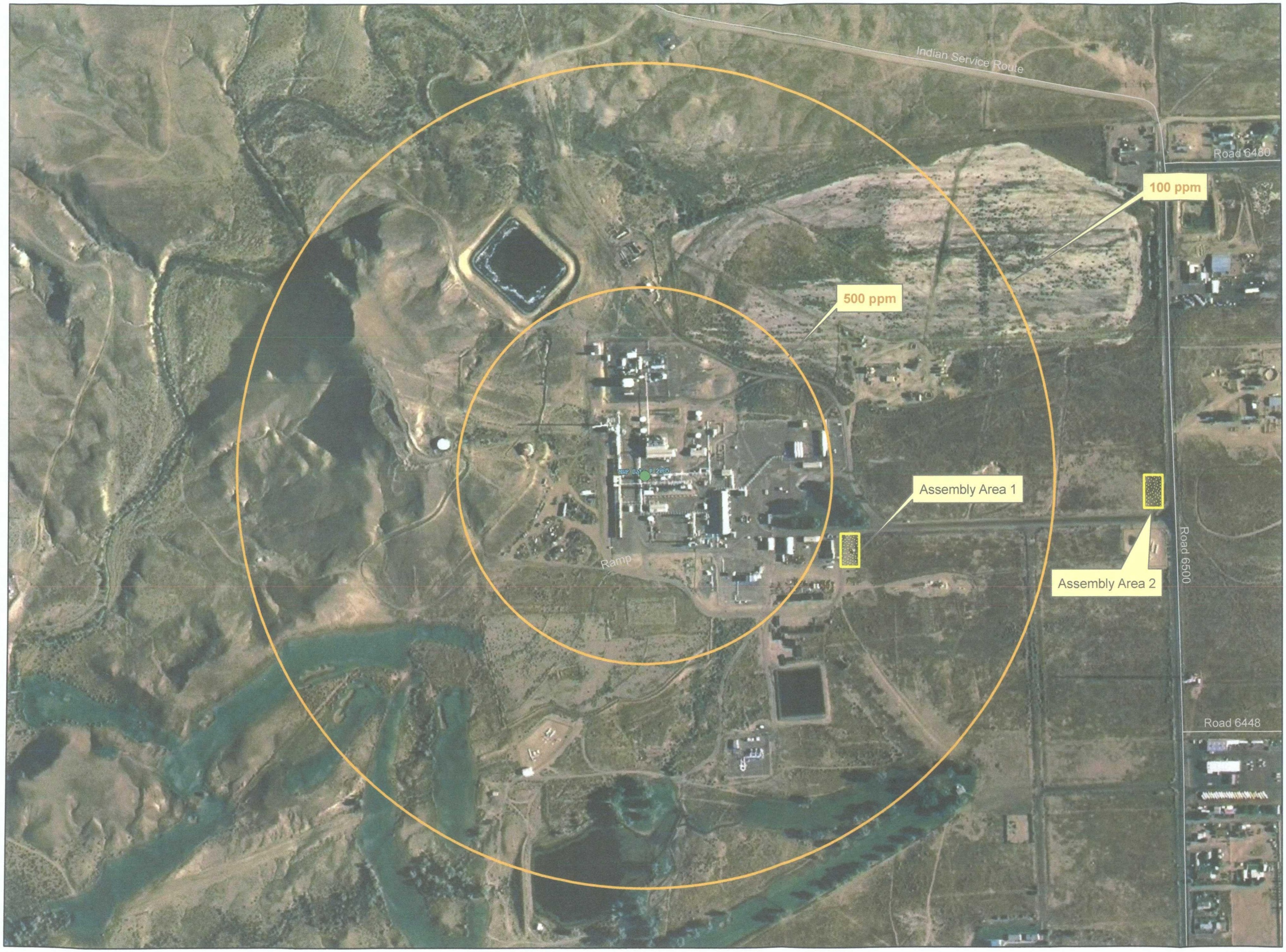
$$[(1.589)*(H_2S \text{ concentration})*(\text{gas volume})]^{0.6258}$$

$$[(1.589)*(3500*.000001)*(35{,}000{,}000)]^{0.6258}$$

100-ppm ROE = 2,042 feet

APPENDIX C

100-PPM AND 500-PPM RADIUS OF EXPOSURE MAP



N
W E
S

San Juan River Gas Plant
Hydrogen Sulfide Contingency Plan
Radius of Exposure

CURRENT OPERATIONS

- Amine Tower *

Radius of Exposure

- 933 ft (500 ppm)
- 2042 ft (100 ppm)

*Based on 35 MMscfd @ 3500 ppm H_2S

Anadarko Petroleum Corporation

San Juan River Gas Plant
Hydrogen Sulfide Contingency Plan
Radius of Exposure

PROPOSED OPERATIONS

- **AGI Well ***

Radius of Exposure

- **1634 ft (500 ppm)**
- **3576 ft (100 ppm)**

*Based on 50 MMscfd @ 6000 ppm H_2S

Anadarko
Petroleum Corporation

APPENDIX D

PLANT DIAGRAM WITH EVACUATION ROUTES & EMERGENCY EQUIPMENT LOCATIONS

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LEGEND:

- EMERGENCY SHUTDOWN
- H2S TRANSMITTER
- HYDROCARBON TRANSMITTER
- HYDROCARBON TRANSMITTER IN SUMP
- FIRE EXTINGUISHER
- WIND SOCK
- MONITOR INDICATOR
- BEACON
- HORN
- EMERGENCY EVACUATION ROUTE
- SCBA (30 MINUTE)
- SCBA (5 MINUTE)
- BRIEFING AREA

N41+00 N40+00 N39+00 N38+00 N37+00 N36+00 N35+00 N34+00

FLARE STACK
2 @ THIS LOCATION
PIT
REACTOR
A4 A3 A1 A2
CONTROL ROOM
FIN FANS
2 @ THIS LOCATION
AMBER H2S ALARM
LOAD OUT DOCK
BLOWER SKID
SULFER PLANT
BOILER HOUSE
LAB
ANBETH SCRUBBER
BARKER SCRUBBER
CONTACTOR
SCRUBBER
B1
STILL
B3
B4
E1
FLASH TANK
REBOILER
H1
AMINE BLDG.
H&E
RED H2S ALARM
SURGE TANK
B2
H2
H3
B
WEST MCC
FIN FANS
TREATER BLDG.
C4
RED H2S ALARM
C
C2
A PUMP HOUSE
CONTROL ROOM
AMBER HC ALARM
RED H2S ALARM
D&J
D1
D2
D3
D4
J1
J6
J5
J2
J3
J7
J4
J8
FAN
FUEL BLDG.
PORTA TEST BLDG.
GLYCOL CONTACTOR
MARLEY
DEHY BLDG.
CRYO SKID
FANS
COMPRESSOR BLDG.
C1
C3
LOADING PUMP BLDG.
LOADING DOCKS
MAINTENANCE/SAFETY OFFICE BLDG.
BRIEFING AREA #2 @ HIGHWAY
OFFICE BLDG.
BRIEFING AREA #1
SHOP
WAREHOUSE

NOTES:

XXFD0000 FOUNDATION LOCATION PLAN

REFERENCE DRAWINGS		REVISIONS						
		0	ISSUED FOR INFORMATION	SID	07/16/09	DD	07/16/09	MB	07/16/09
DWG. NO.	TITLE	NO.	DESCRIPTION	BY	DATE	CHK.	DATE	APPR.	DATE

Western Gas Resources, Inc.
1099 18th St., Suite 1200 – Denver, CO 80202-1955 (303)-452-5603

SCALE: 1"=40'-0"	DRAWING CREATION	P.EDGERS 7/31/85	ENT DATE	MB 8/6/09	PLOT DATE	Diederich, Scott 8/6/09

SAN JUAN RIVER PLANT
EMERGENCY ITEMS AND PLACEMENT

SAN JUAN RIVER PLANT
P.O. BOX 70 – KIRTLAND, NM 87417 – (505) 598-6210

ARE NO.	DRAWING NUMBER	REV.
–	SJPP-H280200	0

FILE NAME: SJPPH280200

Diederich, Scott 8/6/2009

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APPENDIX E

DESCRIPTION OF H_2S MONITORING & ALARM SYSTEMS

A. EMERGENCY SHUTDOWN SYSTEM

There are (8) ESD manual stations located at various points in the facility (Appendix D). **The plant ESD can be activated at any time at the direction of the Plant Superintendent or Incident Commander and is to be activated based on this Plan after 20 ppm H_2S has been detected in the Plant and efforts to resolve the issue for 15 minutes have failed.**

When anyone of the eight (8) manual stations are activated, the system will be shutdown and the natural gas inlets and outlets will be blocked. The operators are also able to auto close the two (2) main blocks on the incoming gas lines to the Plant. Activating these should allow the Plant to avoid a Level 4 response. Two miles north of the Plant on the Barker Dome line and the Aneth line, there are isolating block valves (manual) that can prevent further gas flow into the Plant pipeline system. Also, further upstream on the Barker and Aneth lines there are additional isolating block valves at 6 miles and 8 miles upstream on their respective lines. These block values furthest upstream, isolate the entire system from the field gathering lines coming into the Plant.

B. PLANT ALARMS & WIND INDICATORS

1. Colored beacons, horns, and wind directions indicators are located in various locations throughout the plant and are indicated on Appendix D.

2. A routine process alarm will cause a horn to sound. This horn is a wavering siren sound that is used to alert the Plant Operator to return to the Control Room. No emergency response or evacuation is required when this siren sounds.

3. The audible signal for an emergency response and plant evacuation is a repeating intermittent on/off horn that sounds at 10 ppm H_2S. The frequency of this on/off horn will increase as the concentration of the H_2S release increases. The horn will become continuous when the concentration of the H_2S release is 20 ppm or higher. At the initial sound of this horn, the plant operator will don a SCBA and all personnel in the plant complex shall immediately proceed in a safe manner to assembly area #1.

4. Flashing beacons are located throughout the plant and are utilized to assist the Plant Operator in identifying the location of the plant alarm or plant upset. Any beacon colors other than red do not identify an emergency response or evacuation.

5. If an alarm beacon is flashing in a red color, this signifies an H_2S release of 10 ppm and all personnel in the Plant complex shall immediately proceed in a safe manner to the emergency assembly area #1 located east of the main office. If this area is not determined to be safe all will move to assembly area #2 which is on road 6500 at the main gate on the east side of the facility. Evacuation routes and assembly area #1 are indicated on Appendix D.

6. Wind direction indicators are installed throughout the plant and at the Plant Superintendent Office Building. At least one wind direction indicator can be seen at any location within the plant complex, as well as, from any point on the perimeter of the plant. There are 10 windsocks located in the plant.

C. GAS DETECTION EQUIPMENT

1. The San Juan Plant uses the Industrial Scientific Corporation 4200 Series Remote H_2S Sensors. These sensors are a fixed point monitor to detect the presence of hydrogen sulfide in ambient air. The sensors are connected to Allan Bradley/SLC-500 Rockwell Logic Controllers with an output to Moore Micro-Advantage controllers and from here to the operators PLC. The red flashing beacon is activated at 10 ppm. The horn is activated with a wobble sound at 10 ppm and changes to a steady alarm at 20 ppm.

2. The fixed hydrogen sulfide monitors are strategically located throughout the plant to detect an uncontrolled released of hydrogen sulfide. The SRU has 4 sensors labeled A-1 through A-4. The treating plant area has 4 sensors labeled B-1 through B-4. There are two sensors at the east side of the plant labeled C-1 and C-3. There is one sensors located at the liquid stabilizer skid labeled E-1. This is the center of the process area. The compressor building has eight methane sensors, these shut the compressors down at 50% LEL. The compressor building also is equipped with fire eyes that will also shut the units down. The plant operators are able to monitor the ppm level of H_2S of all the plant sensors on their control/monitor PLC located in the operators building. These sensors are all located on the plot plan on Appendix D. These sensors all have to be acknowledged and will not clear themselves. This requires immediate action for any occurrence or malfunction. The plant sensors are calibrated quarterly.

3. Hand held gas detection monitors are available to plant personnel to check specific areas and equipment prior to initiating maintenance or work on the process or equipment. There are 2 handheld and 9 personal monitors that are used by individuals for special projects and field work. The hand held gas detection devices are BW Technologies 4-gas detectors. The detectors have sensors for oxygen, LEL (explosive hydrocarbon atmospheres), hydrogen sulfide, and carbon dioxide. They indicate the presence H_2S with a beeping sound at 10 ppm. The beeps change in tone as H_2S increases to 20 ppm. The personal monitors are set to alarm (beep) at 10 ppm with the beeps becoming closer together as the H_2S concentration increases to 20 ppm. Both the hand held and personal monitors have digital read outs of H_2S ppm concentration.

D. RESPIRATORS

1. The Plant has 30 minute Self-Contained Breathing Apparatus (SCBA) respirators and 5 minute escape packs strategically located throughout the Plant.

2. The respirator containers are identified in the process area and the locations are identified on **Appendix D.**

3. All Plant personnel with the exception of the Plant Operations Specialist are certified to use the SCBA respirators.

E. FIRE FIGHTING EQUIPMENT

1. The Plant personnel are trained only for insipient stage fire fighting.

2. The fire extinguishers located in the Plant process areas, compressor buildings, process buildings, and company vehicles are typically a 20# Ansul dry chemical fire extinguisher. **See Appendix D.**

3. The Plant does not have a fire water system, but only a utility water system that is not designed for fire fighting.

APPENDIX F

SIMPLIFIED H_2S CONTINGENCY PLAN FLOW DIAGRAM

LEVEL 1 RESPONSE

H_2S DETECTED GREATER THAN 10 PPM &/OR INTERMITTENT ALARM SOUNDS

- **OPERATORS PUT ON RESPIRATORS (30 minute SCBA) TO ASSESS & RESOLVE PROBLEM**

(Operators are allowed under OSHA to work for up to 8 hours in 10ppm H2S environment)

- **ALL OTHERS EVACUATE TO ASSEMBLY AREA 1**
- **NOTIFY BHP MINES**

AT ASSEMBLY AREA 1

- **MONITOR H_2S LEVELS AT ASSEMBLY AREA**
- **OPERATORS WILL SET UP SECONDARY ENTRY TEAMS W/ 30-MIN SCBA TO TRY TO RE-ENTER AND RESOLVE**
- **RE-ENTRY WILL OCCUR IN 15 MINUTE SHIFTS AT THE DIRECTION OF THE IC UNTIL IC DETERMINES PROBLEM HAS BEEN RESOLVED OR ESD IS ACTIVATED)**

CALL 911
IF INJURY OR DEATH FOR EMERGENCY ASSISTANCE

ONCE RESOLVED & MONITORED LEVELS IN PLANT ARE LESS THAN 10 PPM RETURN TO PLANT

IF H_2S LEVELS AT ASSEMBLY AREA 1 EXCEED 10PPM

EVACUATE TO ASSEMBLY AREA 2

NOTIFY NMOCD WITHIN ONE HOUR MAKE AGENCY REPORTS AS NECESSARY

AT ASSEMBLY AREA #2

- **MONITOR H_2S LEVELS AT ASSEMBLY AREA**
- **FOLLOW LEVEL 2 RESPONSE ACTIONS**

LEVEL 2 RESPONSE

H_2S LEAK DETECTED GREATER THAN 20 PPM &/ CONTINUOUS ALARM SOUNDS

- **OPERATORS PUT ON RESPIRATORS (30-MIN SCBA) TO ASSESS & RESOLVE PROBLEM**

(Operators have 15 minutes to resolve after which they must evacuate to Assembly Area #2 and begin rotational entry to Plant)

- **ALL OTHERS EVACUATE TO ASSEMBLY AREA #2**
- **NOTIFY BHP MINES**
- **EVACUATE PRAXAIRE**

AT ASSEMBLY AREA #2

- **MONITOR H_2S LEVELS AT ASSEMBLY AREA**
- **IF MONITORED LEVELS EXCEED 10 PPM EVACUATE TO ASSEMBLY AREA 3 (KIRTLAND ELEMENTARY SCHOOL PARKING LOT)**
- **RE-ENTRY WILL OCCUR IN 15 MINUTE SHIFTS AT THE DIRECTION OF THE IC UNTIL IC DETERMINES PROBLEM HAS BEEN RESOLVED OR ESD IS ACTIVATED)**

CALL 911
IF INJURY OR DEATH FOR EMERGENCY ASSISTANCE

ONCE RESOLVED & MONITORED LEVELS IN PLANT ARE LESS THAN 10 PPM RETURN TO PLANT

NOTIFY NMOCD WITHIN <u>ONE HOUR</u>
MAKE OTHER AGENCY REPORTS AS PER H_2S PLAN

IF CONSTANT ALARM SOUNDS FOR 15 MINUTES

- **ACTIVATE PLANT EMERGENCY SHUT DOWN (ESD)**
- **ACTIVATE FULL H_2S PLAN WITH NOTIFICATIONS & REPORTING (FOLLOW LEVEL 3 RESPONSE)**

LEVEL 3 RESPONSE

WORST CASE SCENERIO AND/OR CATASTROPHIC RELEASE FROM FIRE AND/OR EXPLOSION

- **ALL PERSONNEL EVACUATE TO ASSEMBLY AREA 2; IF MONITORED LEVELS ARE LESS THAN 10 PPM**
- **IF MONITORED LEVELS AT ASSEMBLY AREA 2 ARE GREATER THAN 10 PPM; EVACUATE TO ASSEMBLY AREA 3 (ELEMENTARY SCHOOL PARKING LOT)**
- **IMPLEMENT FULL H_2S PLAN WITH ALL NOTIFICATIONS**
- **NOTIFY LOCAL FIRE, POLICE AND EMERGENCY SERVICES**
- **EVACUATE PRAXAIRE**

ONCE RESOLVED & MONITORED LEVELS IN PLANT ARE LESS THAN 10 PPM RETURN TO PLANT

IF CONSTANT ALARM SOUNDS FOR 15 MINUTES

- **ACTIVATE PLANT EMERGENCY SHUT DOWN (ESD)**
- **RE-ENTRY WILL OCCUR IN 15 MINUTE SHIFTS AT THE DIRECTION OF THE INCIDENT COMMANDER (IC) UNTIL IC DETERMINES PROBLEM HAS BEEN IDENTIFIED OR REPAIRED**

APPENDIX G

EMERGENCY CALL LIST

SAN JUAN GAS PLANT EMERGENCY CALL LIST

ENTITIES WITH IN THE 100- PPM ROE

Name	Address	**Contact Person**	Phone Number
Riverview Golf Course	583 County Rd 6100 Kirtland, NM 87417		505-598-0140
BHP Mining	16 Miles West of Farmington, NM San Juan County Road RD6800	Dave Hales, Safety Manager	505-598-2311 505-486-1612
El Paso Natural Gas	81 County Road 4900 Bloomfield, NM 87413		800-334-8047
Mid-America Pipeline Co. (Enterprise)	3621 East Main Farmington, NM 87402		505-599-3276 505-599-3277 800-546-3482
Praxair	101 County Road 6500 Bloomfield, NM 87417		505-598-0549 800-598-0549
XTO Energy	2700 Farmington Ave. Farmington, NM 87401		505-324-1090
San Juan College West*	69 County Road 6500 Kirtland, NM 87417		505-598-5897

*Note: The San Juan College West is not within the 100-ppm ROE but is approximately 468 ft outside the 100-ppm radius of exposure. Due to the near proximity, the San Juan College West will be included in this contingency plan.

ENTITIES WITH IN THE 500- PPM ROE

Name	Address	**Contact Person**	Phone Number
El Paso Natural Gas	81 County Rd 4900 Bloomfield, NM 87413		800-334-8047
Praxair	101 County Rd 6500 Bloomfield, NM 87417		505-598-0549 800-598-0549

A. COMPANY INTERNAL NOTIFICATIONS
SAN JUAN RIVER PLANT PERSONNEL

NAME	TITLE	OFFICE No.	CELLULAR No.	HOME No.
Kent McEvers	Plant Superintendent	505-598-5601 ext. 15523	505-860-7208	505-326-4054
Rick Fetch	Plant Foreman	505-598-5601 ext. 15522	505-947-2416	505-324-6441
Arlyn Thorson	Maintenance Foreman	505-598-5601 ext. 15524	505-947-2417	505-326-6718
Bob McClain	Plant Operator	505-598-5601 ext. 15542	505-330-1966	505-325-8715
Brenda Wilson	Sr. Operations Specialist	505-598-5601 ext. 15521		505-325-6525
Andrew Adame	Plant Operator			505-360-7051
Chee Anderson	Plant Operator			505-326-1397
Glen Daniell	Plant Operator		505-860-7483	505-632-9705
Curtis Day	Plant Operator			505-801-4404
Johnny Foster	Plant Operator			505-801-5062
Frank Hale	Plant Operator		505-860-5897	505-598-9091
Bobby James	Plant Operator			505-598-5314
Melvin Jim	Plant Operator			505-368-4733
Charlie Barr	Mechanic		505-324-1100	505-330-2614
Jerry Darnell	Fieldman			505-632-2722
Ted Francis	Fieldman			505-564-2999
Kent Galyon	Fieldman		505-860-1875	970-565-1006
William Golbe	Mechanic		505-215-2517	505-598-9716
Charlie Medders	Mechanic		505-947-7039	505-598-5573
Corwyn Yazzie	Mechanic		505-793-2567	505-327-3286

B. COMPANY INTERNAL NOTIFICATIONS
CORPORATE PERSONNEL – THE WOODLANDS, TEXAS

NAME	TITLE	OFFICE No.	CELLULAR No.	HOME No.
Mario Reyes	Operations Mgr	832-636-3234	713-816-5006	281-360-1084
Mike Ross	General Mgr	832-636-3431	832-381-0923	281-296-0385
Tony Marques	Engineering Mgr	832-636-7368		
Chuck Johnson	Commercial Develop. Mgr	832-636-7119		

David Ponikvar	S&H Mgr	832-636-3414	281-732-7887	281-374-8334
Julie Betik	Env & Reg Anal	832-636-2609	281-793-7705	281-320-2066
Eric Weaver	EHS Analyst	432-684-2808	432-413-2494	432-756-3493
Jerry Adams	EHS Mgr	832-636-8304	281-731-5931	281-363-4693
Mike Gray	EHS Director	832-636-2454	281-415-6964	936-271-9869

C. COUNTY & LOCAL LAW ENFORCEMENT

AGENCY	DAYTIME / 24 HR. PHONE No.
Law Enforcement Dispatch	**911**
San Juan County Sheriff	505-334-6622
Farmington Police	505-327-0222
Navajo Tribal Police	505-368-4333
Ute Mountain BIA	303-565-8471
New Mexico Highway Patrol	505-325-7547
New Mexico FBI	505-325-8631
San Juan County LEPC	505-334-1180
BLM Farmington Office	505-599-8900

D. MEDICAL SERVICES

AGENCY	EMERGENCY SERVICE	PHONE No.
Emergency Dispatch	Fire & Ambulance	**911**
San Juan County Fire Marshall	Fire Department	505-334-9431
San Juan Regional Medical Center	Hospital	505-325-5011
Emergency Trauma Lifeline Service - Farmington		505-325-5602
Dr. Robert C. Rhein	Doctor	505-327-4867
Dr. Ken Crider	Doctor	505-327-4439
San Juan Air Care Farmington	Air Ambulance	800-452-9990

E. FEDERAL NOTIFICATIONS

AGENCY	DAYTIME / 24 HR. PHONE No.
National Response Center	800-424-8802
EPA Region 8	800-227-8917
OSHA	800-321-6742
OSHA Area Office New Mexico	505-827-4230
DOT	800-424-8802
BLM Farmington	505-599-8900

F. NEW MEXICO STATE NOTIFICATIONS

AGENCY	DAYTIME / 24 HR. PHONE No.
New Mexico One Call	800-321-2537
New Mexico Oil Conservation Division	505-334-6178
New Mexico Environmental Department	505-476-4300
New Mexico Emergency Response Commission	505-476-9681
New Mexico Public Utilities Commission	505-490-2375
New Mexico State Patrol	505-325-7547

G. CONTRACTORS

CONTRACTOR	CONTACT	OFFICE No.	CELLULAR No.
Contractors - General			
IMI Construction		505-325-5005	
Weeminuche Construction	Benton Dean	970-565-7430	
Service Companies Supplies			
Noels Inc		505-327-3375	

ESSO Pipe & Supply		505-325-7568	
Air Gas		505-325-6660	
DXP	Steve Martinez	505-326-3333	
DeWees Tool & Supply		505-326-5491	
Emergency Response & Safety Services			
ChemTrec		800-424-9300	
Hands On Safety Service		505-325-4218	
Electrical Services			
Four Corners Electric		505-325-1459	
B&G Electric		505-325-7511	

H. OTHER PRODUCERS

COMPANY	CONTACT	OFFICE No.	CELLULAR No.
Burr Oil & Gas	Deana	505-325-1701	
Conoco/Burlington	Jerry Lodermilk		505-320-0452
	Renae	505-330-2946	
DJ Simmons Company	John Byrom	505-326-3753	
Elm Ridge Resources	Office	505-334-3476 ext 210	
	Terry Lindeman	972-749-6941	
El Paso Natural Gas		505-632-6000	
	Emergency Number	800-334-8047	
Nacogdoches Oil & Gas	Aaron	936-697-3750	
Resolute Natural Resources	Office	970-564-5200	
	Montezuma Creek	435-651-3682	
	Roger Atcitty		435-444-0001
Rim Southwest Corporation	Thelma Dee	435-651-4391	
XTO Energy Inc.	Office	505-324-1090	
	John Weaver		505-330-3278

I. OTHER RESOURCES

COMPANY	OFFICE No.	Website
National Weather Service Albuquerque, New Mexico	505-243-0702	
Farmington Four Corners Regional Airport – National Weather Service		*http://weather.noaa.gov/weather/current/KFMN.html*
Additional Weather Sites		www.accuweather.com www.wunderground.com www.weather.com

APPENDIX H

H_2S PLAN DISTRIBUTION LIST

New Mexico Oil & Gas Conservation Division

New Mexico Environment Department

New Mexico Department of Public Safety (Farmington Office)

New Mexico Department of Public Safety (State Office)

Farmington Fire Department

San Juan County Fire Department

San Juan County Sheriff Department

San Juan County Emergency Manager

San Juan County LEPC

Farmington Police

San Juan Regional Medical Center

San Juan Plant Office

Anadarko Petroleum Corporate Office

ANADARKO PETROLEUM CORPORATION

SAN JUAN RIVER GAS PLANT
KIRTLAND, SAN JUAN COUNTY, NEW MEXICO

HYDROGEN SULFIDE CONTINGENCY PLAN

ANADARKO PETROLEUM CORPORATION
SAN JUAN RIVER GAS PLANT
HYDROGEN SULFIDE CONTINGENCY PLAN

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ANADARKO PETROLEUM CORPORATION
SAN JUAN RIVER GAS PLANT
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A. LOCATION

The San Juan River Gas Plant is located in Section 1, Township 29 S, Range 15 W in Kirtland, San Juan County, New Mexico. The location is further defined as follows:

Latitude: 36.453 N **Longitude: 108.220 W**

Directions to the San Juan River Plant from Farmington, New Mexico are as follows:

From the intersection of US Highway 64 and the LaPlata Highway (New Mexico Highway 170), travel west on US Highway 64 approximately 6.2 miles to the intersection of US Hwy 64 and County Road 6500 in Kirtland, New Mexico. Turn right on County Road 6500 and travel north approximately 1 mile to the entrance to the San Juan River Gas Plant.

The San Juan River Plant street address is: 99 County Road 6500
Kirtland, New Mexico 87417

The San Juan River Plant mailing address is: P. O. Box 70
Kirtland, New Mexico 87417

A map of the San Juan River Plant location is attached in Appendix A.

B. OBJECTIVE

The San Juan River Gas Plant gathers produced natural gas from San Juan County, New Mexico, as well as, gas from Southwestern Colorado, Northeastern Arizona, and Southeastern Utah. The produced natural gas is compressed; dehydrated to remove the water content; and treated in an amine process for the removal of carbon dioxide and hydrogen sulfide. One inlet natural gas stream is processed to recover the natural gas liquids as a raw mix product in a cryogenic turboexpander process. The carbon dioxide and hydrogen sulfide stream that is removed in the amine treating process is the feedstock to the Claus sulfur recovery process to recover a molten sulfur product.

A plot plan of the San Juan River Gas Plant is attached in Appendix B, and a process block flow diagram is attached in Appendix C.

In order to achieve this objective, Anadarko shall ensure the safety and health of all personnel, and shall ensure a safe working environment on-site. Additionally, the protection of environment shall be ensured throughout the operation.

All operations shall be performed with safety as the primary goal. Any part of the operation that might compromise the safety of personnel will cease until the operation can be re-evaluated and the proper engineering controls implemented.

It is the responsibility of all personnel on-site to follow the safety practices outlined in the following documents:

1. This Hydrogen Sulfide Contingency Plan
2. Anadarko Petroleum Corporation Safety & Health Manual
3. Anadarko Petroleum Corporation Emergency Response & Oil Spill Contingency Plan
4. Anadarko Petroleum Corporation Environmental Policies and Programs.

This San Juan River Gas Plant Hydrogen Sulfide Contingency Plan may be revised as often as required in order to maintain accurate and up-to-date information.

C. CURRENT OPERATION & RADIUS OF EXPOSURE INFORMATION

1. CURRENT VOLUME AND HYDROGEN SULFIDE CONCENTRATION

a) The current gas inlet volume to the San Juan River Gas Plant is 35,000 MCFD
b) The hydrogen sulfide concentration in the inlet gas volume is 3,500 ppm

2. RADIUS OF EXPOSURE INFORMATION

a) The 500 ppm radius of exposure is **933 feet**, and is based on the following formula:

500 ppm radius, ft = $[(0.4546)*(\text{H2S concentration})*(\text{gas volume})]^{0.6258}$
500 ppm radius, ft = $[(0.4546)*(3500*.000001)*(35000*1000)]^{0.6258}$
500 ppm radius, ft = 933 ft.

b) The 100 ppm radius of exposure is **2,042 feet**, and is based on the following formula:

100 ppm radius, ft = $[(1.589)*(\text{H2S concentration})*(\text{gas volume})]^{0.6258}$
100 ppm radius, ft = $[(1.589)*(3500*.000001)*(35000*1000)]^{0.6258}$
100 ppm radius, ft = 2,042 ft.

c) Plant location maps with the radius of exposures for the 500 ppm level and the 100 ppm level are attached in Appendix D.

D. EMERGENCY NOTIFICATION

1. EVACUATION PLAN

In the event of an emergency or the release of hydrogen sulfide or potentially hazardous hydrocarbons, all personnel shall proceed upwind to the nearest designated safe area. The San Juan River Plant Superintendent, or his designee, will immediately review the emergency situation, and activate the necessary parts of this plan in order to provide for the safety of Anadarko and contract personnel, the public, nearby businesses, equipment, and the environment.

The San Juan River Gas Plant evacuation diagram is attached in Appendix E.

The following steps shall be considered in determining the notification required for the emergency situation:

a) In an emergency situation, the San Juan River Plant Superintendent, or his designee, will have complete responsibility and will take whatever action is deemed necessary to ensure personnel safety, to prevent property damage, and to protect the environment.

b) Notify the appropriate Anadarko management and emergency response personnel, and advise them of the existing emergency situation.

c) Advise any Contractor, Service Company, and all others on-site or entering the site of the emergency situation.

d) Contact all businesses and public places as identified within this hydrogen sulfide contingency plan

e) If applicable, advise and request assistance from San Juan County public safety officials.

f) Keep the number of persons on location to a minimum during the emergency situation, and have all personnel rally to the nearest designated safe area.

g) Direct the corrective actions to isolate, control the equipment causing the release, or shut-in the flow of gas into the gas plant to minimize the release volume and exposure.

2. EMERGENCY CALL LIST

The San Juan River Gas Plant Emergency Call List is attached in Appendix F of this document.

The Emergency Call List is comprised of the following information:

a) San Juan River Gas Plant employee contact information
b) Anadarko management and support personnel contact information
c) Federal and State Notification, including the San Juan County LEPC and state & local police enforcement
d) Emergency Response Information for fire, medical, and ambulance services
e) General Contractors that can provide support
f) Other Producers in the Area

E. BUSINESSES AND PUBLIC PLACES WITHIN THE CALCULATED RADIUS OF EXPOSURES:

1. Public and Businesses within the 500 ppm radius of exposure of 933 ft.

a) El Paso Natural Gas
81 County Road 4900
Bloomfield, NM 87413
800-334-8047

b) Praxair
101 County Road 6500
Bloomfield, NM 87417
505-598-0549
800-598-0549

2. Public and Businesses within the 100 ppm radius of exposure of 2,042 ft.

a) Riverview Golf Course
583 County Road 6100
Kirtland, NM 87417
505-598-0140

b) San Juan College West
69 County Road 6500
Kirtland, NM 87417
505-598-5897

Note: The San Juan College West is not within the 2,042 ft. radius of exposure, but is located at a distance of 2,500 ft or 468 ft outside the 100 ppm radius of exposure. Due to the proximity, the San Juan College West will be included in this contingency plan.

c) **BHP Mining**
16 Miles West of Farmington, NM
San Juan County Road RD6800
505-598-2311
505-486-1612 Dave Hales, Safety Manager

d) **El Paso Natural Gas**
81 County Road 4900
Bloomfield, NM 87413
800-334-8047

e) **Mid-America Pipeline Co. (Enterprise)**
3621 East Main
Farmington, NM 87402
505-599-3276
505-599-3277
800-546-3482

f) **Praxair**
101 County Road 6500
Bloomfield, NM 87417
505-598-0549
800-598-0549

g) **XTO Energy**
2700 Farmington Ave.
Farmington, NM 87401
505-324-1090

3. There are not any public roads located within 500 ppm or the 100 ppm radius of exposures.

4. All businesses and public places within the 500 ppm and 100 ppm radius of exposure will be contacted and advised of the following:

   a) The San Juan River Gas Plant operation and hazards
   b) Alerts and alarms that would identify an emergency
   c) Communication and/or contact to advise the business or public place of the emergency

d) Communication of recommended evacuation or shelter-in-place options in the event of an emergency.

F. RESIDENCES WITHIN THE CALCULATED RADIUS OF EXPOSURES:

There are not any residences located within 500 ppm or the 100 ppm radius of exposures.

G. EMERGENCY RESPONSE ORGANIZATION

Anadarko Petroleum Corporation utilizes the Incident Command System (ICS) for emergency response. The ICS structure utilized by Anadarko is based on the National Interagency Incident Management System (NIIMS), and is consistent with the National Contingency Plan (NCP). NIIMS ICS provides a commonly understood framework that allows for effective interaction among response personnel. In some cases, ICS information specific to Anadarko has been modified to account for lessons learned during past responses. Otherwise, traditional NIIMS ICS is followed to the extent possible.

Depending on the severity of the emergency, the emergency response team make-up may be revised. Some of the Anadarko positions will be coordinated from Anadarko's corporate office located in The Woodlands, Texas.

The severity of the emergency will also determine the full activation of the Emergency Response Center in Anadarko's corporate office located in The Woodlands, Texas.

The San Juan Plant Superintendent, or his designee, will be the On-Scene Incident Commander for San Juan Plant emergency response. The Plant Superintendent, or his designee, as On-Scene Incident Commander will contact and coordinate with Anadarko's management in corporate office. If the severity of the response requires activation of the Emergency Response Center in The Woodlands, Texas office, the ICS structure will staffed per the Anadarko Southern Region Emergency Response & Oil Spill Contingency Plan Manual.

H. WEATHER CONDITIONS

The current weather conditions for the Kirtland, New Mexico and Farmington, New Mexico can be obtained from the following:

National Weather Service
Albuquerque, New Mexico
505-243-0702

Farmington Four Corners Regional Airport – National Weather Service
http://weather.noaa.gov/weather/current/KFMN.html

Additional Internet Weather Addresses:
www.accuweather.com
www.weather.com
www.wunderground.com

I. HAZARD SUMMARY

1. PRIMARY HAZARDS

a) Methane or Hydrocarbon Gas

The major component of the inlet gas streams to the San Juan River Gas Plant is hydrocarbon gas and comprised primarily of methane.

Methane is an odorless, colorless gas, or a colorless, odorless liquid in its cryogenic form. Both the liquid and the gas pose a serious fire hazard when accidentally released. The liquid will rapidly boil to the gaseous state at standard temperatures and pressures. As a gas, methane is lighter than air.

As a gas, methane will act as a simple asphyxiant and present a significant health hazard by displacing the oxygen in the atmosphere.

Methane Properties & Characteristics	
CAS No.	74-82-8
Molecular Formula	CH_4
Molecular Weight	16.042
TWA	not any specific exposure limits for methane
STEL	not any specific exposure limits for methane
IDLH	not any specific exposure limits for methane
Specific Gravity (air = 1.0)	0.555
Boiling Point	-258.7°F
Freezing Point	-296°F
Flash Point	-306°F
Vapor Pressure	5,000 psia
Autoignition Temperature	1,202°F
Lower Flammability Limit	5.0%
Upper Flammability Limit	15.0%
Stability	Stable

b) Hydrogen Sulfide

The current inlet gas streams to the San Juan River Gas Plant contain approximately 3,500 ppm of hydrogen sulfide.

Hydrogen sulfide is a colorless, toxic and flammable gas, and has the odor of rotten eggs. Hydrogen sulfide gas is heavier than air.

Hydrogen sulfide presents a significant health hazard by paralyzing the respiratory system resulting in serious injury or death.

Hydrogen Sulfide Properties & Characteristics	
CAS No.	7783-06-4
Molecular Formula	H_2S
Molecular Weight	34.082
TWA	10 ppm
STEL	15 ppm
IDLH	100 ppm
Specific Gravity (air = 1.0)	1.189
Boiling Point	-76.5°F
Freezing Point	-121.8°F
Vapor Pressure	396 psia
Autoignition Temperature	518°F
Lower Flammability Limit	4.3%
Upper Flammability Limit	46.0%
Stability	Stable
pH in water	3
Corrosivity	Reacts with metals, plastics, tissues & nerves

Physical Effecst of Hydrogen Sulfide		
Concentration		
ppm	%	Physical Effect
1	.00010	Can be smelled (rotten egg odor)
10	0.0010	Obvious & unpleasant odor; Permissible Exposure Limit; Safe for 8-hour exposure
15	0.0015	Short Term Exposure Limit (STEL); Safe for 15 minutes of exposure without respirator
50	0.0050	Loss of sense of smell in 15 minutes
100	0.0100	Immediately Dangerous to Life & Health (IDLH); Loss of sense of smell in 3-15 minutes; Stinging in eyes & throat; Altered breathing
200	0.0200	Kills smell rapidly; Stinging in eyes & throat
500	0.0500	Dizziness; Unconscious after short exposure; Need artificial respiration
700	0.0700	Unconscious quickly; death will result if not rescued promptly
1,000	0.1000	Instant unconsciousness; followed by death within minutes

c) Carbon Dioxide

The current inlet gas streams to the San Juan River Gas Plant contain approximately 3% of carbon dioxide.

Carbon dioxide gas is colorless, odorless, and non-flammable. Carbon dioxide is heavier than air.

Carbon Dioxide Properties & Characteristics	
CAS No.	124-38-9
Molecular Formula	CO_2
Molecular Weight	44.010
TWA	5,000 ppm
STEL	30,000 ppm
IDLH	40,000 ppm
Specific Gravity (air = 1.0)	1.5197
Boiling Point	-109.12°F
Freezing Point	-69.81°F
Vapor Pressure	830 psia
Autoignition Temperature	N/A
Lower Flammability Limit	N/A
Upper Flammability Limit	N/A
Stability	Stable
pH in saturated solution	3.7
Corrosivity	dry gas is relatively inert & not corrosive; can be corrosive to mild steels in aqueous solutions

Physical Effects of Carbon Dioxide	
Concentration	**Effect**
1.0 %	Breathing rate increases slightly
2.0 %	Breathing rate increases to 50% above normal level. Prolonged exposure can cause headache, tiredness
3.0 %	Breathing rate increases to twice normal rate and becomes labored. Weak narcotic effect. Impaired hearing, headache, increased blood pressure and pulse rate
4 – 5 %	Breathing increases to approximately four times normal rate, symptoms of intoxication become evident, and slight choking may be felt
5 – 10 %	Characteristic sharp odor noticeable. Very labored breathing, headache, visual impairment, and ringing in the ears. Judgment may be impaired, followed within minutes by loss of consciousness
10 – 100 %	Unconsciousness occurs more rapidly above 10% level. Prolonged exposure to high concentrations may eventually result in death from asphyxiation

d) Sulfur Dioxide

Sulfur dioxide is produced during the burning of hydrogen sulfide.

Sulfur dioxide is colorless, transparent, and is non-flammable. Sulfur dioxide has a pungent odor associated with burning sulfur.

Sulfur dioxide is heavier than air, but will be picked up by a breeze and carried downwind at elevated temperatures. Sulfur dioxide can be extremely irritating to the eyes and mucous membranes of the upper respiratory tract.

Sulfur Dioxide Properties & Characteristics	
CAS No.	7446-09-5
Molecular Formula	SO_2
Molecular Weight	64.07
TWA	2 ppm
STEL	5 ppm
IDLH	100 ppm
Specific Gravity (air = 1.0)	2.26
Boiling Point	-14°F
Freezing Point	-103.9°F
Vapor Pressure	49.1 psia
Autoignition Temperature	N/A
Lower Flammability Limit	N/A
Upper Flammability Limit	N/A
Stability	Stable
Corrosivity	Could form an acid rain in aqueous solutions

Physical Effects of Sulfur Dioxide	
Concentration	**Effect**
1 ppm	Pungent odor, may cause respiratory changes
2 ppm	Permissible exposure limit; Safe for an 8 hour exposure
3-5 ppm	Pungent odor; normally a person can detect sulfur dioxide in this range
5 ppm	Short Term Exposure Limit (STEL); Safe for 15 minutes of exposure
12 ppm	Throat irritation, coughing, chest constriction, eyes tear and burn
100 ppm	Immediately Dangerous To Life & Health (IDLH)
150 ppm	So irritating that it can only be endured for a few minutes
500 ppm	Causes a sense of suffocation, even with first breath
1,000 ppm	Death may result unless rescued promptly.

2. SITE HAZARDS

In addition to the Primary Hazards at the San Juan River Gas Plant, there are additional site hazards. Although not an all inclusive listing, the following is a summary of certain site hazards that will be encountered within the San Juan River Plant:

a) High Pressure Piping and Vessels
b) Hot Equipment Surfaces
c) Seasonal Weather Considerations
   1) Summer Months – Ambient temperatures and process heat may cause worker heat stress and dehydration
   2) Winter Months – Ambient temperatures require proper worker clothing to avoid hypothermia and frost bite
d) Inclement Weather
   1) Rainy or snowy weather can make walkways, stairways, and equipment slick
e) Chemicals – amines, glycols, lube oils, ambitrol, etc.
f) High Noise Areas
g) Fall Hazards
h) Movement of Vehicles & Machinery
i) Uneven Terrain – Due to piping, walkways, guttering, drainage, etc.

J. PLANT ALARMS & WIND INDICATORS

1. Colored beacons, horns, and wind directions indicators are located in various locations throughout the plant.

2. A routine process alarm will cause a horn to sound. This horn is a wavering siren sound that is used to alert the Plant Operator to return to the Control Room. No emergency response or evacuation is required when this siren sounds.

3. The audible signal for an emergency response and plant evacuation is a repeating on/off horn. The frequency of this on/off horn will increase as the concentration of the H_2S release increases. The horn will become continuous when the concentration of the H_2S release is greater than 20 ppm. At the initial sound of this horn, all personnel in the plant complex shall immediately proceed in a safe manner to the emergency assembly area.

4. Flashing beacons are located throughout the plant and are utilized to assist the Plant Operator in identifying the location of the plant alarm or plant upset. Any beacon colors other than red do not identify an emergency response or evacuation.

5. If an alarm beacon is flashing in a red color, this signifies an H_2S release and all personnel in the Plant complex shall immediately proceed in a safe manner to the emergency assembly area.

6. Wind direction indicators are installed throughout the plant and at the Pant Superintendent Office Building. At least one wind direction indicator can be seen at any location within the plant complex, as well as, from any point on the perimeter of the plant.

K. GAS DETECTION EQUIPMENT

1. The San Juan Plant uses the Industrial Scientific Corporation 4200 Series Remote H_2S Sensors. These sensors are a fixed point monitor to detect the presence of hydrogen sulfide in ambient air. The sensors are connected to Rockwell Logic Controllers with an output to the alarm horn and beacons.

2. The fixed hydrogen sulfide monitors are strategically located throughout the plant to detect an uncontrolled released of hydrogen sulfide. The sensor range and controller outlet change the horn output as the released concentration increases.

3. Hand held gas detection monitors are available to plant personnel to check specific areas and equipment prior to initiating maintenance or work on the process or equipment.

4. The hand held gas detection devices are BW Technologies 4-gas detectors. The detectors have sensors for oxygen, LEL (explosive hydrocarbon atmospheres), hydrogen sulfide, and carbon dioxide.

5. In the event of an emergency, additional hand held gas detection equipment will be leased to assure the safety of the workers in the Hot Work Zone, the Warm Work Zone, the Cool/Safe Work Zone, and points around the perimeter of the San Juan Plant

L. RESPIRATORS

1. The San Juan River Gas Plant has strategically located throughout the plant Self-Contained Breathing Apparatus (SCBA) respirators.

2. The respirator containers are identified in the process area and the locations are identified on the San Juan Plant emergency response plot plan.

3. All San Juan Plant personnel with the exception of the Plant Operations Specialist are certified to use the SCBA respirators.

M. FIRE FIGHTING EQUIPMENT

1. The San Juan River Gas Plant personnel are trained only for insipient stage fire fighting.

2. The fire extinguishers located in the San Juan Plant process areas, compressor buildings, process buildings, and company vehicles are typically a 20# Ansul dry chemical fire extinguisher.

3. The San Juan Plant does not have a fire water system, but only a utility water system that is not designed for fire fighting.

N. PLANT EMERGENCY RESPONSE

1. OBJECTIVE

The initiation of an emergency response at the San Juan River Gas Plant shall be in accordance with Section D.1. Emergency Notification Evacuation Plan and Section G. Emergency Response Organization of this contingency plan.

All San Juan River Gas Plant employees shall be prepared to respond to an emergency at the plant. Anadarko shall ensure that all employees are supplied with the training, tools, and materials necessary to meet any emergency that may occur. These functions include, but are not limited to:

a) Avoidance of loss of life
b) Minimization of personal injury
c) Protection of the public
d) Protection of the environment
e) Safe restoration of service

2. RESPONSIBILITY

a) The responsibility for all immediate actions in response to an emergency rests with the Plant Superintendent, or his designee. The Plant Superintendent or his designee shall determine:

   1) Plant Shutdowns
   2) Isolation of pipeline segments
   3) Repairs, tests or restarts as required

b) If an emergency occurs, the Plant Superintendent, or his designee, shall be notified first. The Plant Superintendent, or his designee, shall notify Anadarko's Office in The Woodlands, Texas

3. SITE EVACUATION

a) In the event of an emergency response and evacuation, all personnel in the plant complex shall stop work and immediately proceed to the designated emergency assembly area.

b) The plant complex emergency assembly area shall be designated as the parking area on the eastside of the Plant Superintendent Office Building.

c) Roll call shall be conducted at the emergency assembly area to assure all personnel have evacuated safely.

4. EVENTS REQUIRING AN IMMEDIATE RESPONSE

a) Gas detected inside or near a building
b) Fire located near or directly involving a process unit
c) Explosion occurring near or directly involving a process unit
d) Accidental release of hazardous liquid or gas
e) Operational failure causing a hazard

f) Natural disaster
g) Line rupture
h) Leak in the plant
   1) Unusual or unexpected fluctuations in pressure and flow
   2) Whenever the mass balance is calculated short
   3) Evidence of leak by aerial or surface inspections
   4) Reports of a leak by the public
i) Uncontained Spills
j) Acts of Sabotage
k) Other deviations, fluctuations, or releases that cannot be controlled

5. INITIAL REPORTING AND NOTIFICATION

When an employee discovers or is notified of an emergency situation that requires a prompt and effective response, employee shall obtain at a minimum the following information:

a) Name, telephone number, and location of person reporting the situation.
b) Type and severity of the emergency.
c) Location of the emergency (area/block, mile markers, latitude & longitude, or building), and the distance to surrounding equipment and/or structures.
d) If a spill exists, give the cause of the spill or leak, name and quantity of material released, and extent of the affected area including the degree of environmental hazard.
e) Description of injuries and report of damage to property and structures

Initiate and maintain a Chronological Record of Events log. This record should record the time, date, and a summary of the event. Examples of events are, but are not limited to: activated ESD, isolated valve sections, call for assistance, call for local and/or medical emergency assistance, arrival of emergency response groups, contact regulatory agencies, and other pertinent activities and information.

6. INITIAL RESPONSE

The first employee or employees arriving at an emergency location should survey the situation and update the Plant Superintendent, or his designee. The Plant Superintendent shall give instructions on controlling the hazardous condition.

CAUTION: At no time shall personnel place themselves or are placed in a life threatening situation.

The following actions must be taken to control the emergency until additional help can be summoned:

Possible Emergency Condition	Action Required
Fire / Explosion	Activate Emergency Response Plan
High gas levels in enclosed areas	Activate Emergency Response Plan
High smoke levels in enclosed area	Activate Emergency Response Plan
Any other hazardous condition	Activate Emergency Response Plan
Excess pressure in vessels or pipeline	Reduce Pressure
Excess pressure in compressor	Reduce Pressure
Rupture of process line or pipeline	Activate ESD and/or Shutdown Pipeline

The following steps shall also be taken until additional help can be summoned:

a) Evacuate personnel to a safe distance and promptly summon first-aid and medical responders, as required.

b) Ensure that the facility has been shut-in properly and that no sources of hydrocarbons (gas or liquid) are entering the plant complex

c) Do not start or stop any mechanical equipment, operate any switches, or do anything else that could cause a spark unless a portable gas detector has confirmed the area to be free from an explosive atmosphere.

d) Take necessary steps to block off the area to unauthorized vehicles and pedestrians.

e) Ambulance services, ground and/or air, should be requested, as required.

f) Isolate and blowdown damaged sections of the process or pipeline if possible.

g) If there is any doubt regarding the isolation of the emergency in the plant, activate the plant emergency shutdown system (ESD). Depending on the location of the emergency, a total plant or a partial plant ESD can be activated.

h) If escaping vapors have been ignited, the vapors should be allowed to continue to burn unless the fire endangers personnel, other property, or other equipment.

i) Maintain communication with the Plant Superintendent, or his designee, to keep him up-to-date of the situation and the action taken prior to his arrival at the location.

j) Initiate and maintain a Chronological Record of Events log. This record should record the time, date, and a summary of the event. Examples of events are, but are not limited to: activated ESD, isolated valve sections, call for assistance, call for local and/or medical emergency assistance, arrival of emergency response groups, contact regulatory agencies, and other pertinent activities and information.

7. WORK ZONE CLASSIFICATIONS

a) HOT WORK ZONE

1) The Hot Work Zone shall be defined as a circle with the center located at the point of release with a radius of 50 ft. in all directions.

2) The Hot Work Zone shall additionally extend to a point outside the gate between the shop and the Maintenance/Safety Office Building.

3) Only essential responder personnel may enter the Hot Work Zone at the direction of the On-Site Incident Commander.

4) At the discretion of the On-Site Incident Commander, the Hot Work Zone radius may be revised.

5) Wind directions indicators are installed throughout the plant, and at least one wind indicator can be seen from any point in the plant

b) WARM WORK ZONE

1) The Warm Work Zone shall be defined as a circle with the center located at the point of release with a radius of 200 ft. in all directions.

2) The Warm Work Zone shall additionally extend to point on the west end of the Plant Superintendent Office Building.

3) Only essential responder personnel and standby responder personnel may enter the Warm Work Zone at the direction of the On-Site Incident Commander.

4) At the discretion of the On-Site Incident Commander, the Warm Work Zone radius may be revised.

5) Wind direction indicators are installed throughout the plant, and an additional wind direction indicator is located near the Plant Superintendent Office Building

c) COOL / SAFE WORK ZONE

1) The Cool/Safe Work Zone shall be defined as all areas outside the defined limits of the Hot Work Zone and the Warm Work Zone.

2) All non-essential personnel and responders must remain in the Cool/Safe Work Zone.

3) All essential and non-essential personnel must check-in and sign-in at the Cool/Safe Work Zone. After check-in and sign-in, essential responder and standby essential responders will be identified by the On-Site Incident Commander and the Safety Officer and permitted access to either the Hot Work Zone or the Warm Work Zone.

4) At the discretion of the On-Site Incident Commander, the Cool/Safe Work Zone radius may be revised. The Cool/Safe Work Zone may be extended to the property line near County Road 6500 in order to have additional space for parking standby vehicles, equipment, and machinery.

d) SITE SECURITY

1) In order to have an accurate listing of all personnel on-site in the event of an emergency, a daily sign-in log sheet shall be utilized. The sign-in log sheet shall include at a minimum the person's name, the company name, the time of arrival, and the time of departure.

2) The On-Site Incident Commander shall be responsible to assure that all personnel sign-in upon arrival and sign-out upon departure from the job site.

3) The On-Site Incident Commander may at his discretion assign the responsibilities for the daily sign-in log sheet to the individual designated as the Record Keeper or another designee.

4) At the discretion of the On-Site Incident Commander, a security coordinator and/or a security team may be established, and the access to the job site restricted.

e) FIRST-AID STATION

1) A designated location for a First-Aid Station shall be identified by the On-Site Incident Commander or the Safety Officer.

2) The location of the First-Aid Station shall be located in the Cool/Safe Work Zone.

3) A first-aid kit is located in the Plant Superintendent Office Building, the Maintenance/Safety Office Building, and each Anadarko company vehicle.

4) Each Contractor shall provide a first-aid kit and shall have a least one person trained in first-aid.

5) At the discretion of the On-Site Incident Commander, a Medic may be provided.

f) MEDIA SITE

1) The Media Site shall be at the property line near County Road 6500.

2) At no time shall any representative from the media be allowed any closer to the plant complex than the Media Site location, unless approved by the On-Site Incident Commander, the Safety Officer, and the Media Relations Officer.

3) If allowed, the media representative must be escorted at all times by the On-Site Incident Commander, the Safety Officer, or the Media Relations Officer.

g) CELLULAR TELEPHONES, CAMERAS, NON-INSTRINSICALLY SAFE EQUIPMENT

1) Non-intrinsically safe equipment shall not be permitted in the Hot Work Zone or the Warm Work Zone without prior approval by the On-Site Incident Commander and the Safety Officer.

2) No cameras are allowed in the plant complex beyond the Media Site without prior approval by the On-Site Incident Commander and the Safety Officer.

3) Cellular telephones and pagers will be permitted only in the Cool/Safe Work Zone without prior approval by the On-Site Incident Commander and the Safety Officer.

4) All cellular telephones and cellular telephone numbers shall be registered with the On-Site Incident Commander or the person designated as the Record Keeper.

5) All cellular telephones and pager devices shall be turned off when ordered by the On-Site Incident Commander. This may be based on an emergency response event or for the entire emergency response. This may also be inclusive of any or all Work Zones and Sites on the Plant Complex property.

h) SMOKING AREA

1) Anadarko prohibits smoking in company buildings, facilities, and well locations except in designated smoking areas.

2) The On-Site Incident Commander or the Safety Officer will designate safe smoking areas.

8. SAFETY MEETINGS / WORK PLANS

a. ON-SITE WORK PLANS

On-site work plans and procedures will be developed for each major task or portion of the project. Work plans will include special safety and environmental precautions and/or contingencies to be in-place before initiating the task or portion of the project.

b. SAFETY MEETINGS

A safety meeting shall be conducted at the beginning of each work day. A sign-in sheet shall be utilized and a brief description of the topics discussed. A review of the evacuation assembly locations, emergency signals, personal protective equipment, and an overview of the day's activities should be discussed. Additional topics specific to the job may also be reviewed.

c. TAILGATE SAFETY MEETINGS

Prior to starting any critical phase of the project, a tailgate or toolbox meeting shall be conducted. All personnel on the job-site that can be affected by the critical phase work shall be in attendance.

9. COMMUNICATIONS

a) EMERGENCY SIGNALS WITH A HORN

In the event of an emergency, a horn may be utilized to provide signals to evacuate an area or the job site. If the emergency response horn is utilized, the following horn signals shall be used:

1) Intermittent Horn Blasts

   All personnel leave the **Hot Work Zone**

2) Continuous Horn Blast

All personnel leave the **Hot Work Zone and Warm Work Zone**. All personnel proceed to the site emergency assembly area. Conduct a roll call and account for all personnel

b) HAND SIGNALS

1) Standard hand signals shall be utilized. The On-Site Incident Commander and On-Site Person-In-Charge shall determine if the job site is safe to continue with the planned activity while utilizing only hand signals for communications.

2) Description of Hand Signals
   (a) Hand Gripping Throat – Out of air / Cannot breath
   (b) Grip Partners Wrist or Both Hands Around Waist – Leave area immediately
   (c) Hands on Top of Head – Need assistance
   (d) Thumbs Up – OK, I'm all right, I understand
   (e) Thumbs Down – No, Negative

c) TELEPHONE, CELLULAR, & PAGER COMMUNICATIONS

1) Telephone Communication

   If a command center or centers have been setup on-site, telephone communication equipment may be available in these locations.

2) Cellular & Pager Communication

Refer to Section K.7.g above regarding the requirements and usage of cellular telephones and pagers.

10. CONTROL OF RELEASED HYDROCARBON LIQUIDS OR SPILL

a) If an oil or condensate spill occurs, the employee shall immediately notify the Plant Superintendent, or his designee. Refer to the Anadarko Southern Region Emergency Response & Oil Spill Contingency Plan Manual for spill response.

b) The Plant Superintendent, or his designee, will take immediate action of all facts and conditions pertaining to the spill and initiate preventative or clean-up measures.

c) The Plant Superintendent will contact additional Anadarko personnel per the requirement as defined in the Incident Levels of Response as identified in the Anadarko Southern Region Emergency Response & Oil Spill Contingency Plan Manual.

d) The Plant Superintendent, or his designee, will coordinate containment measures, and activate appropriate contract personnel that are trained and have the necessary equipment to deploy for pollution control and containment.

e) Dispersants are not allowed without government approval.

11. VAPOR CLOUDS AFTER RELEASE OF VOLATILE MATERIALS

a) If a release involves a highly volatile liquid, the Plant Superintendent, or his designee, will arrange for gas detection instruments to evaluate the extent and severity of the resulting vapor cloud and to determine the hazardous areas. All possible attempts shall be made to barricade the area to prevent any vehicles from driving into the vapor cloud.

b) If an uncontrolled fire or other extremely dangerous situation occurs, the best action shall be evacuation. All personnel shall report to the designated plant emergency assembly area. The designated plant emergency assembly area shall be the parking area on the eastside of the Plant Superintendent Office Building.

c) If necessary, the local fire and law enforcement officials will halt vehicle traffic at pre-designated barricade points and evacuate nearby public places or businesses to minimize exposure. Any actions to protect the public shall be coordinated with the local fire and law enforcement officials.

12. CONTACT & COORDINATION WITH GOVERNMENT ORGANIZATIONS

a) All phases of an emergency response shall be coordinated through the Plant Superintendent acting as the On-Site Incident Commander and the Incident Commander located in Anadarko's Emergency Response Center in The Woodlands Office.

b) The Incident Commander in the Anadarko Emergency Response Center shall coordinate response operations with all governmental agencies according to the location and type of emergency situation.

c) The listing of governmental agencies that may be notified are tabulated in Sections C, D, E, & F of Appendix F —The Emergency Call List.

13. RESCUE PERSONNEL

a) Based on the emergency and at the direction of the Plant Superintendent acting as the On-Site Incident Commander, rescue and medical responder shall be called and requested to respond to the plant location.

b) If the emergency does not require an immediate response to the plant location, the Plant Superintendent acting as the On-Site Incident Commander, or his designee, shall contact rescue and medical responder personnel and advise them of the emergency and request them to be in a stand-by mode.

c) The listing of rescue and medical responder agencies that may be notified are tabulated in Sections C & D, of Appendix F —The Emergency Call List.

14. CONTRACT AND REPAIR PERSONNEL & EQUIPMENT

a) Based on the emergency and at the direction of the Plant Superintendent acting as the On-Site Incident Commander, repair personnel and equipment suppliers shall be contacted.

b) The listing of rescue and medical responder agencies that may be notified are tabulated in Section G of Appendix F —The Emergency Call List.

c) In the event that certain contractors or equipment suppliers cannot be identified or additional responders and/or equipment and supplies are required, the On-Site Incident Commander shall request the Incident Commander in the Anadarko Emergency Response Center and his Operation and Logistic Chiefs to identify and contact additional required contractors and suppliers.

15. REPAIR & STARTUP PROCEDURES OF EQUIPMENT

a) All repairs shall be made in accordance with accepted industry standards.

b) All repairs and start-up procedures of the affected process or equipment shall be in compliance with the Anadarko and San Juan River Gas Plant Process Safety Management Program and Procedures. The Anadarko and San Juan River Gas Plant Process Safety Management Program and Procedures are based on OSHA Standard "Process Safety Management of Highly Hazardous Chemicals" dated February 24, 1992 and published in Title 29 of the Code of Federal Regulations Part 1910.119

16. POST INCIDENT REVIEW

a) After the emergency response action has been terminated and normal operations have resumed, a review shall be conducted to determine the effectiveness of response and procedures.

b) The review shall include, but not be limited to, the following:

1) A summary of the incident.
2) A review of the Plant Operator actions prior to and during the release.
3) Was the emergency response plan implemented in a timely and efficient manner?
4) Were evacuation alarms activated, escape routes followed and accounting of all personnel conducted?
5) Did San Juan Plant personnel understand their responsibilities and activities?
6) Were public and businesses affected and notified in a timely manner?
7) Were the proper authorities and agencies notified in a timely manner?
8) Were proper procedures and checklists followed by the emergency response team and were they effective in resolving the incident? This includes the San Juan River Plant Gas Plant Hydrogen Sulfide Contingency Plan, the Anadarko Southern Region Emergency Response/Oil Spill Contingency Plan, and the Anadarko and San Juan River Gas Plant Process Safety Management Program and Procedures Manuals.
9) Was the correct personal protective equipment (PPE) available and used?
10) How could the San Juan River Plant Gas Plant Hydrogen Sulfide Contingency Plan, the Anadarko Southern Region Emergency Response/Oil Spill Contingency Plan be changed to increase effectiveness?
11) Are there any environmental, health, and/or safety issues or concerns that need to be addressed?
12) Were there any communication issues that need to be addresses? Examples may be 2-way radios, cellular phones, fax machines, computer access, etc.

13) Were the necessary emergency response personnel in the Anadarko Emergency Response Center in The Woodlands available and supportive? This would include logistics, planning, agency contacts, agency reports, media support, etc.
14) Were the necessary contractor services available and mobilized in a timely manner?
15) Were the necessary vendor supplies and materials available and able to provide materials in a timely manner?
16) Were necessary financial approvals readily available?

c) The incident review should include positive events and procedures, as well as, the shortcomings.

d) The post incident review shall be completed within ten (10) working days after the operations have returned to normal.

e) The post incident review shall be document and filed according to the Anadarko and San Juan River Gas Plant Process Safety Management Program and Procedures Manuals.

f) If the Anadarko Emergency Response Center in The Woodlands participated in the emergency response, an additional post incident review shall be scheduled and completed in a timely manner. Similar review items as stated above should be reviewed with The Woodlands emergency response team.

O. PERSONAL PROTECTIVE EQUIPMENT

1. GENERAL

a) The San Juan River Gas Plant complies with the Anadarko Petroleum Corporation requirements for personal protective equipment as stated in the Anadarko Safety Manual and Safety Program Manuals.

b) The Anadarko specified personal protective equipment shall be designed per industry standards (i.e. ANSI, ASME, NFPA, etc.) and in compliance with Federal, State, and Local regulations.

c) The person performing a job task shall have been trained by that person's company in the correct procedures to perform the job, understand their company's policies, and the appropriate use of the necessary personal protective equipment.

2. ANADARKO MINIMUM REQUIREMENTS

a) The minimum Anadarko personal protective equipment requirements are as follows:

1) Hard Hat

(a) Not acceptable are: bump cap style or cowboy hat style hardhats.
(b) Metal hardhats are typically not acceptable, but under certain emergency responses metal is the preferred hard hat. The On-Site Incident Commander will review the emergency response scope and can provide permission to wear metal hardhats.
(c) Wearing a hard hat backward is not acceptable.

2) Safety-toed Footwear

(a) Tennis shoe style or mesh style safety-toed footwear is unacceptable.
(b) Steel or composite toe material is acceptable.
(c) Footwear must provide ankle coverage.

3) Safety Glasses with side-shields

(a) Only non-conductive safety glasses shall be worn when working on or near electrical equipment. If necessary, goggles or a face shield may be used to cover conduction eye glass frames if the glasses cannot be replaced with non-conductive framed glasses.

4) Clothing at a minimum shall include shirts with shoulder coverage and full length pants. Synthetic material or nylon material shall not be worn.

b) The above minimum personal protective equipment must be worn when on location at the San Juan River Gas Plant and outside of the office or vehicle. An exception would be when located in the office parking lot and not performing any job task. When using a plant utility vehicle (a Kawasaki Mule or equivalent), all minimum personal protective equipment must be worn.

3. EMERGENCY RESPONSE REQUIREMENTS

The following summary of personal protective equipment is the minimum equipment that is required in each Work Zone. Additional personal protective equipment may be required depending on the work or activity being performed, and regardless of the Work Zone.

a) HOT WORK ZONE

1) The basic personal protective equipment is as follows:

- Hard Hat
- Safety-toed footwear
- Eye Protection – basic type is safety glasses with side shields
- Hand Protection – type to be determined by work activity
- Hearing Protection if activity exceeds 85 dbA
- Clothing at a minimum shall include shirts with shoulder coverage and full length pants

2) Depending on the work activity, the following additional personal protective equipment may be required.

- Flame retardant clothing
- Respirators – Self-Contained Breathing Apparatus (SCBA's) or Supplied Air Work Units
- Fall Protection
- Eye Protection – Goggles, Face Shield, Welder's Helmet, etc.

b) WARM WORK ZONE

1) The basic personal protective equipment is as follows:

- Hard Hat
- Safety-toed footwear
- Eye Protection – basic type is safety glasses with side shields
- Hand Protection – type to be determined by work activity
- Hearing Protection if activity exceeds 85 dbA
- Clothing at a minimum shall include shirts with shoulder coverage and full length pants

2) Depending on the work activity, the following additional personal protective equipment may be required.

- Flame retardant clothing
- Respirators – Self-Contained Breathing Apparatus (SCBA's) or Supplied Air Work Units
- Fall Protection
- Eye Protection – Goggles, Face Shield, Welder's Helmet, etc.

c) COOL / SAFE WORK ZONE

1) The basic personal protective equipment is as follows:

- Hard Hat
- Safety-toed footwear
- Eye Protection – basic type is safety glasses with side shields
- Hand Protection – type to be determined by work activity
- Hearing Protection if activity exceeds 85 dbA
- Clothing at a minimum shall include shirts with shoulder coverage and full length pants

P. TRAINING

The following is a summary of the training requirements at the San Juan River Gas Plant, but is not intended to be an all inclusive list of training received by the plant personnel. Additionally, training records for attendance and content are maintained at the San Juan Plant.

1. Plant Orientation Training

   a) All plant personnel, visitors, and contractors must attend a plant overview orientation prior to obtaining permission to enter the plant. The plant orientation training refresher is required by all persons on an annual basis. This training also complies with the requirements of the Anadarko and San Juan River Gas Plant Process Safety Management Program and Procedures Manuals.

2. Hydrogen Sulfide Training

   a) All San Juan Plant personnel receive annual refresher training on hydrogen sulfide. The training also includes training on sulfur dioxide. This training is conducted in-house, but if an individual is unable to attend, they may be required to attend a third party training session. Current hydrogen sulfide training cards are provided as part of the training session.

   b) All contract employees and visitors are required to have had hydrogen sulfide training and to provide the San Juan Plant a copy of their certification card prior to obtaining permission to enter the plant.

3. Respirators

   a) For emergency purposes, the plant maintains self-contained breathing apparatuses (SCBA;s) in the San Juan Plant. All San Juan Plant personnel with the exception of the Plant Operations Specialist are trained annually on respirators. In addition to the annual training, the personnel are fit tested annually on the respirators and have medical clearance. Medical clearance review is conducted on a bi-annual basis unless the individual has experienced medical problems and requires updating the medical clearance.

4. Hazard Communication

   a) All San Juan Plant personnel are trained annually on Hazard Communication and their right-to-know. the annual training includes material safety data sheets, and labeling.

5. Personal Protective Equipment

   a) All San Juan Plant personnel are trained annually on the Anadarko requirements for personal protective equipment. Additionally, the training includes all the types of personal protective equipment and how to select the right equipment for the job.

6. Fire Fighting

   a) All San Juan Plant employees are trained annually on fire fighting techniques using portable fire extinguisher. Included are the types of fires and the proper extinguishers for the fire

7. Permit-To-Work Permits

   a) All San Juan Plant personnel are trained annually on the Anadarko permit-to-work procedure and form. The permit-to-work permit is required for all work conducted within the San Juan Plant for compliance with the Anadarko and San Juan River Gas Plant Process Safety Management Program and Procedures Manuals.

8. Hot Work Permits

   a) All San Juan Plant personnel are trained annually on the Anadarko hot work permit program and form. Included in the training are steps to identify what is defined as hot work and when a permit is required.

9. Lockout / Tagout Requirements

    a) All San Juan Plant personnel are trained annually on the Anadarko lockout/tagout procedure requirements.

10. Electrical Safety Awareness

    a) All San Juan Plant personnel are trained annually on general electrical safety awareness. This awareness training does not certify any employees to perform work on electrical systems. Third party training is utilized for select individuals that have job requirements to troubleshoot or work on electrical and instrumentation systems.

11. Fall Protection

    a) All San Juan Plant personnel are trained annually on fall protection. This includes the usage and equipment. Fall protection equipment is provided in the San Juan Plant.

12. Confined Space

    a) All San Juan Plant personnel are trained annually on confined space and the Anadarko confined space form. San Juan Plant personnel are not trained on permit required confined space entry.

13. Medic First-Aid

    a) All San Juan Plant personnel are trained bi-annually on the Medic first-aid program. The training is conducted with an in-house certified trainer, but if an individual misses the training, they are required to attend a third party training session.

14. Bloodborne Pathogens

    a) All San Juan Plant personnel are trained annually on bloodborne pathogens

15. Hearing Safety

    a) All San Juan Plant personnel are trained annually on hearing safety. Additionally all plant operations and maintenance personnel are included in the Anadarko hearing program and are required to participated in an annual hearing test conducted by a third party.

16. Excavation

    a) All San Juan Plant personnel are trained annually on excavations. This includes all phases of excavation and completion of the Anadarko excavation form.

Q. EMERGENCY RESPONSE DRILLS

1. In order for personnel to understand their responsibilities and required activities in the event of an emergency, training drills are conducted at least annually. Multiple drills during the year may be scheduled at the discretion of the Plant Superintendent or as part of the Emergency Response Center in The Woodlands drill.
2. At a minimum, drills shall be tabletop exercises. The Plant Superintendent can require the drill to include role playing and request participation from Contractors and local area emergency responder personnel.
3. Drill training will be documented and filed at the San Juan Plant. The documentation shall include at a minimum the following:

    a) Description or scope of the drill, including date and time
    b) Attendees and Participant to the drill
    c) Summary of activities and responses
    d) Post drill audit

R. CONTINGENCY PLAN REVISIONS

1. The San Juan River Gas Plant Hydrogen Sulfide Contingency Plan shall be reviewed based on the following schedule:

    a) If no known changes have occurred, the Plan will be reviewed annually for content and accuracy.

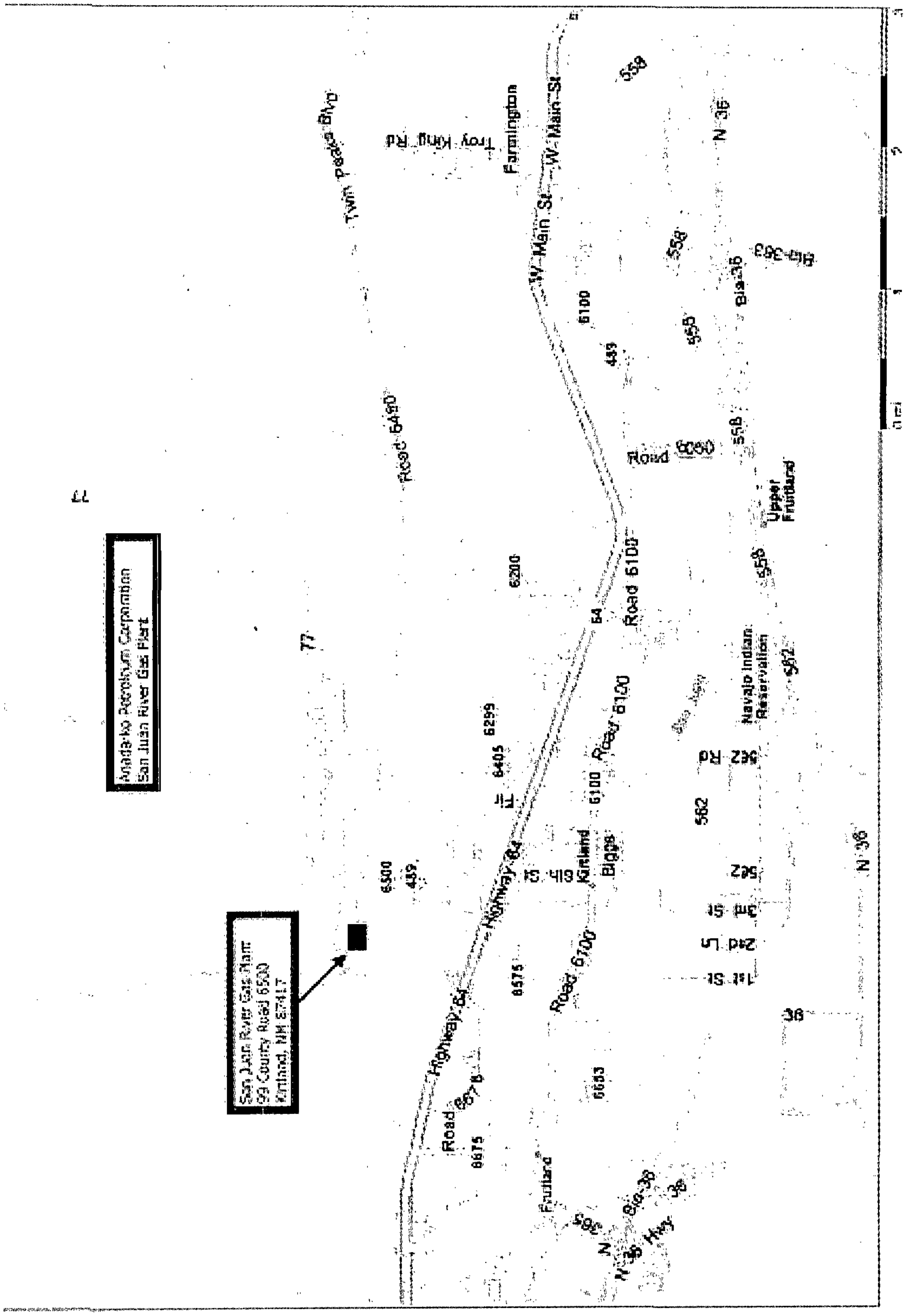
b) The Plan will be reviewed and revised as necessary due to an addition, deletion, or modification to any of the San Juan River Plant processes or equipment.

c) The Plan will be reviewed and revised as necessary due to an addition, deletion, or modification of a public place including roads, business, or resident within the calculated radius-of-exposures. Modifications would include revising names for residences or businesses bought or sold.

APPENDIX A

SAN JUAN RIVER GAS PLANT

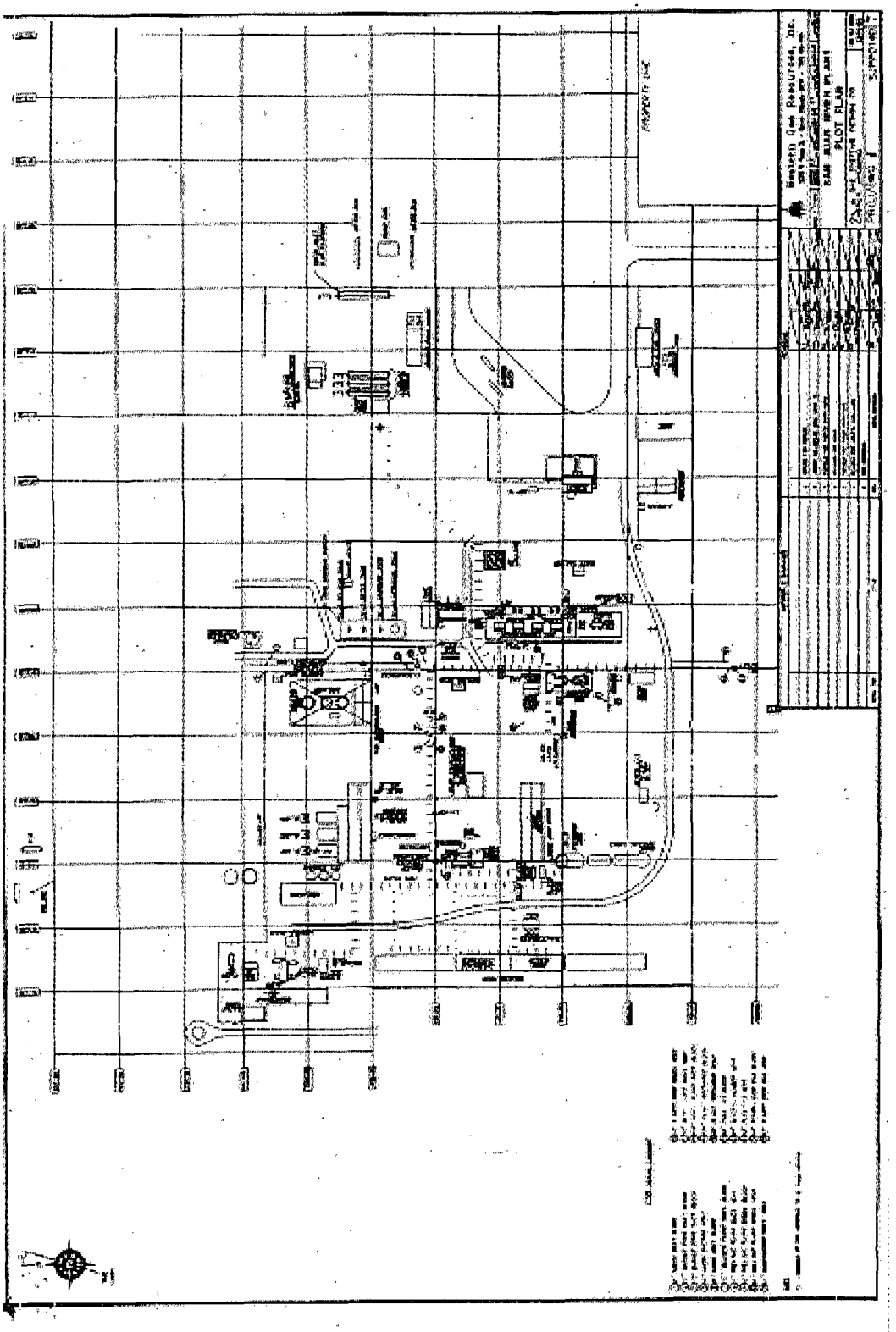
GENERAL LOCATION MAP


Anadarko Petroleum Corporation
San Juan River Gas Plant
San Juan River Gas Plant
99 County Road 6500
Kirtland, NM 87417
Farmington
Highway 64
Navajo Indian Reservation

APPENDIX B

SAN JUAN RIVER GAS PLANT

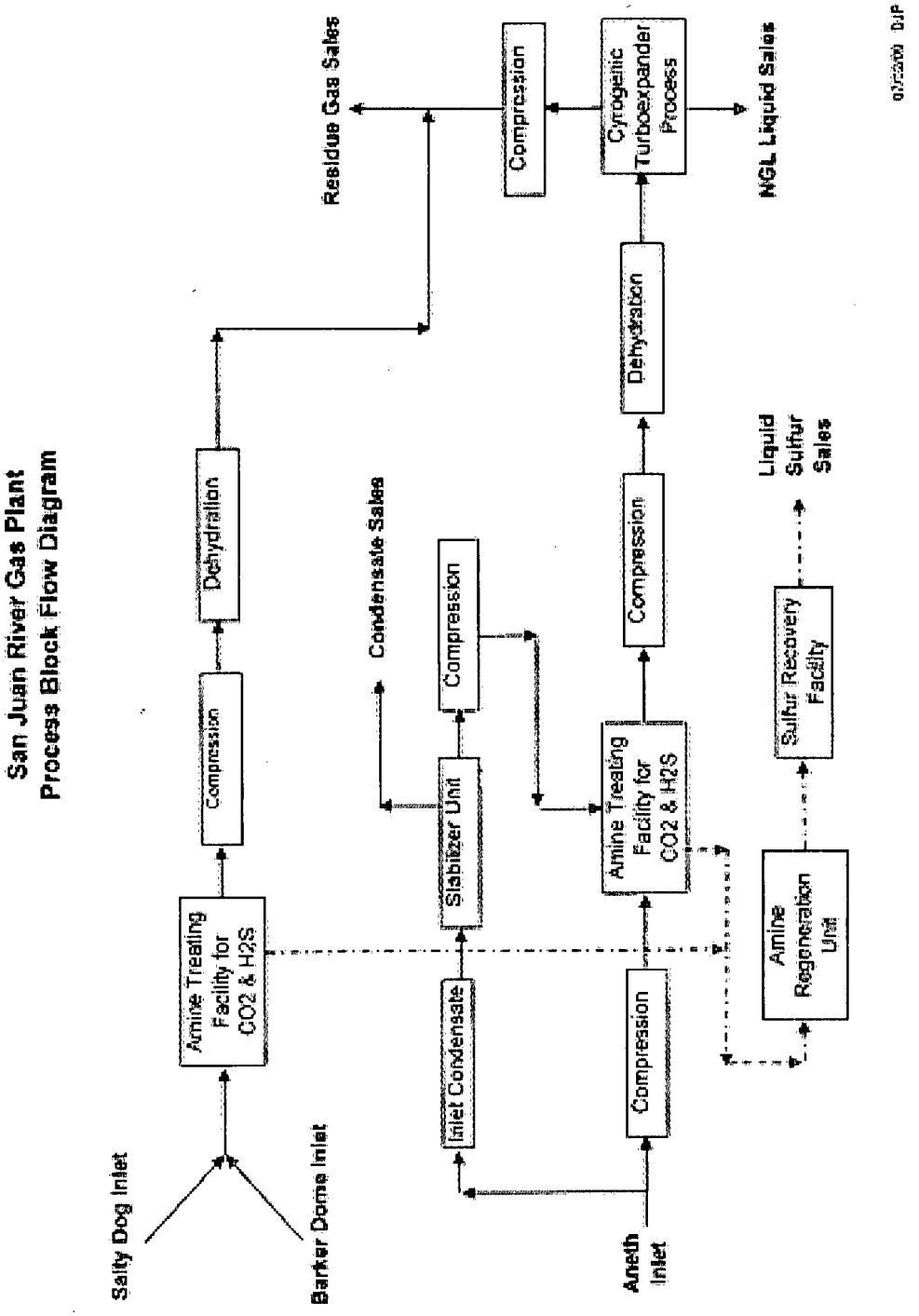
PLANT PLOT PLAN



APPENDIX C

SAN JUAN RIVER GAS PLANT

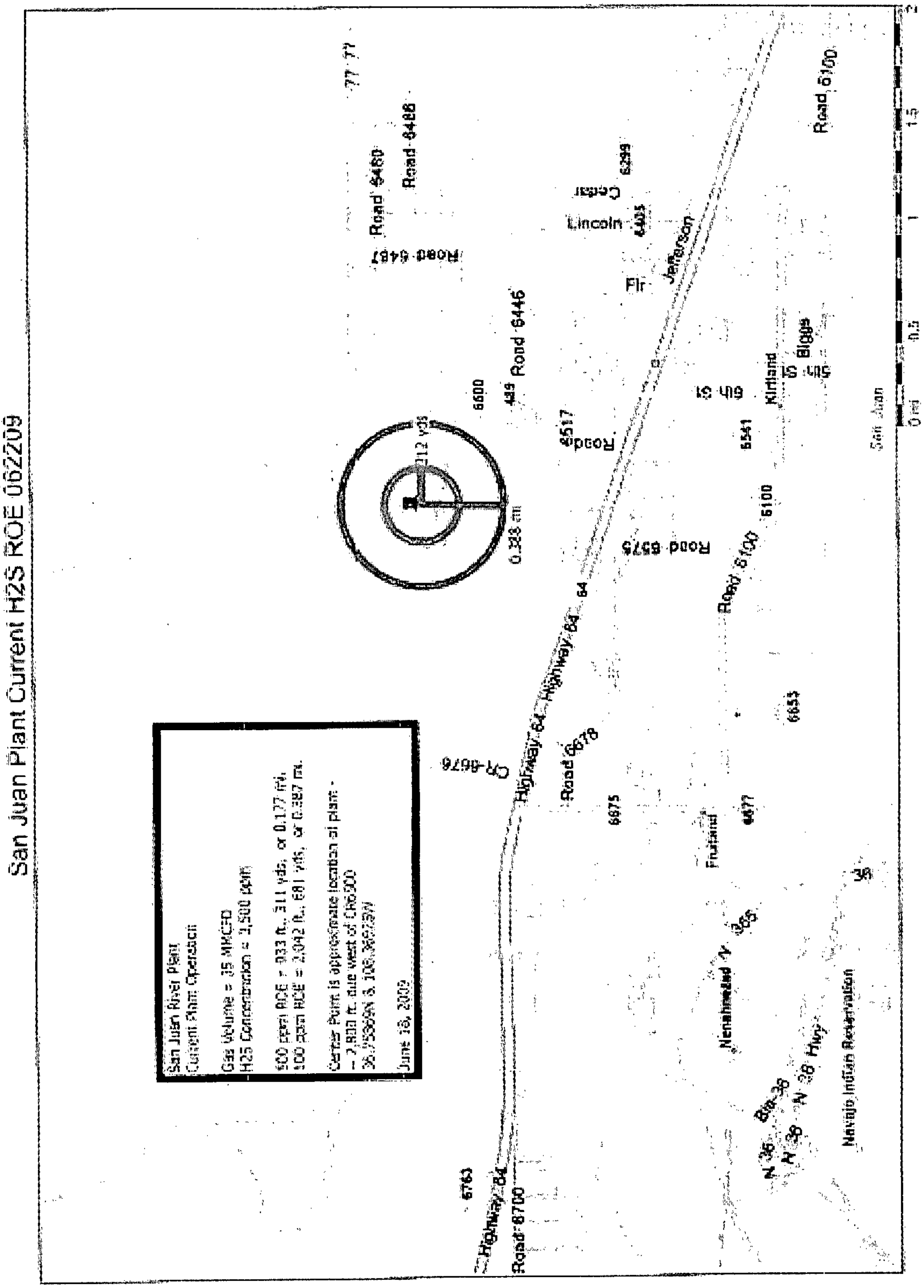
PLANT BLOCK FLOW DIAGRAM

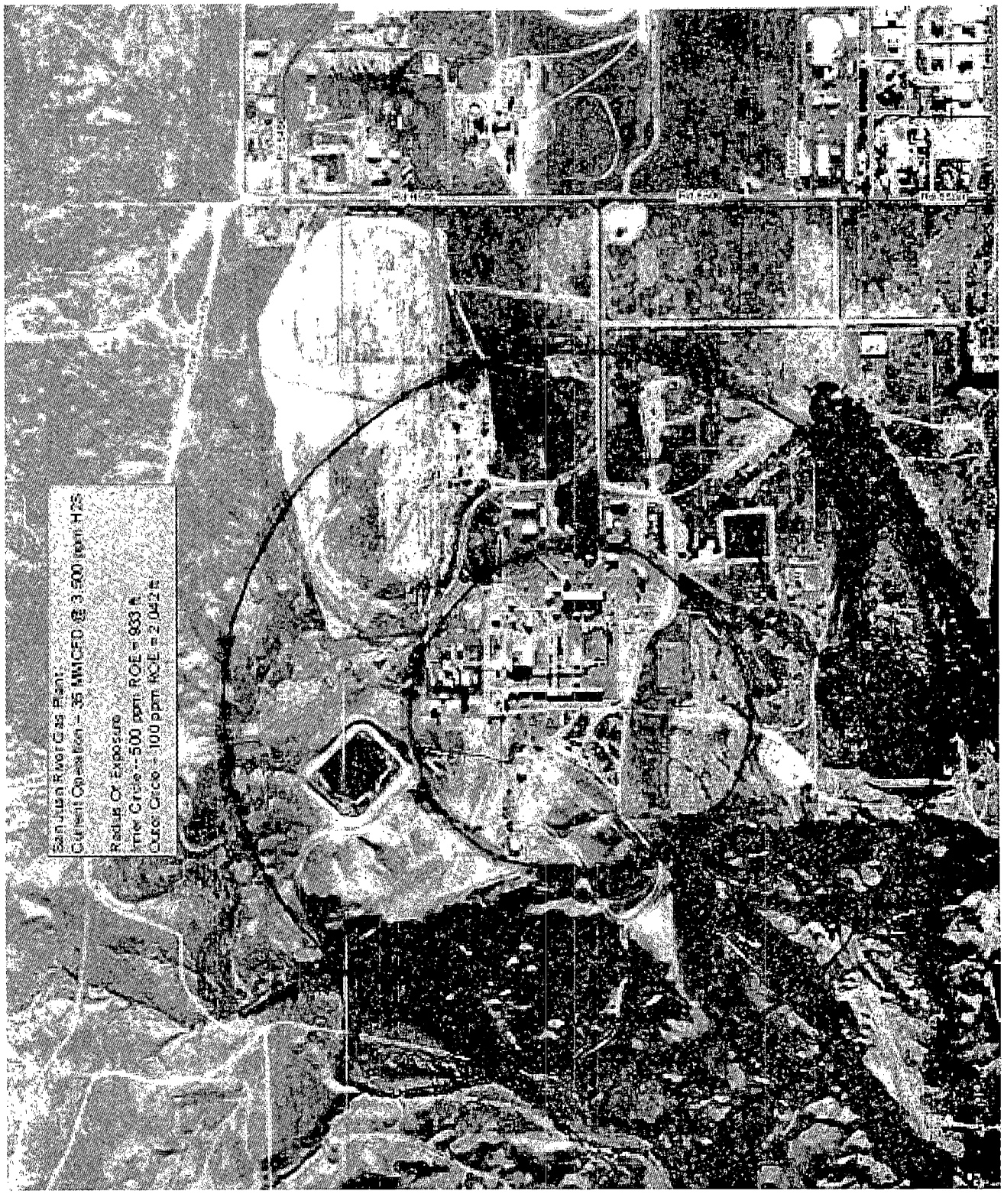

San Juan River Gas Plant
Process Block Flow Diagram
Salty Dog Inlet
Barker Dome Inlet
Amine Treating Facility for CO2 & H2S
Compression
Dehydration
Residue Gas Sales
Inlet Condensate
Stabilizer Unit
Condensate Sales
Compression
Compression
Aneth Inlet
Amine Treating Facility for CO2 & H2S
Compression
Dehydration
Cryogenic Turboexpander Process
NGL Liquid Sales
Amine Regeneration Unit
Sulfur Recovery Facility
Liquid Sulfur Sales

APPENDIX D

SAN JUAN RIVER GAS PLANT

RADIUS OF EXPOSURE MAP

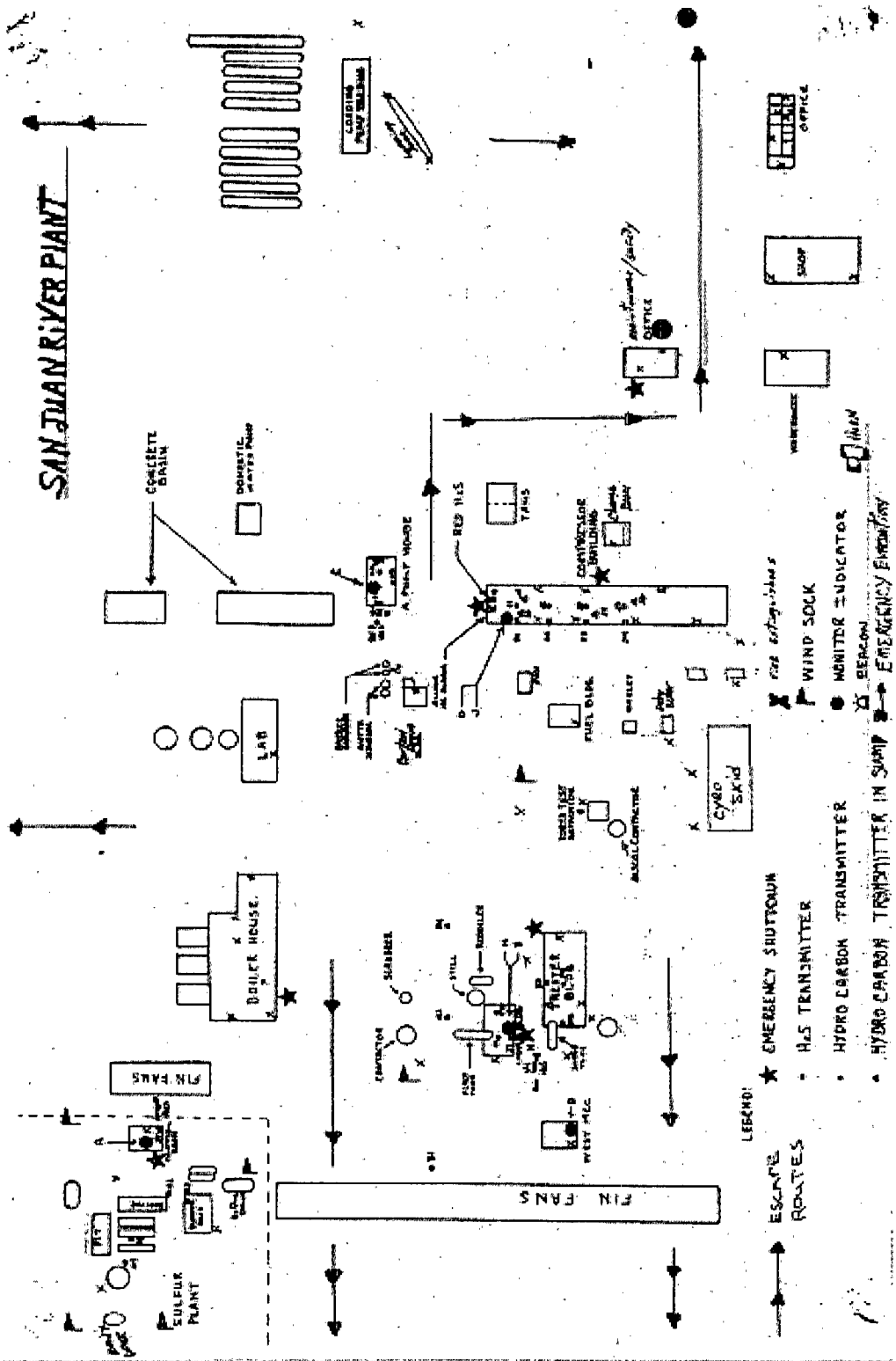

San Juan Plant Current H2S ROE 062209
Highway 64
Road 6446
Road 6100
Road 6575
Road 6480
Road 6488
Road 6487
Lincoln
Cedar
Jefferson
Kirtland
Fruitland
Navajo Indian Reservation
Road 6700
0.323 mi
San Juan River Plant
Current Plant Operation
June 16, 2009


San Juan River Gas Plant
Current Operation - 35 MMCFD @ 3,500 ppm H2S
Radius Of Exposure
Inner Circle - 500 ppm ROE = 933 ft
Outer Circle - 100 ppm ROE = 2,042 ft

APPENDIX E

SAN JUAN RIVER GAS PLANT

PLANT EVACUATION DIAGRAM


SAN JUAN RIVER PLANT
CONCRETE BASIN
DOMESTIC WATER PUMP
RED H2S
TANKS
CONTROL BUILDING
LAB
FUEL GAS
WATER
Cyclo Skid
BOILER HOUSE
SCRUBBER
STILL
REBOILER
FILTER BLDG.
CONDENSER
FLARE
FIN FANS
SULFUR PLANT
OFFICE
SHOP
WAREHOUSE
MAIN
BEACON
WIND SOCK
MONITOR INDICATOR
EMERGENCY SHUTDOWN
H2S TRANSMITTER
HYDRO CARBON TRANSMITTER
HYDRO CARBON TRANSMITTER IN SUMP
LEGEND
ESCAPE ROUTES

APPENDIX F

SAN JUAN RIVER GAS PLANT

EMERGENCY CALL LIST

ANADARKO PETROLEUM CORPORATION
SAN JUAN RIVER GAS PLANT
HYDROGEN SULFIDE CONTINGENCY PLAN

SAN JUAN GAS PLANT EMERGENCY CALL LIST

A. ANADARKO INTERNAL NOTIFICATIONS
SAN JUAN RIVER PLANT PERSONNEL

NAME	TITLE	OFFICE No.	CELLULAR No.	HOME No.
Kent McEvers	Plant Superintendent	505-598-5601 ext. 15523	505-860-7208	505-326-4054
Rick Fetch	Plant Foreman	505-598-5601 ext. 15522	505-947-2416	505-324-6441
Arlyn Thorson	Maintenance Foreman	505-598-5601 ext. 15524	505-947-2417	505-326-6718
Bob McClain	Plant Operator	505-598-5601 ext. 15542	505-330-1966	505-325-8715
Brenda Wilson	Sr. Operations Specialist	505-598-5601 ext. 15521		505-325-6525
Andrew Adame	Plant Operator			505-360-7051
Chee Anderson	Plant Operator			505-326-1397
Glen Daniell	Plant Operator		505-860-7483	505-632-9705
Curtis Day	Plant Operator			505-801-4404
Johnny Foster	Plant Operator			505-801-5062
Frank Hale	Plant Operator		505-860-5897	505-598-9091
Bobby James	Plant Operator			505-598-5314
Melvin Jim	Plant Operator			505-368-4733
Charlie Barr	Mechanic		505-324-1100	505-330-2614
Jerry Darnell	Fieldman			505-632-2722
Ted Francis	Fieldman			505-564-2999
Kent Galyon	Fieldman		505-860-1875	970-565-1006
William Golbe	Mechanic		505-215-2517	505-598-9716
Charlie Medders	Mechanic		505-947-7039	505-598-5573
Corwyn Yazzie	Mechanic		505-793-2567	505-327-3286
Bobby Turner	S & H Analyst	432-684-2805	432-230-4218	432-689-8750
Eric Weaver	EHS Analyst	432-684-2808	432-413-2494	432-756-3493

B. ANADARKO INTERNAL NOTIFICATIONS
CORPORATE PERSONNEL – THE WOODLANDS, TEXAS

NAME	TITLE	OFFICE No.	CELLULAR No.	HOME No.
Mario Reyes	Operations Mgr	832-636-3234	713-816-5006	281-360-1084
Mike Ross	General Mgr	832-636-3431	832-381-0923	281-296-0385
Tony Marques	Engineering Mgr	832-636-7368		
Chuck Johnson	Commercial Develop. Mgr	832-636-7119		
Julie Betik	Env & Reg Anal	832-636-2609	281-793-7705	281-320-2066
Jerry Adams	EHS Mgr	832-636-8304	281-731-5931	281-363-4693
David Ponikvar	S&H Mgr	832-636-3414	281-732-7887	281-374-8334
Mike Gray	EHS Director	832-636-2454	281-415-6964	936-271-9869

C. COUNTY & LOCAL LAW ENFORCEMENT

AGENCY	DAYTIME / 24 HR. PHONE No.
Law Enforcement Dispatch	**911**
San Juan County Sheriff	505-334-6622
Farmington Police	505-327-0222
Navajo Tribal Police	505-368-4333
Ute Mountain BIA	303-565-8471
New Mexico Highway Patrol	505-325-7547
New Mexico FBI	505-325-8631
San Juan County LEPC	505-334-1180
BLM Farmington Office	505-599-8900

D. MEDICAL SERVICES

AGENCY	EMERGENCY SERVICE	PHONE No.
Emergency Dispatch	Fire & Ambulance	**911**
San Juan County Fire Marshall	Fire Department	505-334-9431
San Juan Regional Medical Center	Hospital	505-325-5011
Emergency Trauma Lifeline Service - Farmington		505-325-5602
Dr. Robert C. Rhein	Doctor	505-327-4867
Dr. Ken Crider	Doctor	505-327-4439
San Juan Air Care Farmington	Air Ambulance	800-452-9990

E. FEDERAL NOTIFICATIONS

AGENCY	DAYTIME / 24 HR. PHONE No.
National Response Center	800-424-8802
EPA Region 8	800-227-8917
OSHA	800-321-6742
OSHA Area Office New Mexico	505-827-4230
DOT	800-424-8802
BLM Farmington	505-599-8900

F. NEW MEXICO STATE NOTIFICATIONS

AGENCY	DAYTIME / 24 HR. PHONE No.
New Mexico One Call	800-321-2537
New Mexico Oil Conservation Division	505-334-6178
New Mexico Environmental Department	505-476-4300
New Mexico Emergency Response Commission	505-476-9681
New Mexico Public Utilities Commission	505-490-2375
New Mexico State Patrol	505-325-7547

G. CONTRACTORS

CONTRACTOR	CONTACT	OFFICE No.	CELLULAR No.
Contractors - General			
IMI Construction		505-325-5005	
Weeminuche Construction	Benton Dean	970-565-7430	
Service Companies Supplies			
Noels Inc		505-327-3375	
ESSO Pipe & Supply		505-325-7568	
Air Gas		505-325-6660	
DXP	Steve Martinez	505-326-3333	
DeWees Tool & Supply		505-326-5491	
Emergency Response & Safety Services			
ChemTrec		800-424-9300	
Hands On Safety Service		505-325-4218	
Electrical Services			
Four Corners Electric		505-325-1459	
B&G Electric		505-325-7511	

H. OTHER PRODUCERS

COMPANY	CONTACT	OFFICE No.	CELLULAR No.
Burr Oil & Gas	Deana	505-325-1701	
Conoco/Burlington	Jerry Lodermilk		505-320-0452
	Renae	505-330-2946	
DJ Simmons Company	John Byrom	505-326-3753	
Elm Ridge Resources	Office	505-334-3476 ext 210	
	Terry Lindeman	972-749-6941	
El Paso Natural Gas		505-632-6000	
	Emergency Number	800-334-8047	
Nacogdoches Oil & Gas	Aaron	936-697-3750	
Resolute Natural Resources	Office	970-564-5200	
	Montezuma Creek	435-651-3682	
	Roger Atcitty		435-444-0001
Rim Southwest Corporation	Thelma Dee	435-651-4391	
XTO Energy Inc.	Office	505-324-1090	
	John Weaver		505-330-3278

APPENDIX E

H_2S CONTINGENCY PLAN
PURSUANT TO NMOCD RULE 118

H_2S Contingency Plan

Acid Gas Injection Facility
Anadarko San Juan River Gas Plant
Kirtland, New Mexico

April 2009

ANADARKO PETROLEUM CORPORATION
H_2S Contingency Plan
ANADARKO SAN JUAN RIVER GAS PLANT

TABLE OF CONTENTS

Anadarko Petroleum Corporation
Acid Gas Injection Facility
Anadarko San Juan River Gas Plant
Hydrogen Sulfide (H_2S) Contingency Plan

I. INTRODUCTION

Anadarko Petroleum Corporation conducts its business responsibly by providing employees and any other person working or visiting, a safe work place. The Anadarko San Juan River Gas Plant Hydrogen Sulfide Contingency Plan for acid gas injection (AGI) was developed to satisfy the Oil Conservation Division Rule 118; and paragraph 7.6 of the guidelines published by the API in its publication entitled "Recommended Practices for Oil and Gas Producing and Gas Processing Plant Operations Involving Hydrogen Sulfide," RP-55.

This plan provides guidelines to assist in responding to and managing an emergency in the event of an H_2S release from a pipeline or facility. The goals of this plan are to provide tools to enable an efficient, coordinated and effective response to emergencies. This plan contains written guidelines to evaluate and respond to an incident, and to prevent or minimize personal injury or loss, to avoid environmental hazards, and to reduce damage to property.

The Anadarko San Juan gas plant is located in the northern portion of the San Juan Basin near Kirtland, New Mexico, and encompasses approximately 320 acres in the northern half of Section 1, T29S, R15W in San Juan County, NM (see Figure 1).

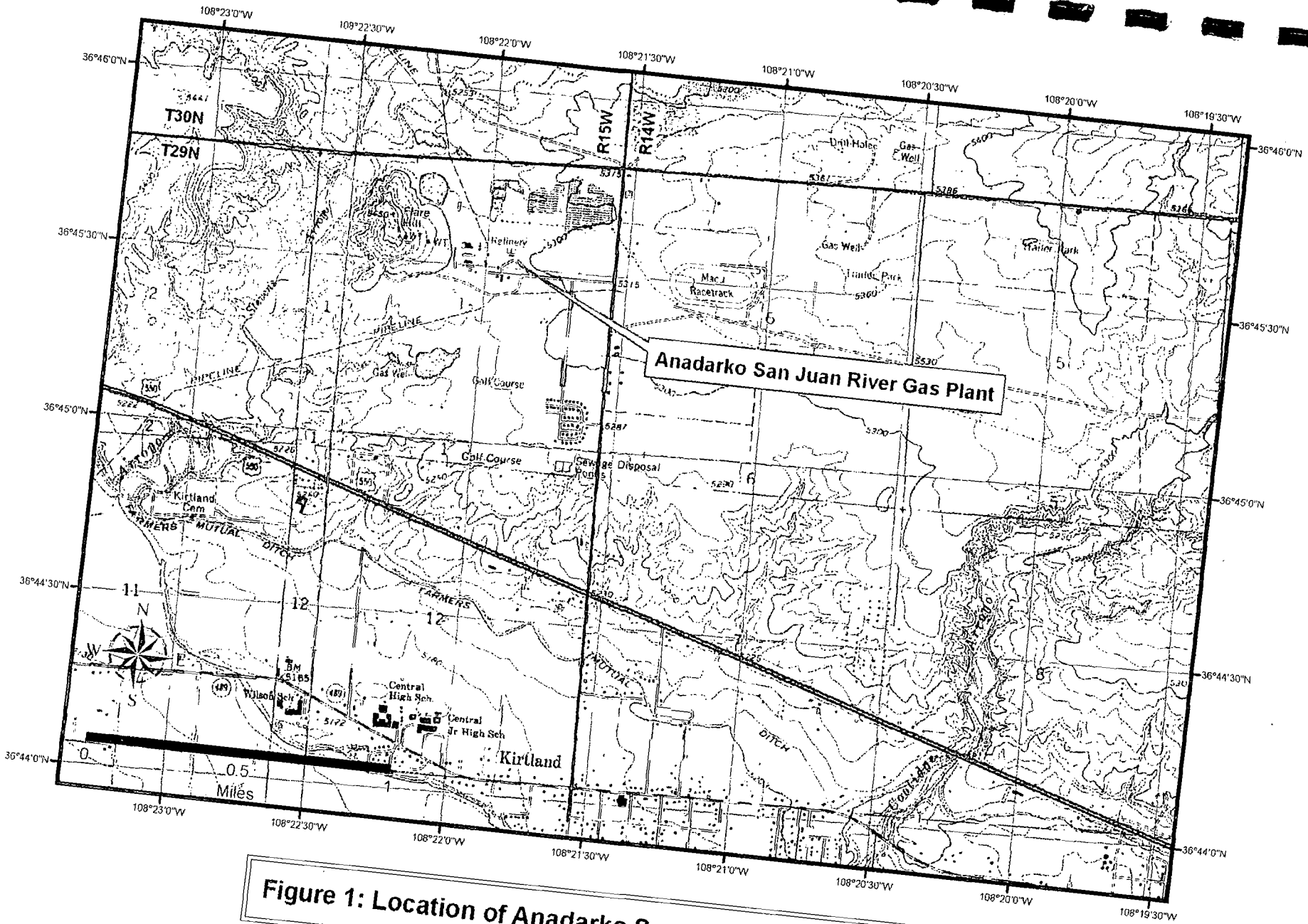


Figure 1: Location of Anadarko San Juan River Gas Plant

II. DEFINITIONS USED IN THIS PLAN

ANSI	The acronym "ANSI" means the American National Standards Institute.
API	The acronym "API" means the American Petroleum Institute.
Area of Exposure (AOE)	The phrase "area of exposure" means the area within a circle constructed with a point of escape at its center and the radius of exposure as its radius.
ASTM	The acronym "ASTM" means the American Society for Testing and Materials.
Dispersion Technique	A "dispersion technique" is a mathematical representation of the physical and chemical transportation characteristics, dilution characteristics and transformation characteristics of hydrogen sulfide gas in the atmosphere.
Division	The "division" return to the N.M. Oil Conservation Division.
Escape Rate	The "escape rate" is the maximum volume (Q) that is used to designate the possible rate of escape of a gaseous mixture containing hydrogen sulfide, as set forth herein. (a) For existing gas facilities or operations, the escape rate shall be calculated using the maximum daily rate of the gaseous mixture produced or handled or the best estimate thereof. For an existing gas well, the escape rate shall be calculated using the current daily absolute open flow rate against atmospheric pressure or the best estimate of that rate. (b) For new gas operations or facilities, the escape rate shall be calculated as the maximum anticipated flow rate through the system. For a new gas well, the escape rate shall be calculated using the maximum open flow rate of offset wells in the pool or reservoir, or the pool or reservoir average of maximum open flow rates. (c) For facilities or operations not mentioned, the escape rate shall be calculated using the actual flow of the gaseous mixture through the system or the best estimate thereof.
GPA	The acronym "GPA" means the Gas Processors Association.
LEPC	The acronym "LEPC" means the Local Emergency Planning Committee established pursuant to the Emergency Planning and Community Right-to-Know Act, 42 U.S.C. Section 11001.
NACE	The acronym "NACE" means the National Association of Corrosion Engineers.
PPM	The acronym "ppm" means "parts per million" by volume.
PHV	Potentially Hazardous Volume means the volume of hydrogen sulfide gas of such concentration that: (a) the 100-ppm radius of exposure includes any public area; (b) the 500-ppm radius of exposure includes any public road; or (c) the 100-ppm radius of exposure exceeds 3,000 feet.
Public Area	A "public area" is any building or structure that is not associated with the well, facility or operation for which the radius of exposure is being calculated and that is used as a dwelling, office, place of business, church, school, hospital, or government building, or any portion of a park, city, town, village or designated school bus stop or other similar area where members of the public may reasonably be expected to be present.
Public Road	A "public road" is any federal, state, municipal or county road or highway.

Radius of Exposure (ROE)

The radius of exposure is that radius constructed with the point of escape as its starting point and its length calculated using the following Pasquill-Gifford derived equation, or by such other method as may be approved by the division:

(a) For determining the 100-ppm radius of exposure: $X= [(1.589)(\text{hydrogen sulfide concentration})(Q)]^{(0.6258)}$, where "X" is the radius of exposure in feet, the "hydrogen sulfide concentration" is the decimal equivalent of the mole or volume fraction of hydrogen sulfide in the gaseous mixture, and "Q" is the escape rate expressed in cubic feet per day (corrected for standard conditions of 14.73 psia and 60 degrees F).

(b) For determining the 500-ppm radius of exposure: $X=[(0.4546)(\text{hydrogen sulfide concentration})(Q)]^{(0.6258)}$, where "X" is the radius of exposure in feet, the "hydrogen sulfide concentration" is the decimal equivalent of the mole or volume fraction of hydrogen sulfide in the gaseous mixture, and "Q" is the escape rate expressed in cubic feet per day (corrected for standard conditions of 14.73 psia and 60 degrees F).

Regulatory Threshold

(1) Determination of Hydrogen Sulfide Concentration.

(a) Each person, operator or facility shall determine the hydrogen sulfide concentration in the gaseous mixture within each of its wells, facilities or operations either by testing (using a sample from each well, facility or operation), testing a representative sample, or using process knowledge in lieu of testing. If a representative sample or process knowledge is used, the concentration derived from the representative sample or process knowledge must be reasonably representative of the hydrogen sulfide concentration within the well, facility or operation.

(b) The tests used to make the determination referred to in the previous subparagraph shall be conducted in accordance with applicable ASTM or GPA standards or by another method approved by the division.

(c) If a test was conducted prior to the effective date of this section that otherwise meets the requirements of the previous subparagraphs, new testing shall not be required.

(d) If any change or alteration may materially increase the concentration of hydrogen sulfide in a well, facility or operation, a new determination shall be required in accordance with this section.

(2) Concentrations Determined to be Below 100 ppm. If the concentration of hydrogen sulfide in a given well, facility or operation is less than 100 ppm, no further actions shall be required pursuant to this section.

(3) Concentrations Determined to be Above 100 ppm.

(a) If the concentration of hydrogen sulfide in a given well, facility or operation is determined to be 100 ppm or greater, then the person, operator or facility must calculate the radius of exposure and comply with applicable requirements of this section.

(b) If calculation of the radius of exposure reveals that a potentially hazardous volume is present, the results of the determination of the hydrogen sulfide concentration and the calculation of the radius of exposure shall be provided to the division. For a well, facility or operation existing on the effective date of this section, the determination, calculation and submission required herein shall be accomplished within 180 days of the effective date of this section; for any well, facility or operation that commences operations after the effective date of this section, the determination, calculation and submission required herein shall be accomplished before operations begin.

(4) Recalculation. The person, operator or facility shall calculate the radius of exposure if the hydrogen sulfide concentration in a well, facility or operation increases to 100 ppm or greater. The person, operator or facility shall also recalculate the radius of exposure if the actual volume fraction of hydrogen sulfide increases by a factor of twenty-five percent in a well, facility or operation that previously had a hydrogen sulfide concentration of 100 ppm or greater. If calculation or recalculation of the radius of exposure reveals that a potentially hazardous volume is present, the results shall be provided to the division within sixty (60) days.

III. CHARACTERISTICS OF HYDROGEN SULFIDE (H_2S) AND SULFUR DIOXIDE (SO_2)

Hazards of Hydrogen Sulfide

At normal atmospheric conditions, hydrogen sulfide (H_2S) is a colorless gas. It is commonly referred to by other names such as Rotten Egg Gas, Acid Gas, Sour Gas, Sewer Gas, Poison Gas and Sulfur Gas. It has a characteristic "rotten egg" smell at low concentrations. At higher concentrations, it has a sweet odor. At still higher concentrations, an odor cannot be detected at all due to olfactory nerve anesthesia. Odor must *not* be used as means of determining the concentration of H_2S gas! Hydrogen sulfide can form explosive mixtures at concentrations between 4.3% and 46%, by volume. Its auto-ignition temperature is 500 degrees F (260 degrees C). When burning, its flame is practically invisible. It is denser than air (1.19 times heavier than air) and may accumulate in low places. Hydrogen sulfide gas tends to interact with high carbon steel, causing embitterment and fine fractures in metal components and piping.

H_2S acts as a chemical asphyxiate, preventing the body from utilizing oxygen in the tissue. Breathing may stop after a few seconds of exposure to H_2S gas in concentrations of 600-700 ppm. This produces symptoms such as panting, pallor, cramps, dilation of eye pupils and loss of speech. This is generally followed by immediate loss of consciousness. Death may occur quickly from respiratory paralysis and cardiac arrest. The table below illustrates the physical effects of hydrogen sulfide on a healthy adult.

Table 1 Effect of exposure to Hydrogen Sulfide Gas on a Healthy Adult

Concentration			Physical Effects
percent (%)	ppm	grains per ft³	
0.001	10	0.65	Obvious and unpleasant odor. Safe for 8 hours exposure.
0.01	100	6.48	Kills smell in 3 to 15 minutes; may sting eyes and throat.
0.02	200	12.96	Kills smell shortly; stings eyes and throat.
0.05	500	32.96	Dizziness; breathing ceases in a few minutes; artificial respiration / oxygen must be given promptly.
0.07	**700**	45.36	**Unconscious quickly; death will result if not rescued promptly.**
0.10	**1000**	64.80	**Unconscious at once; followed by death within minutes.**

Properties of H_2S

COLOR	Colorless.
ODOR	Very offensive, commonly referred to as the odor of rotten eggs.
VAPOR DENSITY	1.189 (Air=1.0) H_2S is heavier than air.
BOILING POINT	-76 degrees F (-24 degrees C).
EXPLOSIVE LIMITS	4.3 to 46% by volume in air.
IGNITION TEMPERATURE	500 degrees F (260 degrees C).
WATER SOLUBLE	Yes (4 volumes gas in 1 volume water at 32 degrees F (0 degrees C).
FLAMMABILITY CORROSIVE	Forms explosive mixtures with air or oxygen.

Toxicity Table – H_2S

1 ppm = .0001% (1/10,000 of 1%)	Can smell (rotten egg odor).
10 ppm = .001% (1/1000 OF 1%)	Allowable for 8 hours exposure. (PEL & TLV)
100 ppm = .01% (1/100 of 1%)	Kills smell in 3-15 minutes. May burn eyes and throat. Considered to be IDLH atmosphere (Immediately Dangerous to Life and Health).
200 ppm = .03% (2/100 of 1%)	Kills smell rapidly. Burns eyes and throat.
500 ppm = .05% (5/100 of 1%)	Loses sense of reasoning and balance. Respiratory disturbances in 2-15 minutes. Needs prompt artificial resuscitation.
700 ppm = .07% (7/100 of 1%)	Will become unconscious quickly. Breathing will stop and death will result if not rescued promptly. Immediate artificial resuscitation is required.
1000 ppm = .1% (1/10 OF 1%)	Unconscious at once. PERMANENT BRAIN DAMAGE MAY RESULT UNLESS RESCUED PROMPTLY.
	ppm=parts of gas per million parts of air by volume. 1% = 10,000 ppm.

Properties of Sulfur Dioxide SO_2

Sulfur Dioxide - SO_2	Physical and Chemical Properties
Chemical Formula	SO_2
Molecular Weight	64
Boiling Point	14 degrees Fahrenheit
Non-Combustible	Produced by burning of H_2S Gas
Vapor Pressure	>1 atm @ 68 degrees Fahrenheit
Melting Point	-104 degrees Fahrenheit
Specific Gravity	Heavier than air, 2.26 degrees gravity
Colorless gas	SO_2 is colorless gas, very irritating to the eyes and lungs
Odor	Pungent odor and can cause injury or death to persons exposed to it
Reactions	Reacts with water or steam to produce toxic and corrosive gases
Hazards of Sulfur Dioxide	
Toxicity	The physiological effects on humans when inhalation of SO_2 occurs, varies at different levels of concentration and may be as follows
Concentrations SO_2	Physiological Effects SO_2
0.3-1 ppm	Detection level – pungent odor
2 ppm	Threshold Limit Value (TLV) Time Weighted Average (TWA)
5 ppm	15 minute Short Term Exposure Limit (STEL) permitted by OSHA
6 – 12 ppm	Irritation of the throat and nose
20 ppm	Eye irritation
100 ppm	Immediately Dangerous to Life or Health (IDLH) set by NIOSH

IV. EMERGENCY RESPONSE POLICY AND AUTHORITY

It is the policy of Anadarko to take the necessary actions required to safeguard Anadarko personnel and the public from emergency incidents. Such emergency incidents may include fires, hazardous materials releases, and incidents resulting from natural hazards such as tornadoes.

In the event of an emergency incident, Anadarko personnel will take prompt action within their immediate work area to ensure that all appropriate Anadarko personnel, corporate personnel, and the public are alerted or notified that an emergency incident exists.

Whenever possible, personnel will take immediate action to limit the effects of the emergency. Four objectives will be considered when developing an appropriate emergency response. These objectives are:

- Life safety.
- Environmental protection.
- Protection of company and public property.
- Preventing interruption of business and public services such as highway access, water, and utilities.

While all four of the above objectives are important, life safety will always remain the first and highest priority.

All Anadarko personnel have the responsibility, if necessary, to immediately alert Anadarko personnel that an emergency condition exists and to take appropriate action to protect life, property, and the environment. All emergency response actions by Anadarko personnel are voluntary. Emergency response actions taken by individuals should be within the limitations of their training, experience, and physical abilities. At no time will Anadarko San Juan River Gas Plant personnel assume an unreasonable risk during an emergency response. An unreasonable risk exists when:

- The task exceeds the physical abilities of the individual.
- The individual is not properly trained to complete the task.
- The individual does not have adequate experience to complete the task.

V. RESPONSE PROCEDURES FOR UNINTENTIONAL (ACCIDENTAL) RELEASES (SEE ATTACHMENT 8 FOR SIMPLIFIED FLOW CHART)

If an H_2S leak is detected as a result of an accidental release, the following emergency plan of action should be put into effect to adequately ensure the safety of Anadarko employees, contractors and the public. These response sequences should be altered to fit the prevailing situation and event/site-specific requirements.

1. Upon detecting a leak, assess wind direction and immediately move away from the source and attempt to get out of the affected area by moving upwind, or cross wind if travel upwind is not possible.

2. Alert other personnel in the area. Assist personnel in distress if this can be done without endangering yourself. Proceed to the designated emergency assembly area.

3. If injury or death has occurred, immediately call emergency services (911).

4. If possible, take immediate measures by shutting manual valve on AGI line to control present or potential discharge and to eliminate possible ignition sources. Auto control valve may have already activated to shut down flow of acid gas to compressor.

5. Notify the supervisory foreman (this may have occurred via the control room alarm system). The supervisor or their designee will formally assume the role of the Incident Commander (IC). Until relieved by the supervisor, the senior employee having initially discovered the leak should fill the role of IC.

6. If the IC deems it necessary, ensure that steps are taken to stop traffic through the area, most importantly, highway traffic. Roadblocks must be set up at the 10-ppm H_2S boundary. The H_2S boundary shall be delineated by using a calibrated H_2S monitor. Call emergency services (911) for assistance in quarantining the area, if needed. Refer to maps in Section XVII for highway and pipeline locations.

7. The IC will assess the situation and direct further actions to be taken. If assistance is required from law enforcement, safety or medical agencies, consult the emergency services telephone listing under Section XIII. The Division Operations Vice-President or his designee should also be notified.

8. Personnel equipped with self-contained breathing apparatus (SCBA) and portable H_2S monitoring equipment will determine the cause and extent of the leak. Personnel should enter the area from upwind of the site. If a reading of 10 ppm or higher of H_2S is obtained, then backup personnel equipped with SCBA will also be required.

9. Initiate evacuation of employees or any nearby residents, if deemed necessary. Coordinate with emergency services.

10. No one will be intentionally exposed to H_2S concentrations in excess of 10 ppm without proper personal protection equipment (PPE), IC authorization and backup personnel.

11. If possible, de-energize all sources of ignition, using lockout/tagout procedures.

12. If needed, perform shutdown on appropriate equipment and systems.

13. Trained personnel will continuously monitor H_2S concentrations, wind direction and area of exposure and will advise public safety and emergency personnel on current conditions.

14. Protective measures shall be maintained until the threat of injury from H_2S poisoning has been eliminated. The area must be checked with monitoring equipment and cleared below 10 ppm before allowing entry without proper PPE.

15. Notify the Division Health & Safety Manager. See Section XIII Assistance will be provided to ensure all proper notifications and reporting requirements are made to local, state and federal agencies.

16. As soon as possible, **but no more than four hours after plan activation,** notify the New Mexico Oil Conservation Division – San Juan County (See Section XIII). At a minimum, the following information will be needed:

    - The company name.
    - Facility name.
    - Your name and telephone number for them to contact you.
    - The location and source of the discharge.
    - A description of the area affected by the discharge, the probable concentration of H_2S in the region and the wind direction/velocity.
    - If necessary, request additional assistance from the agency.
    - If necessary, and if it is determined that a reportable quantity of H_2S (excess of 100 lbs) has been released, contact the National Response Center a 1-800-424-8802 and report the release.

    Note: A simplified version of these steps is shown on a flowchart included as Attachment 8.

VI. EMERGENCY INCIDENT MANAGEMENT

Emergency incident management will follow the Incident Command System (ICS) as described by the Federal Emergency Management Act (FEMA). The intent of using ICS for all emergency incidents provides automatic continuity with outside agencies and assists in establishing a "unified command" of the incident. Anadarko provides instruction and training on the ICS, which is beyond the scope of this contingency plan. However a brief overview of the system is provided below.

The Incident Command System (ICS) utilizes a flexible, modular approach to organizing resources to effectively respond to emergency events. FEMA suggests that the basic Incident Command System has five functional areas:

- Command;
- Operations;
- Planning;
- Logistics; and,
- Finance.

However, for incidents such as those described in this plan, it seems more likely that the basic Incident Command System would be comprised of: 1) Command; 2) Operations Chief; and, 3) Safety Officer. Larger incidents may require additional positions such as Public Information Officer, Logistics Chief, Planning Chief, Finance Chief, Staging Manager, Medical Group Supervisor and Environmental Group Supervisor. The exact number and combination of positions will vary depending upon the type, size and duration of the incident.

In every incident, command must first be established. The first person to discover the problem is, by default, the Incident Commander (IC) until this responsibility is transferred to someone else. This responsibility should be formally transferred to the Facility/Field Supervisor as soon as practical. Who is acting as the IC should be clear and apparent at all times.

The Incident Commander (IC) is responsible for the overall management of the incident. Where the IC does not delegate or assign a position, the IC retains that responsibility. The IC should be careful to have no more than 5 to 8 people reporting directly to him. The IC establishes the strategy and goals for the incident and is ultimately responsible for the safety and success of the response activities.

An Operations Chief (OPS) is responsible for implementing the strategy to accomplish the goals defined by the IC. OPS directs all tactical operations, oversees response personnel and may assist the IC in the development of the action plan.

The Safety Officer is assigned by and reports directly to the IC. This position is responsible for identifying hazardous or unsafe situations, and developing measures necessary to assure the safety of response personnel and any victims of the incident. He/she should ensure that any personnel responding to the incident are using the proper PPE and have adequate training. The Safety Officer has the authority and responsibility to terminate or suspend operations that is believed to be unsafe or will place people in imminent danger.

VII. PERSONNEL VEHICLES AND EQUIPMENT

Plant personnel are equipped with personal H_2S monitors and portable gas detection devices.

The plant has a fully equipped mobile breathing air system with work units. Also, there are self contained breathing apparatus (SCBA's) located strategically throughout the facility (see Attachment 3 for locations). The AGI facility itself has additional H_2S monitoring and alarm monitoring systems, which are integrated with the plant H_2S alarm systems. These systems are described in Attachment 5 and are shown on a map of the AGI facility within the Anadarko San Juan Plant on Attachment 3.

An Emergency Response Kit and Road Block Kits are located at the egress stations for easy access if the facility is evacuated.

Personnel have cellular phones for communication, as well as two-way radios for inter-company communication.

All Anadarko personnel are equipped with personal H_2S monitors and portable gas detection devices are available at the plant site. A detailed description of the H_2S monitoring systems is included as Attachment 5.

Communications to Anadarko field personnel is via mobile cellular telephones or two-way radios.

Each Anadarko field truck is also equipped with a fire extinguisher in order to enable assistance as needed.

Company vehicles are equipped with two-way radios, roadblock kits and mobile phones.

Emergency Equipment on site at the Anadarko Plant

Quantity	Description
2 30# and 70 20#	**Ansul Fire Extinguishers**
7	**Wind Socks**
1	**150# Fire Extinguisher – Wheeled Units**
10	**Fixed Ambient H_2S Monitors**
7 30 minute-6 5 min. escape units	**SCBA – 30-Minute Breathing Air Packs (level A or B)**
5	**First Aid Kits**
3	**Fire Blankets (wool)**
2	**Eye Wash Stations**
2	**Emergency Showers**
2	**PPE Boxes**

VIII. EVACUATION PROCEDURE

Evacuation may become necessary to protect personnel and the public from hazards associated with an incident. Orderly evacuation is essential to protect the general public as well as Anadarko personnel and property.

Anadarko personnel have reviewed the affected area for this plan and have determined the safe evacuation routes and assembly areas to reduce confusion if evacuation becomes necessary. The Anadarko Facility Operator may assign employees to direct evacuation and account for personnel during emergencies. (See Section XIV and Attachment 7 for evacuation routes).

Designated Assembly Areas shall be at a safe distance from the incident in an appropriate direction (upwind, upstream, and upgrade). If the Assembly Areas do not provide adequate shelter, transportation to a central shelter should be arranged after all personnel are accounted for. As the incident progresses, the IC must continuously evaluate the adequacy of the assembly area and necessity of the shelter.

Anadarko personnel evacuating their work areas should evacuate the facility and initiate the plant ESD system, and proceed to the Designated Assembly Area (Attachment 7). Facility personnel will account for all personnel, ensure the evacuated area is secured and report the status of the evacuation to the IC. Evacuated personnel shall remain at the assembly area or shelter until directed otherwise by the IC.

- Local law enforcement and/or emergency management authority must be notified in conjunction with any community evacuation or public protective measures initiated.
- Emergency Response Plan initiated.
- Assess the scene; protect yourself.
- Summon EMS to the scene; provide information on the nature and number of injuries.
- If trained, provide First Aid/CPR as necessary, until EMS arrives at the scene; injured personnel should not be moved unless the situation is life threatening.
- Evacuate unnecessary personnel from the area.
- Establish a secure perimeter around the area to prevent unauthorized entry.
- Initiate the site security plan.
- Notify Facility Supervisor and make appropriate notifications to local Fire and EMS.
- Make other internal management contact as appropriate.

In case of a fatality:

- Do not move the victim.
- Do not release name of victim(s).
- Contact local law enforcement.
- Contact local medical examiner.
- Preserve the accident site.
- Restrict all unauthorized communications concerning the incident.

Make appropriate government agency notification and conduct post-incident activities.

IX. COORDINATION WITH STATE EMERGENCY PLANS

The Hydrogen Sulfide Contingency Plan as described will be coordinated with the New Mexico Oil Conservation Division (NMOCD) and with the New Mexico State Police consistent with the New Mexico Hazardous Materials Emergency Response Plan (HMER). A copy of this plan will be submitted to the New Mexico State Police and Local Emergency Planning Committee for San Juan County.

SAN JUAN COUNTY EMERGENCY PLANNING COMMITTEE
(505) 334-6107

NEW MEXICO STATE POLICE
(San Juan County Office)
(505) 827-9316

SAN JUAN COUNTY SHERIFF'S OFFICE
(505) 334-6107

STATE EMERGENCY RESPONSE COMMISSION
(SERC)
(505) 476-9681

NEW MEXICO OFFICE OF EMERGENCY MANAGEMENT
(505) 476-9600

NATIONAL RESPONSE CENTER
(800) 424-8802

X. NOTIFICATION OF THE OIL CONSERVATION DIVISION

The person, operator or facility shall notify the New Mexico Oil Conservation Division (NMOCD) upon a release of hydrogen sulfide requiring activation of the Hydrogen Sulfide Contingency Plan as soon as possible, but no more than one hour after plan activation, recognizing that a prompt response should supersede notification. The person, operator or facility shall submit a full report of the incident to the NMOCD on Form C-141 no later than fifteen (15) days following the release.

OIL CONSERVATION DIVISION
SAN JUAN COUNTY
AZTEC OFFICE

DURING WORKING HOURS
(505) 334-6178

EMERGENCY NUMBER
(AFTER WORKING HOURS)
(505) 344-6178
(FOLLOW INSTRUCTIONS FOR EMERGENCY CALLS)

DISTRICT SUPERVISOR MOBILE
(AFTER WORKING HOURS)
(505) 320-0292

XI. PLAN ACTIVATION

If a 10 ppm alarm is activated at any monitor within the plant, the supervisory foreman will determine the cause of the alarm and determine if a release has occurred. In the event of an actual release, the supervisory foreman will coordinate with the Incident Commander (IC) to provide them the data necessary to assess the situation. Consistent with the requirements of Rule 118, the Hydrogen Sulfide Contingency Plan shall be activated when the Incident Commander (IC) believes that a release creates a concentration of hydrogen sulfide that exceeds or is likely to exceed the following activation levels:

- 100 ppm in any defined public area;
- 500 ppm at any public road; or
- 100 ppm at a distance greater than 3000 feet from the site of the release.

As soon as this determination is made, the IC will activate and initiate the H_2S Contingency Plan.

XII. TRAINING AND DRILLS

Training for all affected Anadarko personnel will be conducted prior to completion of the project and introduction of product. Training will then be given as needed for any personnel who may later be affected by this project.

This training will include:

- Training on the responsibilities and duties of essential Anadarko personnel.
- On-site or classroom tabletop drills which simulate a release or other situation affecting the facility.
- Annual H_2S Hazard Training.

Initial training is to take place upon employment with the company and refresher training is to be conducted annually – or sooner if there is a change in the plan or the need for training is determined.

All training will be documented and training records will be maintained on file at the Anadarko San Juan Plant EHS office.

All drills will be evaluated and documented including any recommendations resulting from findings. Recommendations will be assigned to Anadarko personnel for completion by an established date. Upon completion, the action plan will be documented and records will be filed at Anadarko San Juan River Gas Plant.

Only trained and certified personnel from responding agencies will participate in any rescue exercise.

The Hydrogen Sulfide Contingency Plan will also provide for training of noted residents in this plan as appropriate on the proper protective measures to be taken in the event of a release, and shall provide for briefing of public officials on issues such as evacuation or shelter-in-place plans. Literature will be passed out to the noted residents with emergency numbers to be utilized in the event of an incident associated with this facility or any Anadarko equipment and/or piping.

XIII. EMERGENCY ANADARKO CONTACT PHONE NUMBERS

Use the following phone number in the event of a catastrophic release and/or emergency situation at the Anadarko San Juan River Acid Gas Injection facility.

Telephone Numbers of ANADARKO Personnel

24 HOUR TELEPHONE NUMBER 800-241-2778
Local Plant Phone Numbers (505)-598-6451 or (505)-598-5601 Ext-15526)

ANADARKO SAN JUAN RIVER PLANT			505-598-5601-15526
NAME	TITLE	HOME	CELLULAR
Kent McEvers	Plant Manager	505-326-4054	505-860-7208
Rick Fetch	Operations Supervisor	505-324-6441	505-947-2416
Rick Fetch	Technical Supervisor	Same	Same
Arlyn Thorson	Maintenance Foreman	505-326-6718	505-947-2417

ANADARKO THE WOODLANDS HEADQUARTERS				(832) 636-1000
NAME	TITLE	OFFICE	HOME	CELLULAR
Mario Reyes	GM of Operations	832-636-3431	281-296-0385	832-636-5446
Tony Marques	Manager of Engineering	832-636-7368		303-945-5086
Mike Gray	Dir. EH&S	832-636-2454	936-271-9869	281-415-6964

ANADARKO San Juan Area Safety Offices Location: San Juan Plant				
NAME	TITLE	OFFICE	HOME	CELLULAR
Jerry Adams	Environmental Manager	832-636-83054	281-363-4693	281-731-5931
Mike Gray	EHS Director	832-636-2454	936-271-9869	281-415-6964
Julie Betik	Envir. Sr Staff Analyst/air	832-636-2609	281-320-2066	281-793-7705
Eric Weaver	Envir. Sr Analyst/soil-water	432-684-2808	432-634-1997	432-413-2494
Kelly Velasquez	PSM Coordinator	720-929-6192		303-358-7858

In case of an emergency at the Anadarko San Juan River Gas Plant requiring assistance for fire, ambulance, medical authorities or HazMat issues – immediately call:

911

Responder Emergency Numbers:

Facility		Kirtland, New Mexico
Fire Department	Farmington	911 or 505-599-1430
Medical Facility	San Juan Regional Medical Center	505-327-2271
State Police	Farmington, NM	505-827-9316
Sheriff Department	Farmington, NM	505-334-6107
Local EPC	Farmington, NM	505-334-6107

Telephone Numbers of Public Agencies

Oil Conservation Division – San Juan County	505-334-6178
State Emergency Response Commission (SERC)	505-476-9681
New Mexico Office of Emergency Management	505-476-9600
Bureau of Land Management –Farmington	505-599-8900

Telephone Numbers of Emergency Resources

Organization	Phone Number
Environmental Consultants	
Geolex, Inc. – Alberto Gutierrez or James Hunter	505-842-8000
ESI, Inc. – Sam Cudney	505-266-6611
Spill – Cleanup Contractors	
IMI Construction	505-325-5005
TRC Construction	505-334-8220
Envirotech	505-632-0615
Heavy Equipment Contractors	
Weeminuche Construction	970-565-7430
Transportation Services	
Key Energy	505-327-0416

Remember – Our FOUR Objectives in an Emergency Are:

1. Life Safety.
2. Environmental Protection.
3. Protection of Company and Public Property.
4. Preventing interruption of business and public services such as Highway Access, Water & Utilities.

Life Safety Will Always Remain the First and Highest Priority!

XIV. DETAIL INFORMATION - POTENTIALLY HAZARDOUS AREAS

Anadarko San Juan River Gas Plant and Anadarko San Juan River AGI #1

DRIVING DIRECTIONS:

From Farmington:
Location: Section 1 T 29 S, R 15 W, San Juan County, NM
Latitude: 36.453 N
Longitude: 108.220 W

EVACUATION ROUTE:

At all times note the wind direction before evacuating procedures begin. The primary evacuation assembly area will be the east entrance to the plan, and then follow the plant road east approximately ¼ mile to County Road 6500, (Area #1) where employees and visitors will assemble to assure that all personnel are accounted for. As necessary, evacuation may then proceed south one mile to Highway 64.

Evacuation for all persons inside of the AGI Facility fences would be west to the west side dirt road and then south to the plant entrance (wind conditions permitting) group assembly area #1 to account for all employees including any visitors (see Attachment 7). Visitor sign in sheet shall be used to account for all visitors.

ROAD BLOCKS:

In emergencies involving a large acid gas pipeline leak near the Anadarko San Juan River Gas Plant, US Highway 64 may be blocked at approximately one mile east and west of the plant.

The unpaved access roads around the Anadarko San Juan River Plant shall be secured in the event of a release that is likely to cause an exceedance of 10ppm H2S in the road area. In this event, appropriate roadblock locations will be established on these roads.

COMMAND POST:

The Command Post will be established at one of the roadblock locations. The site will be dependent of the wind direction.

The Incident Commander, after arriving at the scene, has the authority to assess the situation and determine the severity level of the incident. The Incident Commander may determine that the Contingency Plan as written cannot be activated effectively. The Emergency Response Plan may then be activated depending on the Incident Commander's evaluation of the situation.

PUBLIC RECEPTORS LOCATED INSIDE RADIUS OF EXPOSURE (ROE):

There are no public receptors located within either the 500ppm or the 100ppm radii of exposure. The radii as calculated in Attachment 2 and shown in Attachment 4 are contained within the plant or adjacent unoccupied land.

XV. ANADARKO PUBLIC AWARENESS PROGRAM

Anadarko participates in an extensive annual Public Awareness Program and Damage Prevention Program.

Anadarko installs pipeline markers and signs at all facilities and road crossings to identify our underground pipelines and maintains these markers on an annual schedule. Anadarko installs poison gas signs at periodic intervals on the fence surrounding the Anadarko San Juan River Plant.

XVI. EMERGENCY SHUTDOWN EQUIPMENT

Anadarko has an installed automatic and manually activated emergency shutdown system (ESD) at the Acid Gas Injection Facility at the Anadarko San Juan River Gas Plant. The plant operator and/or Incident Commander (IC) may use these systems to shutdown and isolate the equipment in the facility. This is a fail safe system that will shut valves and equipment if any portion of the system fails. The Acid Gas Injection system will be normally controlled from the Anadarko San Juan River Plant Control Room and shutdown of equipment and ESD valves at the well-site may be accomplished from this system as well as at the well-site.

When activated the ESD shuts an automatic valve on the inlet acid gas feed stream, shuts an automatic valve on the compressed acid gas to the acid gas injection well, and sends a signal to the wellhead panel to shut down automatic valves on the wellhead. The major equipment is shut down. The specific major equipment items at injection well site that are shutdown in an ESD include the acid gas compressors and associated coolers and pumps. The fuel gas, which is used for flare fuel and purge gas is left on-line; however an automatic valve is provided in this line at the well-site that can be actuated separately in the control system to close this valve.

In the wellhead control panel there is a separate shutdown for the subsurface safety valve (SSSV). The SSSV can be closed if required. The SSSV will close automatically upon detection of high pressure in the wellhead piping. The SSSV will shut if there is a fault in the wellhead control panel.

In addition to these systems the well-site facility contains portable fire extinguishers that may be used in an emergency. The well-site facility also has air packs used for escape or rescue located throughout the facility at key locations. The facility also has a breathing air system at the compressor units consisting of air bottles, tubing, and a manifold to connect 5 minute air packs. These are primarily used when performing maintenance work on the compressor units; however, they can also be used during an emergency if required. Refer to the "Emergency Equipment Location Plan" (See Attachment 3) for the location of this equipment.

Anadarko has also installed hydrogen sulfide detectors throughout the Well-Site Facility in key locations to detect possible leaks. Upon detection of hydrogen sulfide at 10 ppm levels at any detector a visible beacon is activated at that detector and an alarm is sounded. Pursuant to the procedures described in sections V, XI and Attachment 8, the supervisory foreman will investigate the alarm and determine if the plan should be activated. In the event of a detection of hydrogen sulfide at 50 ppm levels at any detector, an evacuation alarm is sounded throughout the Facility. All personnel proceed immediately to a designated area near the Facility office outside the fence (or alternate area south of the plant depending on wind direction and their location in the well-site facility).

In addition to sounding evacuation alarm sirens, at concentrations of 50 ppm in the acid gas compressor area the acid gas compressor is shutdown and isolation valves upstream and downstream of the unit are closed, including the wellhead automatic wing valve. Refer to Attachment 3 for the locations of the hydrogen sulfide detectors.

During shut downs of the well-site compression or the injection well the acid gas will be flared at the Anadarko San Juan River Plant, if necessary

.

The above described system satisfies all requirements under Rule 118 regarding downhole conditions in the AGI. The subsurface safety valve (SSV) and the packer and inert fluid filling the annular space, combined with pressure monitoring will ensure safety and Rule 118 compliance.

XVII. ATTACHMENTS

LISTING OF ATTACHMENTS

1. Description of Worst Case Scenario of H_2S Release
2. Standard Calculations of Radius of Exposure (ROE)
3. Map of Entire Anadarko San Juan River Plant Showing H_2S Monitoring System and Emergency Equipment Locations
4. Map Showing Calculated Radius of Exposure for 100 and 500 ppm H_2S
5 Description of H_2S Monitoring and Alarm Systems at Anadarko Plant
6. Hazardous Material Incident Notification Information Checklist
7. Map Showing Evacuation Routes and Assembly Areas (Wind Conditions Permitting)
8. Simpified H_2S Contingency Plan Flowchart
9. Distribution List

ATTACHMENT 1 Description of Worst Case Scenario of H_2S Release

The basis for worst case calculations is 10% hydrogen sulfide in the acid gas from the Anadarko San Juan River Gas Plant, which is at typical maximum concentration observed at the plant.

Note that essentially all of the hydrogen sulfide in the plant feed gas is separated from the processed gas and becomes the acid gas stream. Therefore, the worst case calculated radius of exposure will be the same for the Acid Gas Injection Facility and for the Anadarko San Juan River Gas Plant as a whole. Furthermore, the worst case scenario is being assumed in the standard calculations since it would be a rupture that results in release of all of the hydrogen sulfide from the acid gas. Calculations using the Pasquill-Gifford equations as described in OCD Rule 118 are presented on the following page (Attachment 2). Also included below is a diagrammatic representation of the AGI system (Figure 5 from C-108 Application).

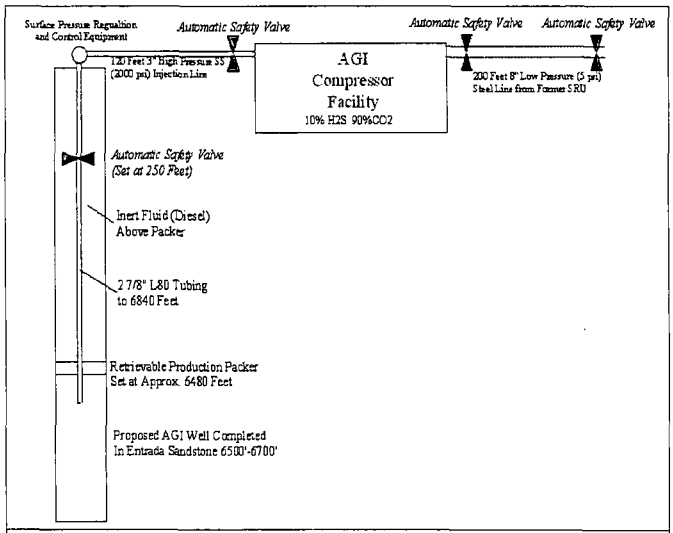


Figure 5: Schematic of Anadarko San Juan River Gas Plant Acid Gas Injection System Components

ATTACHMENT 2

Standard Calculations of Radius of Exposure (ROE)

ATTACHMENT 2

STANDARD CALCULATIONS OF RADIUS OF EXPOSURE

The calculation provided in the regulation assumes an escape rate (Q) that is continuous. However, the anticipated worst-case release for this facility is expected to be a short-term release, as the facility is equipped with automatic safety devices to prevent a continuous release. For this reason, OCD's calculation for ROE cannot be used here.

OCD also states that,

> *For facilities or operations not mentioned, the escape rate shall be calculated using the actual flow of the gaseous mixture through the system or the best estimate thereof.* [19.15.3.118.B.6.e NMAC].

In the case of Anadarko's San Juan Basin Plant, the worst-case anticipated releases of H_2S will be discontinuous, limited to the volume in two discrete sections of pipe:

- **Section 1**: a 120 ft length of 3" line leading from compressor to the well head.
- **Section 2**: a 250 ft section of 2 7/8" tubing in the well.

The Radius of Exposure was calculated for a release from these two segments. These sections are identified in Table 1 of the attached calculation [*Table 1, Calculated Volume of Release*]. Table 1 also describes the assumed temperature and pressure for each section of pipe.

Table 2 of the attached calculation shows the standardization of the release parameters to 60 degrees F and 14.73 psia, per OCD requirements. The standardization is via a method approved by NMED.

The release rate, Q (g/s), is calculated in Table 3 using the Ideal Gas Law, (PV=nRT), where $P_1V_1/T_1 = P_2V_2/T_2$. The time for release to occur is conservatively estimated at 5 minutes. The H_2S percentage for the pipeline is based on assumed worst case values from facility gas analyses.

To calculate the final ROE, we used a variation of the Gaussian distribution equation for ground level releases as described in the *Workbook of Atmospheric Dispersion Estimates* [D. Bruce Turner, 1994, CRC Press]. Copies of referenced pages from the text are attached. The calculation determines the distance to a concentration Level of Concern for a ground level release, as a function of the Pasquill-Gifford Stability classes:

$\sigma_y \sigma_z = Q / (\pi * u * \chi_{LOC})$ (Equation 2.6, page 2-16)

Where

$Q =$ pollutant concentration (calculated in Table 3 of spreadsheet)

$\chi_{LOC} =$ normalized air pollutant concentration at the Level Of Concern (100 ppm and 500 ppm, standardized in Table 2 of spreadsheet)

u = windspeed (assume 1 m/s)

$\sigma_y \sigma_z$ = Gaussian standard deviation product; product of vertical and horizontal dispersion coefficients

Table 4 of the spreadsheet shows the calculation of the distance to the concentration Level Of Concern using the variables assumed above. This equation results in a standard deviation product, $\sigma_y \sigma_z$. For this calculation, we assumed Stability Class F as a conservative measure.

Attachment 2-A is an excerpt from Turner's *Workbook* and shows a tabulation of calculated $\sigma_y \sigma_z$ values vs distance x in 10 m increments. The calculated $\sigma_y \sigma_z$ product results for the release are not exact matches to the tabulated values, so we assumed a linear interpolation between the $\sigma_y \sigma_z$ products to estimate a distance to the Level of Concern. The interpolated distances for 100 ppm and 500 ppm are shown in Table 4.

Anadarko San Juan Basin Plant
H_2S Radius of Exposure Calculations

Table 1: Calculated Volume of Release

Pipe Section	Length of Pipe ft	diameter of pipe ft	volume of pipe ft3	Pipe Section Pressure psi	Pipe Section Temperature F
1	120	0.25	5.89048623	1900	100
2	250	0.24	11.3097336	1900	100.00
3	0	0	0	0	0.00
4	0	0	0	0	0.00

Pipe length, diameter, pressure and temperature are actual values

Table 2: Standarization

Per OCD, release parameters must be standardized to 60F and 14.7 psi

Elevation	5500	5500	ft		
concentration	100	500	ppm		Concentrations of concern selected by OCD
corrected	115084.1	575420.6	$\mu g/m^3$	χ	Concentration corrected for Elevation, using NMED method
χ	0.115084119	0.57542059	g/m^3	χ	$1x10^6$ µg/g
Specific Volume	11.136	11.136	ft^3/lb		Specific Volume of H_2S

Table 3: Release Rate Calculation using Ideal Gas Law

Pipe Section		P1	P2	V1	T1	T2	Standardized Pipe Release Volume V2	H_2S Concentration	H_2S Release Volume	H_2S Release Mass	Time of Release	Release Concentration Q
		psi	psi	ft^3	K	K	ft^3	%	ft^3	lb	min	g/s
	1	1914.7	14.7	5.890486225	311.1	288.7	712.053037	10%	71.20530374	6.39415443	5	9.667961499
	2	1914.7	14.7	11.30973355	255.5	288.7	1664.38535	10%	166.4385349	14.94598912	5	22.59833555
Release Sum												**32.266297**

Notes

1 Pipeline Volume calculated using ideal gas law, (P1V1)/T1 = (P2V2)/T2, where:
- P1 = Actual pressure + standard pressure (14.7 psi)
- P2 = Standard pressure (14.7 psi)
- V1 = Volume of the pipe section to be released
- V2 = Release volume at standard conditions - equation is solved for this
- T1 = Temperature of gas in pipeline (in Kelvin)
- T2 = Standard Temperature (60F, expressed in Kelvin = 288.7K)
- °C = (°F - 32) x 5/9
- K = C + 273.3

2 H_2S Release volume is H_2S Concentration * Standardized Pipe Release Volume

3 H_2S Release Mass is H_2S Release Volume * Specific Volume of H_2S

4 Time of Release is 5 minutes, as a conservative estimate

5 Release Concentration, Q, is H_2S Mass (lb) * 453 .6 g/lb / (10 min * 60 sec/min)

Table 4: Radius of Impact Distance Calculation

Calculated radius of impact is estimated from equations found in the Workbook of Atmospheric Dispersion Estimates (D. Bruce Turner).

$\sigma_y \sigma_z = Q / \pi u \chi_{LOC}$ D. Bruce Turner, *Workbook of Atmospheric Dispersion Estimates*, Equation 2.6

u = Windspeed, conservative estimate

Q = Pollutant emission rate

χ_{LOC} = Level-of-Concern concentration

x = distance from source Based on the above calculation, x is interpolated from Table 2.5 of Turner's Workbook (assuming Stability Class F), for the resulting σ_y σ_z..

Pipe Section	Exposure Concentration ppm	u m/s	Q g/s	χ_{LOC} g/m^3	$\sigma_y \sigma_z$ m^2	**Radius of Exposure x m**	
1	100	1	9.67	0.12	26.74		
	500	1	9.67	0.58	5.35		
2	100	1	22.60	0.12	62.50		
	500	1	22.60	0.58	12.50		
Sum	100	1	32.27	0.12	89.24	**368**	radius
	500	1	32.27	0.58	17.85	**144**	radius

Scenario 3 consists of 1 & 2 added together

WORKBOOK OF ATMOSPHERIC DISPERSION ESTIMATES

Second Edition

An Introduction to Dispersion Modeling

with floppy diskette

D. Bruce Turner
Trinity Consultants, Inc.
Chapel Hill, North Carolina

LEWIS PUBLISHERS
Boca Raton Ann Arbor London Tokyo

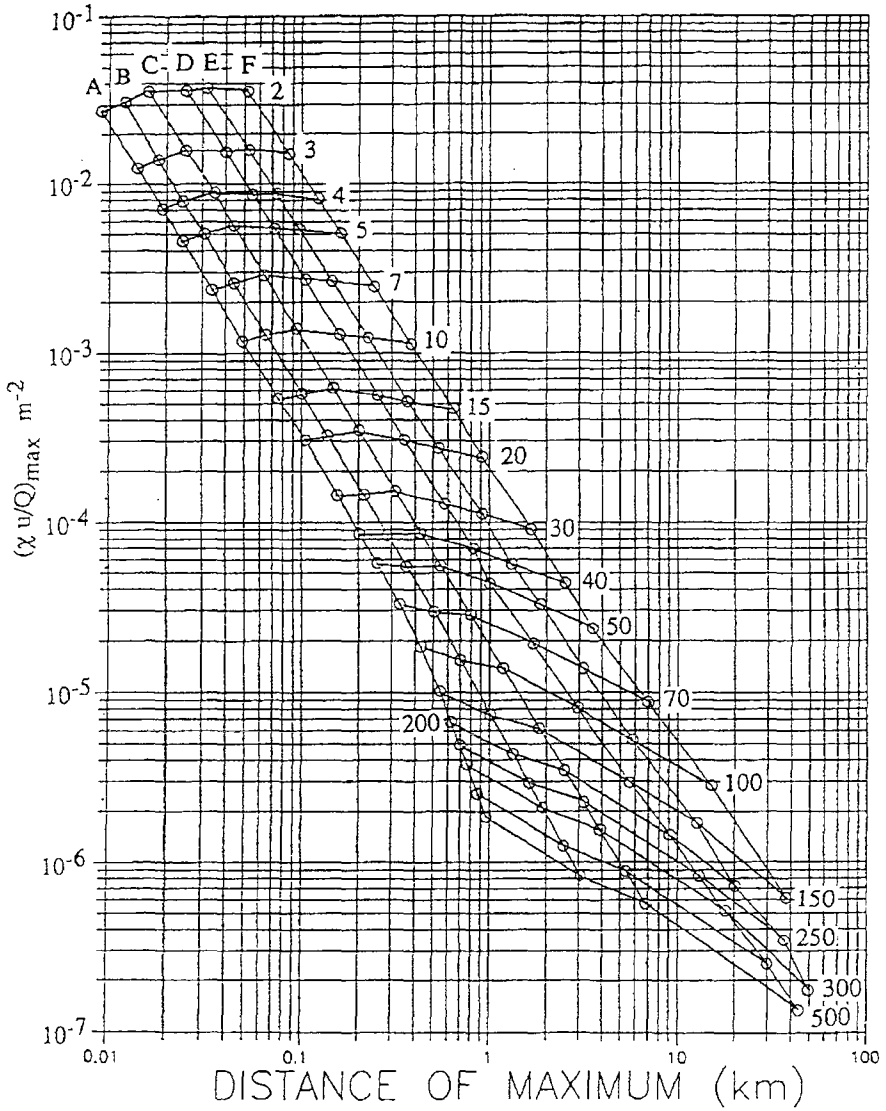


Figure 2.5 Relative maximum concentration normalized for wind speed and distance to maximum concentration as functions of Pasquill stability class and effective height of release.

dispersion parameters we are considering the atmosphere in only six classes while, in reality, it is a continuum. One will note by making sample calculations that considerably different concentrations are calculated with a change of one stability class in the assumptions. The difference is greater at greater distances.

Larger errors in the dispersion parameters, σ_y and σ_z, are expected for the extremes of stability and at larger distances. In some cases the σ_z may be expected to be correct within a factor of two. These are: 1) all stabilities for distance of travel out to a few hundred meters; 2) neutral to moderately unstable conditions for distances out to a few kilometers; and 3) unstable conditions in the lower 1000 meters of the atmosphere, with an inversion limiting the mixing above, for distances out to 10 km or more. Uncertainties in the estimates of σ_y are, in general, less than those of σ_z. The groundlevel centerline concentrations for these three cases (where σ_z can be expected to be within a factor of 2) should be correct within a factor of 3, including errors in σ_y, H, and u. The relative confidence in the σ's is indicated by the solid and dashed lines in Figures 2.3 and 2.4.

It should be noted that the σ_y behavior may not be as neat and orderly as given in Figure 2.3 especially during periods of light winds. There may be some meander (wind direction changes with a longer time period) of the wind under such conditions which will cause an increase in the effective horizontal dispersion that is not really due to turbulent fluctuations. This meander under light wind conditions is not included in the Pasquill-Gifford σ_y's.

The errors that have been discussed are those associated with estimates of the concentrations directly downwind from the point of release. Slight errors in the estimation of wind direction, especially under stable conditions when pollutant plumes are relatively narrow, can result in tremendous errors of concentration where the problem is to estimate the concentration at specific locations. This is also the principal reason why so many hour-to-hour field concentration measurements relate rather poorly with concentration estimates. The estimated plume path dependent on the estimated wind direction is somewhat different than the actual plume path responding to the actual wind direction at the height of the plume centerline. In these cases the magnitude of the highest downwind concentrations under the stated stability and wind speed are estimated quite well, but the location of this maximum may be in error. Therefore, if one is trying to use dispersion estimates to estimate the concentration at specific times and specific locations, it is important to try to make exceptionally good estimates of the wind direction for each time period or expect to put up with large error bounds, perhaps as much as a factor of ten, about the estimated concentrations. See Problem 5e in Chapter 8.

2.12 Determining the Distance to a Concentration Level of Concern for a Groundlevel Release

For a groundlevel release the equation for concentration directly downwind (y = 0) is given by eq. 2.5. In order to determine the distance to a particular value of concentration, call it the Level-of-Concern concentration, χ_{LOC}, this equation can be rearranged to solve for the product of σ_y times σ_z. This is:

$$\sigma_y \sigma_z = \frac{Q}{\pi u \chi_{LOC}} \qquad (2.6)$$

The distance where the product achieves this value can then be approximated by inspection of the right side of Table 2.5 or of Figure 2.6. Of course, the emission rate, Q, and wind speed, u, must be known or closely approximated.

This just gives the distance to the point where the concentration can be expected to drop off to the level of concern. As stated in the above section, the location where this is occurring is highly dependent upon the wind direction. If nothing is known about the wind direction, all that can be said is that there is a circle with a radius equal to the distance to the level-of-concern concentration and the concentrations that are higher are occurring somewhere within this circle. If something more definitive is known about the wind direction at this site for this time interval then the location of the high concentrations can be located more specifically.

The distance to χ_{LOC} can be determined directly from the above procedures for the simplified situation of the groundlevel release. For an elevated release the additional complication of the exponential involving the ratio of H to σ_z occurs. A direct solution is not available and eq. 2.3 must be solved at various downwind distances to determine where the concentration decreases to the LOC. The first estimate can be made with eq. 2.6 however, and then closer distances tried until the proper distance is found.

2.13 Treatment of Effect of Mixing Height

The mixing height according to Holzworth (1972, p 3) is "the height above the surface through which relatively vigorous mixing occurs." Therefore the mixing height is assumed to occur with unstable and neutral conditions and to be undefined when the surface layer is stable. Plume trapping occurs when the plume is trapped between the ground surface and a stable layer aloft. Such a stable layer frequently caps the mixing height. Bierly and Hewson (1962) have suggested the use of an equation that accounts for the multiple eddy reflections from both the ground and the stable layer where z_i is the height of the stable layer and J = 3 or 4 is sufficient to include the reflections of any significance. The principal off-axis position vertically involving the mixing height is the distance from the point of release to the mixing height plus the distance from the mixing height to the receptor height. However, all other possible combinations of multiple eddy reflection between the ground and the mixing height have been included in eq. 2.7. This equation is evaluated for receptors that are close to the source.

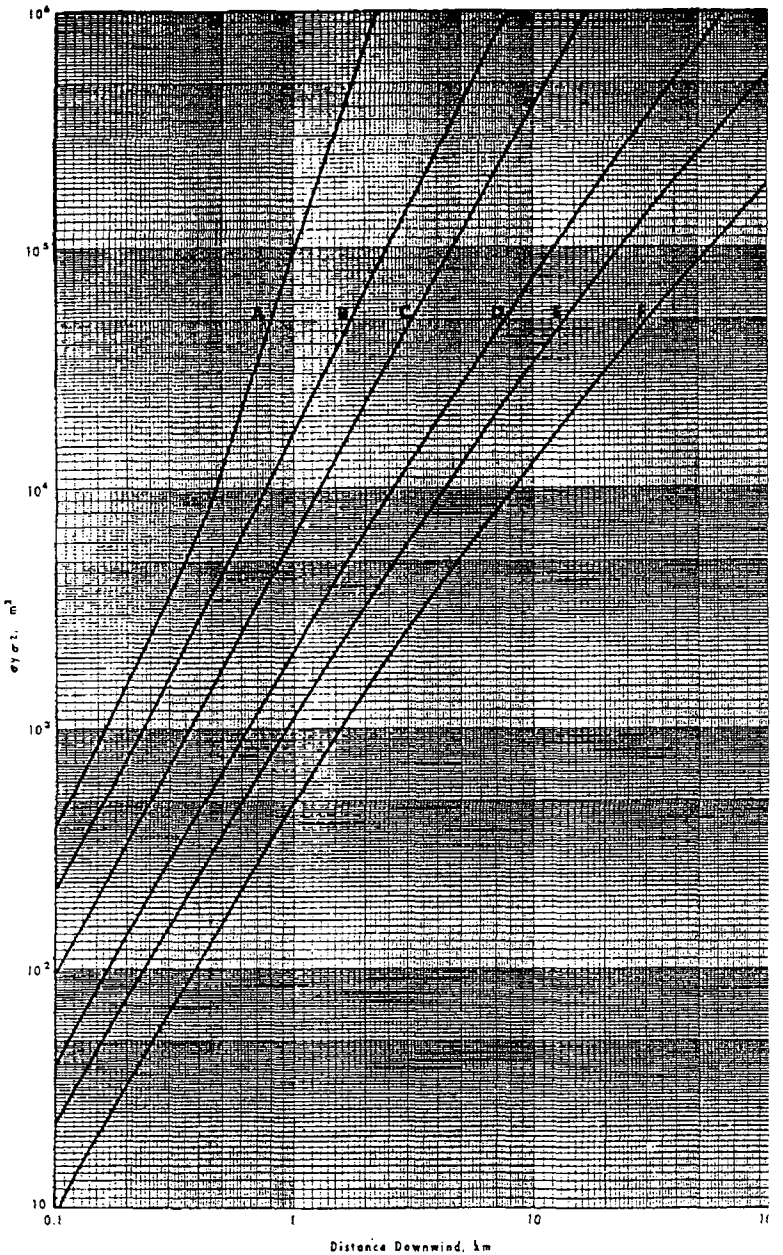


Figure 2.6 The product of $\sigma_y \sigma_z$ as a function of downwind distance from the source.

Table 2.5 (Part 1) Pasquill-Gifford Dispersion Parameters

x, km	Sigma-y, meters						Sigma-z, meters						Sigma-y times Sigma-z				
	A	B	C	D	E	F	A	B	C	D	E	F	A	B	C	D	E	F
0.01	3.36	2.34	1.47	0.96	0.72	0.48	1.58	1.24	0.91	0.63	0.51	0.36	5.32	2.90	1.33	0.60	0.37	0.17
0.02	6.29	4.42	2.80	1.84	1.37	0.91	3.05	2.37	1.71	1.15	0.92	0.63	19.2	10.5	4.78	2.11	1.26	0.57
0.03	9.08	6.41	4.08	2.68	2.00	1.33	4.47	3.45	2.47	1.63	1.29	0.87	40.6	22.1	10.1	4.37	2.58	1.16
0.04	11.8	8.34	5.33	3.50	2.61	1.74	5.87	4.51	3.22	2.10	1.64	1.10	69.1	37.7	17.2	7.34	4.29	1.91
0.05	14.4	10.2	6.56	4.31	3.22	2.14	7.25	5.56	3.95	2.55	1.98	1.32	104.	56.9	25.9	11.0	6.37	2.82
0.06	17.0	12.1	7.77	5.11	3.81	2.53	8.61	6.59	4.66	2.98	2.31	1.53	146.	79.6	36.2	15.2	8.79	3.88
0.07	19.5	13.9	8.96	5.89	4.40	2.92	9.96	7.61	5.37	3.41	2.62	1.74	194.	106.	48.1	20.1	11.5	5.08
0.08	22.0	15.7	10.1	6.67	4.98	3.31	11.3	8.61	6.07	3.83	2.93	1.94	248.	135.	61.5	25.5	14.6	6.41
0.09	24.4	17.5	11.3	7.44	5.55	3.69	12.6	9.61	6.76	4.24	3.24	2.13	308.	168.	76.4	31.6	18.0	7.88
0.10	26.9	19.3	12.5	8.20	6.12	4.07	13.9	10.6	7.44	4.65	3.53	2.33	375.	204.	92.7	38.1	21.6	9.46
0.11	29.3	21.0	13.6	8.96	6.69	4.45	15.4	11.6	8.12	5.05	3.82	2.51	451.	244.	111.	45.3	25.6	11.2
0.12	31.6	22.7	14.7	9.71	7.25	4.82	16.9	12.6	8.79	5.45	4.10	2.70	535.	286.	130.	52.9	29.8	13.0
0.13	34.0	24.5	15.9	10.5	7.81	5.19	18.4	13.5	9.46	5.84	4.38	2.88	625.	331.	150.	61.1	34.2	14.9
0.14	36.3	26.2	17.0	11.2	8.36	5.56	19.9	14.5	10.1	6.23	4.66	3.06	722.	380.	172.	69.8	38.9	17.0
0.15	38.6	27.9	18.1	11.9	8.91	5.92	21.4	15.5	10.8	6.62	4.93	3.24	826.	431.	195.	79.0	43.9	19.2
0.16	40.9	29.5	19.2	12.7	9.46	6.29	23.0	16.4	11.4	7.00	5.20	3.41	940.	485.	220.	88.7	49.2	21.5
0.17	43.2	31.2	20.3	13.4	10.0	6.65	24.5	17.4	12.1	7.38	5.46	3.58	1.06E+03	543.	246.	98.8	54.6	23.8
0.18	45.5	32.9	21.4	14.1	10.5	7.01	26.1	18.3	12.7	7.76	5.72	3.76	1.19E+03	603.	273.	110.	60.4	26.3
0.19	47.7	34.5	22.5	14.8	11.1	7.37	27.7	19.3	13.4	8.13	5.98	3.93	1.32E+03	666.	302.	121.	66.3	28.9
0.20	50.0	36.2	23.6	15.6	11.6	7.73	29.3	20.2	14.0	8.50	6.24	4.09	1.46E+03	732.	331.	132.	72.5	31.6
0.21	52.2	37.8	24.7	16.3	12.2	8.08	31.0	21.2	14.7	8.87	6.49	4.25	1.62E+03	802.	362.	144.	79.0	34.4
0.22	54.4	39.4	25.8	17.0	12.7	8.44	32.6	22.2	15.3	9.23	6.75	4.41	1.78E+03	876.	395.	157.	85.6	37.2
0.23	56.6	41.0	26.9	17.7	13.2	8.79	34.3	23.2	15.9	9.60	7.00	4.57	1.94E+03	953.	428.	170.	92.5	40.2
0.24	58.8	42.7	27.9	18.4	13.8	9.14	36.0	24.2	16.6	9.96	7.24	4.72	2.12E+03	1.03E+03	463.	183.	99.6	43.2
0.25	61.0	44.3	29.0	19.1	14.3	9.50	37.7	25.2	17.2	10.3	7.49	4.88	2.30E+03	1.12E+03	499.	197.	107.	46.3
0.26	63.2	45.9	30.1	19.8	14.8	9.85	39.6	26.2	17.8	10.7	7.74	5.03	2.50E+03	1.20E+03	536.	212.	115.	49.5
0.27	65.3	47.5	31.1	20.5	15.3	10.2	41.5	27.2	18.5	11.0	7.98	5.18	2.71E+03	1.29E+03	575.	226.	122.	52.8
0.28	67.5	49.0	32.2	21.2	15.9	10.5	43.5	28.2	19.1	11.4	8.22	5.33	2.93E+03	1.38E+03	614.	242.	130.	56.2
0.29	69.6	50.6	33.2	21.9	16.4	10.9	45.5	29.2	19.7	11.7	8.46	5.48	3.16E+03	1.48E+03	655.	257.	139.	59.6
0.30	71.8	52.2	34.3	22.6	16.9	11.2	47.4	30.1	20.3	12.1	8.70	5.62	3.40E+03	1.57E+03	697.	273.	147.	63.2

Table 2.5 (Part 2) Pasquill-Gifford Dispersion Parameters

x, km	Sigma-y, meters						Sigma-z, meters						Sigma-y times Sigma-z					
	A	B	C	D	E	F	A	B	C	D	E	F	A	B	C	D	E	F
0.31	73.9	53.8	35.3	23.3	17.4	11.6	49.7	31.1	20.9	12.4	8.92	5.77	3.67E+03	1.67E+03	740.	289.	155.	66.8
0.32	76.0	55.3	36.4	24.0	17.9	11.9	52.0	32.1	21.6	12.7	9.13	5.92	3.95E+03	1.78E+03	785.	306.	164.	70.5
0.33	78.1	56.9	37.4	24.7	18.4	12.3	54.3	33.1	22.2	13.1	9.35	6.06	4.24E+03	1.88E+03	830.	322.	172.	74.3
0.34	80.2	58.5	38.5	25.4	19.0	12.6	56.6	34.1	22.8	13.4	9.56	6.20	4.54E+03	1.99E+03	877.	340.	181.	78.2
0.35	82.3	60.0	39.5	26.1	19.5	12.9	59.0	35.1	23.4	13.7	9.77	6.35	4.85E+03	2.10E+03	925.	357.	190.	82.2
0.36	84.4	61.5	40.5	26.7	20.0	13.3	61.3	36.1	24.0	14.0	9.98	6.49	5.18E+03	2.22E+03	974.	375.	199.	86.2
0.37	86.5	63.1	41.6	27.4	20.5	13.6	63.8	37.0	24.6	14.3	10.2	6.63	5.52E+03	2.34E+03	1.02E+03	393.	209.	90.3
0.38	88.6	64.6	42.6	28.1	21.0	14.0	66.2	38.0	25.2	14.6	10.4	6.77	5.86E+03	2.46E+03	1.07E+03	412.	218.	94.5
0.39	90.6	66.2	43.6	28.8	21.5	14.3	68.7	39.0	25.8	15.0	10.6	6.91	6.22E+03	2.58E+03	1.13E+03	430.	228.	98.8
0.40	92.7	67.7	44.6	29.5	22.0	14.6	71.2	40.0	26.4	15.3	10.8	7.05	6.60E+03	2.71E+03	1.18E+03	450.	238.	103.
0.41	94.8	69.2	45.7	30.1	22.5	15.0	74.3	41.1	27.0	15.6	11.0	7.19	7.04E+03	2.84E+03	1.24E+03	469.	248.	108.
0.42	96.8	70.7	46.7	30.8	23.0	15.3	77.4	42.2	27.7	15.9	11.2	7.32	7.50E+03	2.98E+03	1.29E+03	489.	258.	112.
0.43	98.9	72.2	47.7	31.5	23.5	15.6	80.6	43.3	28.3	16.2	11.4	7.46	7.97E+03	3.13E+03	1.35E+03	510.	269.	117.
0.44	101.	73.8	48.7	32.1	24.0	16.0	83.9	44.4	28.9	16.5	11.6	7.59	8.47E+03	3.28E+03	1.41E+03	530.	279.	121.
0.45	103.	75.3	49.7	32.8	24.5	16.3	87.2	45.5	29.5	16.8	11.8	7.73	8.98E+03	3.43E+03	1.46E+03	551.	290.	126.
0.46	105.	76.8	50.7	33.5	25.0	16.6	90.6	46.6	30.1	17.1	12.0	7.86	9.51E+03	3.58E+03	1.53E+03	573.	301.	131.
0.47	107.	78.3	51.8	34.2	25.5	17.0	94.0	47.7	30.6	17.4	12.2	8.00	1.01E+04	3.74E+03	1.59E+03	594.	312.	136.
0.48	109.	79.8	52.8	34.8	26.0	17.3	97.5	48.9	31.2	17.7	12.4	8.13	1.06E+04	3.90E+03	1.65E+03	616.	323.	141.
0.49	111.	81.3	53.8	35.5	26.5	17.6	101.	50.0	31.8	18.0	12.6	8.26	1.12E+04	4.06E+03	1.71E+03	639.	334.	146.
0.50	113.	82.8	54.8	36.1	27.0	18.0	105.	51.1	32.4	18.3	12.8	8.40	1.18E+04	4.23E+03	1.78E+03	661.	346.	151.
0.55	123.	90.2	59.8	39.4	29.5	19.6	128.	56.7	35.4	19.8	13.8	9.05	1.58E+04	5.11E+03	2.11E+03	780.	406.	177.
0.60	133.	97.5	64.7	42.7	31.9	21.2	154.	62.4	38.3	21.2	14.7	9.69	2.05E+04	6.08E+03	2.48E+03	906.	469.	206.
0.65	143.	105.	69.6	46.0	34.4	22.9	182.	68.1	41.2	22.6	15.6	10.3	2.60E+04	7.14E+03	2.87E+03	1.04E+03	536.	236.
0.70	152.	112.	74.5	49.2	36.8	24.5	213.	73.9	44.1	24.0	16.5	10.9	3.25E+04	8.28E+03	3.29E+03	1.18E+03	607.	267.
0.75	162.	119.	79.3	52.4	39.2	26.1	247.	79.7	47.0	25.4	17.4	11.5	4.00E+04	9.50E+03	3.73E+03	1.33E+03	681.	299.
0.80	171.	126.	84.1	55.6	41.5	27.6	283.	85.6	49.9	26.8	18.3	12.0	4.85E+04	1.08E+04	4.19E+03	1.49E+03	759.	331.
0.85	181.	133.	88.9	58.7	43.9	29.2	322.	91.5	52.7	28.1	19.1	12.5	5.82E+04	1.22E+04	4.69E+03	1.65E+03	840.	365.
0.90	190.	140.	93.7	61.9	46.3	30.8	363.	97.4	55.5	29.5	20.0	13.0	6.91E+04	1.37E+04	5.20E+03	1.82E+03	924.	400.
0.95	199.	147.	98.4	65.0	48.6	32.3	407.	103.	58.3	30.8	20.8	13.5	8.12E+04	1.52E+04	5.74E+03	2.00E+03	1.01E+03	436.
1.00	209.	154.	103.	68.1	50.9	33.9	454.	109.	61.1	32.1	21.6	14.0	9.47E+04	1.68E+04	6.30E+03	2.19E+03	1.10E+03	473.

ATTACHMENT 3

Map of Entire Anadarko San Juan River Plant Showing H2S Monitoring System and Emergency Equipment Locations

ATTACHMENT 3 Locations Of H_2S Monitors, Emergency Equipment Locations

The manufacturer of the gas monitors is Industrial Scientific Cat. No. HKB 0292. The monitors are calibrated low alarm setpoint 10 ppms high alarm setpoint 25 ppms.

The H_2S heads operate by a 4-20 milliamp signal that is sent to a Allen-Bradley controller and a Moore 383 display unit. The Allen-Bradley unit controls the alarm siren and beacon, the Moore 383 interfaces with the control computer and the concentrations are displayed on the operators' control screen.

When the signal reaches 10ppms the beacon starts flashing and the siren alarms. When the signal reaches 25ppms the beacon is still flashing and the siren alarm speeds up.

Locations of the existing and proposed new H_2S heads are shown in Figure 3-1.

The locations of emergency equipment are shown in Figure 3-2.

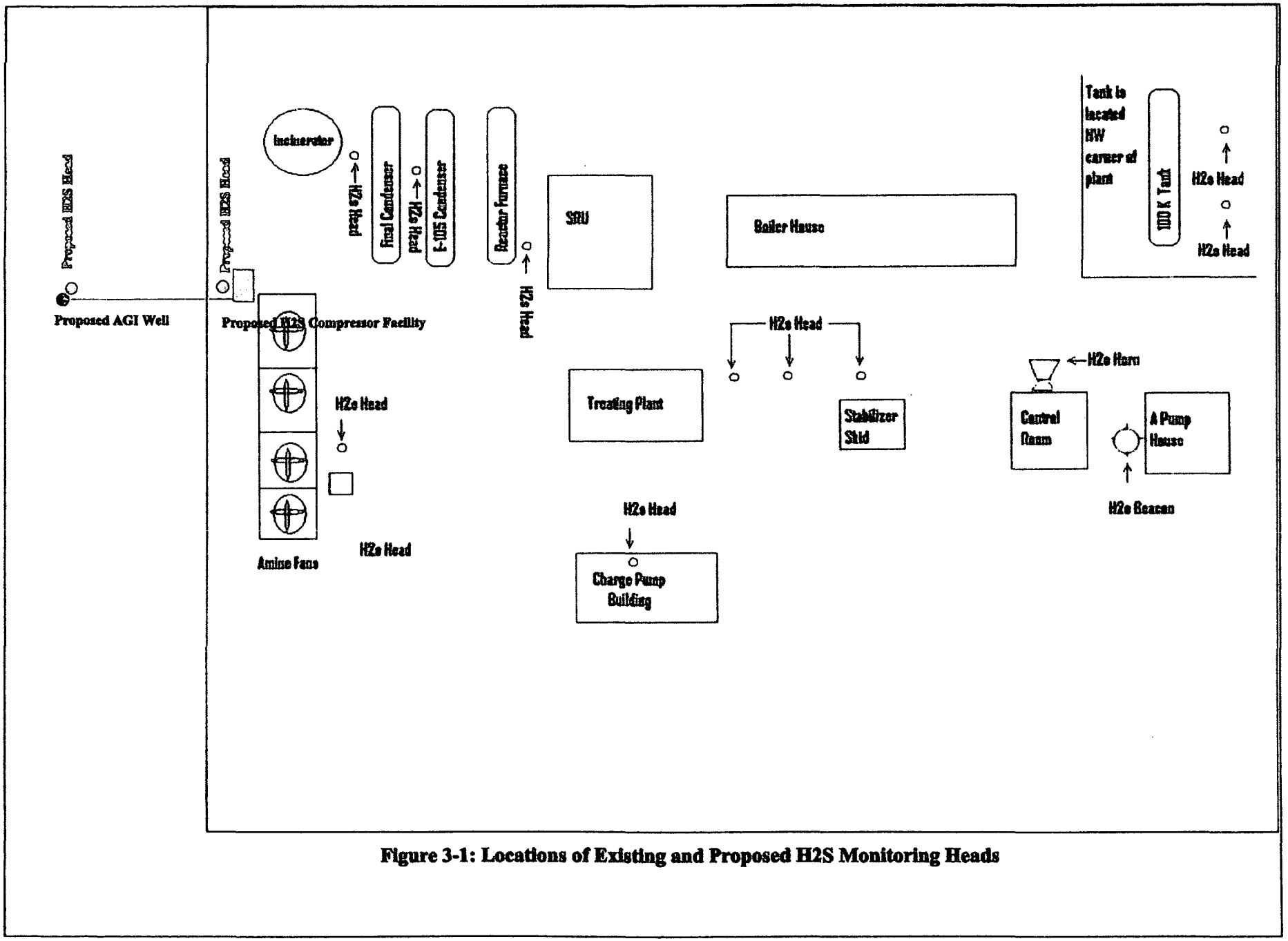


Figure 3-1: Locations of Existing and Proposed H2S Monitoring Heads

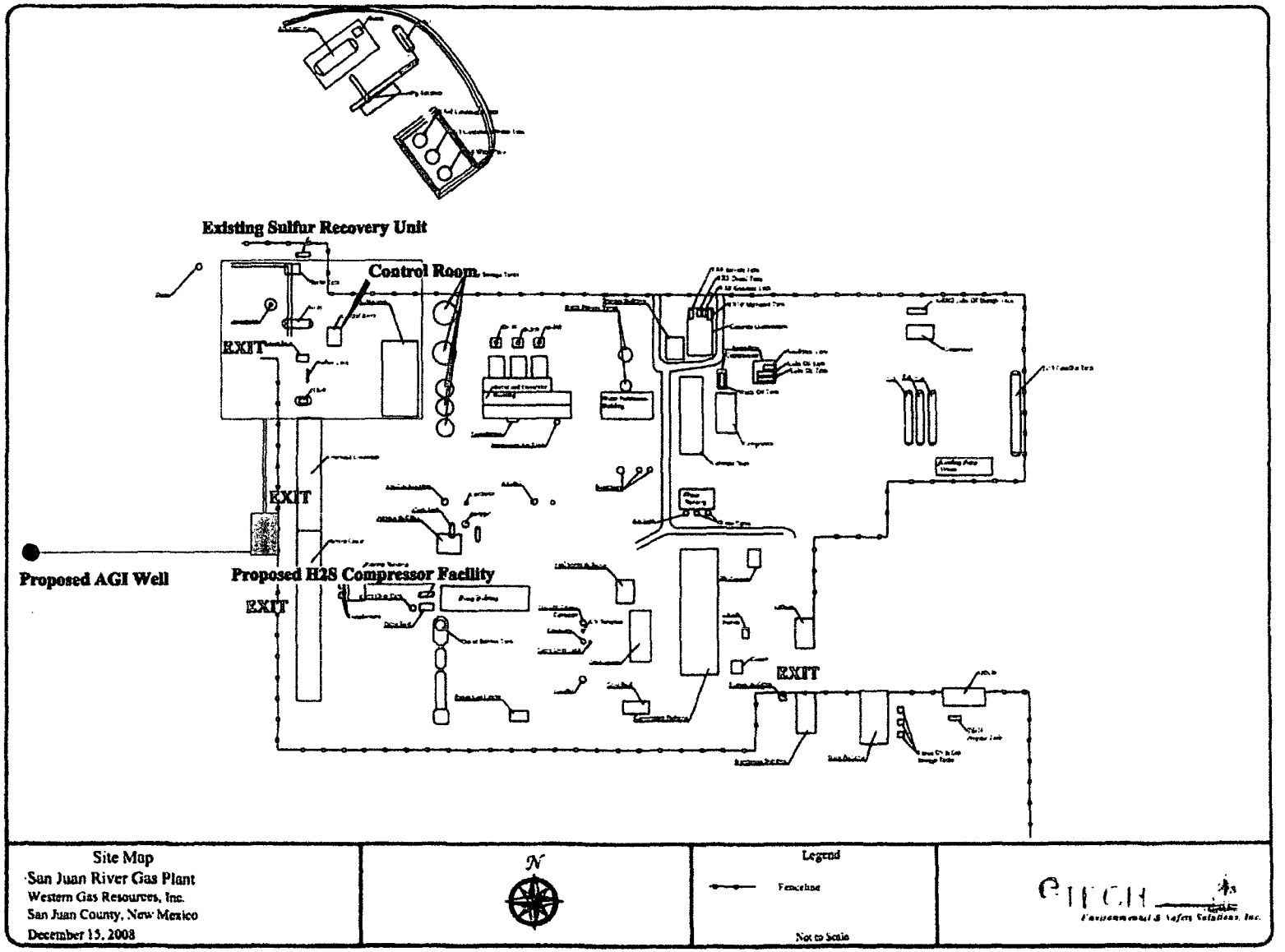


Figure 3-2: Locations of Emergency Equipment and Exits

ATTACHMENT 4

Map Showing Calculated Radius of Exposure for 100 and 500 ppm H2S

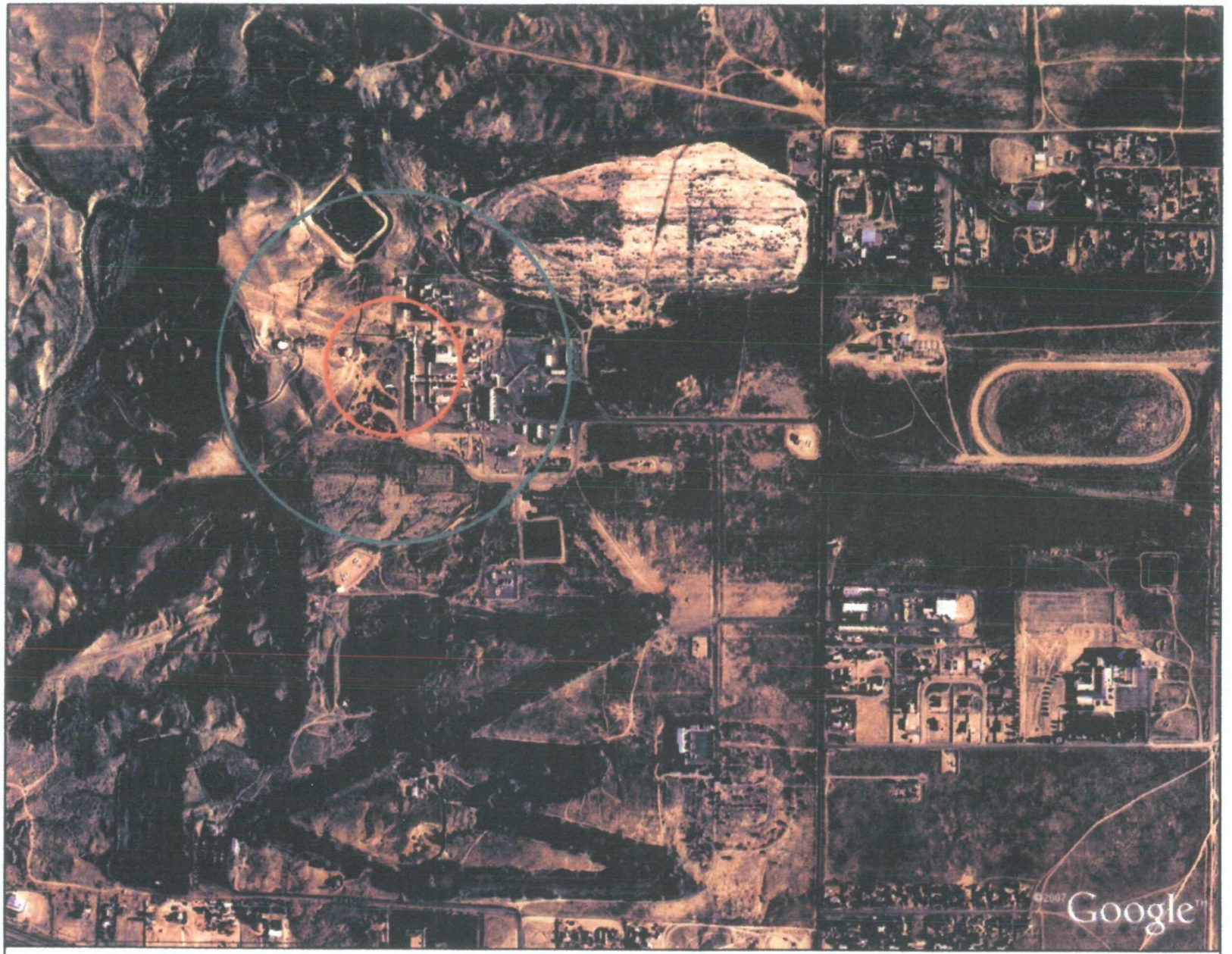


Figure 4-1: Calculated Areas of Hydrogen Sulfide Influence for 100 ppm and 500 ppm

500 ppm Area of Influence

100 ppm Area of Influence

ATTACHMENT 5

Description of H2S Monitoring and Alarm Systems at Anadarko Plant

INDUSTRIAL SCIENTIFIC CORPORATION

4200 SERIES
REMOTE H_2S SENSOR

OPERATION AND MAINTENANCE MANUAL

3700-0355

1.0 INTRODUCTION

The Industrial Scientific Corporation 4200 Series Remote H_2S Sensor is a fixed point monitor designed to detect the presence of Hydrogen Sulfide in ambient air. The monitor operates in a standard two wire current loop system where 4mA is equal to a concentration of zero parts per million (ppm) H_2S and 20mA is equal to the desired full scale range of the monitor, settable from 50 to 200 ppm.

The sensing element is an electrochemical fuel cell which reacts as ambient air diffuses into it and produces a signal directly proportional to the concentration of hydrogen sulfide present. This signal is electronically conditioned to produce the linear 4-20mA current loop output.

A liquid crystal display is standard with the 4200 Series Remote H_2S Sensor; A non-display unit is also available, as is a display option kit for upgrading to a display unit at a later time. The units are designed to be explosion proof for use in Class I, Division 1, Groups B, C, and D hazardous locations.

2.0 INSTALLATION

After unpacking, visually inspect the unit for signs of physical damage. If damage is evident contact the local distributor of ISC gas detection products, or call Industrial Scientific Corporation at:

1-800-338-3287

The 4200 Series Remote H_2S Sensor should be mounted to a flat surface using the mounting flanges located on the outside of the enclosure. The unit should be mounted so that the sensor nose is pointing downward. Because Hydrogen Sulfide is heavier than air, if the unit is being used in an enclosed space it should be mounted at the lowest point of the area. However, in general the unit should be mounted in the location most likely to contain the highest concentration of hydrogen sulfide.

Cable entrance to the remote sensor should be made through the inlet port in the top of the enclosure using 3/4 inch NPT conduit with an approved explosion proof conduit sealing fitting installed within 18 inches of the enclosure.

2.1 Input Connections - Display Model (See Figure 1A)

To make input connections to the unit:

1. Open the enclosure by loosening the set screw and unscrewing the enclosure cover.

2. Remove the snap-on faceplate to expose the display printed circuit board.

3. Using a pair of needle nosed pliars feed the power wires up through the corner cut out in the display (outermost) printed circuit board (See Figure 1A).

Item	Part No.	Description
8	3700-0293	Sensor plug
9	3700-0241	4200 series enclosure
10	3700-0344	Sensor bushing
11	1703-3960	H_2S sensor
12	3700-0268	Sensor cap
13	3700-0352	Flame Arrestor, 100 micron

7.0 OPTIONS

Part No.	Description
3810-0032	4200 Series Remote H_2S w/display
3810-0033	4200 Series Remote H_2S w/o display
3810-0034	4200 Series Display Option Kit

8.0 ACCESSORIES

Part No.	Description
1810-0859	Calibration gas, 25 ppm H_2S
1810-1586	Calibration gas, zero grade air
1810-0883	Calibration regulator, 0.5 liter/minute
3700-0348	Calibration plug
1702-6642	Calibration test cable
1703-7185	Calibration multimeter
3700-0355	Instruction Manual, 4200 Series Remote H_2S

9.0 SPECIFICATIONS

Input Power Supply:	12 -30 Volts DC @ 25mA, Maximum.
Output:	4 -20 mA DC (25mA, MAX, in overange)
Measuring Range:	Standard 0 - 50 ppm H_2S Field settable from 50 - 200 ppm full scale range
Cable Length (18 awg soft copper, with 50 OHM termination in controller)	2000 ft. with 12.0 volt power source 35000 ft. in 24.0 volt power source
Display Increments:	1 ppm
Operating Temperature Range:	-40°C to +40°C (to +55°C for intermittent periods)

Specifications (cont.)

Operating Humidity Range:	5 - 90% RH non-condensing (0 - 99% RH for intermittent periods)
Accuracy:	+/- 5% or 2 ppm which ever is greater at the temperature of calibration +/- 15% or 2 ppm which ever is greater over operating temperature range
Display/current loop Correlation	Maximum error of 1/2 of 1 count.
Sensor:	3 electrode electrochemical
Sensor Life:	Typical 12 - 24 months
Enclosure:	Cast aluminum enclosure w/stainless steel sensor nose
Warranty:	Full warranty covering parts and labor for one year from date of purchase, including sensor.

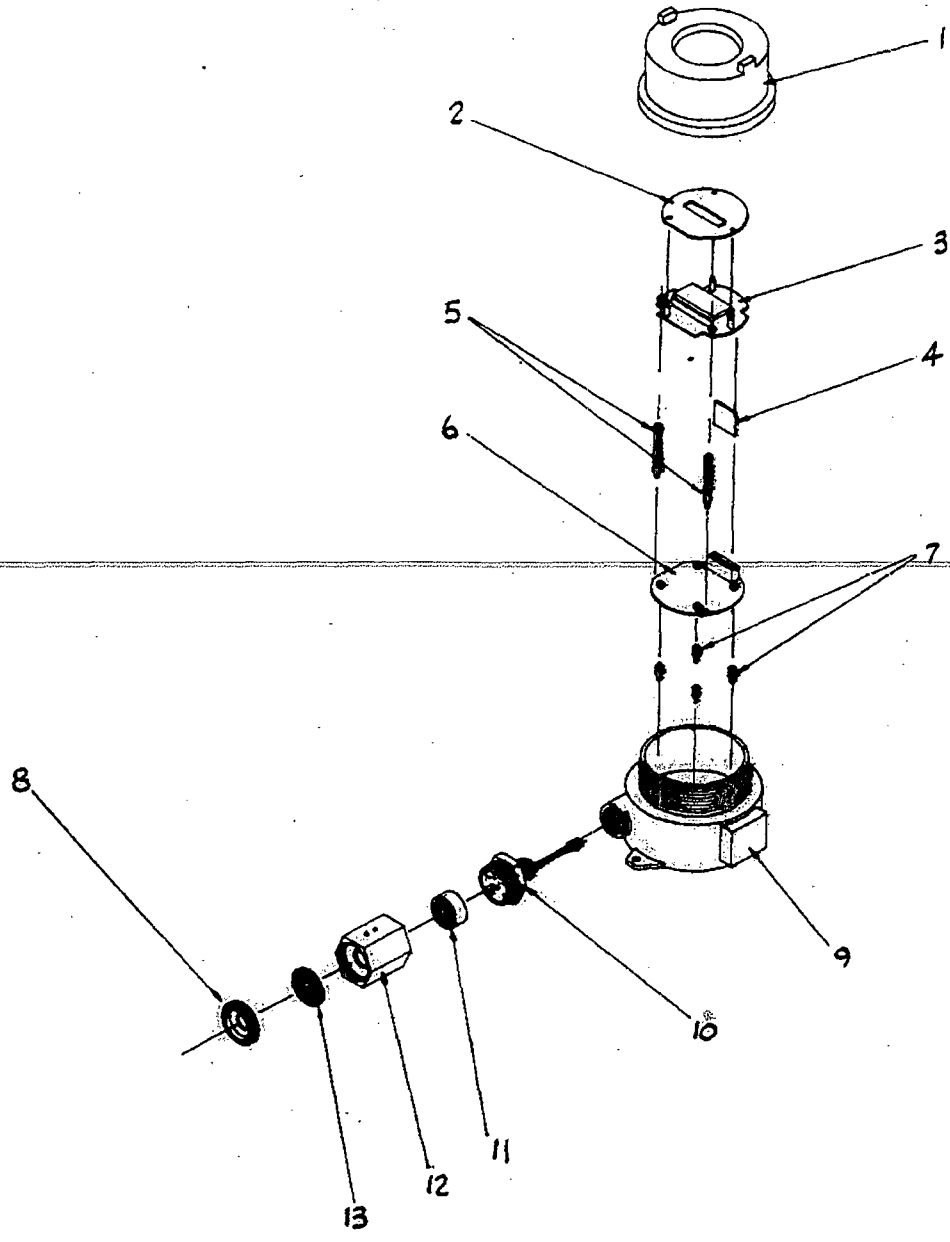
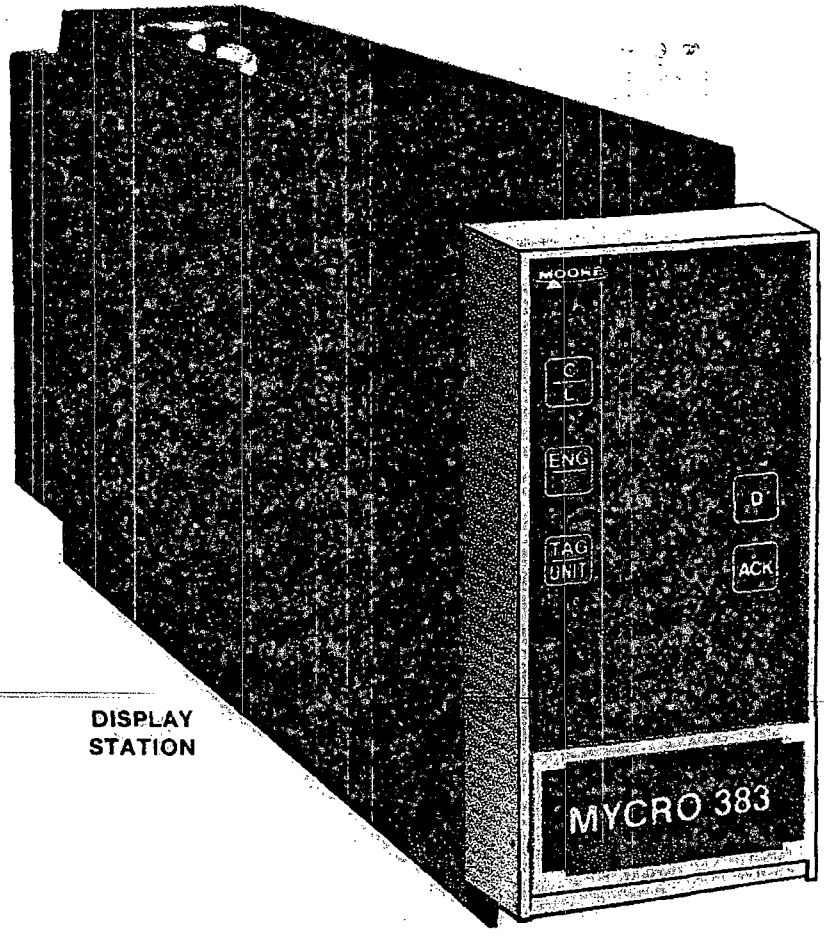
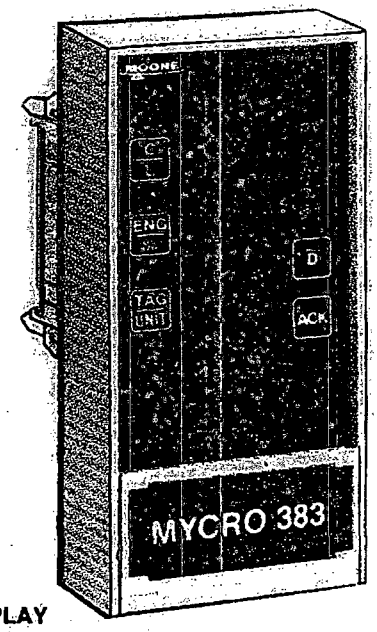


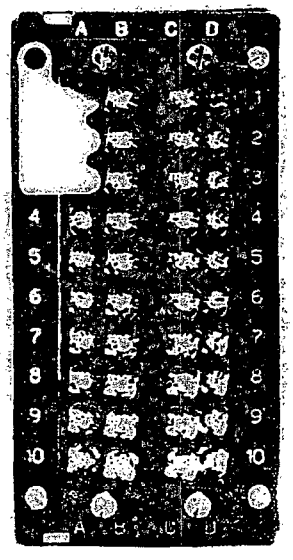
FIGURE 2
4200 SERIES REMOTE H_2S SENSOR



DISPLAY
STATION



DISPLAY
ASSEMBLY



REAR
TERMINALS

FIGURE 1-1 Multi-Point Display Station

DIGITAL OUTPUTS

B4	DO+ (FB04)	Each digital output is connected between a digital output (DO+) terminal and a DOC- terminal. 'ON' saturation voltage is 0.3V at 0 mA or 0.6V at 100 mA, referenced to station common. Voltage source to external load can be +26 Vdc at terminal B5 or a separate power supply. Load must limit current to 100 mA or less. An inductive load must be shunted by a transient suppression diode to prevent damage to Display Station circuits. Refer to Figure 2-6.
B6	DO+ (FB05)	
B7	DOC- (FB04/FB05)	

VOLTAGE EXPANDER BOARD INPUTS

C1	AI+ (FB14)	Voltage inputs are 1-5 Vdc; connect between an AI(+) terminal and an AI(-) terminal for the specified function block. Refer to section 1.4 for specifications.
C2	AIC- (FB14)	
C3	AI+ (FB15)	
C4	AIC- (FB15/16)	
C5	AI+ (FB16)	
C6	AI+ (FB17)	
C7	AIC- (FB17/18)	
C8	AI+ (FB18)	
C9	AI+ (FB19)	
C10	AI- (FB19)	
D1	AI+ (FB20)	
D2	AIC- (FB20)	
D3	AI+ (FB21)	
D4	AIC- (FB21/22)	
D5	AI+ (FB22)	
D6	AI+ (FB23)	
D7	AIC- (FB23/FB24)	
D8	AI+ (FB24)	
D9	AI+ (FB25)	
D10	AIC- (FB25)	

LOCAL INSTRUMENT LINK

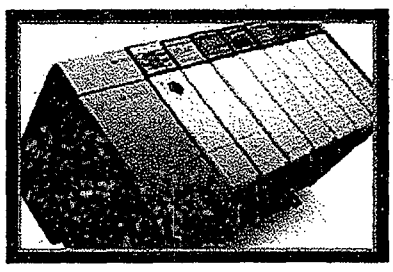
B1	LK+ (FB98)	Refer to Figure 2-7 for typical LIL connections and to SD15492 for LIL cable and tap box installation.
B2	LK- (FB98)	

NO CONNECTION

A9	---	Do not connect wires to this terminal.
A10	---	Do not connect wires to this terminal.
B3	---	Do not connect wires to this terminal.
B10	---	Do not connect wires to this terminal.

Rockwell Automation

PROGRAMMABLE LOGIC CONTROLLERS
SLC 500 System



Overview

Power and Flexibility for a Complete Control Solution

The Allen-Bradley SLC 500 is a small, chassis-based, modular family of programmable controllers and I/O. With its multiple processor choices, numerous power supply options and extensive I/O capacity, the SLC 500 allows you to create a system specifically designed for your application.

As one of the first full-featured small controllers on the market, it remains the gold standard in small logic controllers more than a decade after its introduction.

Right For Today. Ready For Tomorrow.

SLC 500 controllers control hundreds of thousands of processes around the world – everything from amusement park rides to pharmaceutical processing.

- 1.6M processors and 12M, I/O modules installed worldwide
- Used by over 75% of companies comprising the Dow Jones Industrial Average (DJIA)
- Large choice of I/O available from Rockwell Automation and third party companies, making these products appropriate for almost any application
- Over 100,000 customers trained in the U.S. alone, making this product one of the most understood of its type
- Proven Reliability. An example is the addition of 1747-BSN Back-Up Scanner, which has grown application base to even more critical areas
- Step Forward program ensures customer can upgrade to latest technology

New Developments Now Available

- MODBUS RTU Master capability: Provides increased compatibility with SCADA applications and 3rd party devices. Compatible with other RA Modbus-compatible products including MicroLogix controllers and PowerFlex drives.
- Improved PID instruction: Provides better accuracy in the PID instruction with the implementation of rational approximation feature.
- 1747-DPS2 RS-232/DF1 Configurable Port Splitter: Allows a single RS-232/DF1 port on a Rockwell Automation controller (e.g. SLC 500, MicroLogix, PLC-5, ControlLogix, CompactLogix) to be expanded (or split) into two ports for communication with a network and an HMI or Programming Station.

A Solid Investment. Today. Tomorrow.

- Excellent quality now and in the future
- Continued support for an enormous installed base
- On-going engineering investment
- Customer advance warning long before any products are no longer available for sale

We are committed to selling & supporting SLCs into the next decade!

Management Statement

TABLE 2.1 Rear Terminal Assignments

REAR TERMINAL	TERMINAL ASSIGNMENT	COMMENT
POWER INPUT		
AH	HOT	AC Supply HOT or DC +
AN	NEUTRAL	AC Supply Neutral or DC -
AG	GROUND	Case or Safety Ground
TWO-WIRE TRANSMITTER POWER		
B5	+26V	Supply to power up to four transmitters; 26 Vdc (+/- 7.5%) @ 80 mA maximum, referenced to station common.
ANALOG INPUTS		
A4	AI+ (FB01)	Each analog input is connected between an AI(+) terminal and a common (AIC-) terminal. Terminal A5 (station common) should be connected to user's instrument bus common. Typical input is 1-5 Vdc.
A5	AIC- (FB01/FB02)	
A6	AI+ (FB02)	
ANALOG OUTPUT		
A7	AO+ (FB03)	Standard output is 4-20 mAdc referenced to station common.
A8	AO- (FB03)	
DIGITAL INPUT		
B8	DI+ (FB06)	Connections made between digital input (DI+) terminal and digital input common (DI-). Logic '1' is 15 to 30 Vdc; logic '0' is 0 to 1 Vdc; minimum on and off time is 500 msec. An inductive source must be shunted by a transient suppression diode to prevent damage to Display Station input circuits. Protection required is similar to that shown in Figure 2-6 for digital outputs.
B9	DI- (FB06)	

ATTACHMENT 6

Hazardous Material Incident Notification Information Checklist

ATTACHMENT 6 Hazardous Materials Incident Notification Information Checklist

The following information should be given to dispatch. Dispatch should be instructed to give all information received to response agencies.

Notification	Time Dispatch Notified: Date: _____
Caller	Caller Name: _____ Caller Location: _____ Caller Phone Number: _____
Hazardous Materials Information	Incident location _____ (Address or Nearest Milepost or Exit) Time Incident Occurred _____ Container Type _____ (Truck, train car, drum storage, Tank, pipeline, etc.) Substance _____ UN Identification Number _____ Other Identification _____ (Placards, shipping papers, etc.) Amount of material spilled/released _____ Current condition of material _____ (Flowing, on fire, vapors present, etc.)
Scene Description	Weather conditions _____ (i.e., sunny, overcast, wet, dry, etc.) Wind direction _____ Wind speed _____ Terrain _____ (i.e., valley, stream bed, depression, asphalt, etc.) Environmental Concerns _____ (Streams, sewers, etc.)
Affected Population	Number of people affected _____ Condition of people affected _____
Resources	Resources required _____ (EMS, HazMat Team, Fire Department, etc.)
Response	Response actions anticipated And/or in progress (i.e., rescue, fire suppression, containment, etc.)
Comments	_____ _____ _____

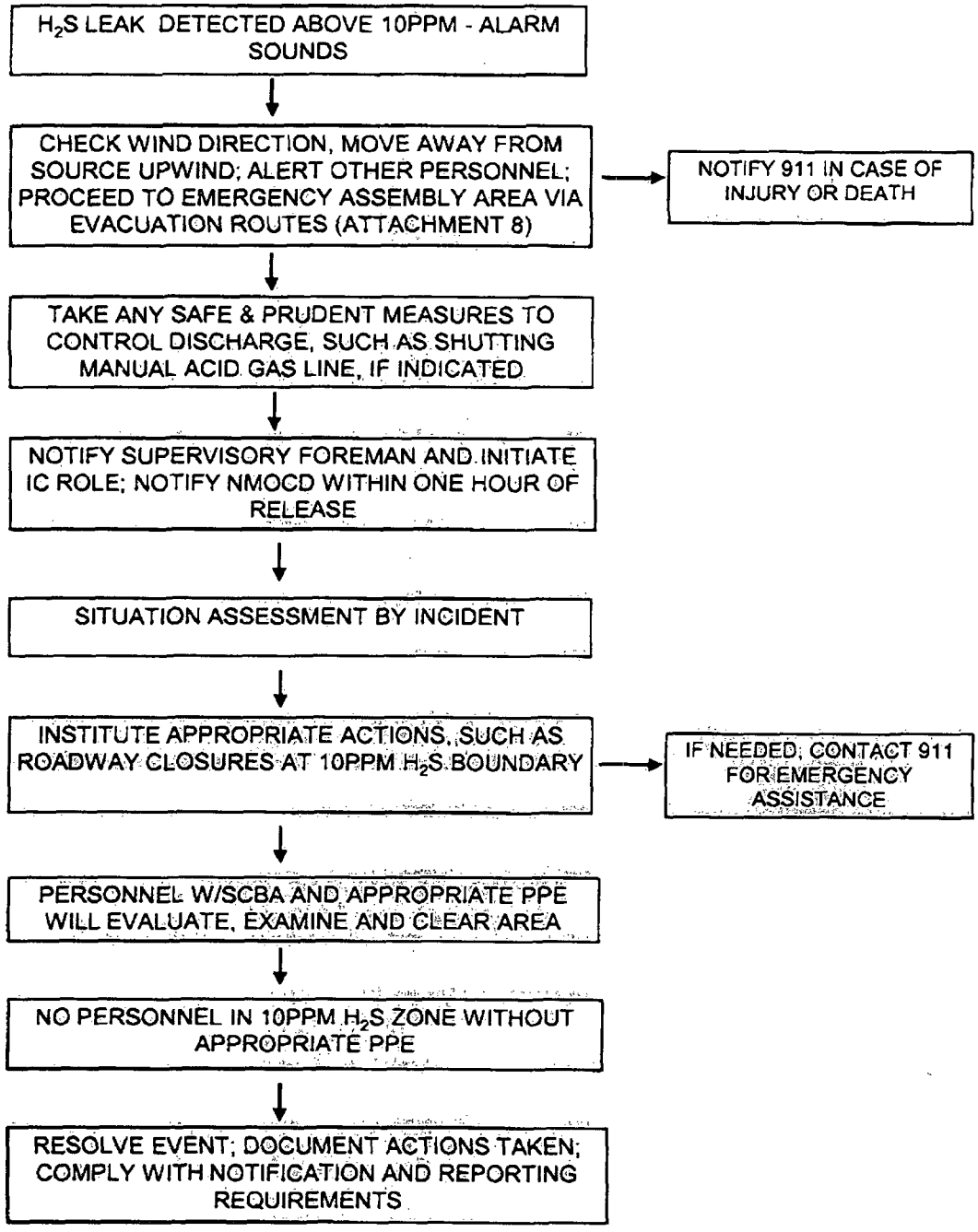
ATTACHMENT 7

Map Showing Evacuation Routes and Assembly Areas (Wind Conditions Permitting)

Figure 7-1:
Map Showing Evacuation Routes and Assembly Area

ATTACHMENT 8
Simplified H2S Contingency Plan Flowchart

ATTACHMENT 8
SIMPLIFIED H_2S CONTINGENCY PLAN FLOWCHART



ATTACHMENT 9

Distribution List

ATTACHMENT 9:
DISTRIBUTION LIST

San Juan Co Sheriff's Department **(also San Juan Emergency Preparedness Coordinator)** Attn: Mr. Bob Melton 211 Oliver St. Aztec, NM 87401 505-334-6107	**Farmington Fire Department** Chief Troy Brown 310 N. Auburn Ave. Farmington, NM 87401
New Mexico State Police Dept. 1025 W. Navajo St. Farmington, NM 87401 505-327-5853	**Farmington Police Department** Chief Jim Runnek 800 Municipal Dr. Farmington, NM 87410 505-599-1070
San Juan Regional Medical Center 801 W. Maple Farmington, NM 87401 505-609-2000	**Anadarko San Juan Plant Office** Mr. Kent McEvers #99 County Rd. 6900 Kirtland, NM 87417 505-598-5601
Anadarko Corporate Office Mr. Chuck Johnson 1202 Lake Robbins Dr. The Woodlands, TX 77380 832-636-1000	