13-108

Form 3160-3
(March 2012)

OCD Artesia

FORM APPROVED
OMB No. 1004-0137
Expires October 31, 2014

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

1a. Type of work: ☑ DRILL ☐ REENTER	5. Lease Serial No. NMNM 99015
	6. If Indian, Allotee or Tribe Name
1b. Type of Well: ☑ Oil Well ☐ Gas Well ☐ Other ☑ Single Zone ☐ Multiple Zone	7. If Unit or CA Agreement, Name and No.
2. Name of Operator OXY USA INC <16696>	8. Lease Name and Well No. SEVEN RIVERS 17 FEDERAL #3H <304957>
3a. Address P.O. BOX 4294 HOUSTON, TX 77210	3b. Phone No. (include area code) 713-513-6640
4. Location of Well (Report location clearly and in accordance with any State requirements.*) At surface 330' FNL & 940' FWL At proposed prod. zone 330' FSL & 840' FWL	9. API Well No. 30-015-41062
	10. Field and Pool, or Exploratory N SEVEN RIVERS GLORIETA YESO <97565>
	11. Sec., T. R. M. or Blk. and Survey or Area D; SEC 17, T20S, R25E
14. Distance in miles and direction from nearest town or post office* 24 MILES NORTHWEST OF CARLSBAD,NM	12. County or Parish EDDY COUNTY / 13. State NM

15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) 330'	16. No. of acres in lease 320	17. Spacing Unit dedicated to this well 160
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. 1000'	19. Proposed Depth 6934' MD / 2600' TVD	20. BLM/BIA Bond No. on file NMB000862 / ESB00226
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 3526.8'	22. Approximate date work will start*	23. Estimated duration 30 DAYS

24. Attachments

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

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

25. Signature	Name (Printed/Typed) JENNIFER DUARTE (jennifer_duarte@oxy.com)	Date 10/22/2012
Title REGULATORY ANALYST		
Approved by (Signature) /s/ Don Peterson	Name (Printed/Typed) /s/ Don Peterson	Date FEB - 1 2013
Title for FIELD MANAGER	Office CARLSBAD FIELD OFFICE	

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

APPROVAL FOR TWO YEARS

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

(Continued on page 2)

*(Instructions on page 2)

Roswell Controlled Water Basin

RECEIVED
FEB 05 2013
NMOCD ARTESIA

SEE ATTACHED FOR
CONDITIONS OF APPROVAL

Approval Subject to General Requirements & Special Stipulations Attached

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

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

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

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number	Pool Code	Pool Name
30-015-41062	97565	N. Seven Rivers Glorieta Yeso

Property Code	Property Name	Well Number
304957	SEVEN RIVERS "17" FEDERAL	3H

OGRID No.	Operator Name	Elevation
16696	OXY USA INC.	3526.8'

Surface Location

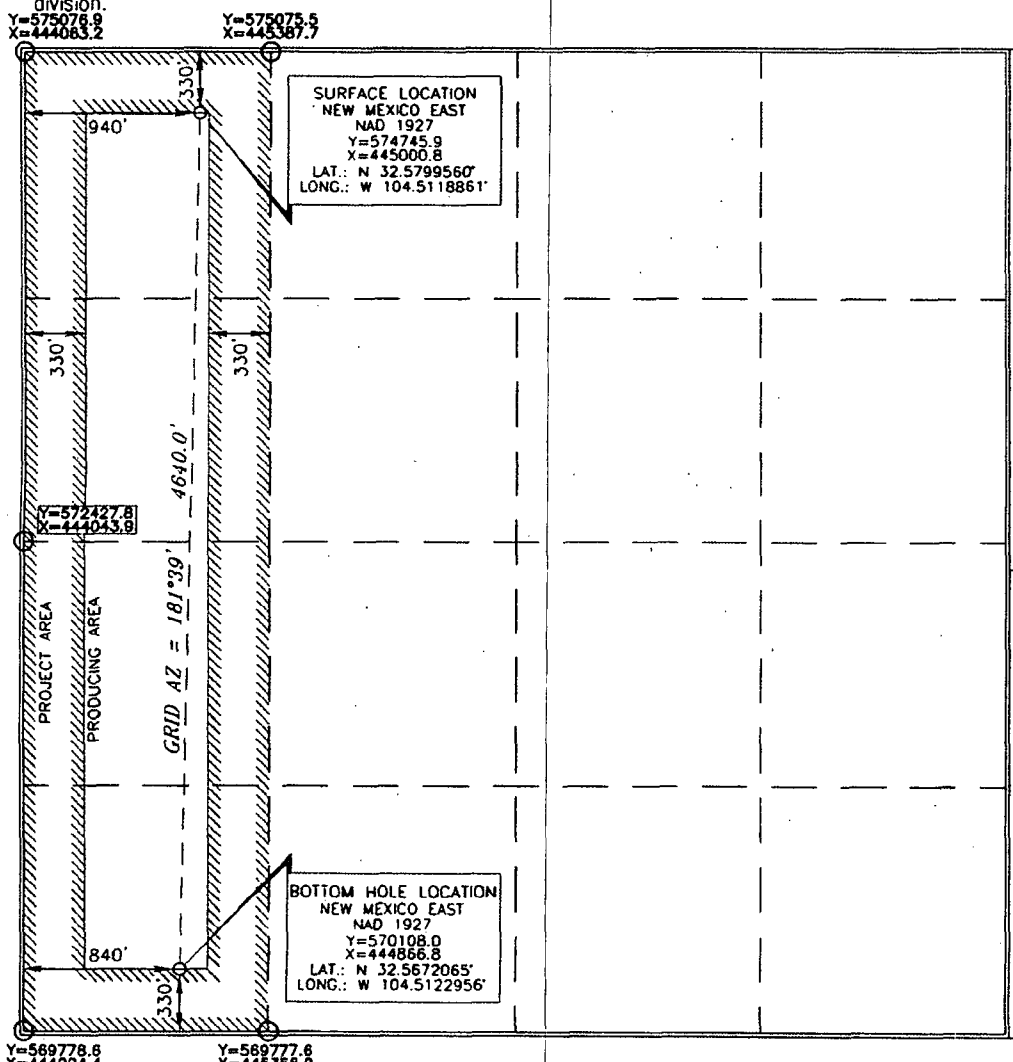
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
D	17	20 SOUTH	25 EAST, N.M.P.M.		330'	NORTH	940'	WEST	EDDY

Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
M	17	20 SOUTH	25 EAST, N.M.P.M.		330'	SOUTH	840'	WEST	EDDY

Dedicated Acres	Joint or Infill	Consolidation Code	Order No.
160			

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



OPERATOR CERTIFICATION

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

Signature — Date 10/22/12

Jennifer Duarte
Printed Name

SURVEYOR CERTIFICATION

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

JANUARY 25, 2012
Date of Survey

Signature and Seal of Professional Surveyor:

NEW MEXICO 15079 REGISTERED PROFESSIONAL LAND SURVEYOR

Certificate Number 15079

2/27/2012

WO# 110921WL-f-XY (Rev. A) (KA)

OPERATOR CERTIFICATION

I hereby certify that I, or someone under my direct supervision, have inspected the drill site and access route proposed herein; that I am familiar with the conditions that presently exist; that I have full knowledge of State and Federal laws applicable to this operation; that the statements made in this APD package are, to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed in conformity with this APD package and the terms and conditions under which it is approved. I also certify that I, or the company I represent, am responsible for the operations conducted under this application. These statements are subject to the provisions of 18 U.S.C. 1001 for the filing of false statements. Executed this 22nd day of October 2012.

Name: David Schellstede

Position: Reservoir Management Team Leader

Address: 5 Greenway Plaza, Suite 110, Houston, TX 77046

Telephone: 713-366-5013

E-mail: (optional): david_schellstede@oxy.com

Company: OXY USA Inc.

Field Representative (if not above signatory): Dusty Weaver

Address (If different from above): P.O. Box 50250 Midland, TX 79710

Telephone (if different from above): 432-685-5723

E-mail (if different from above): calvin_weaver@oxy.com

OXY USA Inc
Seven Rivers 17 Fed #3H
APD Data

OPERATOR NAME / NUMBER: OXY USA Inc

LEASE NAME / NUMBER: Seven Rivers 17 Fed #3H

STATE: NM **COUNTY:** Eddy

SURFACE LOCATION: 330' FNL & 940' FWL, Sec 17, T20S, R25E

BOTTOM HOLE LOCATION: 330' FSL & 840' FWL, Sec. 17, T20S, R25E

C-102 PLAT APPROX GR ELEV: 3526.8'

EST KB ELEV: 3543.3' (16.5' KB)

1. **GEOLOGIC NAME OF SURFACE FORMATION**
   a. Permian

2. **ESTIMATED TOPS OF GEOLOGICAL MARKERS & DEPTHS OF ANTICIPATED FRESH WATER, OIL OR GAS**

Formation	TVD	Expected Fluids
T. Grayburg	400	Form Water
T. San Andres	708	Form Water
T. Glorietta	2280	Oil
T. Yeso	2432	Oil
Yeso Target Depth	2600	Oil

A. There is no indication of the presence of fresh water formations. Any possible fresh water formation will be covered by the surface casing.

LATERAL GREATEST PROJECTED TD 6934' MD/ 2600' TVD **OBJECTIVE:** Yeso

3. CASING PROGRAM (All new casing)

Surface Casing 9.625" casing set at ± 450' MD/ 450' TVD in a 12 1/4" hole filled with 8.60 ppg mud

Interval	Length	Wt	Gr	Cplg	Coll Rating (psi)	Burst Rating (psi)	Jt Str (M-lbs)	ID (in)	Drift (in)	SF Coll	SF Burst	SF Ten
0'-450'	450'	36	J-55	ST&C	2020	3520	394	8.921	8.765	14.96	3.02	27.30

See COA 685

Production Casing: 5.5" casing set at ± 6934'MD / 2600'TVD in an 8.5" hole filled with 9.40 ppg mud

Interval	Length	Wt	Gr	Cplg	Coll Rating (psi)	Burst Rating (psi)	Jt Str (M-lbs)	ID (in)	Drift (in)	SF Coll	SF Burst	SF Ten
0'- 6934'	6934'	17	L-80	LT-C	6290	7740	338	4.892	4.767	3.41	4.79	6.89

Collapse and burst loads calculated using Stress Check with actual anticipated loads.

4. CEMENT PROGRAM:

See COA

Surface Interval

Interval	Amount sx	Ft of Fill	Type	Gal/Sk	PPG	Ft^3/sk	24 Hr Comp
Surface (TOC: 0' - 450')							
Tail: 0' –450' (100% Excess)	250	450	Premium Plus cement with 2% Calcium Chloride	6.39	14.80	1.35	1408 psi

Production Interval

Interval	Amount sx	Ft of Fill	Type	Gal/Sk	PPG	Ft^3/sk	24 Hr Comp
Production (TOC: 0 - 6932')							
Lead: 0' – 1883' (125 % Excess)	200	1883'	Interfill C with 0.5% LAP-1(Fluid Loss Control) and 0.25% D-AIR 5000 (Defoamer)	14.31	11.90	2.47	262 psi
Tail: 1883' – 6934' (85% Excess)	1510	5051'	50/50 Poz Premium Plus with 0.4% CFR-3 (Dispersant), 0.4% LAP-1 (LFLC), 0.25 lb/sk D-AIR 5000, 0.125 lbm/sk Poly-E-Flake	5.67	14.2	1.26	1317 psi

Description of Cement Additives: Bentonite (Light Weight Additive), Poly-E-Flake (Lost Circulation Additive), Calcium Chloride – Flake (Accelerator), Kol-Seal (Lost Cirulation Additive), Well Life 734 (Cement Enhancer), Halad®-344 (Low Fluid Loss Control), CFR – 3 (Dispersant), HR – 601 (Retarder)

5. DIRECTIONAL PLAN

Please see attached directional plan

6. PRESSURE CONTROL EQUIPMENT

685

Surface: 0 – 450' None.

Pilot and Production: 0 - 6932'. The minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required to drill below the surface casing shoe shall be 3000 (3M) psi. Operator will be using an 11" 5M two ram stack w/ 3M annular preventer, & 5M Choke Manifold.

a. The 11" 3000 psi blowout prevention equipment will be installed and operational after setting the 9 5/8" surface casing and the 9.625" SOW x 11" 3K conventional wellhead; the rotating head body will be installed but the rubber will be installed when it becomes operationally necessary.

b. The BOP and ancillary BOPE will be tested by a third party upon installation of the 9 5/8" J-55 36ppf surface casing. All equipment will be tested to 250/3000 psi for 30 minutes with third party and charted, except the annular preventer, which will be tested to 250/2100 psi for 30 minutes (70% of WP.) This is to be in compliance with the Onshore Order # 2.

c. The pipe rams will be functionally tested during each 24 hour period; the blind rams will be functionally tested on each trip out of the hole. These functional tests will be documented on the Daily Driller's Log. Other accessory equipment (BOPE) will include a safety valve and subs as needed to fit all drill strings, and a 2" kill line and 3 " choke line having a 5000 psi WP rating. The system will be tested to 3,000 psi.

d. Oxy also requests a variance to connect the BOP choke outlet to the choke manifold using a co-flex hose made by *Contitech Rubber Industrial KFT*. It is a 3" ID x 8.84m flexible hose rated to 5,000 psi working pressure. It has been tested to 10,000 psi and is built to API Spec 16C. Once the flex line is installed it will be tied down with safety clamps. Please see attached certifications.

e. See attached BOP & Choke manifold diagrams.

7. MUD PROGRAM:

Depth	Mud Wt ppg	Vis Sec	Fluid Loss	Type System
0 – 450' 685	8.4 – 8.8	32 – 38	NC	Fresh Water /Spud Mud
450' – 6932'	9.0 – 9.2	28 – 29	NC	Salt Gel

Remarks: Pump high viscosity sweeps as needed for hole cleaning. The mud system will be monitored visually/manually as well as with an electronic PVT. The necessary mud products for additional weight and fluid loss control will be on location at all times.

Appropriately weighted mud will be used to isolate potential gas, oil, and water zones until such time as casing can be cemented into place for zonal isolation.

8. AUXILIARY WELL CONTROL AND MONITORING EQUIPMENT

a. A Kelly cock will be in the drill string at all times.

b. A full opening drill pipe stabbing valve having the appropriate connections will be on the rig floor unobstructed and readily accessible at all times.

c. Hydrogen Sulfide detection equipment will be in operation after drilling out the surface casing shoe until the production casing is cemented. Breathing equipment will be on location upon drilling the surface casing shoe until total depth is reached. **If Hydrogen Sulfide is encountered , measured amounts and formations will be reported to the BLM**

9. POTENTIAL HAZARDS:

A. H2S detection equipment will be in operation after drilling out the surface casing shoe until the production casing has been cemented. Breathing equipment will be on location from drilling out the surface shoe until production casing is cemented. If H2S is encountered the operator will comply with Onshore Order #6.

B. The maximum anticipated bottom hole pressure is between 1100 and 1200 psi.

C. No abnormal temperatures or pressures are anticipated. **The highest anticipated pressure gradient is 0.45 psi**. All personnel will be familiar with all aspects of safe operation of equipment being used to drill this well. Adequate flare lines will be installed off the mud/gas separator where gas may be flared safely.

10. ANTICIPATED STARTING DATE AND DURATION OF OPERATIONS

Road and location construction will begin after the BLM has approved the APD. Anticipated spud date will be as soon as possible after BLM approval and as soon as a rig will be available. Move in operations and drilling is expected to take 35 days. If production casing is run, then an additional 30 days will be needed to complete the well and construct surface facilities and/or lay flow lines in order to place well on production.

10. WIRELINE LOGGING/MUD LOGGING See Cont

Run Gamma/Neutron/Density/Resistivity from the curve to Surface casing, with Gamma/Neutron to surface. Mud logs from the base of the surface casing to TD. GR-MWD from the curve to TD.

COMPANY PERSONNEL:

Name	Title	Office Phone	Mobile Phone
Carlos Mercado	Drilling Engineer	(713)366-5418	(713)455-3481
Sebastian Millan	Drilling Engineer Supervisor	(713)350-4950	(832)528-3268
Roger Allen	Drilling Superintendent	(713)215-7617	(281)682-3919
Douglas Chester	Drilling Manager	(713)366-5194	(713)918-9124

Scientific Drilling

Project: **Eddy County, New Mexico**
Site: **Seven Rivers 17 Federal 3H**
Well: **Seven Rivers 17 Fed 3H**
Wellbore: **Original Wellbore**
Design: **Design #1**

OXY

Azimuths to Grid North
True North: 0.10°
Magnetic North: 8.03°

Magnetic Field
Strength: 48633.5snT
Dip Angle: 60.33°
Date: 05/10/2012
Model: IGRF2010

PROJECT DETAILS: Eddy County, New Mexico

Geodetic System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: New Mexico East 3001
System Datum: Mean Sea Level

SITE DETAILS: Seven Rivers 17 Federal 3H

Northing: 574745.90
Easting: 445000.80
Elevation: 3526.8
KB: Estimated @ 3550.8usft (24' RKB)

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting
SR-17 Fed 3H BHL - plan hits target center	2602.0	-4637.9	-134.0	570108.00	444866.80

SECTION DETAILS

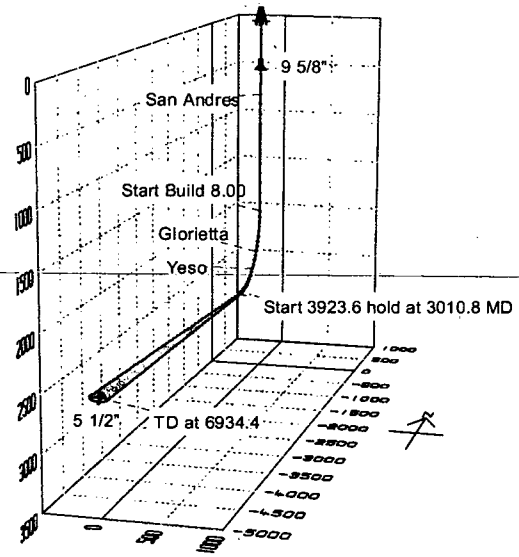
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	VSect	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.0	
1885.8	0.00	0.00	1885.8	0.0	0.0	0.00	0.0	
3010.8	90.00	181.65	2602.0	-715.9	-20.7	8.00	716.2	
6934.4	90.00	181.65	2602.0	-4637.9	-134.0	0.00	4639.8	BHL

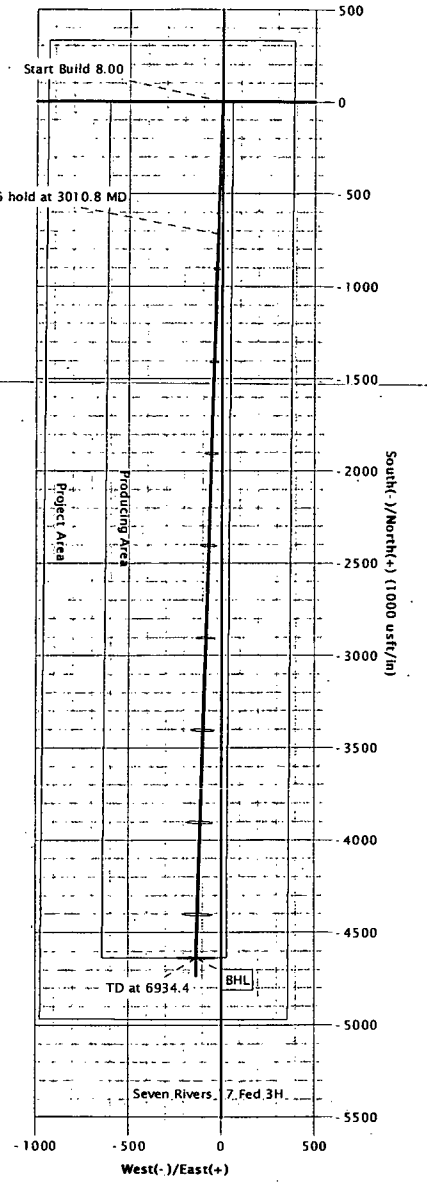
FORMATION TOP DETAILS

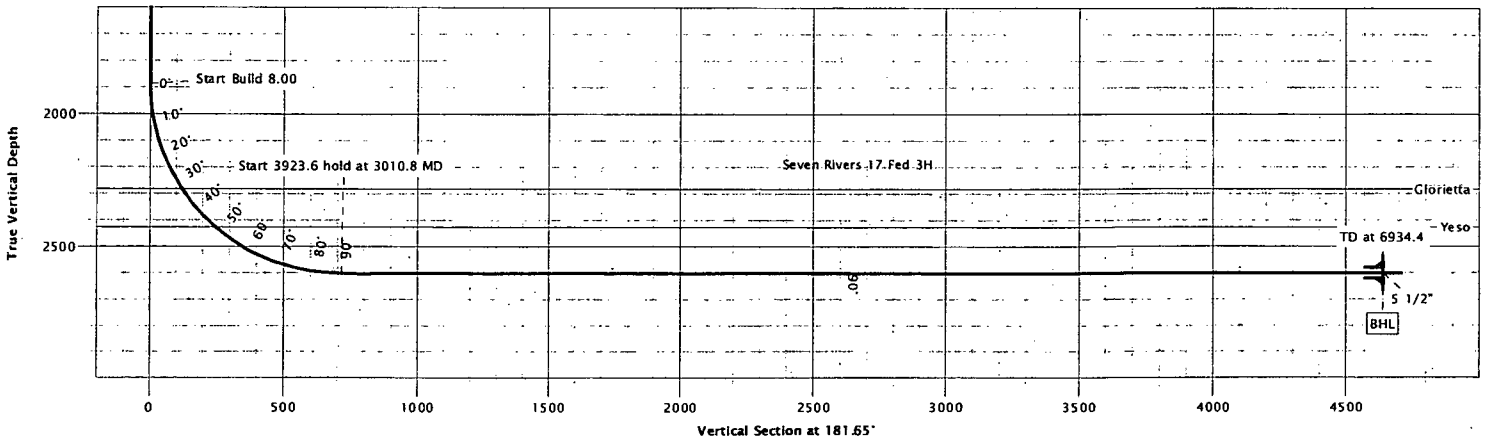
TVDPath	MDPath	Formation
702.0	702.0	San Andres
2282.0	2305.6	Glorietta
2427.0	2499.3	Yeso

CASING DETAILS

TVD	MD	Size
450.0	450.0	9-5/8
2602.0	6934.4	5-1/2







Database:	EDM-JodyBarclay-Local	**Local Co-ordinate Reference:**	Well Seven Rivers 17 Fed 3H
Company:	OXY	**TVD Reference:**	Estimated @ 3550.8usft (24' RKB)
Project:	Eddy County, New Mexico	**MD Reference:**	Estimated @ 3550.8usft (24' RKB)
Site:	Seven Rivers 17 Federal 3H	**North Reference:**	Grid
Well:	Seven Rivers 17 Fed 3H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Original Wellbore		
Design:	Design #1		

Project	Eddy County, New Mexico, New Mexico,		
Map System:	US State Plane 1927 (Exact solution)	**System Datum:**	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site	Seven Rivers 17 Federal 3H				
Site Position:		**Northing:**	574,745.90 usft	**Latitude:**	32° 34' 47.841 N
From:	Map	**Easting:**	445,000.80 usft	**Longitude:**	104° 30' 42.790 W
Position Uncertainty:	0.0 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	-0.10 °

Well	Seven Rivers 17 Fed 3H					
Well Position	**+N/-S**	0.0 usft	**Northing:**	574,745.90 usft	**Latitude:**	32° 34' 47.841 N
	+E/-W	0.0 usft	**Easting:**	445,000.80 usft	**Longitude:**	104° 30' 42.790 W
Position Uncertainty		0.0 usft	**Wellhead Elevation:**		**Ground Level:**	3,526.8 usft

Wellbore	Original Wellbore				
Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	IGRF2010	05/10/12	7.93	60.33	48,633

Design	Design #1				
Audit Notes:					
Version:		**Phase:**	PLAN	**Tie On Depth:**	0.0
Vertical Section:	**Depth From (TVD) (usft)**	**+N/-S (usft)**	**+E/-W (usft)**	**Direction (°)**	
	0.0	0.0	0.0	181.65	

Plan Sections

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,885.8	0.00	0.00	1,885.8	0.0	0.0	0.00	0.00	0.00	0.00	
3,010.8	90.00	181.65	2,602.0	-715.9	-20.7	8.00	8.00	0.00	181.65	
6,934.4	90.00	181.65	2,602.0	-4,637.9	-134.0	0.00	0.00	0.00	0.00	SR 17 Fed 3H BHL

Database:	EDM-JodyBarclay-Local	**Local Co-ordinate Reference:**	Well Seven Rivers 17 Fed 3H
Company:	OXY	**TVD Reference:**	Estimated @ 3550.8usft (24' RKB)
Project:	Eddy County, New Mexico	**MD Reference:**	Estimated @ 3550.8usft (24' RKB)
Site:	Seven Rivers 17 Federal 3H	**North Reference:**	Grid
Well:	Seven Rivers 17 Fed 3H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Original Wellbore		
Design:	Design #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
450.0	0.00	0.00	450.0	0.0	0.0	0.0	0.00	0.00	0.00
9 5/8"									
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
702.0	0.00	0.00	702.0	0.0	0.0	0.0	0.00	0.00	0.00
San Andres									
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	0.00
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	0.00
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	0.00
1,885.8	0.00	0.00	1,885.8	0.0	0.0	0.0	0.00	0.00	0.00
1,900.0	1.14	181.65	1,900.0	-0.1	0.0	0.1	8.00	8.00	0.00
1,950.0	5.14	181.65	1,949.9	-2.9	-0.1	2.9	8.00	8.00	0.00
2,000.0	9.14	181.65	1,999.5	-9.1	-0.3	9.1	8.00	8.00	0.00
2,050.0	13.14	181.65	2,048.6	-18.7	-0.5	18.7	8.00	8.00	0.00
2,100.0	17.14	181.65	2,096.8	-31.8	-0.9	31.8	8.00	8.00	0.00
2,150.0	21.14	181.65	2,144.0	-48.2	-1.4	48.2	8.00	8.00	0.00
2,200.0	25.14	181.65	2,190.0	-67.8	-2.0	67.8	8.00	8.00	0.00
2,250.0	29.14	181.65	2,234.5	-90.6	-2.6	90.6	8.00	8.00	0.00
2,300.0	33.14	181.65	2,277.3	-116.4	-3.4	116.5	8.00	8.00	0.00
2,305.6	33.59	181.65	2,282.0	-119.5	-3.5	119.6	8.00	8.00	0.00
Glorietta									
2,350.0	37.14	181.65	2,318.2	-145.2	-4.2	145.2	8.00	8.00	0.00
2,400.0	41.14	181.65	2,356.9	-176.7	-5.1	176.8	8.00	8.00	0.00
2,450.0	45.14	181.65	2,393.4	-210.9	-6.1	211.0	8.00	8.00	0.00
2,499.3	49.08	181.65	2,427.0	-247.0	-7.1	247.1	8.00	8.00	0.00
Yeso									
2,500.0	49.14	181.65	2,427.4	-247.5	-7.2	247.6	8.00	8.00	0.00
2,550.0	53.14	181.65	2,458.8	-286.4	-8.3	286.5	8.00	8.00	0.00
2,600.0	57.14	181.65	2,487.4	-327.4	-9.5	327.6	8.00	8.00	0.00
2,650.0	61.14	181.65	2,513.0	-370.3	-10.7	370.5	8.00	8.00	0.00
2,700.0	65.14	181.65	2,535.6	-414.9	-12.0	415.1	8.00	8.00	0.00
2,750.0	69.14	181.65	2,555.0	-460.9	-13.3	461.1	8.00	8.00	0.00
2,800.0	73.14	181.65	2,571.2	-508.2	-14.7	508.4	8.00	8.00	0.00
2,850.0	77.14	181.65	2,584.0	-556.5	-16.1	556.7	8.00	8.00	0.00
2,900.0	81.14	181.65	2,593.4	-605.6	-17.5	605.8	8.00	8.00	0.00
2,950.0	85.14	181.65	2,599.4	-655.2	-18.9	655.5	8.00	8.00	0.00
3,000.0	89.14	181.65	2,601.9	-705.1	-20.4	705.4	8.00	8.00	0.00
3,010.8	90.00	181.65	2,602.0	-715.9	-20.7	716.2	8.00	8.00	0.00
3,100.0	90.00	181.65	2,602.0	-805.1	-23.3	805.4	0.00	0.00	0.00
3,200.0	90.00	181.65	2,602.0	-905.0	-26.1	905.4	0.00	0.00	0.00

Database:	EDM-JodyBarclay-Local	**Local Co-ordinate Reference:**	Well Seven Rivers 17 Fed 3H
Company:	OXY	**TVD Reference:**	Estimated @ 3550.8usft (24' RKB)
Project:	Eddy County, New Mexico	**MD Reference:**	Estimated @ 3550.8usft (24' RKB)
Site:	Seven Rivers 17 Federal 3H	**North Reference:**	Grid
Well:	Seven Rivers 17 Fed 3H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Original Wellbore		
Design:	Design #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
3,300.0	90.00	181.65	2,602.0	-1,005.0	-29.0	1,005.4	0.00	0.00	0.00
3,400.0	90.00	181.65	2,602.0	-1,104.9	-31.9	1,105.4	0.00	0.00	0.00
3,500.0	90.00	181.65	2,602.0	-1,204.9	-34.8	1,205.4	0.00	0.00	0.00
3,600.0	90.00	181.65	2,602.0	-1,304.8	-37.7	1,305.4	0.00	0.00	0.00
3,700.0	90.00	181.65	2,602.0	-1,404.8	-40.6	1,405.4	0.00	0.00	0.00
3,800.0	90.00	181.65	2,602.0	-1,504.8	-43.5	1,505.4	0.00	0.00	0.00
3,900.0	90.00	181.65	2,602.0	-1,604.7	-46.4	1,605.4	0.00	0.00	0.00
4,000.0	90.00	181.65	2,602.0	-1,704.7	-49.3	1,705.4	0.00	0.00	0.00
4,100.0	90.00	181.65	2,602.0	-1,804.6	-52.1	1,805.4	0.00	0.00	0.00
4,200.0	90.00	181.65	2,602.0	-1,904.6	-55.0	1,905.4	0.00	0.00	0.00
4,300.0	90.00	181.65	2,602.0	-2,004.6	-57.9	2,005.4	0.00	0.00	0.00
4,400.0	90.00	181.65	2,602.0	-2,104.5	-60.8	2,105.4	0.00	0.00	0.00
4,500.0	90.00	181.65	2,602.0	-2,204.5	-63.7	2,205.4	0.00	0.00	0.00
4,600.0	90.00	181.65	2,602.0	-2,304.4	-66.6	2,305.4	0.00	0.00	0.00
4,700.0	90.00	181.65	2,602.0	-2,404.4	-69.5	2,405.4	0.00	0.00	0.00
4,800.0	90.00	181.65	2,602.0	-2,504.3	-72.4	2,505.4	0.00	0.00	0.00
4,900.0	90.00	181.65	2,602.0	-2,604.3	-75.2	2,605.4	0.00	0.00	0.00
5,000.0	90.00	181.65	2,602.0	-2,704.3	-78.1	2,705.4	0.00	0.00	0.00
5,100.0	90.00	181.65	2,602.0	-2,804.2	-81.0	2,805.4	0.00	0.00	0.00
5,200.0	90.00	181.65	2,602.0	-2,904.2	-83.9	2,905.4	0.00	0.00	0.00
5,300.0	90.00	181.65	2,602.0	-3,004.1	-86.8	3,005.4	0.00	0.00	0.00
5,400.0	90.00	181.65	2,602.0	-3,104.1	-89.7	3,105.4	0.00	0.00	0.00
5,500.0	90.00	181.65	2,602.0	-3,204.1	-92.6	3,205.4	0.00	0.00	0.00
5,600.0	90.00	181.65	2,602.0	-3,304.0	-95.5	3,305.4	0.00	0.00	0.00
5,700.0	90.00	181.65	2,602.0	-3,404.0	-98.3	3,405.4	0.00	0.00	0.00
5,800.0	90.00	181.65	2,602.0	-3,503.9	-101.2	3,505.4	0.00	0.00	0.00
5,900.0	90.00	181.65	2,602.0	-3,603.9	-104.1	3,605.4	0.00	0.00	0.00
6,000.0	90.00	181.65	2,602.0	-3,703.8	-107.0	3,705.4	0.00	0.00	0.00
6,100.0	90.00	181.65	2,602.0	-3,803.8	-109.9	3,805.4	0.00	0.00	0.00
6,200.0	90.00	181.65	2,602.0	-3,903.8	-112.8	3,905.4	0.00	0.00	0.00
6,300.0	90.00	181.65	2,602.0	-4,003.7	-115.7	4,005.4	0.00	0.00	0.00
6,400.0	90.00	181.65	2,602.0	-4,103.7	-118.6	4,105.4	0.00	0.00	0.00
6,500.0	90.00	181.65	2,602.0	-4,203.6	-121.5	4,205.4	0.00	0.00	0.00
6,600.0	90.00	181.65	2,602.0	-4,303.6	-124.3	4,305.4	0.00	0.00	0.00
6,700.0	90.00	181.65	2,602.0	-4,403.6	-127.2	4,405.4	0.00	0.00	0.00
6,800.0	90.00	181.65	2,602.0	-4,503.5	-130.1	4,505.4	0.00	0.00	0.00
6,900.0	90.00	181.65	2,602.0	-4,603.5	-133.0	4,605.4	0.00	0.00	0.00
6,934.4	90.00	181.65	2,602.0	-4,637.9	-134.0	4,639.8	0.00	0.00	0.00
5 1/2" - SR 17 Fed 3H BHL									

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
SR 17 Fed 3H BHL - plan hits target center - Point	0.00	360.00	2,602.0	-4,637.9	-134.0	570,108.00	444,866.80	32° 34' 1.944 N	104° 30' 44.265 W

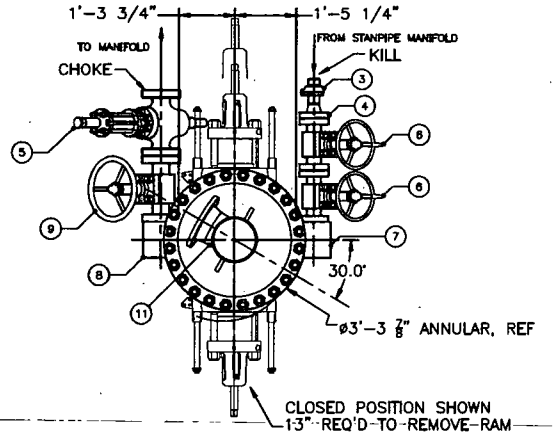
Database:	EDM-JodyBarclay-Local	**Local Co-ordinate Reference:**	Well Seven Rivers 17 Fed 3H
Company:	OXY	**TVD Reference:**	Estimated @ 3550.8usft (24' RKB)
Project:	Eddy County, New Mexico	**MD Reference:**	Estimated @ 3550.8usft (24' RKB)
Site:	Seven Rivers 17 Federal 3H	**North Reference:**	Grid
Well:	Seven Rivers 17 Fed 3H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Original Wellbore		
Design:	Design #1		

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
450.0	450.0	9 5/8"	9-5/8	12-1/4
6,934.4	2,602.0	5 1/2"	5-1/2	6

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
702.0	702.0	San Andres		0.00	
2,305.6	2,282.0	Glorietta		0.00	
2,499.3	2,427.0	Yeso		0.00	



PROPER TORQUE FOR BOLTS

COMPONENT	FLANGE SIZE & RATING	BOLT SIZE	TORQUE (FT/LBS) CF=0.07	TORQUE (FT/LBS) CF=0.13
SPOOLS, ANNULAR & RAMS	11"x5M	1 7/8" DIA.	1890	3330
BLOCKS	3 1/8x5M	1 1/8" DIA	401	686
CHOKE VALVES	3 1/8x5M	1 1/8" DIA.	401	686
KILL VALVES	2 1/16x5M	7/8" DIA.	188	319

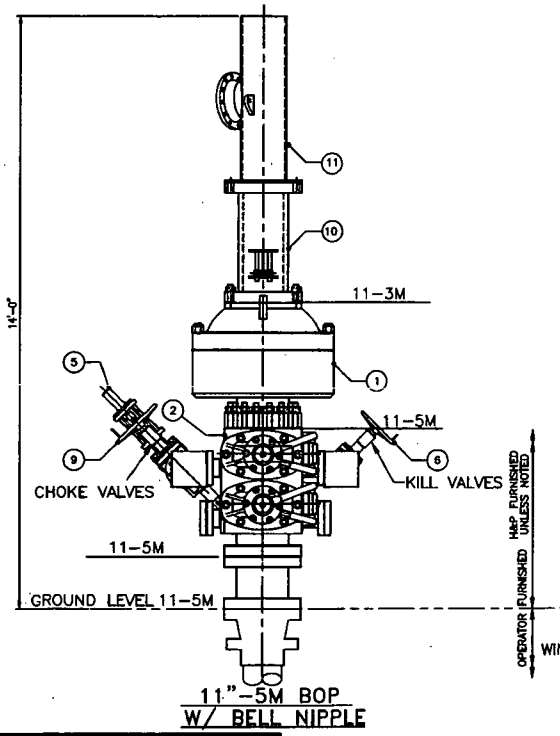
BILL OF MATERIAL

ITEM NO.	QUAN.	DESCRIPTION	PART NUMBER	WEIGHT
		11-5M BOP ASSEMBLY		
1	1	ANNULAR, 11x3M BOLTED TYPE		6005
2	1	BOP DOUBLE RAM		7600
	4	RAM ELEMENTS		444
3	1	HAMMER UNION, 2-1502# XXH (BW)		5
4	1	FLANGE, WN 2 1/16-5M API		42
5	1	VALVE, GATE FLS-HCR 3 1/8-5M		396
6	2	VALVE, GATE 2 1/16-5M		350
7	1	90° STUDDED BLOCK, 3 1/8-5M X 2 1/16-5M		240
8	1	90° STUDDED BLOCK, 3 1/8-5M X 3 1/8-5M		250
9	2	VALVE, GATE 3 1/8-5M		720
10	1	BELL NIPPLE BOP LIFTING SECTION	MK FAM-H-318.01A	780
11	1	BELL NIPPLE EXTENSION	MK FAM-H-319.01A	396
12	1	11"-5M x 11"-5M x 1'-3" LONG SPACER		800
		SPOOL- WORKING PRESSURE 5000 PSI		

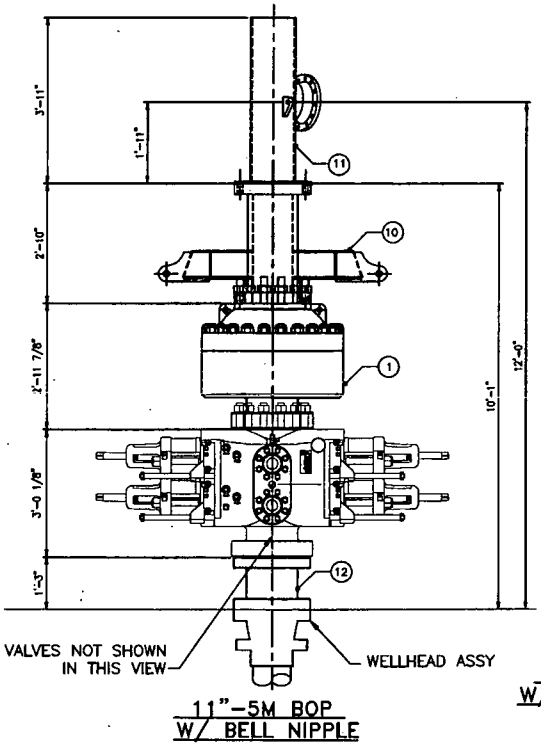
HARDWARE

ITEM NO.	QUAN.	DESCRIPTION	PART NUMBER	WEIGHT
		RINGS AND BOLTS		400

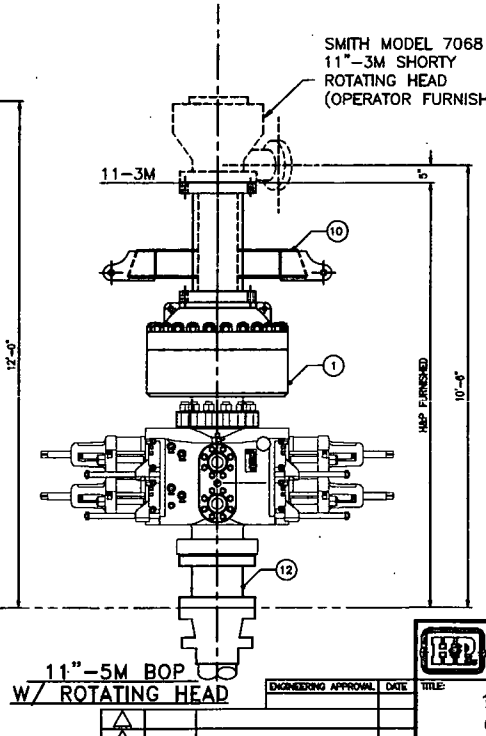
APPROX. TOTAL WEIGHT = 18,228 LBS.



11"-5M BOP
W/ BELL NIPPLE



11"-5M BOP
W/ BELL NIPPLE



11"-5M BOP
W/ ROTATING HEAD

ISSUED FOR FABRICATION
August-08-2008
DRAFTSMAN
ENGINEER

PROPRIETARY

THIS DRAWING AND THE IDEAS AND INFORMATION INCLUDED IN THIS DRAWING ARE PROPRIETARY AND ARE NOT TO BE REPRODUCED, DISTRIBUTED OR DISCLOSED IN ANY MANNER, WITHOUT THE PRIOR, WRITTEN CONSENT OF A DULY AUTHORIZED OFFICER OF HELMERICH & PAYNE INT'L DRILLING CO.

NOTES:

1. ALL BOP RAMS SHOWN ARE SHAFFER MODEL LXT 11-5M PSI WP - FLANGED BOTTOM AND STUDDED TOP

REV	DATE	DESCRIPTION	BY
A	08/08/08	ADDED 1 OF 4 SHTS WAS 1 OF 3	DRJ
A	07/29/08	SHEET 1 OF 3 WAS 1 OF 5	DRJ

ENGINEERING APPROVAL | DATE

HELMERICH & PAYNE
INTERNATIONAL DRILLING CO.

TITLE: 11-5M BOP EQUIPMENT GENERAL ARRANGEMENT

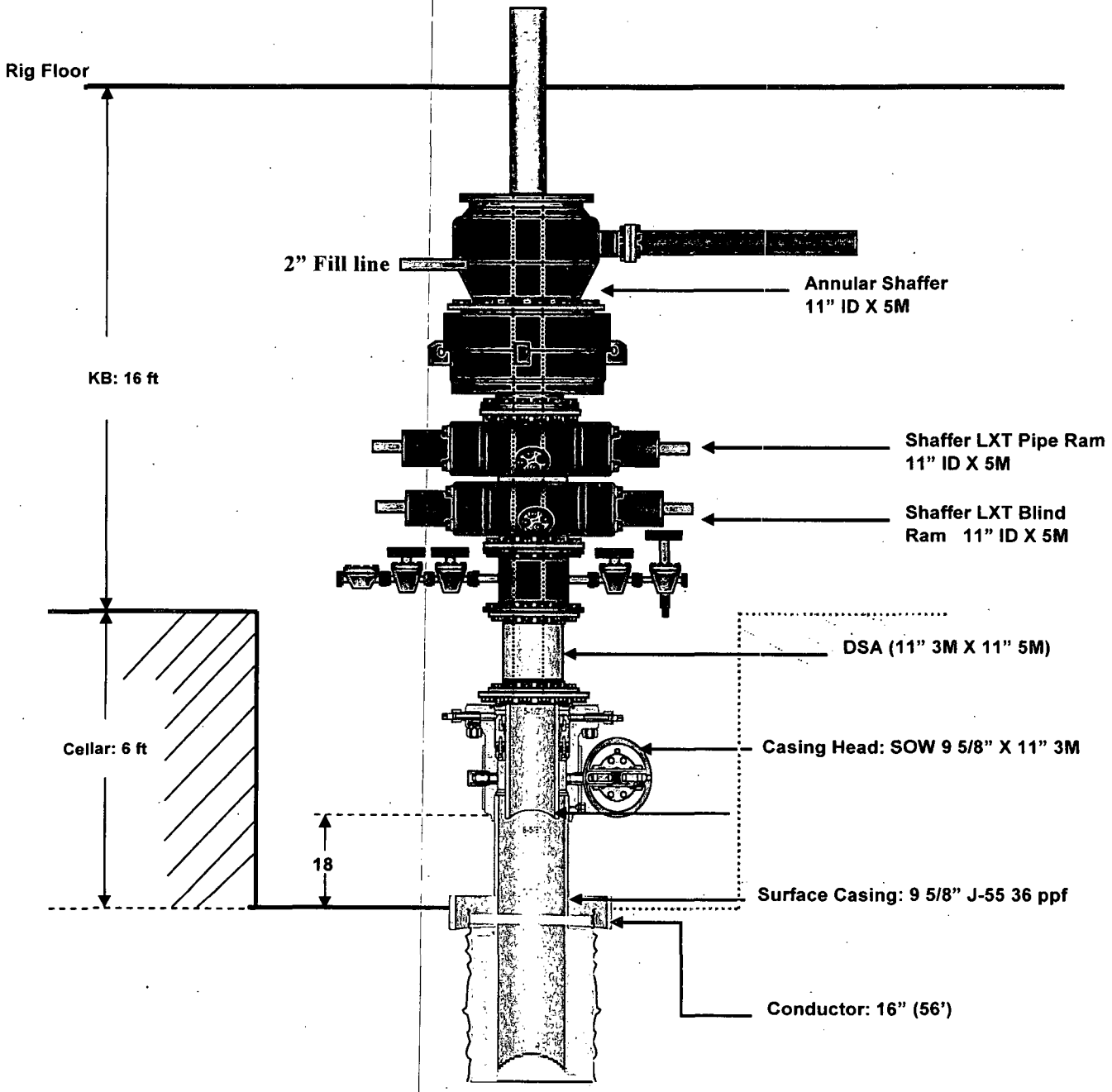
CUSTOMER: OXY-PERMIAN

PROJECT: F4M

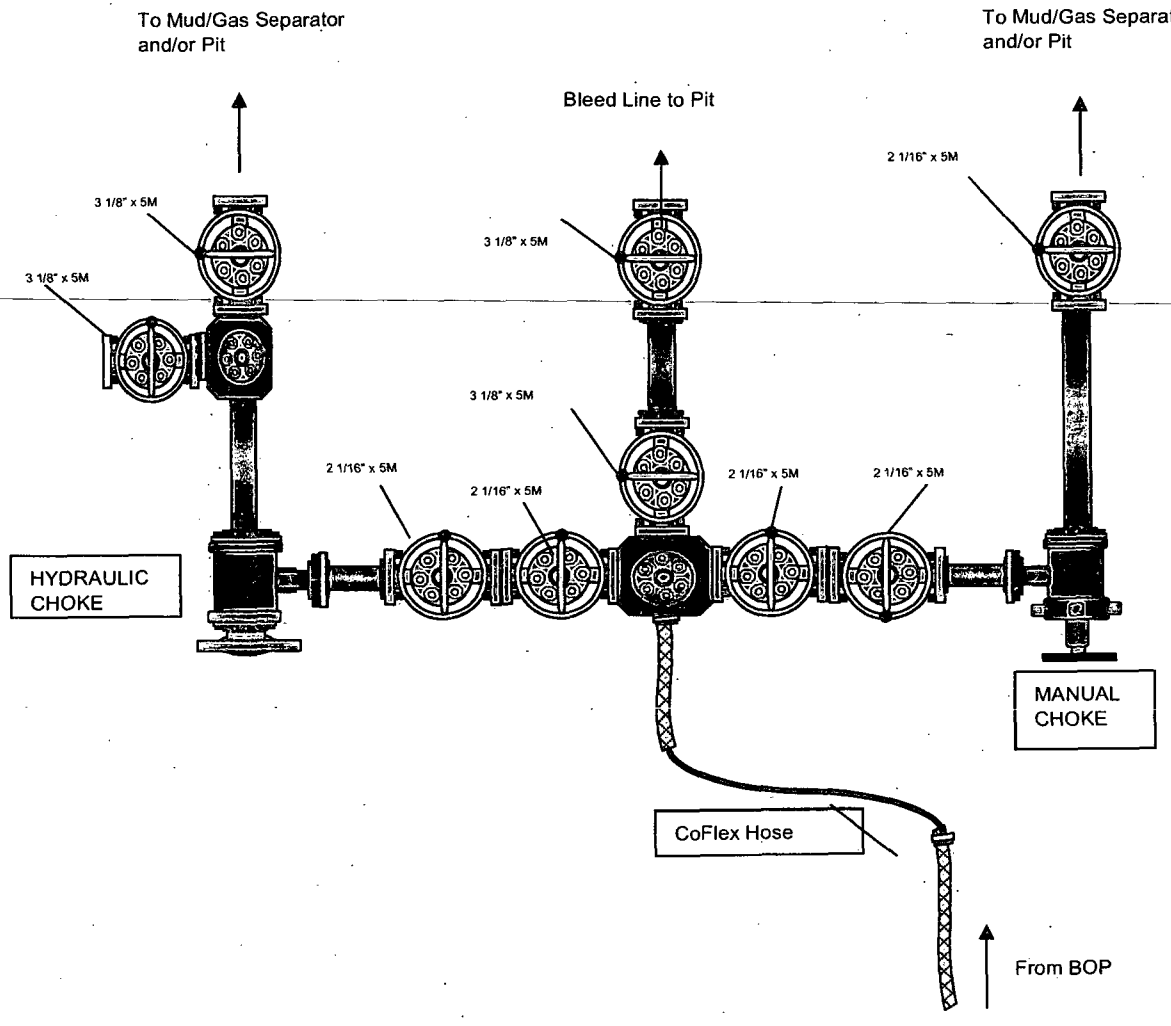
DRAWN: DJOHNSON | DATE: 07/14/08 | DWG. NO.: F4M-H-320 | REV: B

SCALE: NTS | SHEET 1 OF 4

BOP Diagram

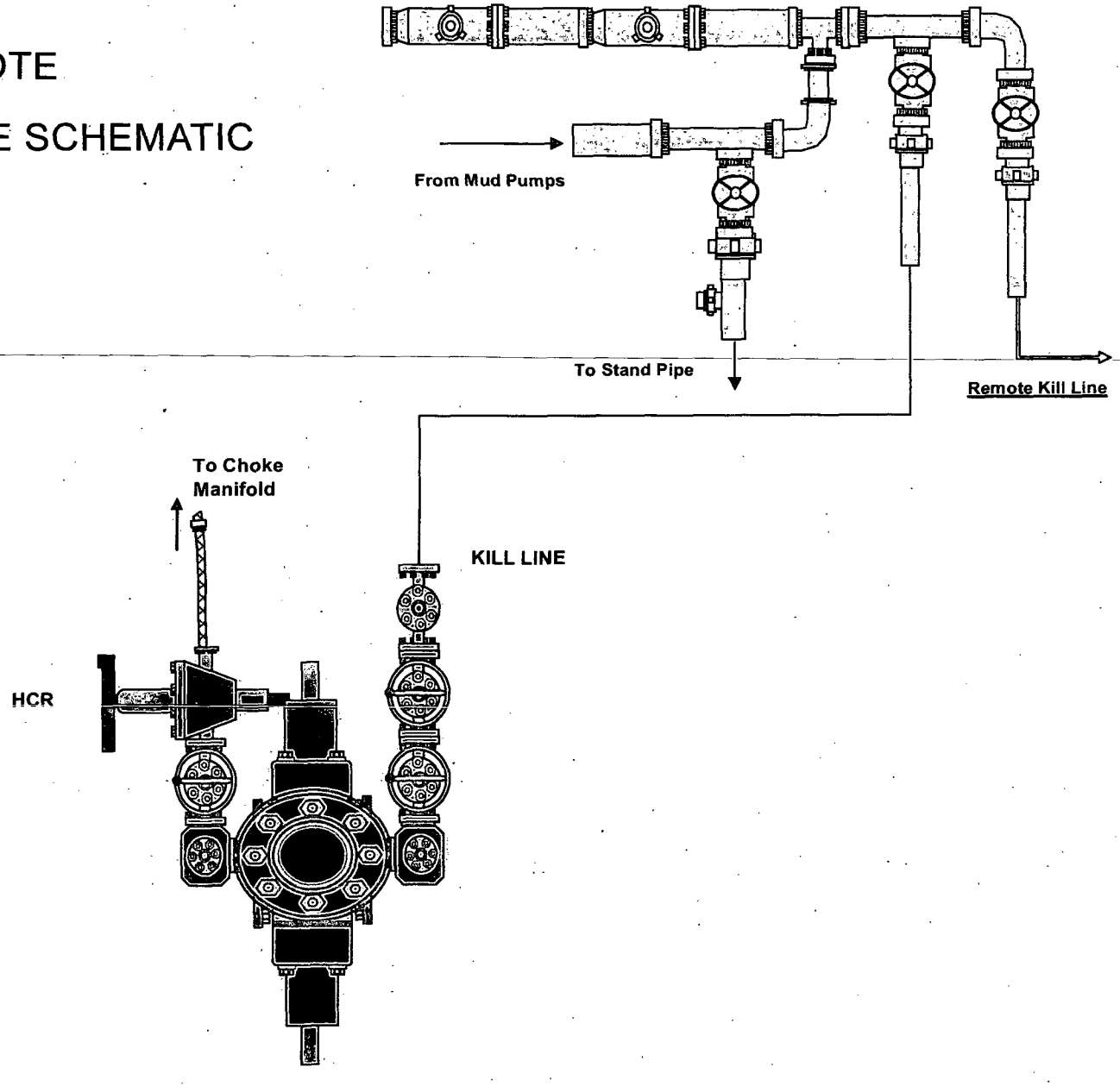

Rig Floor
2" Fill line
Annular Shaffer
11" ID X 5M
KB: 16 ft
Shaffer LXT Pipe Ram
11" ID X 5M
Shaffer LXT Blind
Ram 11" ID X 5M
DSA (11" 3M X 11" 5M)
Cellar: 6 ft
Casing Head: SOW 9 5/8" X 11" 3M
18
Surface Casing: 9 5/8" J-55 36 ppf
Conductor: 16" (56')

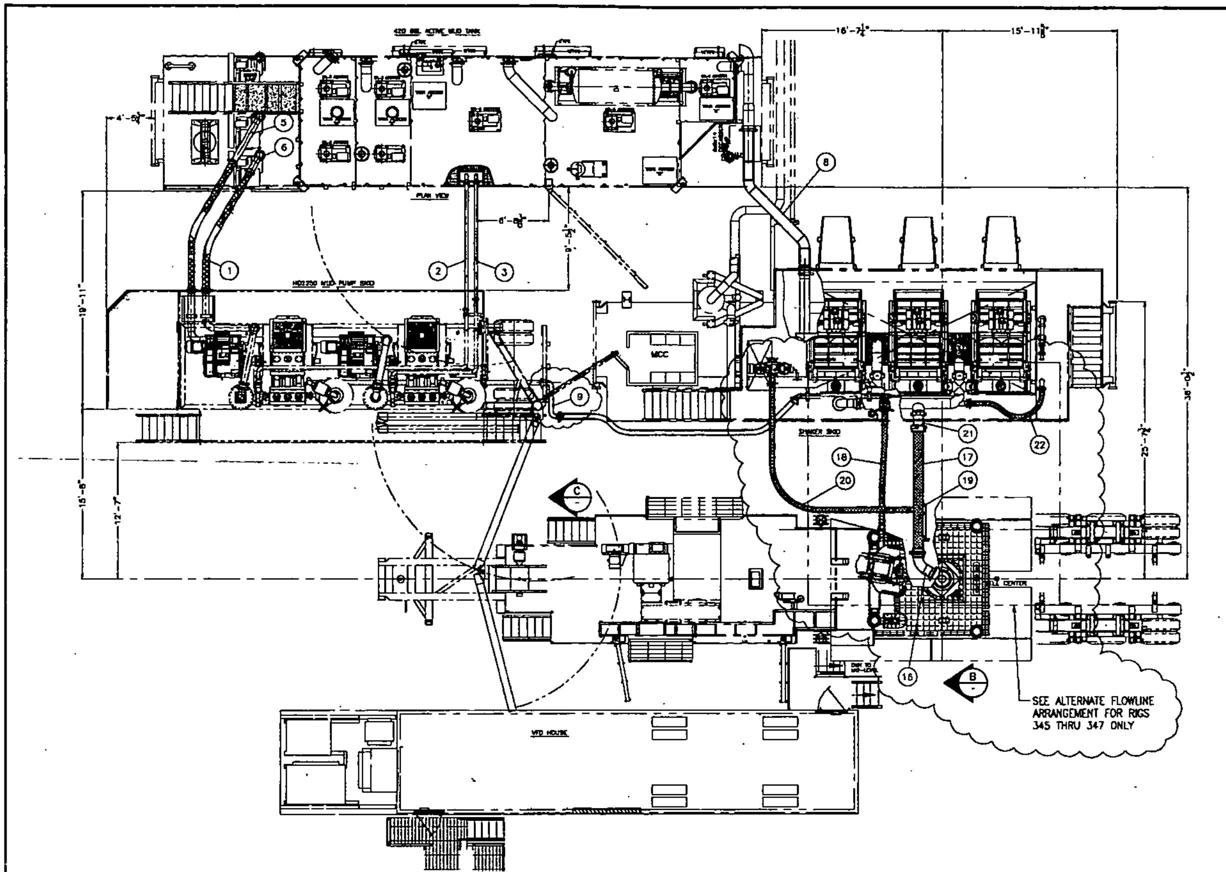
5M CHOKE MANIFOLD CONFIGURATION



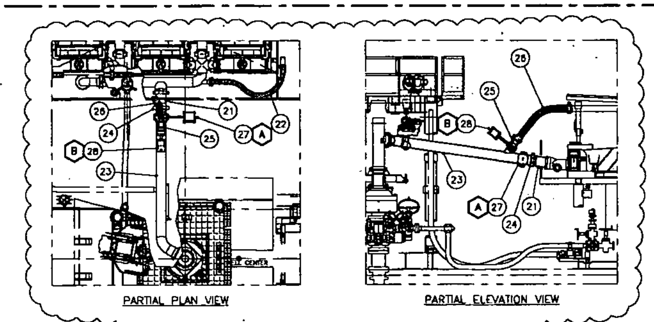
5M REMOTE

KILL LINE SCHEMATIC

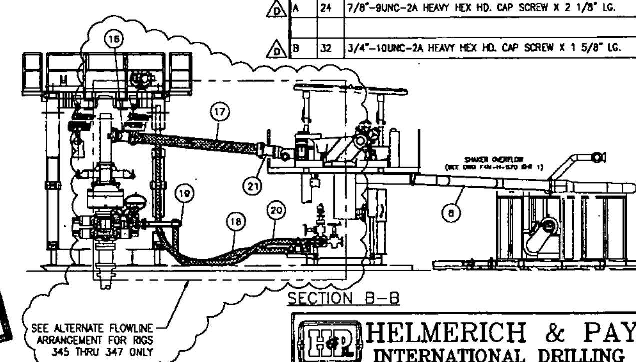




PARTIAL PLAN VIEW



ALTERNATE FLOWLINE ARRANGEMENT
(FOR RIGS 345 THRU 347 ONLY)



SECTION B-B

BILL OF MATERIAL

REV	ITEM NO.	QUAN.	DESCRIPTION	PART NUMBER	WT.
D	1	2	LOW PRESSURE SPOOL #1	MK.F4M-H-570.01F	239
D	2	1	POP-OFF/BLEED SPOOL #1	MK.F4M-H-570.01A	157
D	3	1	POP-OFF/BLEED SPOOL #2	MK.F4M-H-570.01B	140
D	4		DELETED		
D	5	1	LOW PRESSURE SUCTION SPOOL #1	MK.F4M-H-570.01D	199
D	6	1	LOW PRESSURE SUCTION SPOOL #2	MK.F4M-H-570.01H	101
D	7	1	HOSE-HIGH PRESSURE	MK.F4M-H-570.01G	278
D	8	1	OVERFLOW RETURN SPOOL	MK.F4M-H-563.05A	678
D	9	1	MUD PUMP/SHAKER SKID SPOOL	MK.F4M-H-570.01E	181
	10	22FT	TS 1 1/2x1 1/2x3/16 (A500)		150
D	11	1	POP-OFF PIPE HANGER SUPPORT	MK.F4M-H-570.01C	30
	12	1	L3x3x1/4 (1'-6" LG) (A36)		7
	13	1	L3x3x1/4 (1'-6" LG) (A36)		7
	14	1	PLATE, 1/4" THK. 4x2'-3 1/4" (A36)		8
	15	1	L3x3x1/4 (4'-11 3/4" LG) (A36)		25
D	16	1	SHAKER FLOWLINE	MK.F4M-H-562.02A	230
D	17	1	SHAKER FLOWLINE	MK.F4M-H-562.02B	281
D	18	1	HOSE	MK.F4M-H-563.03E	
D	19	1	SPOOL #1	MK.F4M-H-564.02A	182
D	20	1	HIGH PRESSURE HOSE, 3" I.D. x 29'-0" LG.	PHOENIX BEATTY	
			WITH 3 1/8" - 5M FLANGED ENDS		
D	21	1	SHAKER FLOWLINE	MK.F4M-H-562.02C	73
D	22	1	SHAKER SPOOL	MK.F4M-H-562.03B	177

RIGS 345 - 347 ONLY

BILL OF MATERIAL

THESE ITEMS REPLACE ITEMS 16 & 17 (items 23–28)

REV	ITEM NO.	QUAN.	DESCRIPTION	PART NUMBER	WT.
D	23	1	SHAKER FLOWLINE	MK.F4M-H-569-04A	656
D	24	1	SHAKER FLOWLINE	MK.F4M-H-569-04B	118
D	25	1	SHAKER FLOWLINE	MK.F4M-H-569-04C	67
D	26	1	SHAKER FLOWLINE HOSE	MK.F4M-H-569-04D	77
D	27	1	FABRI - 10" AIR ACTUATED KNIFE GATE VALVE		66
D	28	1	FABRI - 6" AIR ACTUATED KNIFE GATE VALVE		52
D			HARDWARE		
D	A	24	7/8"-9UNC-2A HEAVY HEX HD. CAP SCREW X 2 1/8" LG.		18
D	B	32	3/4"-10UNC-2A HEAVY HEX HD. CAP SCREW X 1 5/8" LG.		12

ISSUED FOR FABRICATION
October-23-2008
DRAFTSMAN
ENGINEER

PROPRIETARY

ENGINEERING APPROVAL	DATE

REV	DATE	DESCRIPTION	BY
D	10/23/08	[illegible]	CC/WWL
C	09/04/08	MOVE MUD TANK CLOSER TO SHAKER UPDATED PIPING	DRJ
B	08/05/08	ADDED SHT 2 & BOM	DRJ
A	07/17/08	ADDED XX-HVY PIPING TO POP-OFF	DRJ

HELMERICH & PAYNE INTERNATIONAL DRILLING CO.

TITLE: MUD SYSTEM INTERCONNECT PIPING ASSEMBLY

CUSTOMER: OXY PERMIAN

PROJECT: F4M

DRAWN: DJOHNSON | DATE: 07/08/08 | DWG. NO.: F4M-H-568 | REV: D

SCALE: 3/16"=1'-0" | SHEET: 1 OF 2

Continental CONTITECH

Fluid Technology

Quality Document

QUALITY CONTROL INSPECTION AND TEST CERTIFICATE

CERT. N°: 1051

PURCHASER:	Phoenix Beattie Co.				P.O. N°:	002523	
CONTITECH ORDER N°:	415347	HOSE TYPE:	3"	ID	Choke and Kill Hose		
HOSE SERIAL N°:	53059	NOMINAL / ACTUAL LENGTH:			8,84 m		
W.P. 34,48 MPa	5000 psi	T.P. 68,96 MPa	10000 psi		Duration: 60 min.		

Pressure test with water at ambient temperature

See attachment. (1 page)

↑ 10 mm = 10 Min.

→ 10 mm = 16 MPa

COUPLINGS

Type	Serial N°	Quality	Heat N°
3" coupling with	1304 1302	AISI 4130	9882
3 1/8" Flange end		AISI 4130	9553

INFOCHIP INSTALLED

API Spec 16 C
Temperature rate:"B"

All metal parts are flawless

WE CERTIFY THAT THE ABOVE HOSE HAS BEEN MANUFACTURED IN ACCORDANCE WITH THE TERMS OF THE ORDER AND PRESSURE TESTED AS ABOVE WITH SATISFACTORY RESULT.

Date:	Inspector	Quality Control
20. May. 2008		ContiTech Rubber Industrial Kft. Quality Control Dept. (1)

ContiTech Rubber Industrial Kft.
Budapesti út 10., Szeged H 6728
P.O.Box 152 Szeged H-6701
Hungary

Phone: +36 62 566 737
Fax: +36 62 566 738
e-mail: info@fluid.contitech.hu
Internet: www.contitech-rubber.hu

The Court of Csongrád County as Registry Court
Registry Court No: HU 06-09-002502
EU VAT No: HU11087209

Bank data
Commerzbank Zrt.
Budapest
14230108-26830003

Continental CONTITECH

Fluid Technology

Quality Document

CERTIFICATE OF CONFORMITY

Supplier : CONTITECH RUBBER INDUSTRIAL KFT.
Equipment : 8 pcs. Choke and Kill Hose with installed couplings
Type : **3" x 8,84 m WP: 5000 psi /Fire rated/**
Supplier File Number : 415347
Date of Shipment : May. 2008
Customer : Phoenix Beattie Co.
Customer P.o. : 002523
Referenced Standards / Codes / Specifications : API Spec 16 C
Serial No.: 53053,53054,53055,53056,53057,53058,53059,53060

STATEMENT OF CONFORMITY

We hereby certify that the above items/equipment supplied by us are in conformity with the terms, conditions and specifications of the above Purchaser Order and that these items/equipment were fabricated inspected and tested in accordance with the referenced standards, codes and specifications and meet the relevant acceptance criteria and design requirements.

COUNTRY OF ORIGIN HUNGARY/EU

Signed : .....

ContiTech Rubber Industrial Kft. Quality Control Dept. (1)

Date: 22. May. 2008

Position: Q.C. Manager

ContiTech Rubber Industrial Kft.
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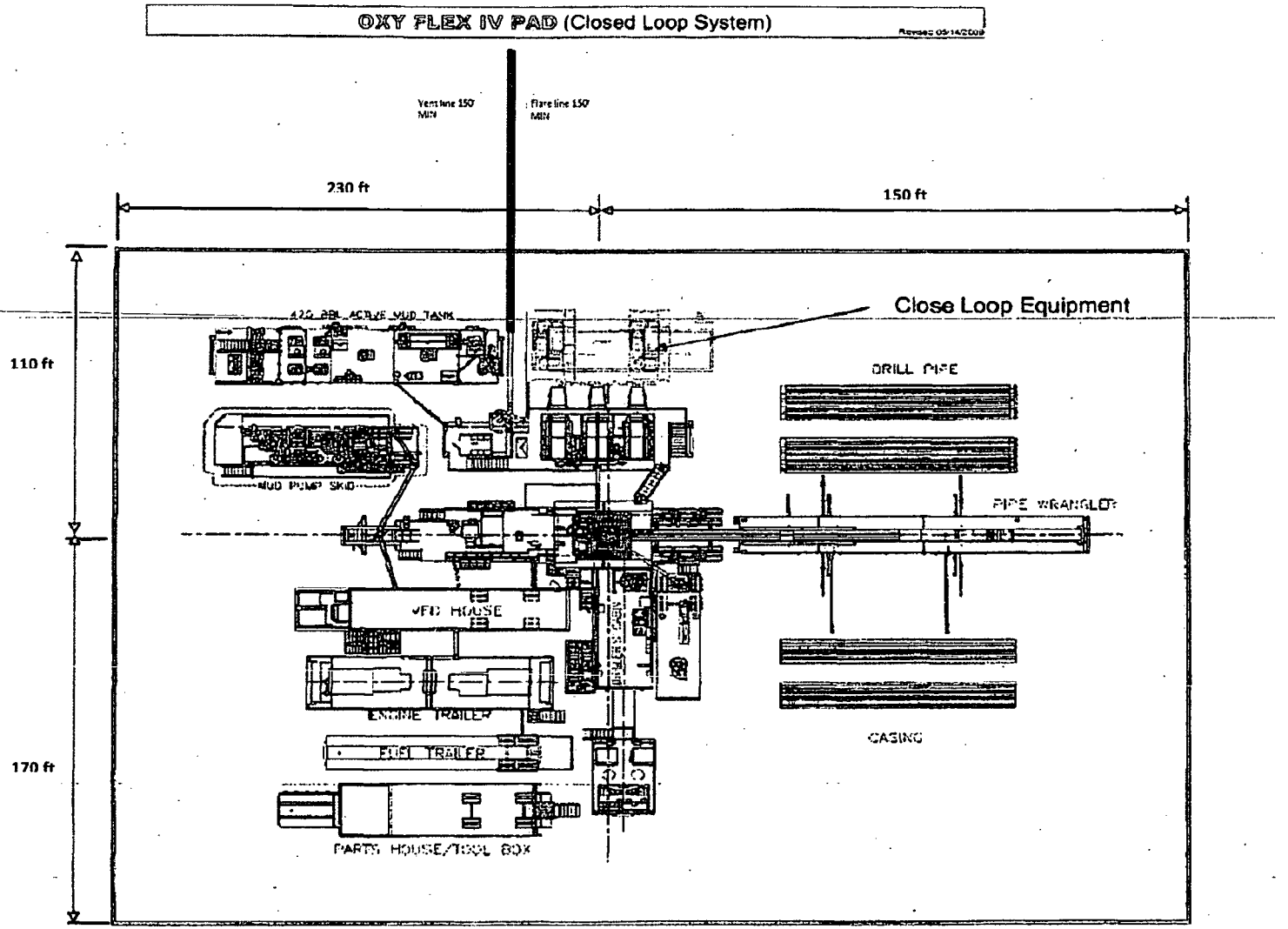
The Court of Csongrád County as Registry Court
Registry Court No: HU 06-09-002502
EU VAT No: HU11087209

Bank data
Commerzbank Zrt.
Budapest
14220108-26830003


OXY FLEX IV PAD (Closed Loop System)
Vent line 150' MIN
Flare line 150' MIN
230 ft
150 ft
110 ft
170 ft
Close Loop Equipment
DRILL PIPE
PIPE WRANGLER
MUD PUMP SKID
VFD HOUSE
ENGINE TRAILER
FUEL TRAILER
PARTS HOUSE/TOOL BOX
CASING

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 (H2S) gas.
While drilling this well, it is possible to encounter H2S bearing formations. At all times, the first barrier to control H2S 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 H2S is detected. All H2S 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 commence.
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 H2S.
2. Proper use and maintenance of personal protective equipment and life support systems.
3. H2S detection.
4. Proper use of H2S 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 H2S 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 H2S Drilling Operations Plan.

H2S 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. H2S 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 H2S 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 H2S.

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.
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. H2S 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. H2S 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, H2S 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 H2S and other formation fluids at surface. Proper mud weight and safe drilling practices will be applied. H2S 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 H2S service.
B. All the elastomers, packing, seals and ring gaskets shall be suitable for H2S 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 H2S 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 H2S 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:

1. On alarm, don escape unit and report to the nearest upwind designated safe briefing / muster area upw
2. Check status of personnel (buddy system).
3. Secure breathing equipment.
4. Await orders from supervisor.

Drill site manager:

1. Don escape unit if necessary and report to nearest upwind designated safe briefing / muster area.
2. Coordinate preparations of individuals to return to point of release with tool pusher and driller (using the buddy system).
3. Determine H2S concentrations.
4. Assess situation and take control measures.

Tool pusher:

1. Don escape unit Report to up nearest upwind designated safe briefing / muster area.
2. Coordinate preparation of individuals to return to point of release with tool pusher drill site manager (using the buddy system).
3. Determine H2S concentration.
4. Assess situation and take control measures.

Driller:

1. Don escape unit, shut down pumps, continue 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 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 H2S 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 H2S detection equipment and self-contained breathing equipment will monitor H2S concentrations, wind directions, and area of exposure. They will delineate the outer perimeter of the hazardous gas area. Extension to the evacuation area will be determined from information gathered.

4. Law enforcement personnel (state police, police dept., fire dept., and sheriff's dept.) Will be called to aid in setting up and maintaining road blocks. Also, they will aid in evacuation of the public if necessary.

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

Percent (%)	Ppm	Concentration Grains 100 std. Ft3*	Physical effects
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 H2S.

B. When breaking out any line where H2S can reasonably be expected.

C. When sampling air in areas to determine if toxic concentrations of H2S exists.

D. When working in areas where over 10 ppm H2S has been detected.

E. At any time there is a doubt as to the H2S level in the area to be entered.

Rescue
First aid for H2S 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 H2S gas poisoning – no matter how remote the possibility is.

6. Notify emergency room personnel that the victim(s) has been exposed to H2S gas.

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

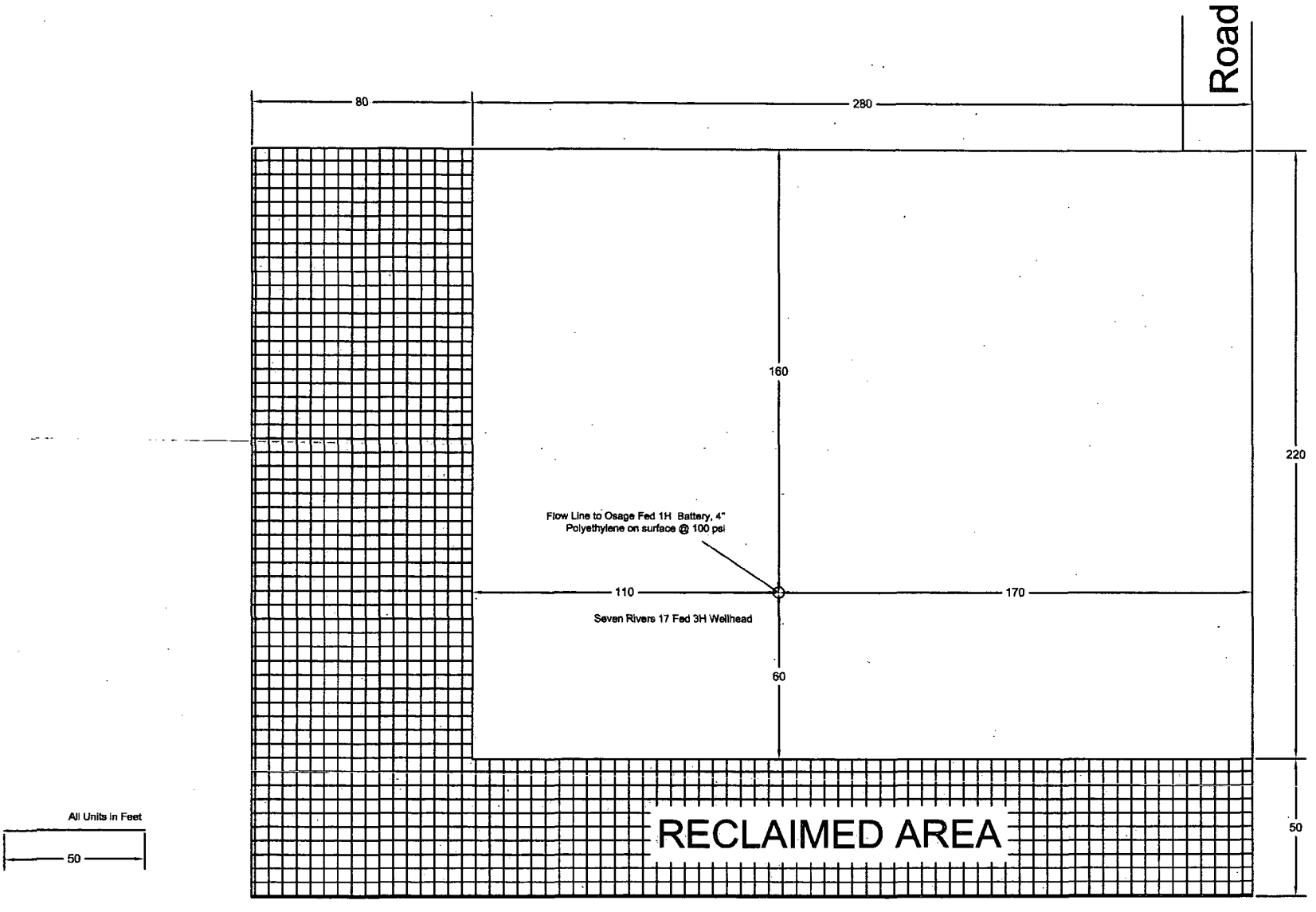
Revised CM 6/27/2012

Permian Drilling
Hydrogen Sulfide Drilling Operations Plan
Seven Rivers 17 Federal #3H

Open drill site. No homes or buildings are near the proposed location.

1. Escape

   Personnel shall escape upwind of wellbore in the event of an emergency gas release. Escape can take place through the lease road on the Northeast side of the location. Personnel need to move to a safe distance and block the entrance to location. If the primary route is not an option due to the wind direction, then a secondary egress route should be taken.



REVISION BLOCK						ENGINEERING RECORD	
NO.	DATE	DESCRIPTION	BY	CHK	APP	BY	DATE
A	10/16/12	Plot Plan for Permiting	RJG			RJG	10/16/2012

PRODUCTION FACILITY LAYOUT

Seven Rivers 17 Fed 3H

DISTRICT
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	COG OPERATING, LLC
LEASE NO.:	NM99015
WELL NAME & NO.:	3H-SEVEN RIVERS 17 FEDERAL
SURFACE HOLE FOOTAGE:	330'/N. & 940'/W.
BOTTOM HOLE FOOTAGE	330'/S. & 840'/W.
LOCATION:	Section 17, T. 20 S., R. 25 E., NMPM
COUNTY:	Eddy County, New Mexico

TABLE OF CONTENTS

Standard Conditions of Approval (COA) apply to this APD. If any deviations to these standards exist or special COAs are required, the section with the deviation or requirement will be checked below.