

**District I**

1625 N. French Dr., Hobbs, NM 88240  
Phone:(575) 393-6161 Fax:(575) 393-0720

**District II**

811 S. First St., Artesia, NM 88210  
Phone:(575) 748-1283 Fax:(575) 748-9720

**District III**

1000 Rio Brazos Rd., Aztec, NM 87410  
Phone:(505) 334-6178 Fax:(505) 334-6170

**District IV**

1220 S. St Francis Dr., Santa Fe, NM 87505  
Phone:(505) 476-3470 Fax:(505) 476-3462

**State of New Mexico**  
**Energy, Minerals and Natural Resources**  
**Oil Conservation Division**  
**1220 S. St Francis Dr.**  
**Santa Fe, NM 87505**

Form C-101

August 1, 2011

Permit 303138

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

1. Operator Name and Address OCCIDENTAL PERMIAN LTD P.O. Box 4294 Houston, TX 772104294		2. OGRID Number 157984
		3. API Number 30-025-49524
4. Property Code 19552	5. Property Name SOUTH HOBBS G/SA UNIT	6. Well No. 302

**7. Surface Location**

UL - Lot C	Section 6	Township 19S	Range 38E	Lot Idn 3	Feet From 977	N/S Line N	Feet From 2061	E/W Line W	County Lea
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**8. Proposed Bottom Hole Location**

UL - Lot C	Section 6	Township 19S	Range 38E	Lot Idn 3	Feet From 867	N/S Line N	Feet From 2243	E/W Line W	County Lea
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**9. Pool Information**

HOBBS;GRAYBURG-SAN ANDRES	31920
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**Additional Well Information**

11. Work Type New Well	12. Well Type OIL	13. Cable/Rotary	14. Lease Type State	15. Ground Level Elevation 3642
16. Multiple N	17. Proposed Depth 4515	18. Formation San Andres Formation	19. Contractor	20. Spud Date 1/31/2022
Depth to Ground water		Distance from nearest fresh water well		Distance to nearest surface water

☒ We will be using a closed-loop system in lieu of lined pits**21. Proposed Casing and Cement Program**

Type	Hole Size	Casing Size	Casing Weight/ft	Setting Depth	Sacks of Cement	Estimated TOC
Surf	13.5	9.625	36	1600	515	0
Prod	8.75	7	23	4515	725	0

**Casing/Cement Program: Additional Comments**

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**22. Proposed Blowout Prevention Program**

Type	Working Pressure	Test Pressure	Manufacturer
Annular	5000	3000	
Double Ram	5000	5000	

23. I hereby certify that the information given above is true and complete to the best of my knowledge and belief. I further certify I have complied with 19.15.14.9 (A) NMAC <input checked="" type="checkbox"/> and/or 19.15.14.9 (B) NMAC <input checked="" type="checkbox"/> if applicable.	<b>OIL CONSERVATION DIVISION</b>	
Signature:		
Printed Name: Electronically filed by KELLEY MONTGOMERY	Approved By: Paul F Kautz	
Title: Manager Regulatory	Title: Geologist	
Email Address: kelley_montgomery@oxy.com	Approved Date: 11/4/2021	Expiration Date: 11/4/2023
Date: 11/1/2021	Phone: 713-366-5716	Conditions of Approval Attached

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Phone: (505) 476-3460 Fax: (505) 476-3462

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

Form C-102  
Revised August 1, 2011  
Submit one copy to appropriate  
District Office

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number 30-025-	Pool Code 31920	Pool Name HOBBS; GRAYBURG-SAN ANDRES
Property Code 19552	Property Name SOUTH HOBBS G/SA UNIT	Well Number 302
OGRID No. 157984	Operator Name OCCIDENTAL PERMIAN LTD.	Elevation 3642.5'

Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
3	6	19 SOUTH	38 EAST, N.M.P.M.		977'	NORTH	2061'	WEST	LEA

Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
3	6	19 SOUTH	38 EAST, N.M.P.M.		867'	NORTH	2243'	WEST	LEA

Dedicated Acres	Joint or Infill	Consolidation Code	Order No.
40			

No allowable will be assigned to this completion until all interests have been consolidated or a non-standard unit has been approved by the division.

	<p>OPERATOR CERTIFICATION</p> <p>I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.</p> <p><u>Roni Mathew</u> 11/1/2021 Signature Date</p> <p>Roni Mathew Printed Name roni_mathew@oxy.com E-mail Address</p> <p>SURVEYOR CERTIFICATION</p> <p>I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.</p> <p><u>STEVE J. ASH</u> 15079 OCTOBER 5, 2021 Date of Survey</p> <p><u>Terry J. Ash</u> 10/25/2021 Signature and Seal of Professional Surveyor</p> <p>Certificate Number 15079</p> <p>WO# 211005WL-j (KA)</p>
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**State of New Mexico**  
**Energy, Minerals and Natural Resources**  
**Oil Conservation Division**  
**1220 S. St Francis Dr.**  
**Santa Fe, NM 87505**

Form APD Conditions

Permit 303138

**PERMIT CONDITIONS OF APPROVAL**

Operator Name and Address: OCCIDENTAL PERMIAN LTD [157984] P.O. Box 4294 Houston, TX 772104294	API Number: 30-025-49524
	Well: SOUTH HOBBS G/SA UNIT #302

OCD Reviewer	Condition
pkautz	Will require a File As Drilled C-102 and a Directional Survey with the C-104
pkautz	Once the well is spud, to prevent ground water contamination through whole or partial conduits from the surface, the operator shall drill without interruption through the fresh water zone or zones and shall immediately set in cement the water protection string
pkautz	Oil base muds are not to be used until fresh water zones are cased and cemented providing isolation from the oil or diesel. This includes synthetic oils. Oil based mud, drilling fluids and solids must be contained in a steel closed loop system
pkautz	Cement is required to circulate on both surface and production strings of casing

# **ENGINEERING DESIGNS**

**EOR - Permit Plans NM NAD83 NME**

**North Hobbs (G/SA)**

**SHU (G/SA) 302**

**ORIG HOLE**

**Plan: Permit Plan #1**

## **Standard Planning Report**

**26 October, 2021**

# OXY

## Planning Report

<b>Database:</b>	HOPSPP	<b>Local Co-ordinate Reference:</b>	Well SHU (G/SA) 302
<b>Company:</b>	ENGINEERING DESIGNS	<b>TVD Reference:</b>	RIG KB @ 3660.00ft
<b>Project:</b>	EOR - Permit Plans NM NAD83 NME	<b>MD Reference:</b>	RIG KB @ 3660.00ft
<b>Site:</b>	North Hobbs (G/SA)	<b>North Reference:</b>	Grid
<b>Well:</b>	SHU (G/SA) 302	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIG HOLE		
<b>Design:</b>	Permit Plan #1		

<b>Project</b>	EOR - Permit Plans NM NAD83 NME		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	New Mexico Eastern Zone		

Site	North Hobbs (G/SA)				
Site Position:		Northing:	624,164.91 usft	Latitude:	32° 42' 37.220400 N
From:	Lat/Long	Easting:	903,596.23 usft	Longitude:	103° 9' 20.073240 W
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in	Grid Convergence:	0.64 °

Well	SHU (G/SA) 302					
Well Position	+N/-S	-6,083.97 ft	Northing:	618,080.95 usft	Latitude:	32° 41' 38.154658 N
	+E/-W	-10,383.12 ft	Easting:	893,213.13 usft	Longitude:	103° 11' 22.345226 W
Position Uncertainty		2.00 ft	Wellhead Elevation:	3,642.50 ft	Ground Level:	3,642.50 ft

<b>Wellbore</b>	ORIG HOLE				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	HDGM_FILE	9/29/2021	6.48	60.62	47,795.10000000

<b>Design</b>	Permit Plan #1			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PROTOTYPE	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>
	0.00	0.00	0.00	58.54

<b>Plan Survey Tool Program</b>	<b>Date</b>	10/26/2021		
<b>Depth From (ft)</b>	<b>Depth To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Remarks</b>
1	0.00	4,515.96	Permit Plan #1 (ORIG HOLE)	A005Mb_MWD+IFR1 OWSG MWD + IFR1

<b>Plan Sections</b>										
<b>Measured Depth (ft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Dogleg Rate (°/100ft)</b>	<b>Build Rate (°/100ft)</b>	<b>Turn Rate (°/100ft)</b>	<b>TFO (°)</b>	<b>Target</b>
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,250.00	0.00	0.00	2,250.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,749.37	9.99	58.54	2,746.85	22.66	37.03	2.00	2.00	0.00	58.54	
3,445.24	9.99	58.54	3,432.17	85.65	139.98	0.00	0.00	0.00	0.00	
4,015.96	0.00	239.63	4,000.00	111.54	182.30	1.75	-1.75	0.00	180.00	BHL Top SHU 302
4,515.96	0.00	239.63	4,500.00	111.54	182.30	0.00	0.00	0.00	239.63	BHL SHU 302

# OXY

## Planning Report

<b>Database:</b>	HOPSP	<b>Local Co-ordinate Reference:</b>	Well SHU (G/SA) 302
<b>Company:</b>	ENGINEERING DESIGNS	<b>TVD Reference:</b>	RIG KB @ 3660.00ft
<b>Project:</b>	EOR - Permit Plans NM NAD83 NME	<b>MD Reference:</b>	RIG KB @ 3660.00ft
<b>Site:</b>	North Hobbs (G/SA)	<b>North Reference:</b>	Grid
<b>Well:</b>	SHU (G/SA) 302	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIG HOLE		
<b>Design:</b>	Permit Plan #1		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00
2,250.00	0.00	0.00	2,250.00	0.00	0.00	0.00	0.00	0.00	0.00
2,300.00	1.00	58.54	2,300.00	0.23	0.37	0.44	2.00	2.00	0.00
2,400.00	3.00	58.54	2,399.93	2.05	3.35	3.93	2.00	2.00	0.00
2,500.00	5.00	58.54	2,499.68	5.69	9.30	10.90	2.00	2.00	0.00
2,600.00	7.00	58.54	2,599.13	11.14	18.21	21.35	2.00	2.00	0.00
2,700.00	9.00	58.54	2,698.15	18.41	30.09	35.27	2.00	2.00	0.00
2,749.37	9.99	58.54	2,746.85	22.66	37.03	43.41	2.00	2.00	0.00
2,800.00	9.99	58.54	2,796.71	27.24	44.52	52.19	0.00	0.00	0.00
2,900.00	9.99	58.54	2,895.19	36.29	59.32	69.54	0.00	0.00	0.00
3,000.00	9.99	58.54	2,993.68	45.34	74.11	86.88	0.00	0.00	0.00
3,100.00	9.99	58.54	3,092.16	54.40	88.90	104.22	0.00	0.00	0.00
3,200.00	9.99	58.54	3,190.65	63.45	103.70	121.57	0.00	0.00	0.00
3,300.00	9.99	58.54	3,289.13	72.50	118.49	138.91	0.00	0.00	0.00
3,400.00	9.99	58.54	3,387.62	81.55	133.28	156.25	0.00	0.00	0.00
3,445.24	9.99	58.54	3,432.17	85.65	139.98	164.10	0.00	0.00	0.00
3,500.00	9.03	58.54	3,486.18	90.37	147.69	173.15	1.75	-1.75	0.00
3,600.00	7.28	58.54	3,585.16	97.77	159.79	187.33	1.75	-1.75	0.00
3,700.00	5.53	58.54	3,684.53	103.59	169.31	198.48	1.75	-1.75	0.00
3,800.00	3.78	58.54	3,784.20	107.82	176.23	206.60	1.75	-1.75	0.00
3,900.00	2.03	58.54	3,884.07	110.47	180.55	211.66	1.75	-1.75	0.00
4,000.00	0.28	58.54	3,984.04	111.52	182.27	213.68	1.75	-1.75	0.00
4,015.96	0.00	239.63	4,000.00	111.54	182.30	213.72	1.75	-1.75	0.00
BHL Top SHU 302									
4,100.00	0.00	0.00	4,084.04	111.54	182.30	213.72	0.00	0.00	0.00
4,200.00	0.00	0.00	4,184.04	111.54	182.30	213.72	0.00	0.00	0.00
4,300.00	0.00	0.00	4,284.04	111.54	182.30	213.72	0.00	0.00	0.00
4,400.00	0.00	0.00	4,384.04	111.54	182.30	213.72	0.00	0.00	0.00
4,500.00	0.00	0.00	4,484.04	111.54	182.30	213.72	0.00	0.00	0.00
4,515.96	0.00	239.63	4,500.00	111.54	182.30	213.72	0.00	0.00	0.00
BHL SHU 302									

# OXY

## Planning Report

<b>Database:</b>	HOPSP	<b>Local Co-ordinate Reference:</b>	Well SHU (G/SA) 302
<b>Company:</b>	ENGINEERING DESIGNS	<b>TVD Reference:</b>	RIG KB @ 3660.00ft
<b>Project:</b>	EOR - Permit Plans NM NAD83 NME	<b>MD Reference:</b>	RIG KB @ 3660.00ft
<b>Site:</b>	North Hobbs (G/SA)	<b>North Reference:</b>	Grid
<b>Well:</b>	SHU (G/SA) 302	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	ORIG HOLE		
<b>Design:</b>	Permit Plan #1		

Design Targets									
Target Name									
- hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting		
- Shape	(°)	(°)	(ft)	(ft)	(ft)	(usft)	(usft)	Latitude	Longitude
BHL Top SHU 302	0.00	0.07	4,000.00	111.54	182.30	618,192.49	893,395.43	32° 41' 39.238706 N	103° 11' 20.198235 W
- plan hits target center									
- Circle (radius 100.00)									
BHL SHU 302	0.00	0.07	4,500.00	111.54	182.30	618,192.49	893,395.43	32° 41' 39.238706 N	103° 11' 20.198235 W
- plan hits target center									
- Point									

Formations						
	Measured Depth	Vertical Depth				
	(ft)	(ft)	Name	Lithology	Dip	Dip Direction
					(°)	(°)
	170.00	170.00	Red Beds			
	1,604.00	1,604.00	Rustler			
	1,727.00	1,727.00	Salt			
	2,840.91	2,837.00	Yates			
	3,055.16	3,048.00	Seven Rivers			
	3,603.87	3,589.00	Queen			
	3,930.95	3,915.00	Grayburg			
	4,200.96	4,185.00	San Andres			



## **Permian Drilling Hydrogen Sulfide Drilling Operations Plan New Mexico**

### **Scope**

This contingency plan establishes guidelines for the public, all company employees, and contract employees who's work activities may involve exposure to hydrogen sulfide (H<sub>2</sub>S) gas.

While drilling this well, it is possible to encounter H<sub>2</sub>S bearing formations. At all times, the first barrier to control H<sub>2</sub>S emissions will be the drilling fluid, which will have a density high enough to control influx.

### **Objective**

1. Provide an immediate and predetermined response plan to any condition when H<sub>2</sub>S is detected. All H<sub>2</sub>S detections in excess of 10 parts per million (ppm) concentration are considered an Emergency.
2. Prevent any and all accidents, and prevent the uncontrolled release of hydrogen sulfide into the atmosphere.
3. Provide proper evacuation procedures to cope with emergencies.
4. Provide immediate and adequate medical attention should an injury occur.



## **Discussion**

Implementation:	This plan with all details is to be fully implemented before drilling to <u>commence</u> .
Emergency response Procedure:	This section outlines the conditions and denotes steps to be taken in the event of an emergency.
Emergency equipment Procedure:	This section outlines the safety and emergency equipment that will be required for the drilling of this well.
Training provisions:	This section outlines the training provisions that must be adhered to prior to drilling.
Drilling emergency call lists:	Included are the telephone numbers of all persons to be contacted should an emergency exist.
Briefing:	This section deals with the briefing of all people involved in the drilling operation.
Public safety:	Public safety personnel will be made aware of any potential evacuation and any additional support needed.
Check lists:	Status check lists and procedural check lists have been included to insure adherence to the plan.
General information:	A general information section has been included to supply support information.

### **Hydrogen Sulfide Training**

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

1. The hazards and characteristics of H<sub>2</sub>S.
2. Proper use and maintenance of personal protective equipment and life support systems.
3. H<sub>2</sub>S detection.
4. Proper use of H<sub>2</sub>S detectors, alarms, warning systems, briefing areas, evacuation procedures and prevailing winds.
5. Proper techniques for first aid and rescue procedures.
6. Physical effects of hydrogen sulfide on the human body.
7. Toxicity of hydrogen sulfide and sulfur dioxide.
8. Use of SCBA and supplied air equipment.
9. First aid and artificial respiration.
10. Emergency rescue.

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

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

H<sub>2</sub>S training refresher must have been taken within one year prior to drilling the well. Specifics on the well to be drilled will be discussed during the pre-spud meeting. H<sub>2</sub>S and well control (choke) drills will be performed while drilling the well, at least on a weekly basis. This plan shall be available in the well site. All personnel will be required to carry the documentation proving that the H<sub>2</sub>S training has been taken.

#### **Service company and visiting personnel**

- A. Each service company that will be on this well will be notified if the zone contains H<sub>2</sub>S.
- B. Each service company must provide for the training and equipment of their employees before they arrive at the well site.
- C. Each service company will be expected to attend a well site briefing

### **Emergency Equipment Requirements**

#### 1. Well control equipment

The well shall have hydraulic BOP equipment for the anticipated pressures. Equipment is to be tested on installation and follow Oxy Well Control standard, as well as BLM Onshore Order #2.

*Special control equipment:*

- A. Hydraulic BOP equipment with remote control on ground. Remotely operated choke.
- B. Rotating head
- C. Gas buster equipment shall be installed before drilling out of surface pipe.

#### 2. Protective equipment for personnel

- A. Four (4) 30-minute positive pressure air packs (2 at each briefing area) on location.
- B. Adequate fire extinguishers shall be located at strategic locations.
- C. Radio / cell telephone communication will be available at the rig.
  - Rig floor and trailers.
  - Vehicle.

#### 3. Hydrogen sulfide sensors and alarms

- A. H<sub>2</sub>S sensor with alarms will be located on the rig floor, at the bell nipple, and at the flow line. These monitors will be set to alarm at 10 ppm with strobe light, and audible alarm.
- B. Hand operated detectors with tubes.
- C. H<sub>2</sub>S monitor tester (to be provided by contract Safety Company.)
- D. There shall be one combustible gas detector on location at all times.

#### 4. Visual Warning Systems

- A. One sign located at each location entrance with the following language:

**Caution – potential poison gas  
Hydrogen sulfide  
No admittance without authorization**

*Wind sock – wind streamers:*

- A. One 36" (in length) wind sock located at protection center, at height visible from rig floor.
- B. One 36" (in length) wind sock located at height visible from pit areas.

*Condition flags*

- A. One each condition flag to be displayed to denote conditions.

**green – normal conditions**  
**yellow – potential danger**  
**red – danger, H<sub>2</sub>S present**

- B. Condition flag shall be posted at each location sign entrance.

5. Mud Program

The mud program is designed to minimize the risk of having H<sub>2</sub>S and other formation fluids at surface. Proper mud weight and safe drilling practices will be applied. H<sub>2</sub>S scavengers will be used to minimize the hazards while drilling. Below is a summary of the drilling program.

*Mud inspection devices:*

Garrett gas train or hatch tester for inspection of sulfide concentration in mud system.

6. Metallurgy

- A. Drill string, casing, tubing, wellhead, blowout preventers, drilling spools or adapters, kill lines, choke manifold, lines and valves shall be suitable for the H<sub>2</sub>S service.
- B. All the elastomers, packing, seals and ring gaskets shall be suitable for H<sub>2</sub>S service.

7. Well Testing

No drill stem test will be performed on this well.

8. Evacuation plan

Evacuation routes should be established prior to well spud for each well and discussed with all rig personnel.

9. Designated area

- A. Parking and visitor area: all vehicles are to be parked at a predetermined safe distance from the wellhead.
- B. There will be a designated smoking area.
- C. Two briefing areas on either side of the location at the maximum allowable distance from the well bore so they offset prevailing winds perpendicularly, or at a 45-degree angle if wind direction tends to shift in the area.

**Emergency procedures**

- A. In the event of any evidence of H<sub>2</sub>S level above 10 ppm, take the following steps:
  - 1. The Driller will pick up off bottom, shut down the pumps, slow down the pipe rotation.
  - 2. Secure and don escape breathing equipment, report to the upwind designated safe briefing / muster area.
  - 3. All personnel on location will be accounted for and emergency search should begin for any missing, the Buddy System will be implemented.
  - 4. Order non-essential personnel to leave the well site, order all essential personnel out of the danger zone and upwind to the nearest designated safe briefing / muster area.
  - 5. Entrance to the location will be secured to a higher level than our usual “Meet and Greet” requirement, and the proper condition flag will be displayed at the entrance to the location.
  - 6. Take steps to determine if the H<sub>2</sub>S level can be corrected or suppressed and, if so, proceed as required.
- B. If uncontrollable conditions occur:
  - 1. Take steps to protect and/or remove any public in the down-wind area from the rig – partial evacuation and isolation. Notify necessary public safety personnel and appropriate regulatory entities (i.e. BLM) of the situation.

2. Remove all personnel to the nearest upwind designated safe briefing / muster area or off location.
3. Notify public safety personnel of safe briefing / muster area.
4. An assigned crew member will blockade the entrance to the location. No unauthorized personnel will be allowed entry to the location.
5. Proceed with best plan (at the time) to regain control of the well. Maintain tight security and safety procedures.

C. Responsibility:

1. Designated personnel.
  - a. Shall be responsible for the total implementation of this plan.
  - b. Shall be in complete command during any emergency.
  - c. Shall designate a back-up.

- |                     |                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| All personnel:      | <ol style="list-style-type: none"> <li>1. On alarm, don escape unit and report to the nearest upwind designated safe briefing / muster area upw</li> <li>2. Check status of personnel (buddy system).</li> <li>3. Secure breathing equipment.</li> <li>4. Await orders from supervisor.</li> </ol>                                                                                               |
| Drill site manager: | <ol style="list-style-type: none"> <li>1. Don escape unit if necessary and report to nearest upwind designated safe briefing / muster area.</li> <li>2. Coordinate preparations of individuals to return to point of release with tool pusher and driller (using the buddy system).</li> <li>3. Determine H2S concentrations.</li> <li>4. Assess situation and take control measures.</li> </ol> |
| Tool pusher:        | <ol style="list-style-type: none"> <li>1. Don escape unit Report to up nearest upwind designated safe briefing / muster area.</li> <li>2. Coordinate preparation of individuals to return to point of release with tool pusher drill site manager (using the buddy system).</li> <li>3. Determine H2S concentration.</li> <li>4. Assess situation and take control measures.</li> </ol>          |
| Driller:            | <ol style="list-style-type: none"> <li>1. Don escape unit, shut down pumps, continue</li> </ol>                                                                                                                                                                                                                                                                                                  |

- rotating DP.
  - 2. Check monitor for point of release.
  - 3. Report to nearest upwind designated safe briefing / muster area.
  - 4. Check status of personnel (in an attempt to rescue, use the buddy system).
  - 5. Assigns least essential person to notify Drill Site Manager and tool pusher by quickest means in case of their absence.
  - 6. Assumes the responsibilities of the Drill Site Manager and tool pusher until they arrive should they be absent.
- Derrick man
- Floor man #1
- Floor man #2
1. Will remain in briefing / muster area until instructed by supervisor.
- Mud engineer:
1. Report to nearest upwind designated safe briefing / muster area.
2. When instructed, begin check of mud for ph and H2S level. (Garett gas train.)
- Safety personnel:
1. Mask up and check status of all personnel and secure operations as instructed by drill site manager.

### **Taking a kick**

When taking a kick during an H2S emergency, all personnel will follow standard Well control procedures after reporting to briefing area and masking up.

### **Open-hole logging**

All unnecessary personnel off floor. Drill Site Manager and safety personnel should monitor condition, advise status and determine need for use of air equipment.

### **Running casing or plugging**

Following the same “tripping” procedure as above. Drill Site Manager and safety personnel should determine if all personnel have access to protective equipment.

### **Ignition procedures**

The decision to ignite the well is the responsibility of the operator (Oxy Drilling Management). The decision should be made only as a last resort and in a situation where it is clear that:

1. Human life and property are endangered.
2. There is no hope controlling the blowout under the prevailing conditions at the well.

#### **Instructions for igniting the well**

1. Two people are required for the actual igniting operation. They must wear self-contained breathing units and have a safety rope attached. One man (tool pusher or safety engineer) will check the atmosphere for explosive gases with the gas monitor. The other man is responsible for igniting the well.
2. Primary method to ignite: 25 mm flare gun with range of approximately 500 feet.
3. Ignite upwind and do not approach any closer than is warranted.
4. Select the ignition site best for protection, and which offers an easy escape route.
5. Before firing, check for presence of combustible gas.
6. After lighting, continue emergency action and procedure as before.
7. All unassigned personnel will remain in briefing area until instructed by supervisor or directed by the Drill Site Manager.

**Remember:** After well is ignited, burning hydrogen sulfide will convert to sulfur dioxide, which is also highly toxic. **Do not assume the area is safe after the well is ignited.**



**Status check list**

Note: All items on this list must be completed before drilling to production casing point.

1. H2S sign at location entrance.
2. Two (2) wind socks located as required.
3. Four (4) 30-minute positive pressure air packs (2 at each Briefing area) on location for all rig personnel and mud loggers.
4. Air packs inspected and ready for use.
5. Cascade system and hose line hook-up as needed.
6. Cascade system for refilling air bottles as needed.
7. Condition flag on location and ready for use.
8. H2S detection system hooked up and tested.
9. H2S alarm system hooked up and tested.
10. Hand operated H2S detector with tubes on location.
11. 1 – 100' length of nylon rope on location.
12. All rig crew and supervisors trained as required.
13. All outside service contractors advised of potential H2S hazard on well.
14. No smoking sign posted and a designated smoking area identified.
15. Calibration of all H2S equipment shall be noted on the IADC report.

Checked by:\_\_\_\_\_ Date:\_\_\_\_\_

**Procedural check list during H2S events**

**Perform each tour:**

1. Check fire extinguishers to see that they have the proper charge.
2. Check breathing equipment to ensure that it is in proper working order.
3. Make sure all the H2S detection system is operative.

**Perform each week:**

1. Check each piece of breathing equipment to make sure that demand or forced air regulator is working. This requires that the bottle be opened and the mask assembly be put on tight enough so that when you inhale, you receive air or feel air flow.
2. BOP skills (well control drills).
3. Check supply pressure on BOP accumulator stand by source.
4. Check breathing equipment mask assembly to see that straps are loosened and turned back, ready to put on.
5. Check pressure on breathing equipment air bottles to make sure they are charged to full volume. ( Air quality checked for proper air grade "D" before bringing to location)
6. Confirm pressure on all supply air bottles.
7. Perform breathing equipment drills with on-site personnel.
8. Check the following supplies for availability.
  - A. Emergency telephone list.
  - B. Hand operated H2S detectors and tubes.

### **General evacuation plan**

1. When the company approved supervisor (Drill Site Manager, consultant, rig pusher, or driller) determines the H<sub>2</sub>S gas cannot be limited to the well location and the public will be involved, he will activate the evacuation plan.
2. Drill Site Manager or designee will notify local government agency that a hazardous condition exists and evacuation needs to be implemented.
3. Company or contractor safety personnel that have been trained in the use of H<sub>2</sub>S detection equipment and self-contained breathing equipment will monitor H<sub>2</sub>S concentrations, wind directions, and area of exposure. They will delineate the outer perimeter of the hazardous gas area. Extension to the evacuation area will be determined from information gathered.
4. Law enforcement personnel (state police, police dept., fire dept., and sheriff's dept.) Will be called to aid in setting up and maintaining road blocks. Also, they will aid in evacuation of the public if necessary.
5. After the discharge of gas has been controlled, company safety personnel will determine when the area is safe for re-entry.

**Important: Law enforcement personnel will not be asked to come into a contaminated area. Their assistance will be limited to uncontaminated areas. Constant radio contact will be maintained with them.**

### **Emergency actions**

#### **Well blowout – if emergency**

1. Evacuate all personnel to “Safe Briefing / Muster Areas” or off location if needed.
2. If sour gas – evacuate rig personnel.
3. If sour gas – evacuate public within 3000 ft radius of exposure.
4. Don SCBA and shut well in if possible using the buddy system.
5. Notify Drilling Superintendent and call 911 for emergency help (fire dept and ambulance) if needed.
6. Implement the Blowout Contingency Plan, and Drilling Emergency Action Plan.
6. Give first aid as needed.

#### **Person down location/facility**

1. If immediately possible, contact 911. Give location and wait for confirmation.
2. Don SCBA and perform rescue operation using buddy system.

### **Toxic effects of hydrogen sulfide**

Hydrogen sulfide is extremely toxic. The acceptable ceiling concentration for eight-hour exposure is 10 ppm, which is .001% by volume. Hydrogen sulfide is heavier than air (specific gravity – 1.192) and colorless. It forms an explosive mixture with air between 4.3 and 46.0 percent by volume. Hydrogen sulfide is almost as toxic as hydrogen cyanide and is between five and six times more toxic than carbon monoxide. Toxicity data for hydrogen sulfide and various other gases are compared in table i. Physical effects at various hydrogen sulfide exposure levels are shown in table ii.

Table i  
Toxicity of various gases

Common name	Chemical formula	Specific gravity (sc=1)	Threshold limit (1)	Hazardous limit (2)	Lethal concentration (3)
Hydrogen Cyanide	Hcn	0.94	10 ppm	150 ppm/hr	300 ppm
Hydrogen Sulfide	H2S	1.18	10 ppm	250 ppm/hr	600 ppm
Sulfur Dioxide	So2	2.21	5 ppm	-	1000 ppm
Chlorine	Cl2	2.45	1 ppm	4 ppm/hr	1000 ppm
Carbon Monoxide	Co	0.97	50 ppm	400 ppm/hr	1000 ppm
Carbon Dioxide	Co2	1.52	5000 ppm	5%	10%
Methane	Ch4	0.55	90,000 ppm	Combustible above 5% in air	

- 1) threshold limit – concentration at which it is believed that all workers may be repeatedly exposed day after day without adverse effects.
- 2) hazardous limit – concentration that will cause death with short-term exposure.
- 3) lethal concentration – concentration that will cause death with short-term exposure.

### **Toxic effects of hydrogen sulfide**

Table ii  
Physical effects of hydrogen sulfide

<u>Percent (%)</u>	<u>Ppm</u>	<u>Concentration</u> Grains <u>100 std. Ft3*</u>	<u>Physical effects</u>
0.001	<10	00.65	Obvious and unpleasant odor.

0.002	10	01.30	Safe for 8 hours of exposure.
0.010	100	06.48	Kill smell in 3 – 15 minutes. May sting eyes and throat.
0.020	200	12.96	Kills smell shortly; stings eyes and throat.
0.050	500	32.96	Dizziness; breathing ceases in a few minutes; needs prompt artificial respiration.
0.070	700	45.36	Unconscious quickly; death will result if not rescued promptly.
0.100	1000	64.30	Unconscious at once; followed by death within minutes.

\*at 15.00 psia and 60'f.

**Use of self-contained breathing equipment (SCBA)**

1. Written procedures shall be prepared covering safe use of SCBA's in dangerous atmosphere, which might be encountered in normal operations or in emergencies. Personnel shall be familiar with these procedures and the available SCBA.
2. SCBA's shall be inspected frequently at random to insure that they are properly used, cleaned, and maintained.
3. Anyone who may use the SCBA's shall be trained in how to insure proper face-piece to face seal. They shall wear SCBA's in normal air and then wear them in a test atmosphere. (note: such items as facial hair {beard or sideburns} and eyeglasses will not allow proper seal.) Anyone that may be reasonably expected to wear SCBA's should have these items removed before entering a toxic atmosphere. A special mask must be obtained for anyone who must wear eyeglasses or contact lenses.
4. Maintenance and care of SCBA's:
  - a. A program for maintenance and care of SCBA's shall include the following:
    1. Inspection for defects, including leak checks.
    2. Cleaning and disinfecting.
    3. Repair.
    4. Storage.
  - b. Inspection, self-contained breathing apparatus for emergency use shall be inspected monthly.
    1. Fully charged cylinders.
    2. Regulator and warning device operation.
    3. Condition of face piece and connections.
    4. Rubber parts shall be maintained to keep them pliable and prevent deterioration.
  - c. Routinely used SCBA's shall be collected, cleaned and disinfected as frequently as necessary to insure proper protection is provided.
5. Persons assigned tasks that requires use of self-contained breathing equipment shall be certified physically fit (medically cleared) for breathing equipment usage at least annually.
6. SCBA's should be worn when:
  - A. Any employee works near the top or on top of any tank unless test reveals less than 10 ppm of H<sub>2</sub>S.

- B. When breaking out any line where H<sub>2</sub>S can reasonably be expected.
- C. When sampling air in areas to determine if toxic concentrations of H<sub>2</sub>S exists.
- D. When working in areas where over 10 ppm H<sub>2</sub>S has been detected.
- E. At any time there is a doubt as to the H<sub>2</sub>S level in the area to be entered.

**Rescue**  
**First aid for H<sub>2</sub>S poisoning**

Do not panic!

Remain calm – think!

1. Don SCBA breathing equipment.
2. Remove victim(s) utilizing buddy system to fresh air as quickly as possible. (go up-wind from source or at right angle to the wind. Not down wind.)
3. Briefly apply chest pressure – arm lift method of artificial respiration to clean the victim's lungs and to avoid inhaling any toxic gas directly from the victim's lungs.
4. Provide for prompt transportation to the hospital, and continue giving artificial respiration if needed.
5. Hospital(s) or medical facilities need to be informed, before-hand, of the possibility of H<sub>2</sub>S gas poisoning – no matter how remote the possibility is.
6. Notify emergency room personnel that the victim(s) has been exposed to H<sub>2</sub>S gas.

Besides basic first aid, everyone on location should have a good working knowledge of artificial respiration.

Revised CM 6/27/2012



**III. Well(s)**

Well Name	API	WELL LOCATION (ULSTR)	Footages	ANTICIPATED OIL BBL/D	ANTICIPATED GAS MCF/D	ANTICIPATED PROD WATER BBL/D
NORTH HOBBS G/SA UNIT 33-962	Pending	C-33-T18S-R38E	232 FNL 1989 FWL	44	537	1780
NORTH HOBBS G/SA UNIT 33-963	Pending	C-33-T18S-R38E	262 FNL 1989 FWL	44	537	1780
NORTH HOBBS G/SA UNIT 33-964	Pending	C-33-T18S-R38E	292 FNL 1989 FWL	44	537	1780
* NORTH HOBBS G/SA UNIT 33-965	Pending	F-33-T18S-R38E	1488 FNL 2027 FWL	NA	NA	NA
NORTH HOBBS G/SA UNIT 33-967	Pending	L-33-T18S-R38E	1803 FSL 1152 FWL	44	537	1780
SOUTH HOBBS G/SA UNIT 302	Pending	F-6-T19S-R38E	977 FNL 2061 FWL	25	450	800

\* NORTH HOBBS G/SA UNIT 33-965 is an injector

**V. Anticipated Schedule**

<b>Well Name</b>	<b>API</b>	<b>Spud Date</b>	<b>TD Reached Date</b>	<b>Completion Commencement Date</b>	<b>Initial Flow Back Date</b>	<b>First Production Date</b>
NORTH HOBBS G/SA UNIT 33-962	PENDING	TBD	TBD	TBD	TBD	TBD
NORTH HOBBS G/SA UNIT 33-963	PENDING	TBD	TBD	TBD	TBD	TBD
NORTH HOBBS G/SA UNIT 33-964	PENDING	TBD	TBD	TBD	TBD	TBD
NORTH HOBBS G/SA UNIT 33-965	PENDING	TBD	TBD	TBD	TBD	TBD
NORTH HOBBS G/SA UNIT 33-967	PENDING	TBD	TBD	TBD	TBD	TBD
SOUTH HOBBS G/SA UNIT 302	PENDING	TBD	TBD	TBD	TBD	TBD

Central Delivery Point Name (CTB the well will produce to): North Hobbs Unit North Injection Battery

#### **Part VI. Separation Equipment**

Operator will size the flowback separator to handle 11,000 Bbls of fluid and 6-10MMscfd which is more than the expected peak rates for these wells. Each separator is rated to 1440psig, and pressure control valves and automated communication will cause the wells to shut in in the event of an upset at the facility, therefore no gas will be flared on pad during an upset. Current Oxy practices avoid use of flare or venting on pad, therefore if there is an upset or emergency condition at the facility, the wells will immediately shut down, and reassume production once the condition has cleared.

## VII. Operational Practices

### Gathering System and Pipeline Notification

Well(s) will be connected to a production facility after flowback operations are complete, where a gas transporter system is in place. The gas produced from production facility is dedicated to Oxy North Hobbs Unit RCF and is connected to high pressure gathering system located in Lea County, New Mexico. OXY USA INC. ("OXY") provides a drilling, completion and estimated first production date for wells that are scheduled to be drilled in the foreseeable future. In addition, OXY has internal conference calls to discuss changes to drilling and completion schedules. Gas from these wells will be processed at North Hobbs RCF in Lea County, New Mexico. The actual flow of the gas will be based on compression operating parameters and gathering system pressures.

#### **VIII. Best Management Practices**

Gas produced from the NHU wells will be processed within the lease and reinjected into the reservoir within the producing zones to help sweep oil. This is a closed loop system with safeguards in place to minimize flaring. In the event that we lose a compressor the wells automatically choke back to cut the gas going to the plant.