OCD-ARTESIA

ATS-09-5
EA-09-219

Form 3160-3
(April 2004)

JAN 05 2009
OCD-ARTESIA

FORM APPROVED
OMB No. 1004-0137
Expires March 31, 2007

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No. BHL ~~NM-24155~~ NM101594

6. If Indian, Allotee or Tribe Name ----------

7. If Unit or CA Agreement, Name and No. ----------

1a. Type of work: [XX] DRILL [ ] REENTER

1b. Type of Well: [XX] Oil Well [ ] Gas Well [ ] Other [XX] Single Zone [ ] Multiple Zone

8. Lease Name and Well No. GAIL "25" FEDERAL # 1

2. Name of Operator ST. MARY LAND & EXPLORATION COMPANY
BRENNAN D. SHORT (432-688-1788)

9. API Well No. 30.015.36873

3a. Address 3300 NORTH A STREET BLDG. 7 SUITE 200 MIDLAND, TEXAS 79705

3b. Phone No. *(include area code)* 432-688-1788

10. Field and Pool, or Exploratory UNDES-CROW FLATS

4. Location of Well *(Report location clearly and in accordance with any State requirements.*)*

At surface 960' FNL & 330' FEL SECTION 25 T16S-R28E EDDY CO. NM

At proposed prod. zone 660' FNL & 330' FWL SECTION 25 T16S-R28E

11. Sec., T. R. M. or Blk. and Survey or Area SECTION 25 T16S-R28E

14. Distance in miles and direction from nearest town or post office*
Approximately 16 miles Northeast of Artesia New Mexico

12. County or Parish EDDY CO.

13. State NM

15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drlg. unit line, if any) 330'

16. No. of acres in lease 280

Pilot Hole: 7400'

17. Spacing Unit dedicated to this well 160

18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. 330'

19. Proposed Depth TVD 6907 MD-11,334' ~~TVD-6837~~ 6838' BHL

20. BLM/BIA Bond No. on file Nation wide MT-1022

21. Elevations (Show whether DF, KDB, RT, GL, etc.) 3668' GL

22. Approximate date work will start* WHEN APPROVED

23. Estimated duration 45 days

24. Attachments

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No.1, shall 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 shall 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 authorized officer.

25. Signature Joe T. Janica — Name *(Printed/Typed)* Joe T. Janica — Date 09/29/08

Title Permit Eng.

Approved by *(Signature)* /s/ Don Peterson — Name *(Printed/Typed)* /s/ Don Peterson — Date DEC 19 2008

Title 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.

(Instructions on page 2)

Roswell Controlled Water Basin

ENTERED
1-8-09

Approval Subject to General Requirements & Special Stipulations Attached

SEE ATTACHED FOR CONDITIONS OF APPROVAL

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
30-015-36873	97102	~~UNDES.~~ CROW FLATS WOLFCAMP

Property Code	Property Name	Well Number
37545	GAIL 25 FED.	1

OGRID No.	Operator Name	Elevation
154903	ST. MARY LAND & EXPLORATION COMPANY	3668.1'

Surface Location

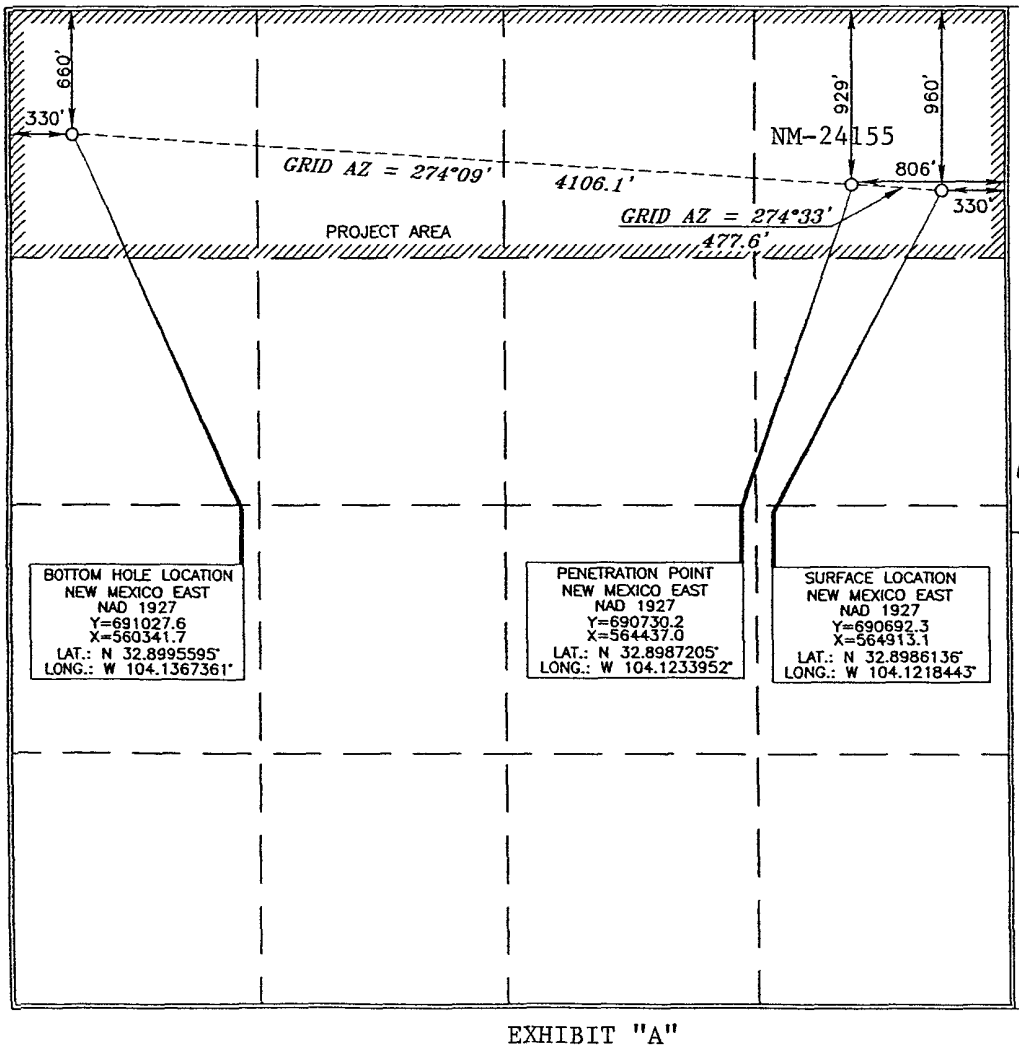
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
A	25	16 SOUTH	28 EAST, N.M.P.M.		960	NORTH	330	EAST	EDDY

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
D	25	16 SOUTH	28 EAST, N.M.P.M.		660	NORTH	330	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.

Joe T. Janica
Signature

09/29/08
Date

Joe T. Janica
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.

NEW MEXICO
15079
REGISTERED PROFESSIONAL LAND SURVEYOR
TERRY J. ASEL

SEPTEMBER 6, 2008
Date of Survey

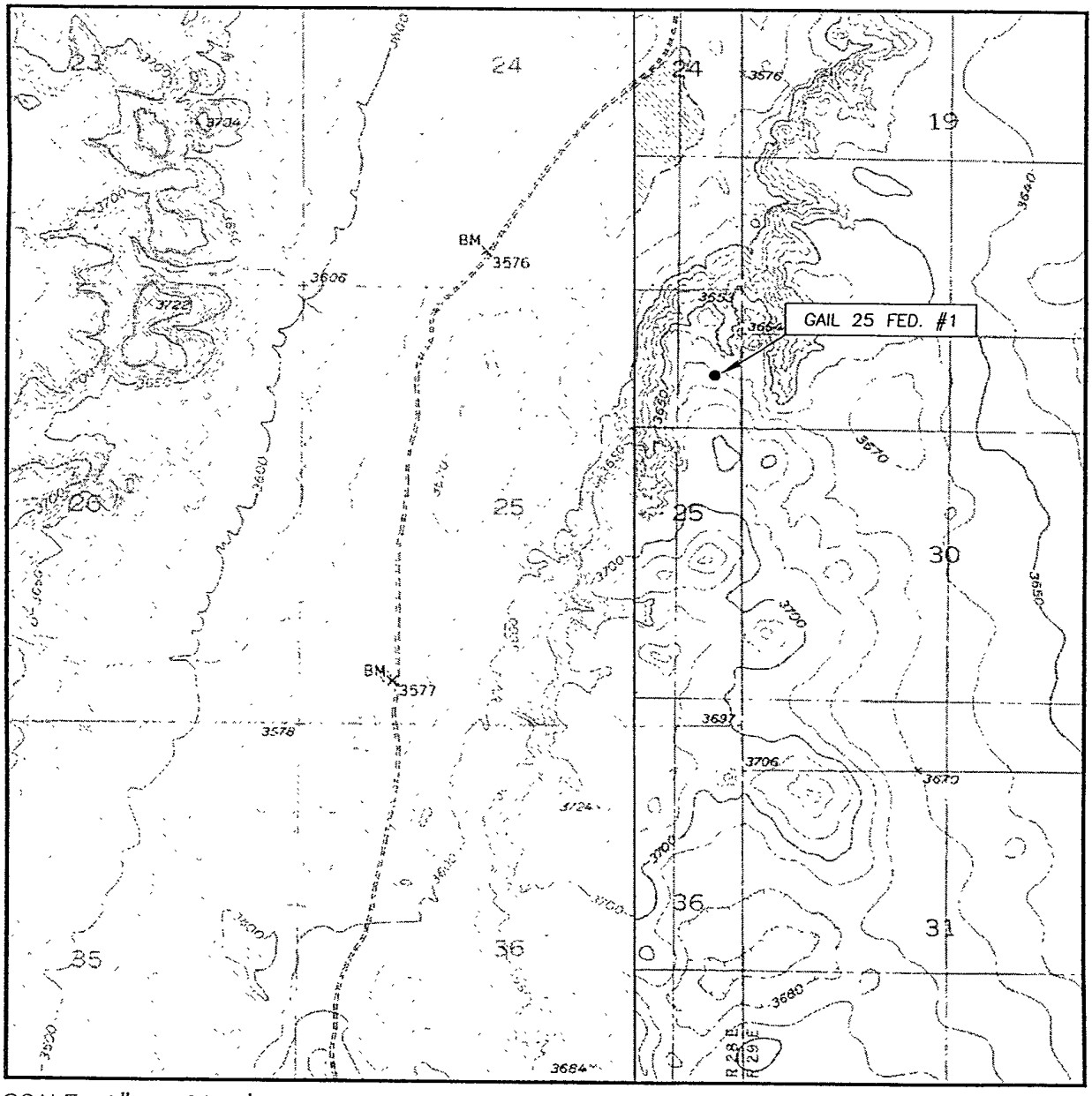
Signature and Seal of Professional Surveyor

Terry J. Asel 9/9/08
Certificate Number 15079

WO# 080806WL-a(KA)

EXHIBIT "A"

LOCATION VERIFICATION MAP



SCALE: 1" = 2000'

CONTOUR INTERVAL: 10'

SEC. 25 TWP. 16-S RGE. 28-E

SURVEY N.M.P.M.

COUNTY EDDY

DESCRIPTION 960' FNL & 330' FEL

ELEVATION 3668.1'

OPERATOR ST. MARY LAND & EXPLORATION COMPANY

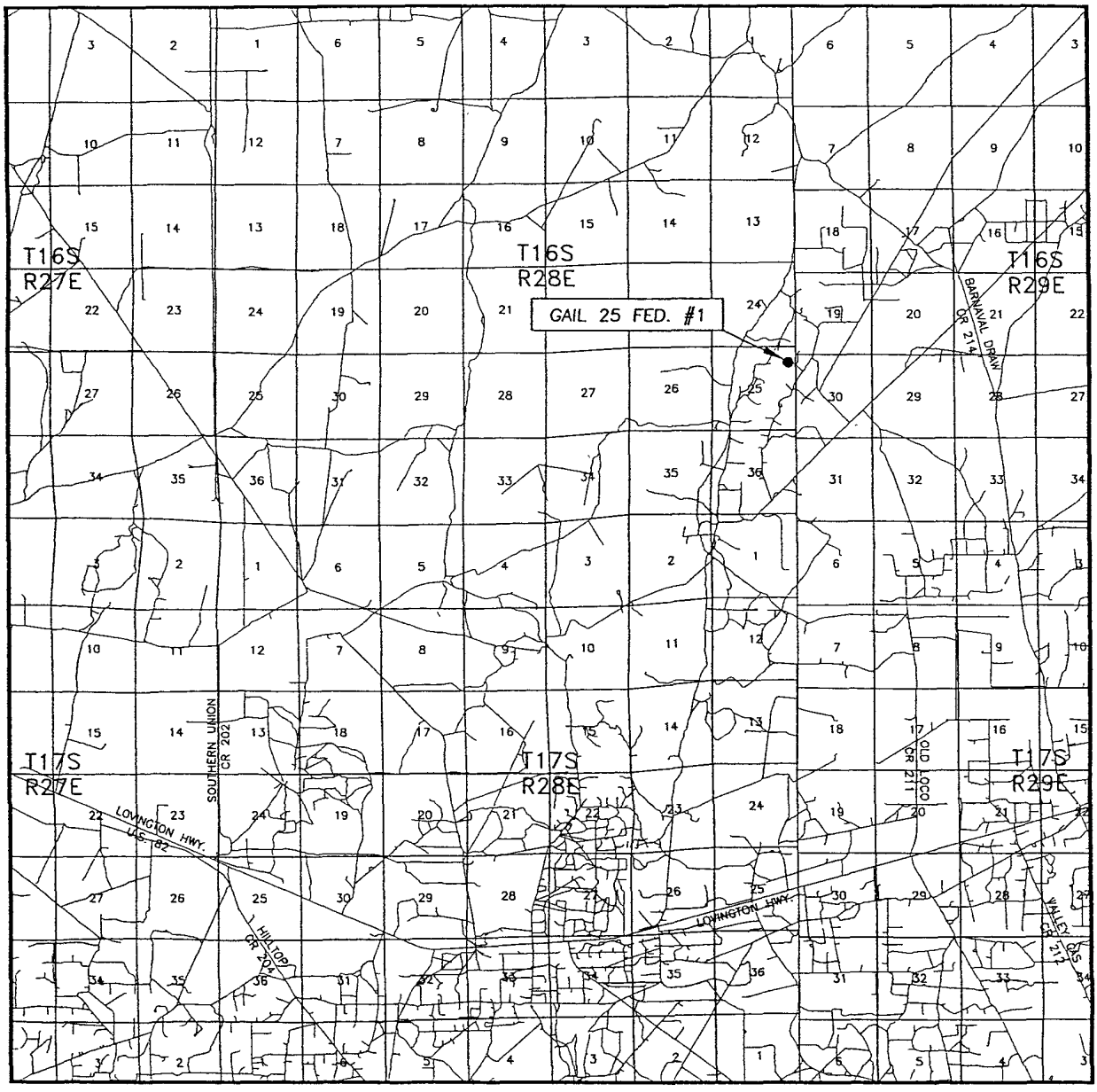
LEASE GAIL 25 FED. #1

U.S.G.S. TOPOGRAPHIC MAP
BASIN WELL, N.M.

Asel Surveying

P.O. BOX 393 - 310 W. TAYLOR
HOBBS, NEW MEXICO - 575-393-9146

VICINITY MAP



SCALE: 1" = 2 MILES

SEC. 25 TWP. 16-S RGE. 28-E
SURVEY N.M.P.M.
COUNTY EDDY
DESCRIPTION 960' FNL & 330' FEL
ELEVATION 3668.1'
OPERATOR ST. MARY LAND & EXPLORATION COMPANY
LEASE GAIL 25 FED. #1

Asel Surveying

P.O. BOX 393 - 310 W. TAYLOR
HOBBS, NEW MEXICO - 575-393-9146

DIRECTIONS BEGINNING IN LOCO HILLS AT THE INTERSECTION OF US HWY. #82 AND EDDY COUNTY ROAD #217, GO WEST ON US HWY. #82 FOR 9.7 MILES TO TURKEY TRACK ROAD (COUNTY ROAD #209), TURN RIGHT AND GO 5.0 MILES TO END OF PAVEMENT, TURN RIGHT AND GO 2.5 MILES, TURN LEFT FOR 0.2 MILES TO LOCATION.

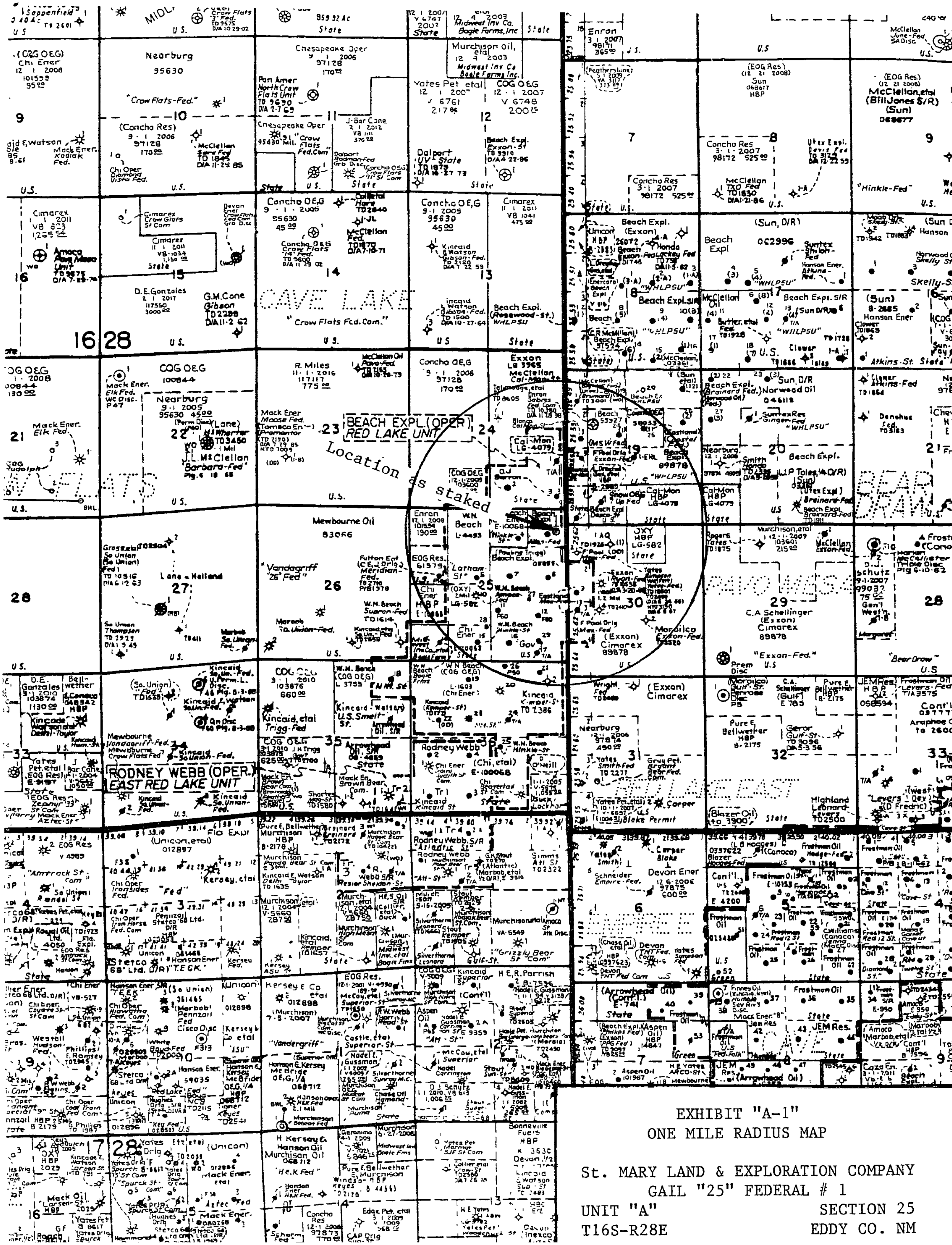


EXHIBIT "A-1"

ONE MILE RADIUS MAP

St. MARY LAND & EXPLORATION COMPANY

GAIL "25" FEDERAL # 1

UNIT "A"	SECTION 25
T16S-R28E	EDDY CO. NM

OUNTY NEW MEXICO

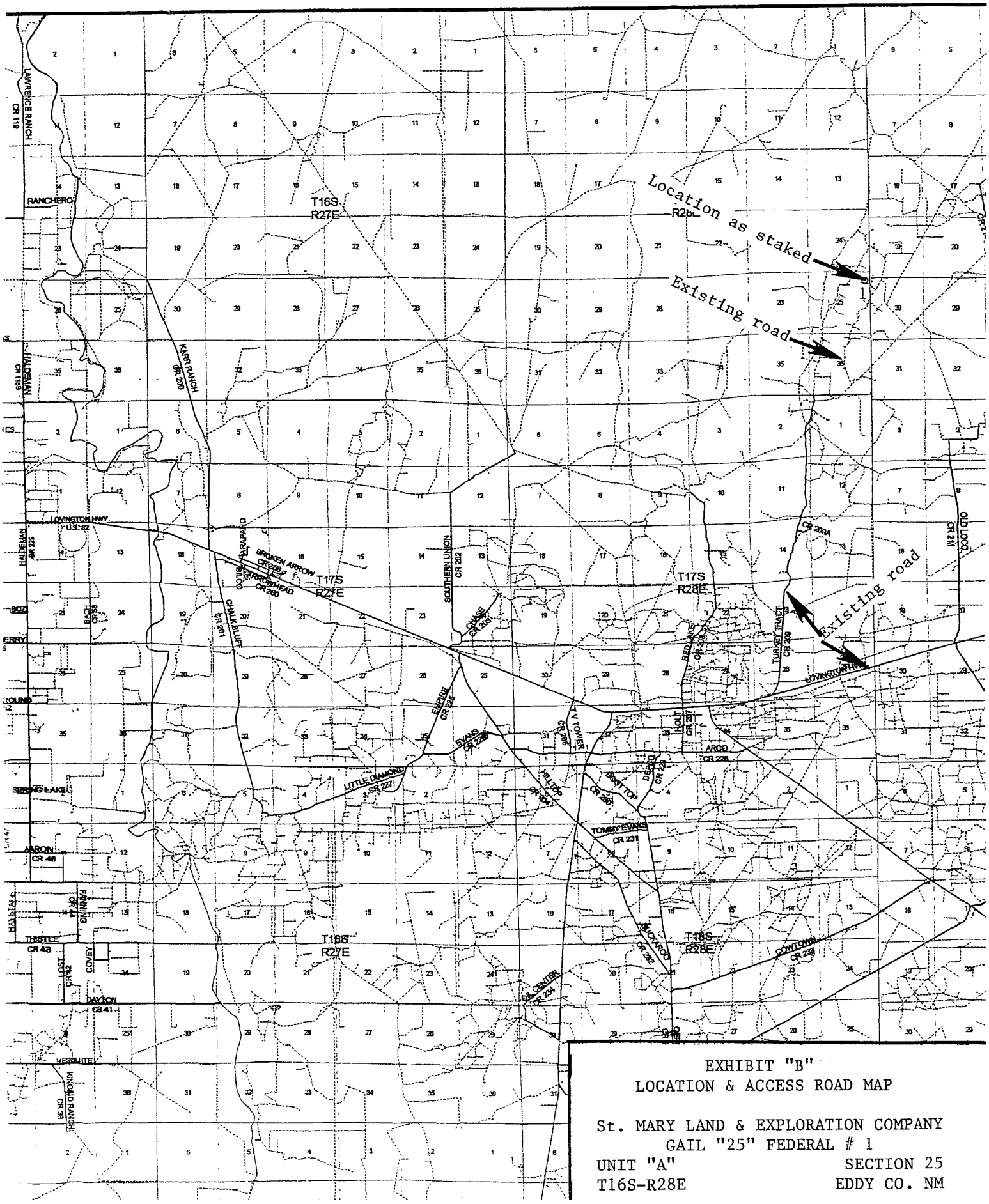
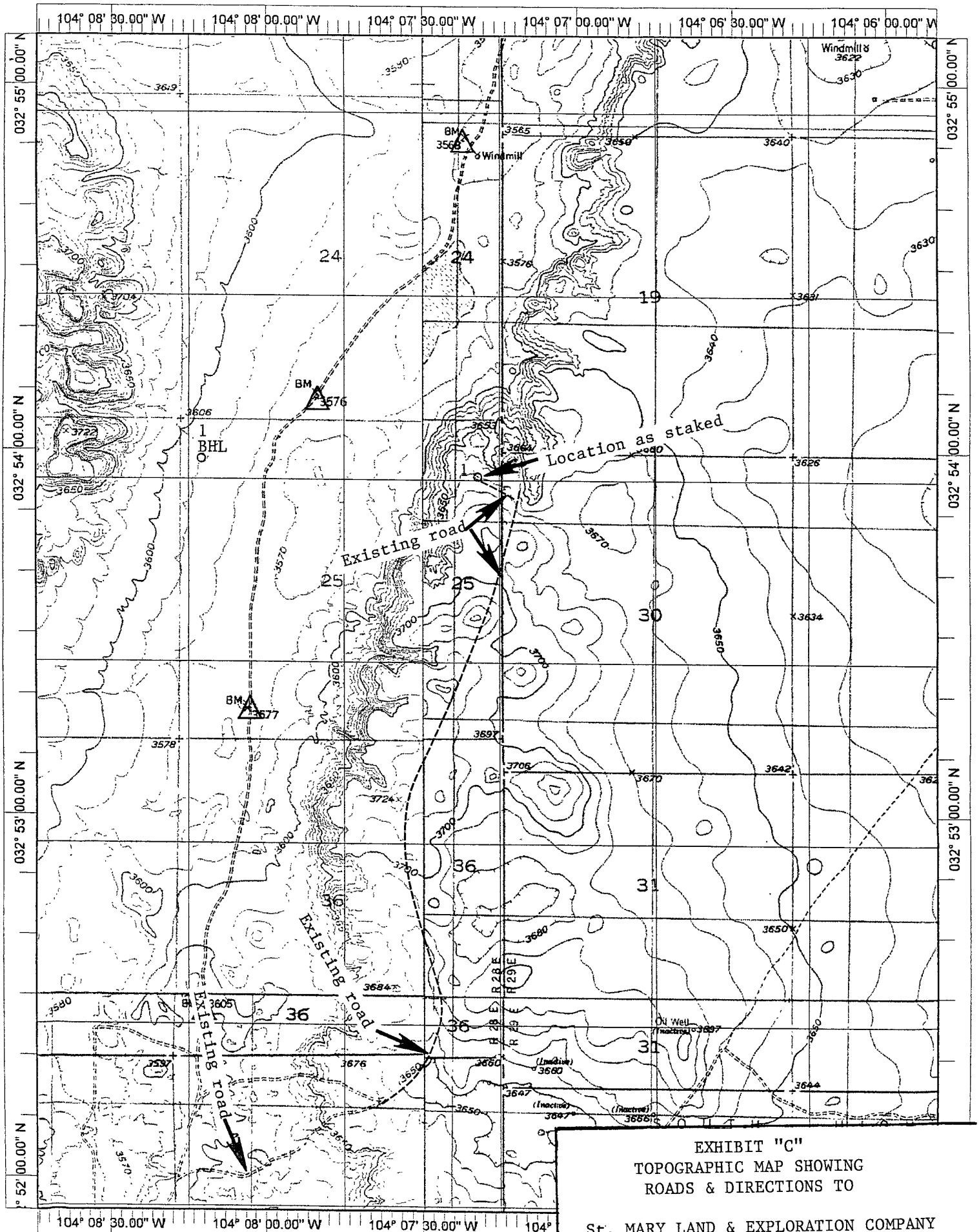


EXHIBIT "B"
LOCATION & ACCESS ROAD MAP

St. MARY LAND & EXPLORATION COMPANY
GAIL "25" FEDERAL # 1
UNIT "A" SECTION 25
T16S-R28E EDDY CO. NM



Datum: NAD27

EXHIBIT "C"
TOPOGRAPHIC MAP SHOWING
ROADS & DIRECTIONS TO

St. MARY LAND & EXPLORATION COMPANY
GAIL "25" FEDERAL # 1
UNIT "A" SECTION 25
T16S-R28E EDDY CO. NM

APPLICATION TO DRILL

St. MARY LAND & EXPLORATION COMPANY
GAIL "25" FEDERAL #1
UNIT "A" SECTION 25
T16S-R28E EDDY CO. NM

In response to questions asked under Section II of Bulliten NTL-6, the following information on the above will be provided.

1. LOCATION: 960' FNL & 330' FEL SECTION 25 T16S-R28E EDDY CO. NM

2. ELEVATION ABOVE SEA LEVEL: 3668' GL

3. GEOLOGICAL NAME OF SURFACE FORMATION: Quaternery Aeolian Deposits.

4. DRILLING TOOLS AND ASSOCIATED EQUIPMENT: Conventional rotary drilling rig using drilling mud as a circulating medium for solids removal from hole.

5. PROPOSED DRILLING DEPTH: TVD- 6838' MD-11,334'

6. ESTIMATED TOPS OF GEOLOGICAL FORMATIONS:

Yates	777'	Glorieta	3718'
Seven Rivers	999'	Abo	5742'
Queen	1529'	Top of Porosity	6908'
San Andres	2295'	Base of Porosity	6993'
		Wolfcamp	7078

7. POSSIBLE MINERAL BEARING FORMATIONS:

Abo	Oil
Wolfcamp	Oil

8. CASING PROGRAM:

HOLE SIZE	INTERVAL	OD OF CASING	WEIGHT	THREAD	COLLAR	GRADE	CONDITION
26"	0-40'	20"	NA	NA	NA	Conductor	New
17½"	0-320'	13 3/8" See COA	48#	8-R	ST&C	H-40	New
12¼"	0-2400'	9 5/8"	36#	8-R	ST&C	J-55	New
8 3/4"	0-7180'	7"	26#	8-R	LT&C	N-80	New
6 1/8"	6800-11,334'	4½"	11.6#	8-R	LT&C	L-80	New

Design Factors: Collapse 1.125 Burst 1.0 Body Yield 1.5 Joint Strength
Buttress 1.6
8-R 1.8

St. MARY LAND & EXPLORATION COMPANY
GAIL "25" FEDERAL #1
UNIT "A" SECTION 25
T16S-R28E EDDY CO. NM

9. CASING CEMENTING & SETTING DEPTHS: ← See COA

20"	Conductor	Set 40' of 20" conductor pipe and cement to surface with Redi-mix.
13 3/8"	Surface	Set 320' of 13 3/8" 48# H-40 ST&C casing. Cement with 250 Sx. of Class "A" cement + additives, mix at 14.8 PPG Yield 1.34, circulate cement to surface.
9 5/8"	Intermediate	Set 2400' of 9 5/8" 36# J-55 ST&C casing. Cement with 500 Sx. of Class "C" cement + additives, mix at 11.5 PPG, Yield 2.76, tail in with 200 Sx. of Class "C" cement + additives, mix at 14.8 PPG Yield 1.32, circulate cement to surface.
7"	2nd Intermediate	Set 7180' of 7" 26# N-80 LT&C casing. Cement with 325 Sx. of 50/50 CLASS "H" POZ + additives, mix at 11.9 PPG, Yield 2.45, tail in with 200 Sx. of Class "H" cement + additives, mix at 13.0 PPG, Yield 1.67, estimate top of cement 2300'. — See COA
4½"	Production Liner	Run 4534' of 4½" production liner. This liner will not be cemented in order to facilitate an open hole completion. ECP's will be run on the outside of the casing.

10. PRESSURE CONTROL EQUIPMENT: Exhibit "E" shows a 900 Series 3000 PSI working pressure B.O.P. consisting of an annular bag type preventor, middle blind rams, and bottom pipe rams. This B.O.P. will be nippled up on the 8 5/8" casing and tested to API specifications. The B.O.P. will be operated at least once in each each 24 hour period and the blind rams will be operated when the drill pipe is out of the hole on trips. Full opening stabbing valve and upper kelly cock will be utilized. Exhibit "E-1" shows a hydraucally operated closing unit and a 3" 5000 PSI choke manifoldwith dual adjustiable chokes. No abnormal pressures or abnormal temperatures are expected while drilling this well. See COA

11. PROPOSED MUD CIRCULATING SYSTEM:

DEPTH	MUD WT.	VISC.	FLUID LOSS	TYPE SYSTEM
40-320' See COA	8.4-8.7	29-34	NC	Fresh water use paper to control seepage.
320-2400'	10.0- 10.2	29-35	NC	Brine water use paper to control seepage and high viscosity sweeps to clean hole.
2400-7180'	8.4-8.8	29-38	NC	Fresh water use high viscosity sweeps to clean hole.
7180-TD	8.4-8.8	29-38	NC	Same as above, if water loss is needs to be controled go to a Polymer system.

Sufficient mud materials will be kept on location at all tines in order to combat lost circulation, or unexpected kicks. In order to run logs, DST's and casing water loss/viscosity may have to be altered or adjusted in order to meet these needs.

12. LOGGING, CORING, AND TESTING PROGRAM:

A. Open hole logs: Spectral Gamma Ray, Neutron, Density, Pe, Laterologs, Sonic logs, from TD back to 9 5/8" casing shoe.

B. Cased Hole logs: Gamma Ray Neutron from TD back to surface.

C. No DST's or cores are planned at this time.

D Rig up mud logger on hole at 2400'±.

13. POTENTIAL HAZARDS:

No abnormal pressures or temperatures are expected. There is no known presence of H^2S in this area. If H^2S is encountered the operator will comply with the provisions of Onshore Oil and Gas Order No. 6. No lost circulation is expected to occur. All personnel will be familiar with all aspects of safe operation of equipment being used to drill this well. Estimated BHP 3600± PSI, and Estimated BHT 165°.

14. ANTICIPATED STARTING DATE AND DURATION OF OPERATION:

Road and location construction will begin after the BLM has approved the APD. Anticipated spud date will be as soon after BLM approval and as soon as a rig will be available. Move in operation and drilling is expected to take 40 days. If production casing is run then an additional 30 days will be needed to complete well and construct surface facilities and/or lay flowlines in order to place well on production.

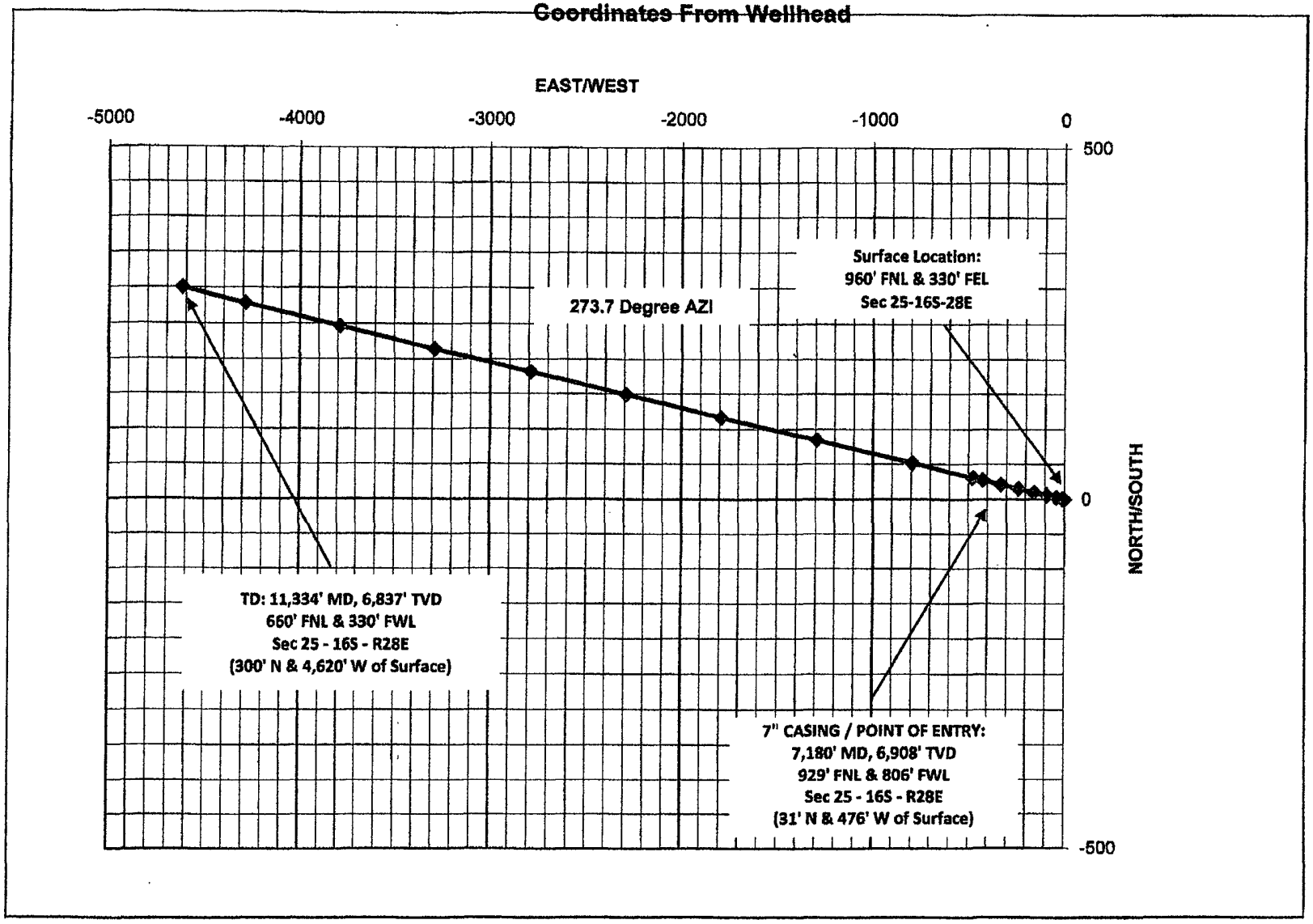
15. OTHER FACETS OF OPERATIONS:

After running casing, cased hole Gamma Ray, Neutron Collar logs will be run from TD back to all possible productive zones. The Wolfcamp formation will be perforated and stimulated in order to establish production. The well will be swab tested and potentialed as an oil well.

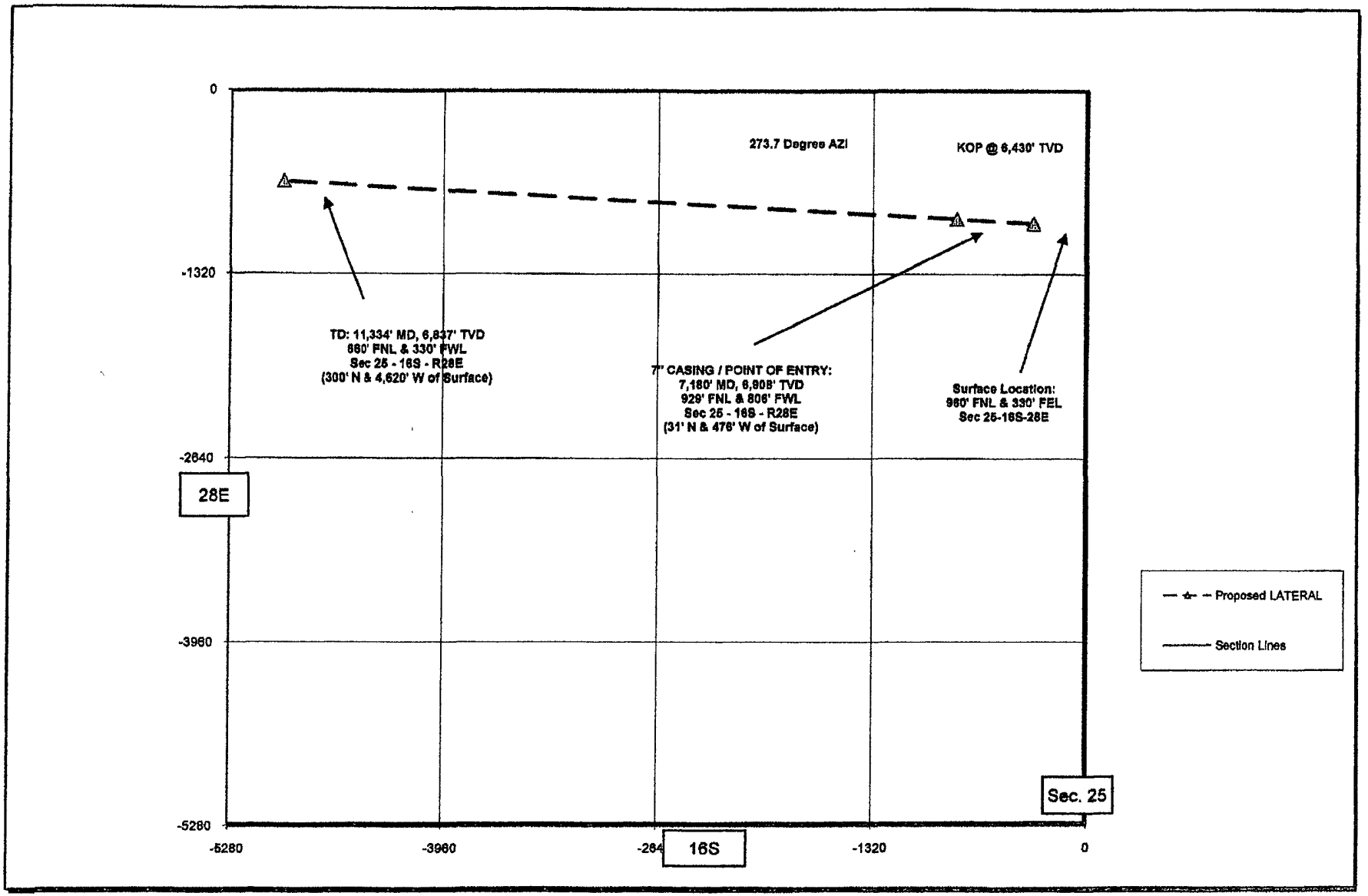
Gail 25 Fed #1			TARGET TVD SHEET	7078.00		SURFACE	-960	-330
NENE 25 -16S- 28E			TARGET INCLINATION =	87.00		Casing Point	-929	-806
11,334 ' MD	6,838' TVD		PROPOSED AZM.=	273.70		Way Point #1	-660	-4950
TOTAL LATERAL:		4,154'	MWDSPACING	36.00		Projected TD	-660	-4950
			BUILD RATE=	12.00				

DEPTH	INC.	AZM	CL	T.V.D.	V.S.	N/S	E/W	N/S from Surface	E/W from Surface
500			500	500.00					
1000			500	1,000.00					
1500			500	1,500.00					
2000			500	2,000.00					
2500			500	2,500.00					
3000			500	3,000.00					
3500			500	3,500.00					
4000			500	4,000.00					
4500			500	4,500.00					
5000			500	5,000.00					
5500			500	5,500.00					
6000			500	6,000.00		-960.00	-330.00		
6430		273.7	430	6,430.00		-960.00	-330.00		
6530	12.0	273.7	100	6529.27	10.4	-959.32	-340.37	0.68	-10.37
6630	24.0	273.7	100	6624.20	41.2	-957.32	-371.08	2.68	-41.08
6730	36.0	273.7	100	6710.35	91.0	-954.08	-420.78	5.92	-90.78
6830	48.0	273.7	100	6784.83	157.6	-949.75	-487.29	10.25	-157.29
6930	60.0	273.7	100	6843.30	238.2	-944.51	-567.71	15.49	-237.71
7030	72.0	273.7	100	6884.10	329.2	-938.59	-658.54	21.41	-328.54
7130	84.0	273.7	100	6904.35	426.7	-932.26	-755.78	27.74	-425.78
7180	90.0	273.7	50	6907.46	476.6	-929.02	-805.56	30.98	-475.56
7500	91.0	273.7	320	6904.67	796.6	-908.26	-1124.87	51.74	-794.87
8000	91.0	273.7	500	6895.95	1296.5	-875.83	-1623.74	84.17	-1293.74
8500	91.0	273.7	500	6887.22	1796.4	-843.39	-2122.61	116.61	-1792.61
9000	91.0	273.7	500	6878.49	2296.3	-810.95	-2621.48	149.05	-2291.48
9500	91.0	273.7	500	6869.77	2796.2	-778.52	-3120.35	181.48	-2790.35
10000	91.0	273.7	500	6861.04	3296.2	-746.08	-3619.22	213.92	-3289.22
10500	91.0	273.7	500	6852.32	3796.1	-713.65	-4118.09	246.35	-3788.09
11000	91.0	273.7	500	6843.59	4296.0	-681.21	-4616.96	278.79	-4286.96
11334	91.0	273.7	334	6837.76	4630.0	-659.55	-4950.21	300.45	-4620.21

Gail 25 Fed #1
Sec. 25 - 16S - 28E
Coordinates From Wellhead



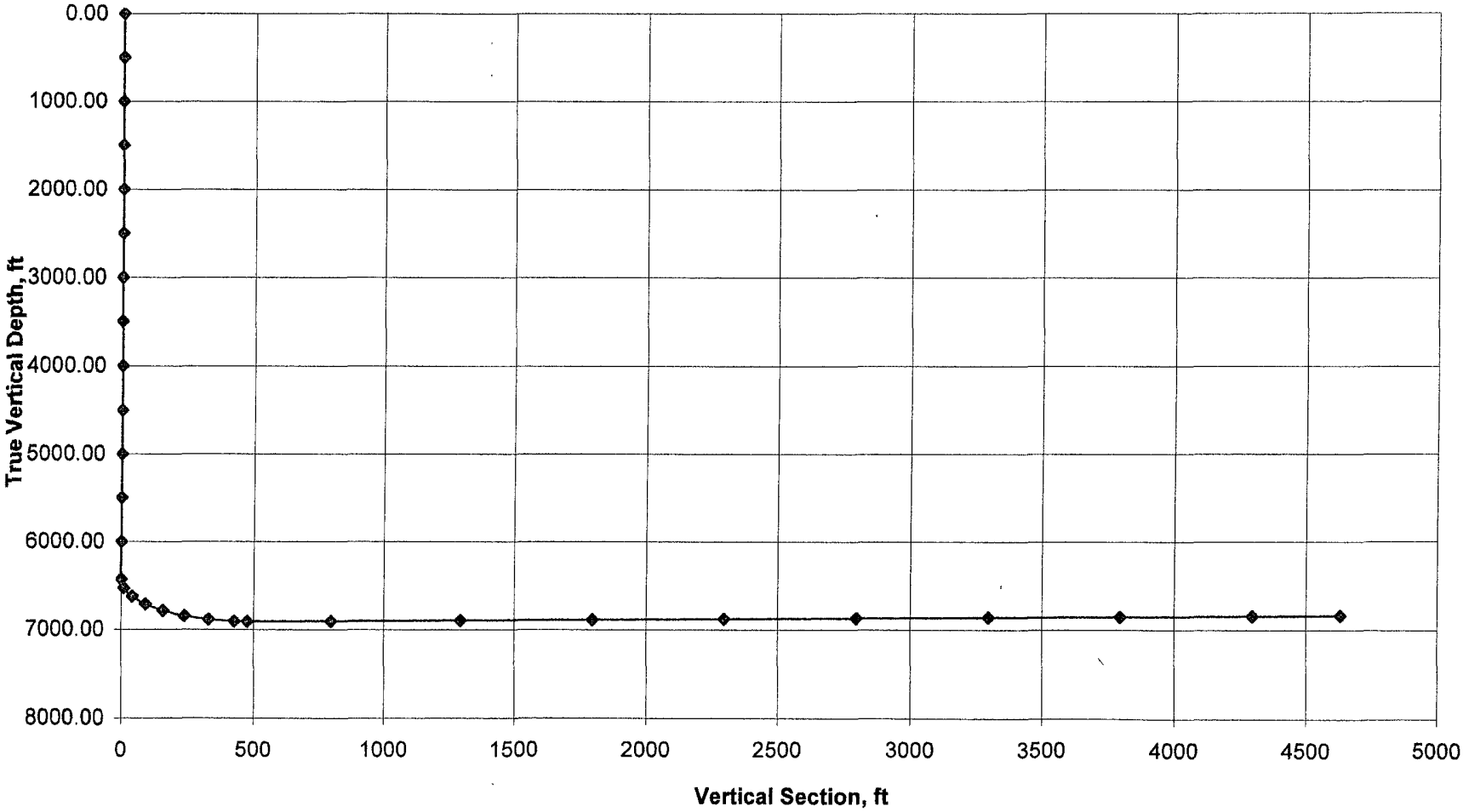
GAIL 25 FED #1
NENE SEC 25 TWN 16S - R28E
EDDY CO, NM



BDS
9/24/2008

Gail 25 Fed #1 Drlg Plan PLAT

Gail 25 Fed #1
Sec 25 Twn 16S R 28E
Vertical Section vs TVD



DRILLING PLAN

PROSPECT/FIELD	WolfBo		**COUNTY/STATE**	Eddy County, New Mexico	
OWNERS	St. Mary Land & Exploration				
WELL NO.	Gail 25 Fed #1		**LEASE**		
LOCATION	NENE 25 -16S- 28E	Surface Location:	960' FNL	330' FEL	
EST. T.D.	11,334 ' MD	6,838 ' TVD	**GROUND ELEV.**	3,660' (est)	ungraded
	Total Lateral:	4,154 ft			

PROGNOSIS: Based on 3,683' KB(est)

MARKER	DEPTH	DATUM
Yates	777	2,906
Seven Rivers	999	2,684
Queen	1,529	2,154
San Andres	2,295	1,388
Glorieta	3,718	(35)
Abo	5,742	(2,059)
Top Of Dolomite Porosity	6,908	(3,225)
Base Of Dolomite Porosity	6,993	(3,310)
Wolfcamp	7,078	(3,395)
Wolfcamp XX Marker	7,238	(3,555)
Pilot Hole TD	7,400	(3,717)

Dip Rate: 2.2 ft/100 ft UP dip

Max. Anticipated BHP:

LOGS:

Type	Interval
Surface	None
Intermediate #2	Quad Combo to Int. Csg. GR/Neu to surf.
CBL	Optional

DEVIATION:

Surf: 2 deg. max., 1 deg / 100'; survey @ TD.
Prod: 3 deg. max., 1 deg / 100'; survey every 500'

DST'S: None Planned

CORES: None Planned

SAMPLES:

Mudlogging:
One-Man:
Two-Man: Intermediate #1 casing point to TD.

BOP:

13 5/8" 3M psi Blind, Pipe & Annular

Surface Formation:

MUD:

Interval	Type	WT	Vis	WL	Remarks
0' - 320'	Native	8.6 - 8.9	28-34	NC	Closed Loop
320' - 2,400'	Saturated Brine	10.0	29	NC	Closed Loop
2,400' - 11,334'	Fresh Water	8.4	29	NC	Closed Loop

CASING:

	Size	Wt ppf	Hole	Depth	Cement	WOC	Remarks
Surface:	13 5/8	48	17 1/2	320'	250 sx	4 hrs	TOC @ Surface
Intermediate #1:	9 5/8	40	12 1/4	2,400'	500 sx	4 hrs	TOC @ Surface
Intermediate #2:	7	26	8 3/4	7,180'		4 hrs	TOC @ 2300 ft
Production.	4 1/2	11.6	6 1/8	11,334'	1,500 sx	NA	Un Cemented

PROBABLE PLUGS, IF REQ'D:

	Depth	Cement	WOC
Plug Back Cmt Plug for Horizontal Kick Off	6300' - 6800'	200 sx	24 hrs

OTHER: Build Rate(per 100'): 12.0

	MD	TVD	FNL/FSL	FEL/FWL	S-T-R	AZI
Surface:	N/A	N/A	960' FNL	330' FEL	19-16S-28E	N/A
KOP:	6,430'	6,430'	960' FNL	330' FEL	19-16S-28E	273.7
Intermediate #2 Csg Point:	7,180'	6,908'	929' FNL	806' FEL	19-16S-28E	273.7
TD:	11,334'	6,838'	660' FNL	330' FWL	19-16S-28E	273.7

Comments:

MWD Surveys will be taken every 30' while building curve and every 90' while drilling lateral.

Prep By: B. D. Short **Date:** 9/24/2008 **Doc:**

Plat for Closed Loop Sys

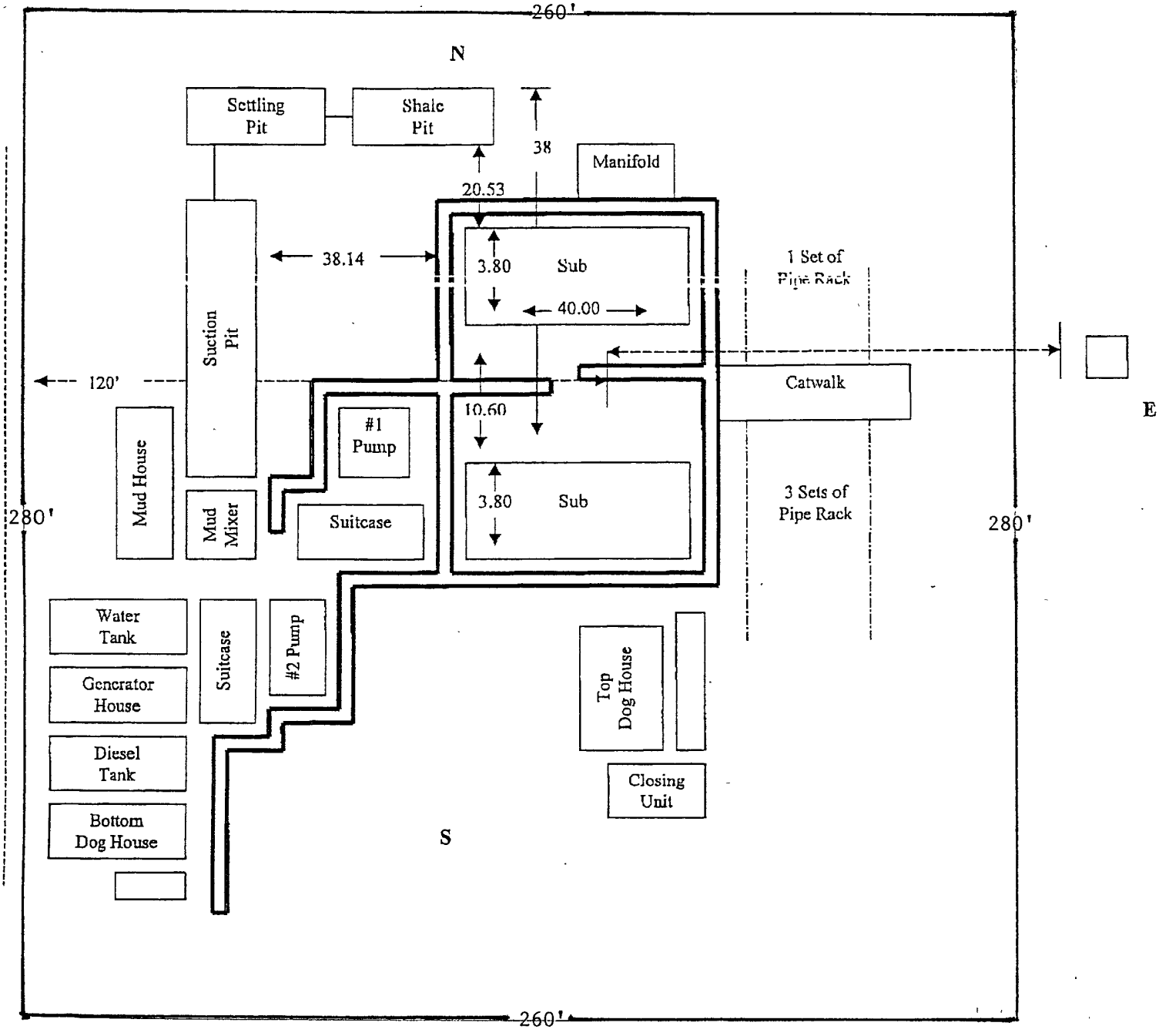
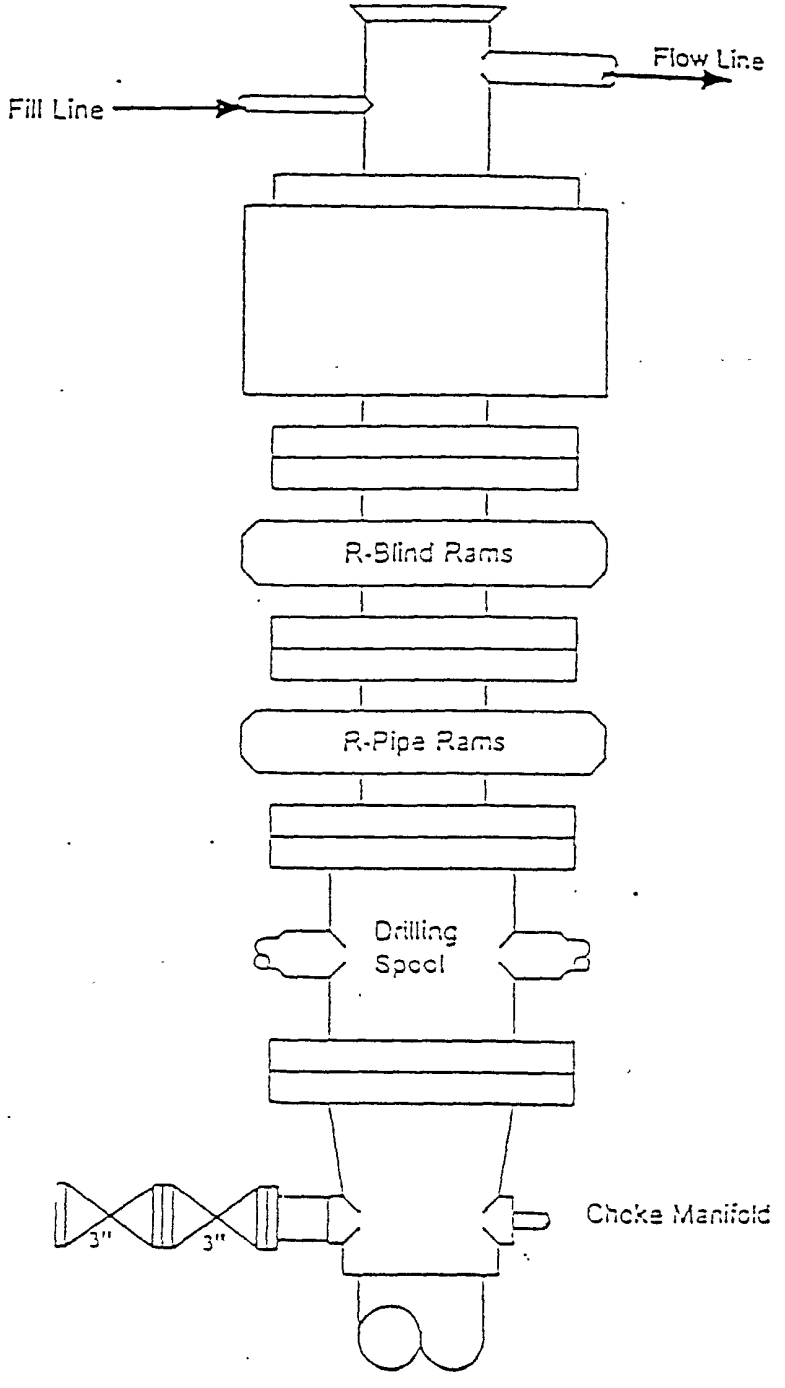


EXHIBIT "D"
RIG LAY OUT PLAT

St. MARY LAND & EXPLORATION COMPANY
GAIL "25" FEDERAL # 1
UNIT "A" SECTION 25
T16S-R28E EDDY CO. NM



Type 900 Series
3000 psi WP

EXHIBIT "E"
SKETCH OF B.O.P. TO BE USED ON

St. MARY LAND & EXPLORATION COMPANY
GAIL "25" FEDERAL # 1
UNIT "A" SECTION 25
T16S-R28E EDDY CO. NM

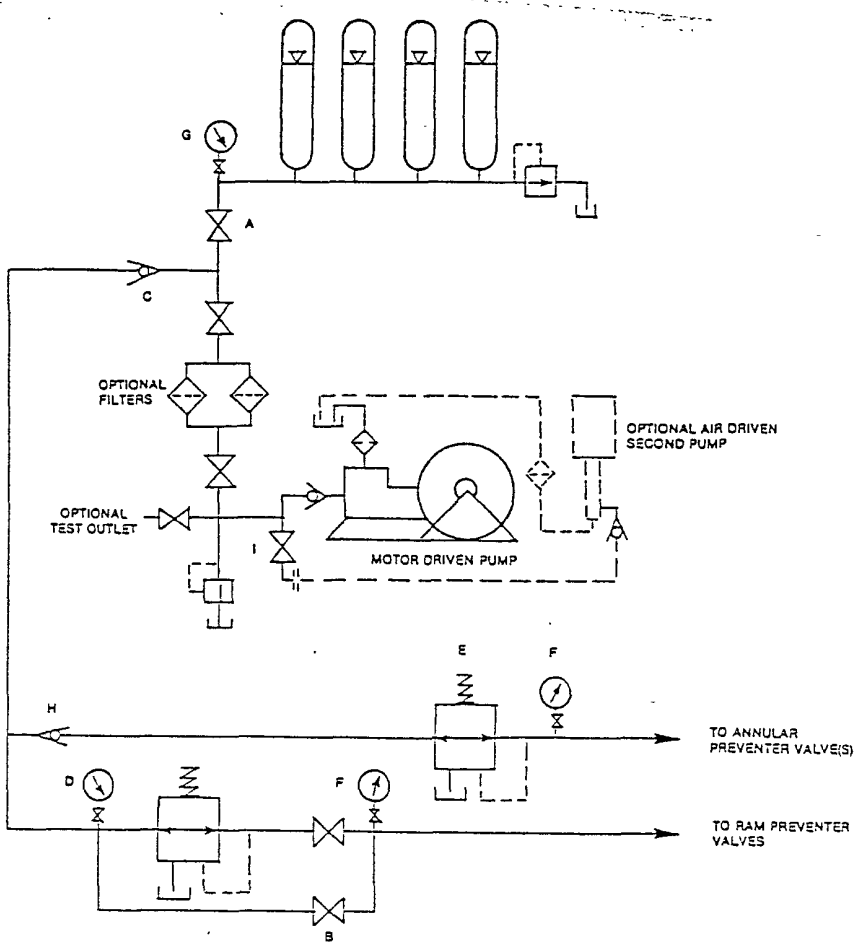


FIGURE K6-1. The schematic sketch of an accumulator system shows required and optional components.

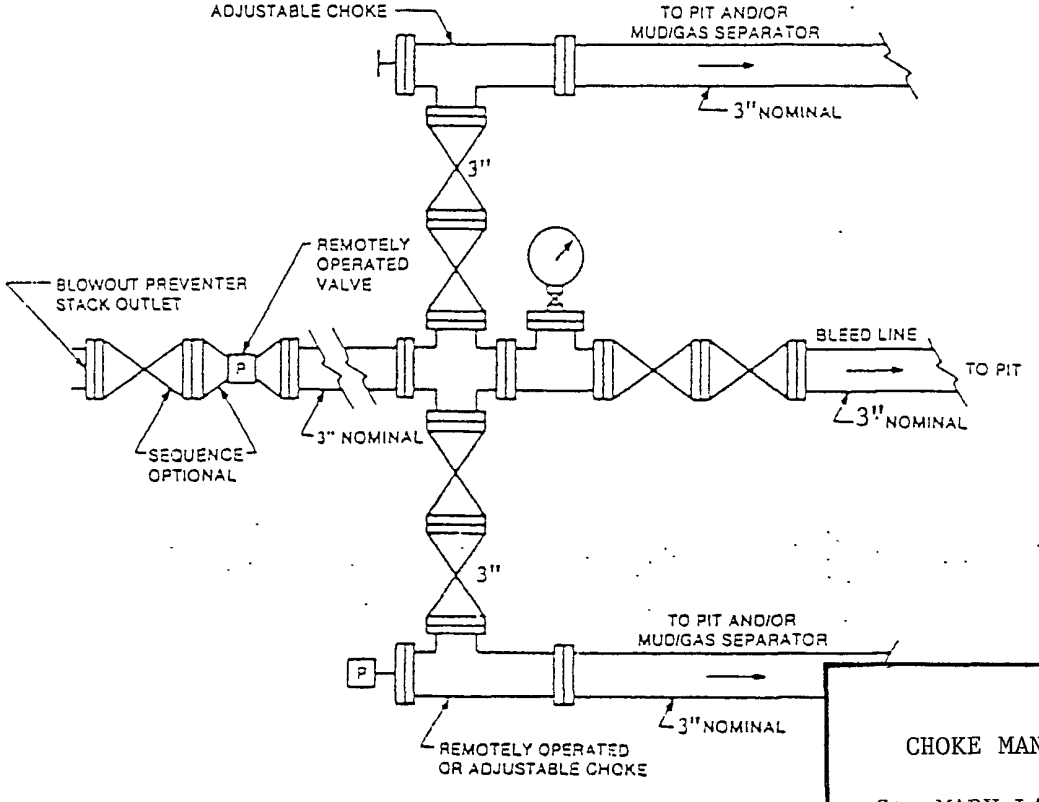


FIGURE K4-2. Typical choke manifold assembly for 5M rated working pressure service — surface installation.

EXHIBIT "E-1"
CHOKE MANIFOLD & CLOSING UNIT

St. MARY LAND & EXPLORATION COMPANY
GAIL "25" FEDERAL # 1
UNIT "A" SECTION 25
T16S-R28E EDDY CO. NM

St. MARY LAND & EXPLORATION COMPANY

HYDROGEN SULFIDE CONTINGENCY PLAN FOR DRILLING/WORKOVER/FACILITY

This well and its anticipated facility are not expected to have Hydrogen Sulfide releases. However, there may be Hydrogen Sulfide production in the nearby area. There are no private Residences in the area but a contingency plan has been orchestrated. St. MARY LAND & EXPLORATION COMPANY Will have a company Representative available to rig personnel through out drilling or production operations. If hydrogen sulfide is detected or suspected, monitoring equipment will be acquired for monitoring and/or testing.

St. MARY LAND & EXPLORATION COMPANY

HYDROGEN SULFIDE CONTINGENCY PLAN
FOR DRILLING/WORKOVER/FACILITY

TABLE OF CONTENTS

St. MARY LAND & EXPLORATION COMPANY

HYDROGEN SULFIDE CONTINGENCY PLAN FOR DRILLING/WORKOVER/FACILITY

General H2S Emergency Actions:

1. All personnel will immediately evacuate to an up-wind and if possible up-hill "safe area".
2. If for any reason a person must enter the hazardous area, they must wear a SCBA (Self Contained Breathing Apparatus).
3. Always use the "buddy system"
4. Isolate the well/problem if possible
5. Account for all personnel
6. Display the proper colors warning all unsuspecting personnel of the danger at hand.
7. Contact the Company personnel as soon as possible if not at the location (use the enclosed call list as instructed)

At this point the company representative will evaluate the situation and coordinate the necessary duties to bring the situation under control, and if necessary, the notification of the emergency response agencies and nearby residents.

EMERGENCY PROCEDURES FOR AN UNCONTROLLABLE RELEASE OF H2S

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

St. MARY LAND & EXPLORATION COMPANY

HYDROGEN SULFIDE CONTINGENCY PLAN
FOR DRILLING/WORKOVER/FACILITY

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

	OFFICE	MOBILE	HOME
St. MARY LAND & EXPLORATION CO.	432-688- 1788		
BRENNAN SHORT	432-688-1788	432-528-7590	432-218-9042
BRAIN HUZZEY	432-688-1706	432-528-8036	
TOM MORROW		432-664-7670	

EMERGENCY RESPONSE NUMBERS:

State Police	Eddy County		575 -748-9718
State Police	Lea County		575-392-5588
Sheriff	Eddy County		575-746-2701
Sheriff	Lea County		
Emergency Medical	Eddy County		911 or 505-746-2701
Service (Ambulance)	Lea County	Eunice	911 or 505-394-3258
Emergency Response	Eddy County SERC		575--476-9620
	Lea County		
Artesia Police Dept			575--746-5001
Artesia Fire Dept			575--746-5001
Carlsbad Police Dept			575-885-2111
Carlsbad Fire Dept			575--885-3125

EMERGENCY CALL LIST (CONT.)

Loco Hills Police Dept		575- 677-2349
Jal Police Dept		575--395-2501
Jal Fire Dept		575--395-2221
Jal Ambulance		575--395-2221
Eunice Police Dept		575- 394-0112
Eunice Fire Dept		575--394-3258
Eunice Ambulance		575--394-3258
Hobbs Police Dept		575- 397-3365
Hobbs Fire Dept		575--397-9308
NMOCD	District 1 (Lea, Roosevelt, Curry)	575- 393-6161
	District 2 (Eddy, Chavez)	575--748-1283
Lea County Information		575--393-8203
Callaway Safety	Eddy/Lea Counties	575--392-2973
BJ Services	Artesia	575--746-3140
	Hobbs	575--392-5556
Halliburton	Artesia	1-800-523-2482
	Hobbs	1-800-523-2482
Wild Well Control	Midland	432-550-6202
	Mobile	432-553-1166

St. MARY LAND & EXPLORATION COMPANY

HYDROGEN SULFIDE CONTINGENCY PLAN FOR DRILLING/WORKOVER/FACILITY

PROTECTION OF THE GENERAL PUBLIC (ROE)

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

CALCULATIONS FOR THE 100 PPM (ROE) "PASQUILL-GIFFORD EQUATION"

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

CALCULATION FOR THE 500 PPM ROE:

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

Example:

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

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

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

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

PUBLIC EVACUATION PLAN:

- Notification of the emergency response agencies of the hazardous condition and implement evacuation procedures.
- A trained person in H2S safety shall monitor with detection equipment the H2S concentration, wind and area exposure (ROE). This person will determine the outer perimeter of the hazardous area. The extent of the evacuation area will be determined from the data being collected. Monitoring shall continue until the situation has been resolved. **(All monitoring equipment shall be UL approved, for use in class 1 groups A, B, C & D, Division 1, hazardous locations. All monitor will have a minimum capability of measuring H2S, oxygen and flammable values.)**

St. MARY LAND & EXPLORATION COMPANY

HYDROGEN SULFIDE CONTINGENCY PLAN
FOR DRILLING/WORKOVER/FACILITY

- Law enforcement shall be notified to set up necessary barriers and maintain such for the duration of the situation as well as aid in the evacuation procedure.

- The company supervising personnel shall stay in communication with all agencies through out the duration of the situation and inform such agencies when the situation has been contained and the effected area(s) is safe to enter.

PROCEDURE FOR IGNITING AN UNCONTROLABLE CONDITION:

1. Human life and/or property are in danger.

2. There is no hope of bringing the situation under control with the prevailing conditions at the site.

INSTRUCTION FOR IGNITION:

1. Two people are required. They must be equipped with positive pressure, self contained breathing apparatus and a "D" ring style full body, OSHA approved safety harness. Non flammable rope will be attached.

2. One of the people will be qualified safety person who will test the atmosphere for H2S, oxygen and LFL. The other person will be the company supervisor; he is responsible for igniting the well.

3. Ignite up wind from a distance no closer than necessary. Make sure that where you ignite from has the maximum escape avenue available. A 25 mm flare gun shall be used, with a ± 500 ft. range to ignite the gas.

4. Prior to ignition, make a final check with combustible gases.

5. Following ignition, continue with the emergency actions & procedures as before.

St. MARY LAND & EXPLORATION COMPANY

HYDROGEN SULFIDE CONTINGENCY PLAN FOR DRILLING/WORKOVER/FACILITY

REQUIRED EMERGENCY EQUIPMENT:

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

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

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

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

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

6. **Auxiliary Rescue Equipment:**
   - Stretcher
   - Two OSHA full body harness
   - 100 ft. 5/8 inch OSHA approved rope.
   - 1 – 20# class ABC fire extinguisher
   - Communication via cell phones on location and vehicles on location.

St. MARY LAND & EXPLORATION COMPANY

HYDROGEN SULFIDE CONTINGENCY PLAN FOR DRILLING/WORKOVER/FACILITY

USING SELF CONTAINED BREATHING AIR EQUIPMENT (SCBA):

- (SCBA) SHOULD BE WORN WHEN ANY OF THE FOLLOWING ARE PERFORMED:
    - Working near the top or on the top of a tank
    - Disconnecting any line where H2S can reasonably be expected
    - Sampling air in the area to determine if toxic concentration of H2S can exist.
    - Working in areas where over 10 ppm on H2S has been detected.
    - At any time there is a doubt as the level of H2S in the area.
- All personnel shall be trained in the use of SCBA prior to working in a potentially hazardous location.
- Facial hair and standard eyeglasses are not allowed with SCBA.
- Contact lenses are never allowed with SCBA.
- Air quality shall be continuously checked during the entire operation.
- After each use, the SCBA unit shall be cleaned, disinfected, serviced and inspected.
- All SCBA shall be inspected monthly.

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

- Do not panic
- Remain calm and think
- Get on the breathing apparatus

St. MARY LAND & EXPLORATION COMPANY

HYDROGEN SULFIDE CONTINGENCY PLAN FOR DRILLING/WORKOVER/FACILITY

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

St. MARY LAND & EXPLORATION COMPANY

HYDROGEN SULFIDE CONTINGENCY PLAN FOR DRILLING/WORKOVER/FACILITY

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

COMMON NAME	CHEMICAL ABBREV.	SPECIFIC GRVTY.	THRESHOLD LIMITS	HAZARDOUS LIMITS	LETHAL CONCENTRATIONS
Hydrogen Sulfide	H2S	1.19	10 ppm 15 ppm	100 ppm/hr	600ppm
Hydrogen Cyanide	HCN	0.94	10 ppm	150 ppm/hr	300 ppm
Sulfur Dioxide	SO2	2.21	2 ppm	N/A	1000 ppm
Chlorine	CL2	2.45	1 ppm	4 ppm/hr	1000 ppm
Carbon Monoxide	CO	0.97	50 ppm	400 ppm/hr	1000 ppm
Carbon Dioxide	CO2	1.52	5000 ppm	5%	10%
Methane	CH4	0.55	90,000	Combustible @ 5%	N/A

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

Hazardous Limit: Concentrations that may cause death.

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

Threshold Limit: NIOSH guide to chemical hazards
(10 ppm)

PHYSICAL EFFECTS OF HYDROGEN SULFIDE:

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

SURFACE USE PLAN

St. MARY LAND & EXPLORATION COMPANY
GAIL "25" FEDERAL #1
UNIT "A" SECTION 25
T16S-R28E EDDY CO. NM

1. EXISTING AND PROPOSED ROADS:

A. Exhibit "B" is a reporduction of a County General Hi-way map showing existing roads. Exhibit "C" is a reproduction of a USGS topographic map showing existing roads and and proposed roads. All existing roads will be maintained in a condition equal to or better than current conditions. All new roads will be constructed to BLM specifications.

B. Exhibit "A" shows the proposed well site as staked.

C. Directions to location: From Loco Hills New Mexico take U. S. Hi-way 82 West 9.7 miles, turn Right on to Turkey Track Road (CR-209) go North 5 miles to end of pavement. Bear Right and go 2.5 miles, Turn Left gp .2 miles to location.

D. Exhibit "C" shows a topographic map with existing roads and any proposed roads.

2. PLANNED ACCESS ROADS:

A. The access roads will be crowned and sitched to a 14' wide travel surface, within a 30' R-O-W.

B. Gradient of all roads will be less than 5%.

C. Turn-outs will be constructed where necessary.

D. If require new access roads will be surface with a minimum of 4-6" of caliche. this material will be obtained from a local source.

E. Center line for new roads will be flagged, road construction will be done as field conditions require.

F. Culverts will be placed in the access road as drainage conditions require. Roads will be constructed to use low water crossings for drainage as required by the topographic conditions.

3. LOCATION OF EXISTING WELLS WITHIN A ONE MILE RADIUS: EXHIBIT "A-1"

A. Water wells - None within 2 miles of location

B. Disposal wells - None known

C. Drilling wells - None known

D. Producing wells - As shown on Exhibit "A-1"

E. Abandoned wells - As shown on Exhibit "A-1"

4. If on completion this well is a producer the operator will lay pipelines and construct powerlines along existing road R-O-W's or other existing R-O-W's. Exhibit "C" shows proposed roads , flowlines and powerlines.

5. LOCATION & TYPE OF WATER SUPPLY:

Water will be purchased locally from a commercial source and trucked over the location access roads or piped to location in flexible lines laid on top of the ground.

6. SOURCE OF CONSTRUCTION MATERIAL:

If possible construction material will be obtained from the excavation of the drill site, if additional material is required it will be obtained from a local source and transported over the location access roads as shown on Exhibit "C".

7. METHODS OF HANDLING WASTE:

A. All trash, junk and other waste material will be contained in trash cages or trash bins in order to prevent scattering. When the job is completed all contents will be removed and disposed of in an approved sanitary land fill.

B. Sewage from living quaters will be drained into holding tanks and will be cleaned out periodically. A Porta-John will be provided for the rig crews. This equipment will be properly maintained during the drilling operations and removed upon completion of well.

C. Where a closed loop mud system is used to drill a well the drilling fluid that remains after the drilling and casing is run or the well is Plugged and abandoned will be removed from the location and in some cases may be used on another well or transported to a State approve disposal site. The drilling cuttings that result from drilling the well will likewise be transported to a State approved disposal site.

D. All water produced while completing this well and completion fluids will be treated in the same procedure as the drilling fluids.

E. Any remaining salts or mud additive that was not used will be removed by the supplier, this includes all broken sacks and containers.

8. ANCILLARY FACILITIES:

A. No camps or air strips will be constructed on this location.

9. WELL SITE LAYOUT:

A. Exhibit "D" shows the proposed well site layout.

B. This Exhibit shows the location of reserve pit, sump pits, and living facilities.

C. Mud pits in the active circulating system will be steel pits and the reserve pits will be unlined unless subsurface conditions encontered during pit construction indicate that a plastic liner is required to contain lateral migration.

D. If needed the reserve pits will be lined with polyethelene. The pit liner will be no less than 21 mils thick and the liner will be extended at least 3 feet over the top of the dikes and secured in place to keep edge of liner in place.

E. The reserve pit will be fenced on three sides and fenced with four strands of barbed wire during drilling and completionphases. The 4th side will be fenced after drilling operations are complete and the drilling rig has moved out.If the well is a producer the mud pits will remain fenced in until the mud has dried up enough to break out the pits and reclaimed according to BLM requirements.

10. PLANS FOR RESTORATION OF SURFACE:

Rehabilitation of the location and reserve pits will be allowed to dry properly, fluids may be moved and disposed of in accordance with article 7-E as previously noted. The pit area will then be leveled and contoured to conform to the original and surrounding area. Drainage systems, if any will be reshaped to the original configuration with provisions made to alleviate furture erosion. In case of the well completed as a producer the drilling pad will be necessary to construct production facilities. After the area has been shaped and contoured top soil from the spoil pile will be placed over the disturbed area to the extent possible so that revegetation procedures can be accomplished to comply with the BLM specifications.

If the well is a dry hole the pad and road area will be contoured to match the existing terrain. Top soil will be spread to the extent possible and revegetation will be carried out according to the BLM specifications.

Should the well be a producer the previously noted procedures will apply to those areas which are not required for production facilities.

11. OTHER INFORMATION:

A. The project area is in a caprock setting with deep drainage paterns to the West & Southwest. Soils consists mostly of caliche and light tan sandy soil. Vegetation consists of Mesquite, prickley pear, snake weed and various native grasses.

B. The surface and minerals are owned by The U. S. Department of Interior and is administered by The Bureau of Land Management. The surface is used to graze livestock and is leased for that purpose to ranchers. The surface is also used to allow Oil & Gas companies to drill for oil and gas.

C. There will ba cultural survey made of the location and access roads and the report will be filed in the Bureau of Land Office in Carlsbad New Mexico.

D. There are no dwellings within 2 miles of location.

CERTIFICATION

I HEREBY CERTIFY THAT I OR PERSONS UNDER MY SUPERVISION HAVE INSPECTED THE PROPOSED DRILL SITE AND THE ACCESS ROAD ROUTES, THAT I AM FAMILIAR WITH THE CONDITIONS THAT CURRENTLY EXIST, AND THAT THE STATEMENTS MADE IN THIS PLAN ARE TO THE BEST OF MY KNOWLEDGE ARE TRUE AND CORRECT, AND THAT THE WORK ASSOCIATED WITH THE OPERATIONS PROPOSED HEREIN WILL BE PERFORMED BY St. MARY LAND & EXPLORATION CONMPANY, IT'S ..CONTRACTORS OR ITS SUB-CONTRACTORS IS IN CONFORMANCE WITH THIS PLAN AND THE TERMS AND THE CONDITIONS UNDER WHICH IT IS APPROVED. THIS STATEMENT IS SUBJECT TO THE PROVISIONS OF U.S.C. 1001 FOR THE FILING OF A FALSE STATEMENT.

OPERATORS REPRESENTATIVES

BEFORE CONSTRUCTION

JOE T. JANICA

TIERRA EXPLORATION, INC.
P. O. BOX 2188
HOBBS, NEW MEXICO 88241
PHONE 505-391-8503
CELL 505-390-1598

DURING AND AFTER CONSTRUCTION

BRENNAN SHORT

ST. MARY LAND & EXPLORATION COMPANY
3300 NORTH "A" STREET
BLDG. 7 SUITE 200
MIDLAND, TEXAS 79705
BRENNAN SHORT 432-688-1788
CELL 432-528-7590

NAME; JOE JANICA Joe T. Janica

TITLE; PERMIT ENGINEER

DATE; 09/29/08

PECOS DISTRICT
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	ST. Mary Land & Exploration Company
LEASE NO.:	NM101594
WELL NAME & NO.:	Gail 25 Federal No 1
SURFACE HOLE FOOTAGE:	960' FNL & 330' FEL
BOTTOM HOLE FOOTAGE	660' FNL & 330' FWL
LOCATION:	Section 25, T. 16 S., R 28 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.

I. GENERAL PROVISIONS

The approval of the Application For Permit To Drill (APD) is in compliance with all applicable laws and regulations: 43 Code of Federal Regulations 3160, the lease terms, Onshore Oil and Gas Orders, Notices To Lessees, New Mexico Oil Conservation Division (NMOCD) Rules, National Historical Preservation Act As Amended, and instructions and orders of the Authorized Officer. Any request for a variance shall be submitted to the Authorized Officer on Form 3160-5, Sundry Notices and Report on Wells.

II. PERMIT EXPIRATION

If the permit terminates prior to drilling and drilling cannot be commenced within 60 days after expiration, an operator is required to submit Form 3160-5, Sundry Notices and Reports on Wells, requesting surface reclamation requirements for any surface disturbance. However, if the operator will be able to initiate drilling within 60 days after the expiration of the permit, the operator must have set the conductor pipe in order to allow for an extension of 60 days beyond the expiration date of the APD. (Filing of a Sundry Notice is required for this 60 day extension.)

III. ARCHAEOLOGICAL, PALEONTOLOGY & HISTORICAL SITES

Any cultural and/or paleontological resource discovered by the operator or by any person working on the operator's behalf shall immediately report such findings to the Authorized Officer. The operator is fully accountable for the actions of their contractors and subcontractors. The operator shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery shall be made by the Authorized Officer to determine the appropriate actions that shall be required to prevent the loss of significant cultural or scientific values of the discovery. The operator shall be held responsible for the cost of the proper mitigation measures that the Authorized Officer assesses after consultation with the operator on the evaluation and decisions of the discovery. Any unauthorized collection or disturbance of cultural or paleontological resources may result in a shutdown order by the Authorized Officer.

IV. NOXIOUS WEEDS

The operator shall be held responsible if noxious weeds become established within the areas of operations. Weed control shall be required on the disturbed land where noxious weeds exist, which includes the roads, pads, associated pipeline corridor, and adjacent land affected by the establishment of weeds due to this action. The operator shall consult with the Authorized Officer for acceptable weed control methods, which include following EPA and BLM requirements and policies.

V. SPECIAL REQUIREMENT(S)

The well pad location will need to have the entire well pad location bermed in order to help prevent, contaminants from going into the nearby drainages to the north of the location. It will also help to prevent any water runoff coming from the south and east of the location from flooding the proposed well location.

Gale 25 Federal # 1: Closed Loop System- V- Door West

VI. CONSTRUCTION

A. NOTIFICATION

The BLM shall administer compliance and monitor construction of the access road and well pad. Notify the Carlsbad Field Office at (575) 234-5972 at least 3 working days prior to commencing construction of the access road and/or well pad.

When construction operations are being conducted on this well, the operator shall have the approved APD and Conditions of Approval (COA) on the well site and they shall be made available upon request by the Authorized Officer.

B. TOPSOIL

The operator shall stockpile the topsoil of the well pad. The topsoil shall not be used to backfill the reserve pit and will be used for interim and final reclamation.

C. Closed Loop System

Gale 25 Federal # 1: Closed Loop System- V- Door West

Tanks are required for drilling operations: No Pits.

The operator shall properly dispose of drilling contents at an authorized disposal site.

D. FEDERAL MINERAL MATERIALS PIT

If the operator elects to surface the access road and/or well pad, mineral materials extracted during construction of the reserve pit may be used for surfacing the well pad and access road and other facilities on the lease.

Payment shall be made to the BLM prior to removal of any additional federal mineral materials from any site other than the reserve pit. Call the Carlsbad Field Office at (575) 234-5972.

E. WELL PAD SURFACING

Surfacing of the well pad is not required.

If the operator elects to surface the well pad, the surfacing material may be required to be removed at the time of reclamation.

The well pad shall be constructed in a manner which creates the smallest possible surface disturbance, consistent with safety and operational needs.

F. ON LEASE ACCESS ROADS

Road Width
The access road shall have a driving surface that creates the smallest possible surface disturbance and does not exceed fourteen (14) feet in width. The maximum width of surface disturbance, when constructing the access road, shall not exceed thirty (30) feet.

Surfacing
Surfacing material is not required on the new access road driving surface. If the operator elects to surface the new access road or pad, the surfacing material may be required to be removed at the time of reclamation.

Where possible, no improvements should be made on the unsurfaced access road other than to remove vegetation as necessary, road irregularities, safety issues, or to fill low areas that may sustain standing water.

The Authorized Officer reserves the right to require surfacing of any portion of the access road at any time deemed necessary. Surfacing may be required in the event the road deteriorates, erodes, road traffic increases, or it is determined to be beneficial for future field development. The surfacing depth and type of material will be determined at the time of notification.

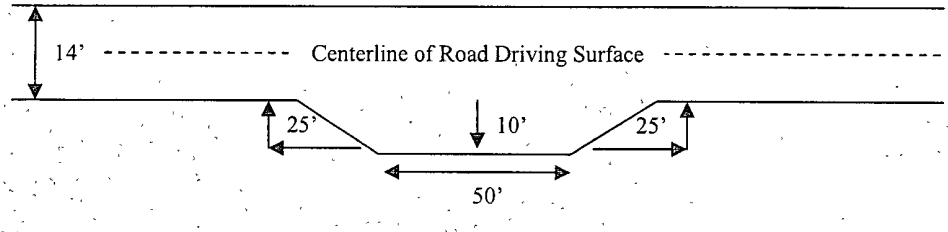
Crowning
Crowning shall be done on the access road driving surface. The road crown shall have a grade of approximately 2% (i.e., a 1" crown on a 14' wide road). The road shall conform to Figure 1; cross section and plans for typical road construction.

Ditching

Ditching shall be required on both sides of the road.

Turnouts
Vehicle turnouts shall be constructed on the road. Turnouts shall be intervisible with interval spacing distance less than 1000 feet. Turnouts shall be constructed on all blind curves. Turnouts shall conform to the following diagram:

Standard Turnout – Plan View

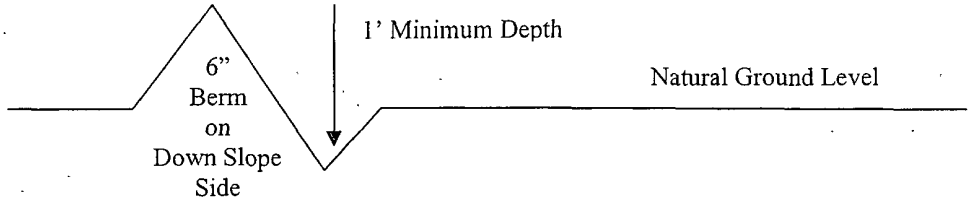


Drainage

Drainage control systems shall be constructed on the entire length of road (e.g. ditches, sidehill outsloping and insloping, lead-off ditches, culvert installation, and low water crossings).

A typical lead-off ditch has a minimum depth of 1 foot below and a berm of 6 inches above natural ground level. The berm shall be on the down-slope side of the lead-off ditch.

Cross Section of a Typical Lead-off Ditch



All lead-off ditches shall be graded to drain water with a 1 percent minimum to 3 percent maximum ditch slope. The spacing interval are variable for lead-off ditches and shall be determined according to the formula for spacing intervals of lead-off ditches, but may be amended depending upon existing soil types and centerline road slope (in %);

Formula for Spacing Interval of Lead-off Ditches

Example - On a 4% road slope that is 400 feet long, the water flow shall drain water into a lead-off ditch. Spacing interval shall be determined by the following formula:

$$\text{400 foot road with 4\% road slope: } \frac{400'}{4\%} + 100' = 200' \text{ lead-off ditch interval}$$

Culvert Installations

Appropriately sized culvert(s) shall be installed at the deep waterway channel flow crossing.

Cattleguards

An appropriately sized cattleguard(s) sufficient to carry out the project shall be installed and maintained at fence crossing(s).

Any existing cattleguard(s) on the access road shall be repaired or replaced if they are damaged or have deteriorated beyond practical use. The operator shall be responsible for the condition of the existing cattleguard(s) that are in place and are utilized during lease operations.

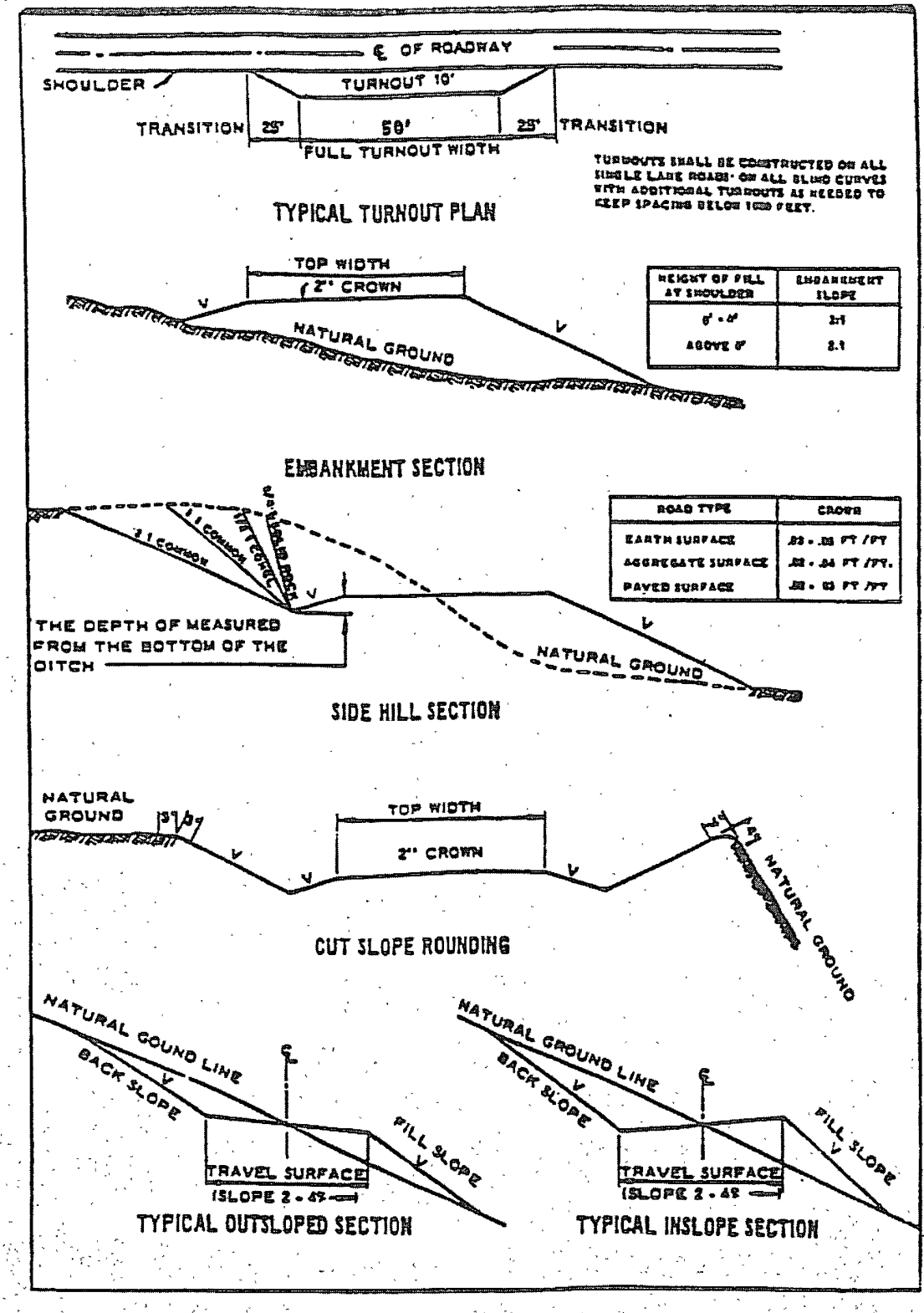
A gate shall be constructed and fastened securely to H-braces.

Fence Requirement
Where entry is required across a fence line, the fence shall be braced and tied off on both sides of the passageway prior to cutting.

The operator shall notify the private surface landowner or the grazing allotment holder prior to crossing any fence(s).

Public Access
Public access on this road shall not be restricted by the operator without specific written approval granted by the Authorized Officer.

Figure 1 – Cross Sections and Plans For Typical Road Sections



VII. DRILLING

A. DRILLING OPERATIONS REQUIREMENTS

The BLM is to be notified a minimum of 4 hours in advance for a representative to witness:

a. Spudding well
b. Setting and/or Cementing of all casing strings
c. BOPE tests

☒ **Eddy County**
Call the Carlsbad Field Office, 620 East Greene St., Carlsbad, NM 88220, (575) 361-2822

1. A Hydrogen Sulfide (H2S) Drilling Plan should be activated 500 feet prior to drilling into the **Yates** formation. **If Hydrogen Sulfide is encountered, please provide measured values and formations to the BLM.**

2. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval.

3. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works are located, this does not include the dog house or stairway area.

B. CASING

Changes to the approved APD casing and cement program require submitting a sundry and receiving approval prior to work. Failure to obtain approval prior to work will result in an Incident of Non-Compliance being issued.

Centralizers required on surface casing per Onshore Order 2.III.B.1.f.

Wait on cement (WOC) time for a primary cement job will be a minimum 18 hours for a water basin, 24 hours in the potash area, or 500 pounds compressive strength, whichever is greater for all casing strings. Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. See individual casing strings for details regarding lead cement slurry requirements.

No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.

Near a high cave/karst area. Vertical section of hole should get past cave area. Possible lost circulation in the Grayburg and San Andres formations. Possible high pressures in the Wolfcamp formation – applies to pilot hole.

1. The **13-3/8** inch surface casing shall be set **at approximately 225 feet (a minimum of 25 feet into the Rustler Anhydrite and above the salt)** and cemented to the surface.

    a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with a surface log readout will be used or a cement bond log shall be run to verify the top of the cement.

    b. Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry.

    c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.

    d. If cement falls back, remedial cementing will be done prior to drilling out that string.

2. The minimum required fill of cement behind the **9-5/8** inch intermediate casing is:

    ☒ Cement to surface. If cement does not circulate see B.1.a, c-d above. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to high cave/karst area to the west..**

Plug required at bottom of pilot hole. Plug to be 175' in length and must be tagged. Operator can set solid plug from bottom of hole to kick off point and the plug will not have to be tagged. Call BLM to witness tag.

Kick off plug to be a minimum of 500' in length.

3. The minimum required fill of cement behind the **7** inch intermediate casing is:

    ☒ Cement should tie-back at least 200 feet into previous casing string. Operator shall provide method of verification.

Centralizers required on horizontal leg, must be type for horizontal service and minimum of one every other joint.

4. The minimum required fill of cement behind the **4-1/2** inch production casing is:

   ☒ Cement not required. Liner with ECPs being used. Liner to be a minimum of 200 feet inside of 7 inch casing. Operator proposing approximately 380 feet.

5. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.

C. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.

2. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the **13-3/8"** surface casing shoe shall be **3000 (3M)** psi.

3. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.

   a. The tests shall be done by an independent service company.

   b. The results of the test shall be reported to the appropriate BLM office.

   c. All tests are required to be recorded on a calibrated test chart. A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.

   d. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug.

   e. BOP/BOPE must be tested by an independent service company within 500 feet of the top of the **Wolfcamp** formation if the time between the setting of the intermediate casing and reaching this depth exceeds 20 days. This test does not exclude the test prior to drilling out the casing shoe as per Onshore Order No. 2.

D. DRILLING MUD

Mud system monitoring equipment, with derrick floor indicators and visual and audio alarms, shall be operating before drilling into the **Wolfcamp** formation, and shall be used until production casing is run and cemented.

Proposed mud weight may not be adequate for drilling through Wolfcamp.

E. DRILL STEM TEST

If drill stem tests are performed, Onshore Order 2.III.D shall be followed.

WWI 110408

VIII. PRODUCTION (POST DRILLING)

A. WELL STRUCTURES & FACILITIES

Placement of Production Facilities
Production facilities should be placed on the well pad to allow for maximum interim recontouring and revegetation of the well location.

Containment Structures
The containment structure shall be constructed to hold the capacity of the entire contents of the largest tank, plus 24 hour production, unless more stringent protective requirements are deemed necessary by the Authorized Officer.

Painting Requirement
All above-ground structures including meter housing that are not subject to safety requirements shall be painted a flat non-reflective paint color
Shale Green, Munsell Soil Color Chart # 5Y 4/2

B. PIPELINES

C. ELECTRIC LINES

IX. INTERIM RECLAMATION & RESERVE PIT CLOSURE

A. INTERIM RECLAMATION

If the well is a producer, interim reclamation shall be conducted on the well site in accordance with the orders of the Authorized Officer. The operator shall submit a Sundry Notices and Reports on Wells (Notice of Intent), Form 3160-5, prior to conducting interim reclamation.

During the life of the development, all disturbed areas not needed for active support of production operations should undergo interim reclamation in order to minimize the environmental impacts of development on other resources and uses.

The operators should work with BLM surface management specialists to devise the best strategies to reduce the size of the location. Any reductions should allow for remedial well operations, as well as safe and efficient removal of oil and gas.

During reclamation, the removal of caliche is important to increasing the success of revegetating the site. Removed caliche may be used for road repairs, fire walls or for building other roads and locations. In order to operate the well or complete workover operations, it may be necessary to drive, park and operate on restored interim vegetation within the previously disturbed area. Disturbing revegetated areas for production or workover operations will be allowed. If there is significant disturbance and loss of vegetation, the area will need to be revegetated. Communicate with the appropriate BLM office for any exceptions/exemptions if needed.

Seed Mixture 1, for Loamy Sites

The holder shall seed all disturbed areas with the seed mixture listed below. The seed mixture shall be planted in the amounts specified in pounds of pure live seed (PLS)* per acre. There shall be no primary or secondary noxious weeds in the seed mixture. Seed will be tested and the viability testing of seed will be done in accordance with State law(s) and within nine (9) months prior to purchase. Commercial seed will be either certified or registered seed. The seed container will be tagged in accordance with State law(s) and available for inspection bye the authorized officer.

Seed will be planted using a drill equipped with a depth regulator to ensure proper depth regulator to ensure proper depth of planting where drilling is possible. The seed mixture will be evenly and uniformly planted over the disturbed area (small/heavier seeds have a tendency to drop the bottom of the drill and are planted first). The holder shall take appropriate measures to ensure this does not occur. Where drilling is not possible, seed will be broadcast and the area shall be raked or chained to cover the seed. When broadcasting the seed, the pounds per acre are to be doubled. The seeding will be repeated until a satisfactory stand is established as determined by the authorized officer. Evaluation of growth will not be made before completion of at least one full growing season after seeding.

Species to be planted in pounds of pure live seed* per acre:

Species	lb/acre
Plains lovegrass (Eragrostis intermedia)	0.5
Sand dropseed (Sporobolus cryptandrus)	1.0
Sideoats grama (Bouteloua curtipendula)	5.0

*Pounds of pure live seed:

Pounds of seed **x** percent purity **x** percent gemination = pounds pure live seed

(Insert Seed Mixture Here)

X. FINAL ABANDONMENT & REHABILITATION REQUIREMENTS

Upon abandonment of the well and/or when the access road is no longer in service the Authorized Officer shall issue instructions and/or orders for surface reclamation and restoration of all disturbed areas.

On private surface/federal mineral estate land the reclamation procedures on the road and well pad shall be accomplished in accordance with the private surface land owner agreement.