

OCD Artesia CONSERVATION
ARTESIA DISTRICT

JUN 28 2016

9/6/16

RECEIVED

ATS-15-617

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

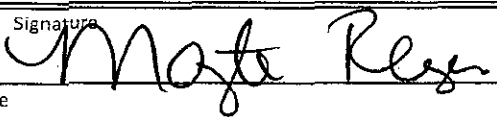

1a. Type of Work: <input checked="" type="checkbox"/> DRILL <input type="checkbox"/> REENTER		5. Lease Serial No. SHL: NMNM112907, BHL: NMNM109748 Sec 24 UL "H, I, P": NMNM096835	
1b. Type of Well: <input checked="" type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input type="checkbox"/> Other <input checked="" type="checkbox"/> Single Zone <input type="checkbox"/> Multiple Zone		6. If Indian, Allottee or Tribe Name	
2. Name of Operator COG Operating LLC.		7. If Unit or CA Agreement, Name and No.	
3a. Address 2208 West Main Street Artesia, NM 88210		8. Lease Name and Well No. (316776) Road Runner Federal Com #11H	
3b. Phone No. (include area code) 575-748-6940		9. API Well No. 30-015-43900	
4. Location of Well (Report location clearly and in accordance with any State requirements. *) At surface 190' FSL & 380' FEL (SESE) Section 25-T25S-R26E At proposed prod. Zone 330' FNL & 330' FEL (NENE) Section 24-T25S-R26E		10. Field and Pool, or Exploratory Cottonwood Draw; Bone Spring	
14. Distance in miles and direction from nearest town or post office* Approximately 10 miles south of White City		11. Sec., T.R.M. or Blk and Survey or Area Section 25 - T25S - R26E	
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. Unit line, if any) 190'		12. County or Parish Eddy County	
16. No. of acres in lease NMNM112907: 440 NMNM109748: 120 NMNM096835: 360		13. State NM	
17. Spacing Unit dedicated to this well 320		18. Distance from location* to nearest well, drilling, completed, applied for, on this lease, ft. SHL: 30' (Road Runner #11H) BHL: 1634'	
19. Proposed Depth TVD: 7,376' MD: 17,237'		20. BLM/BIA Bond No. on file NMB000740 & NMB000215	
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 3250.3' GL		22. Approximate date work will start* 7/1/2015	
23. Estimated duration 30 days			

**UNORTHODOX
LOCATION**

24. Attachments

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

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

15. Signature 	Name (Printed/Typed) Mayte Reyes	Date 4-30-15
Approved by (Signature) 	Name (Printed/Typed) James A. Amos	Date JUN 21 2016
Title Regulatory Analyst	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)

Carlsbad Controlled Water Basin

**Approval Subject to General Requirements
& Special Stipulations Attached**

**SEE ATTACHED FOR
CONDITIONS OF APPROVAL**

DISTRICT I
1825 W. FRENCH DR., HOBBBS, NM 88240
Phone: (575) 393-8101 Fax: (575) 393-0720

DISTRICT II
811 S. FIRST ST., ARTESIA, NM 88210
Phone: (575) 748-1283 Fax: (575) 748-0720

DISTRICT III
1000 RIO BRAZOS RD., AZTEC, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170

DISTRICT IV
1220 S. ST. FRANCIS DR., SANTA FE, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 SOUTH ST. FRANCIS DR.
Santa Fe, New Mexico 87505

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

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number 30-015-43900	Pool Code 97494	Pool Name Cottonwood Draw; Bone Spring
Property Code 316776	Property Name ROAD RUNNER FEDERAL COM	Well Number 11H
GRID No. 229137	Operator Name COG OPERATING, LLC	Elevation 3250.3

Surface Location

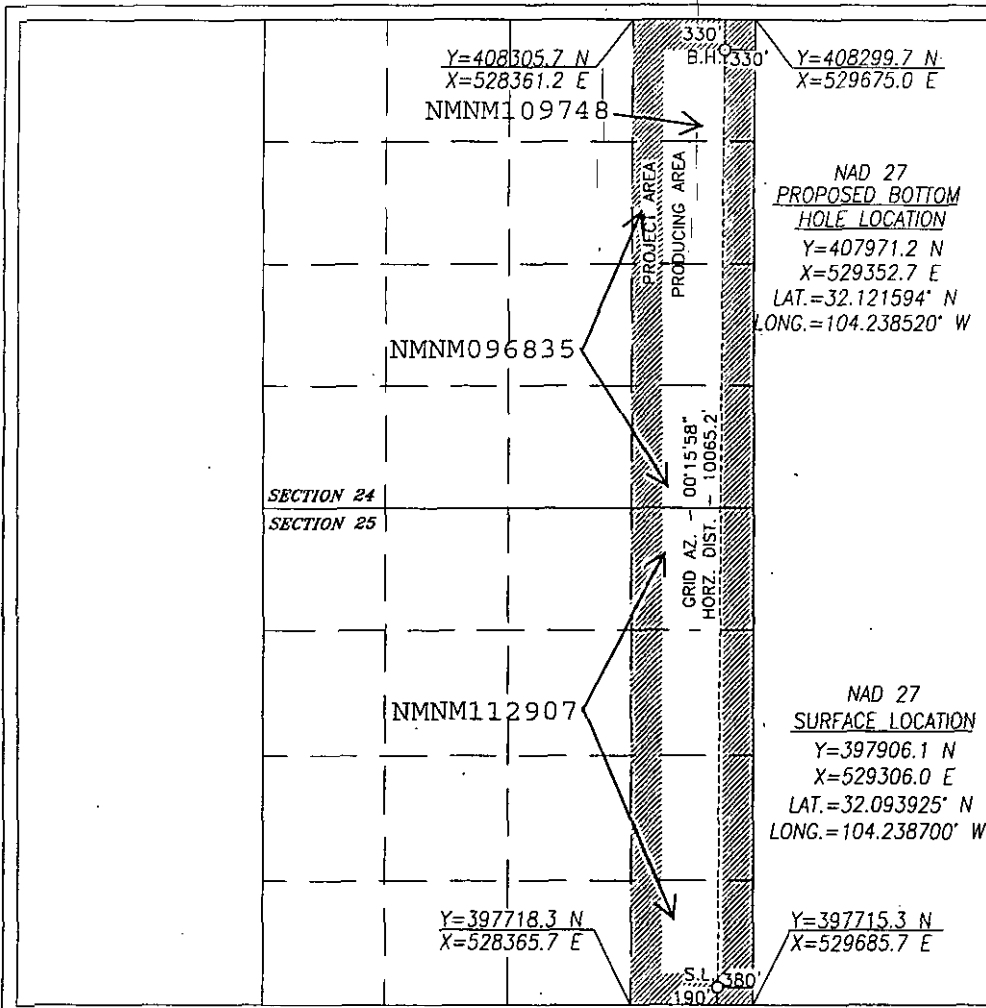
UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
P	25	25-S	26-E		190	SOUTH	380	EAST	EDDY

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
A	24	25-S	26-E		330	NORTH	330	EAST	EDDY

Dedicated Acres	Joint or Infill	Consolidation Code	Order No.
320			

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

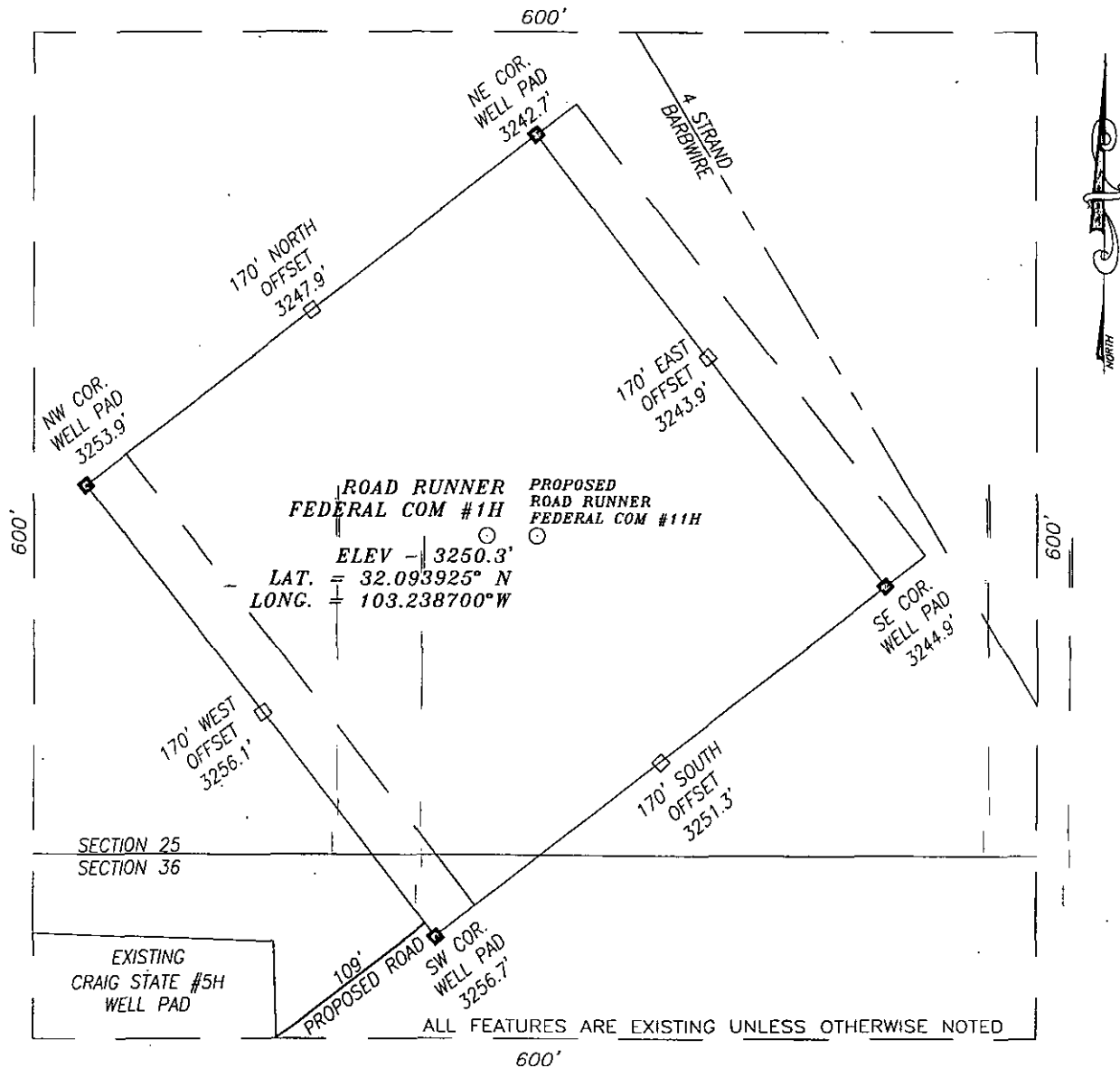


OPERATOR CERTIFICATION
I hereby certify that the information herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or has a right to drill this well at this location pursuant to a contract with an owner of such mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.
Melanie J Wilson 4/30/15
Signature Date
Melanie J Wilson
Printed Name
mwilson@concho.com
E-mail Address

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.
MAY 30, 2014
Date of Survey
Signature & Seal of Professional Surveyor

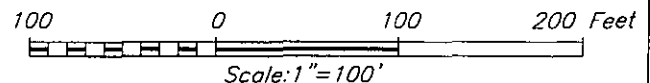
Chad Harcrow 4/29/15
Certificate No. CHAD HARCROW 17777
W.O. # 15-551 DRAWN BY: AF

SECTION 25, TOWNSHIP 25 SOUTH, RANGE 26 EAST, N.M.P.M.,
EDDY COUNTY NEW MEXICO



DIRECTIONS TO LOCATION

HEADING SOUTH ON 285 TURN RIGHT ON WHITE CITY ROAD (CR-724) AND GO APPROX. 12 MILES THEN TURN (NORTH) RIGHT ONTO JOHN D. FOREHAND ROAD (CR-742); THEN GO APPROX. 1.7 MILE THEN TURN RIGHT ONTO CALICHE ROAD AND 0.3 MILE; THEN TURN LEFT AND GO THROUGH CRAIG STATE #5H WELL PAD TO PROPOSED ROAD ON THE NORTHEAST CORNER; THEN PROPOSED WELL IS APPROX. 290 FEET NORTHEAST.



HARCROW SURVEYING, LLC
2314 W. MAIN ST, ARTESIA, N.M. 88210
PH: (575) 746-2158 FAX: (575) 746-2158
c.harcrow@harcrowsurveying.com



COG OPERATING, LLC

ROAD RUNNER FEDERAL COM #1H WELL
LOCATED 190 FEET FROM THE SOUTH LINE
AND 380 FEET FROM THE EAST LINE OF SECTION 25,
TOWNSHIP 25 SOUTH, RANGE 26 EAST, N.M.P.M.,
EDDY COUNTY, NEW MEXICO

SURVEY DATE: 05/30/2014	PAGE: 1 OF 1
DRAFTING DATE: 04/28/2015	
APPROVED BY: CH	DRAWN BY: AF FILE: 15-551



LEGEND

- WELL
- WELLPAD
- EXISTING ROAD
- PROPOSED ROAD

ROAD RUNNER FEDERAL COM #1H

SEC: 25 TWP: 25 S. RGE: 26 E. ELEVATION: 3250.2'
 STATE: NEW MEXICO COUNTY: EDDY 190' FSL & 380' FEL
 W.O. # 15-551 LEASE: ROAD RUNNER FED COM SURVEY: N.M.P.M

0 2,500 FEET

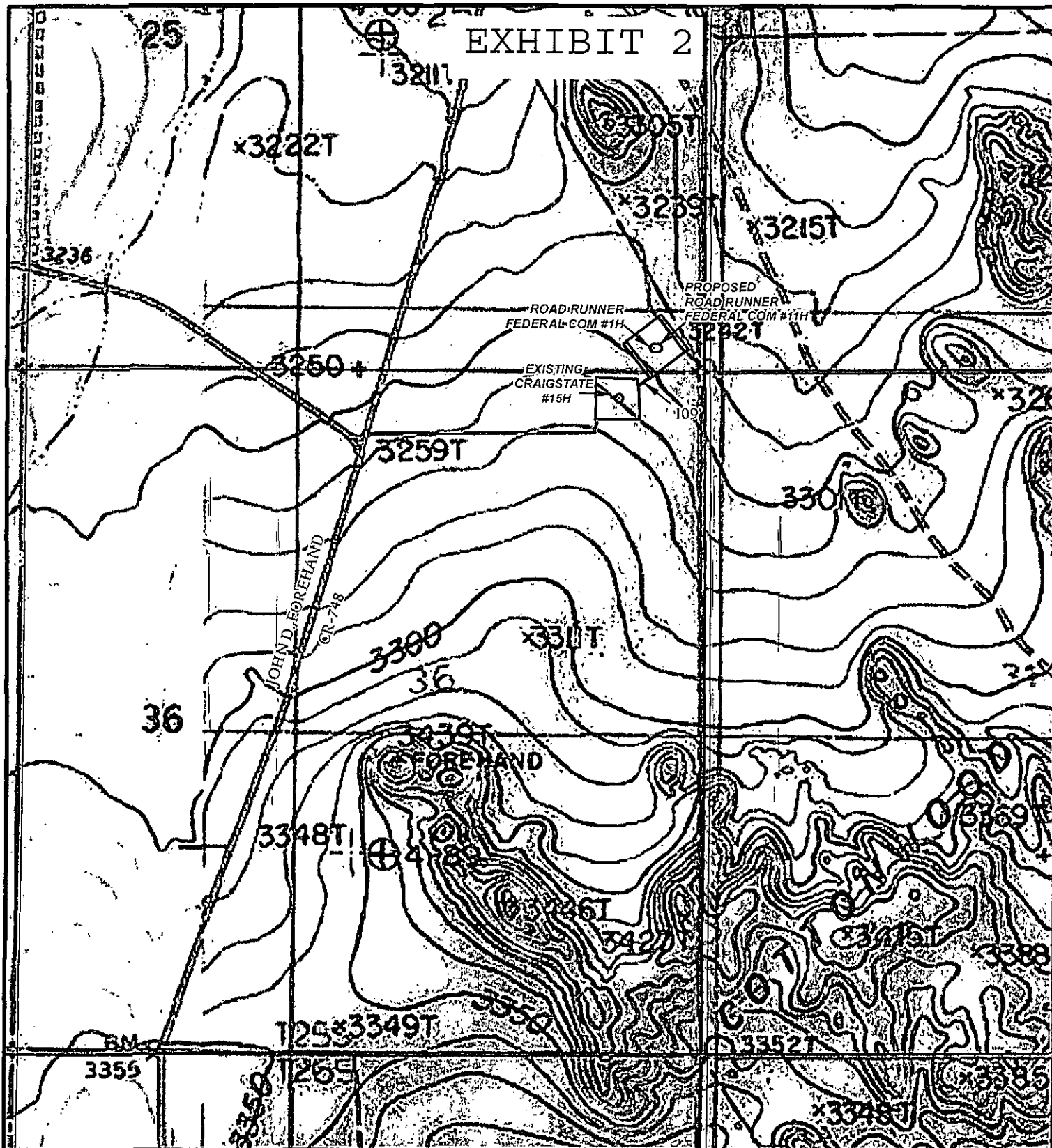
0 0.05 0.1 0.2 Miles 1 IN = 1,000 FT

LOCATION NAME INAGERY ROAD MYZ02015 A.B.

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EXHIBIT 2

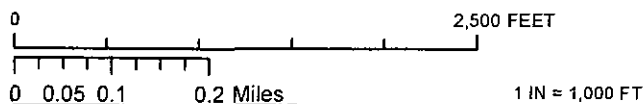


LEGEND

- WELL
- WELLPAD
- EXISTING ROAD
- PROPOSED ROAD

ROAD RUNNER FEDERAL COM #1H

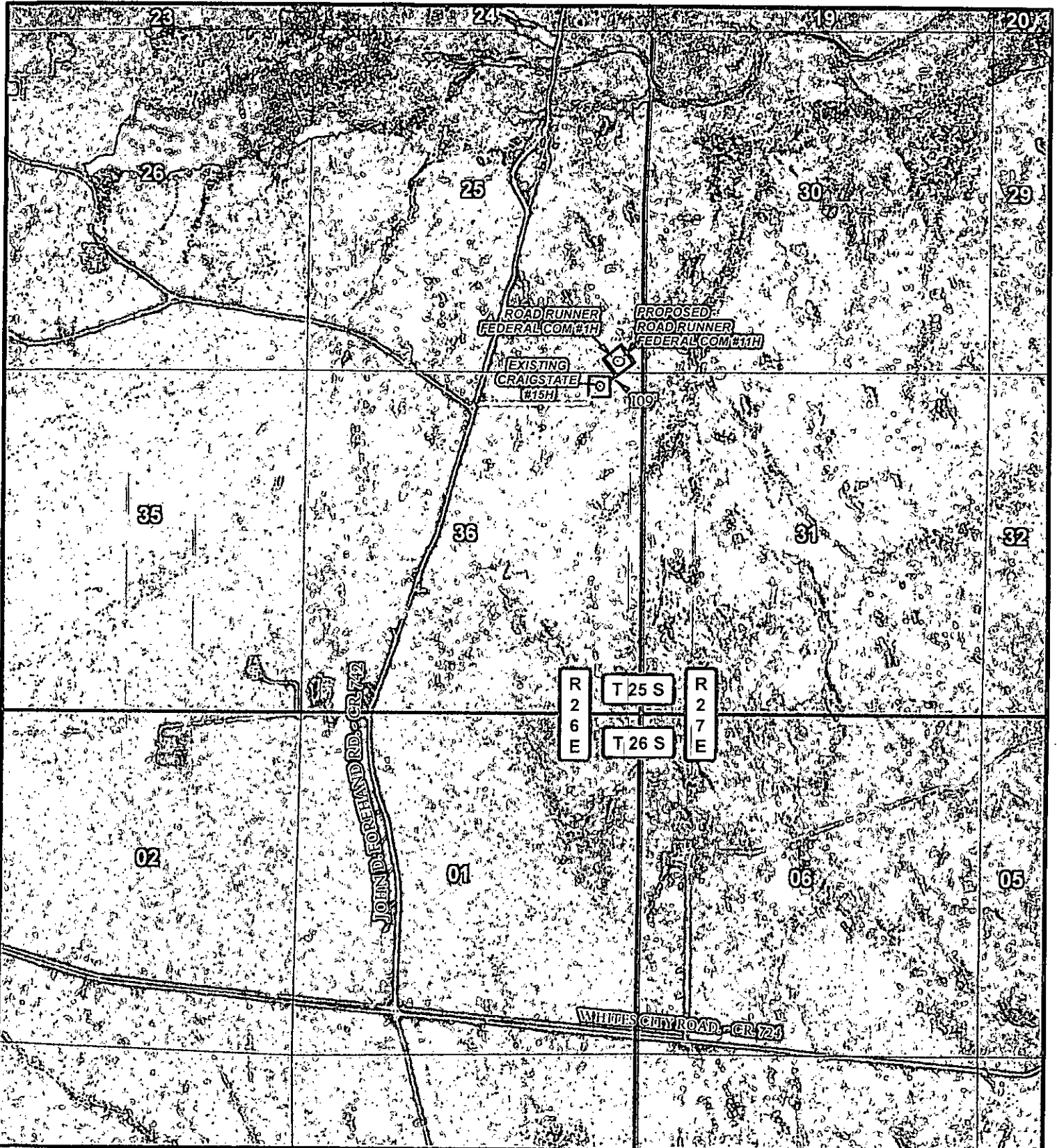
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 STATE: NEW MEXICO COUNTY: EDDY 190' FSL & 380' FEL
 W.O. # 15-551 LEASE: ROAD RUNNER FED COM SURVEY: N.M.P.M



LOCATION MAP TORO ROAD 01/20/2015 AB

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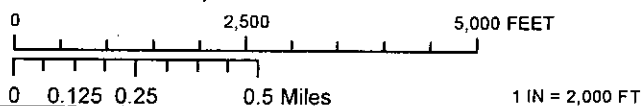


LEGEND

- WELL
- WELLPAD
- EXISTING ROAD
- PROPOSED ROAD

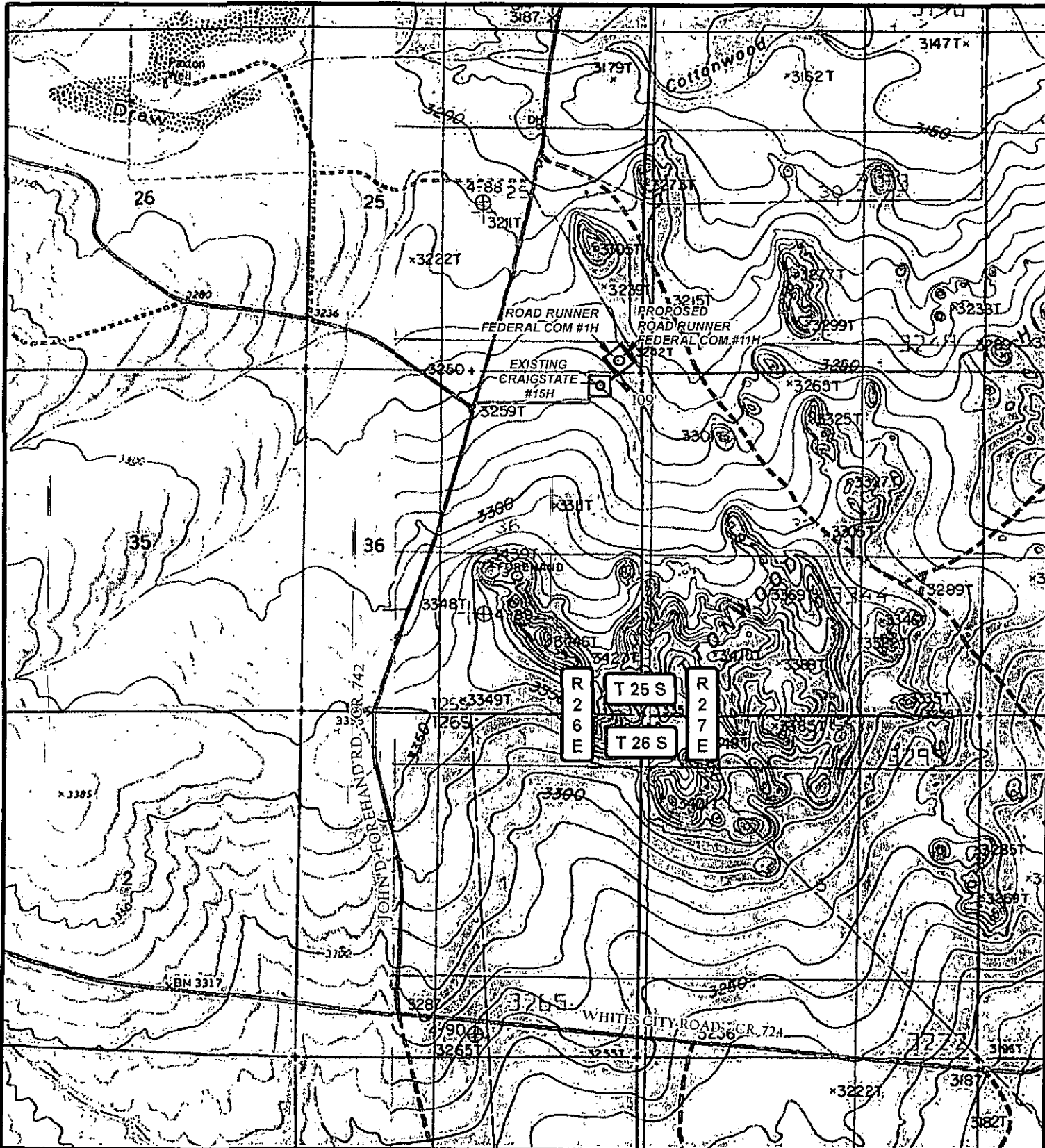
ROAD RUNNER FEDERAL COM #11H

SEC: 25 TWP: 25 S. RGE: 26 E. ELEVATION: 3250.2'
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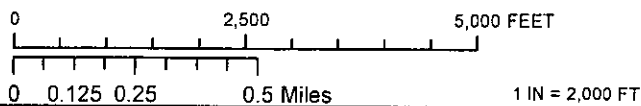


LEGEND

- WELL
- WELLPAD
- EXISTING ROAD
- PROPOSED ROAD

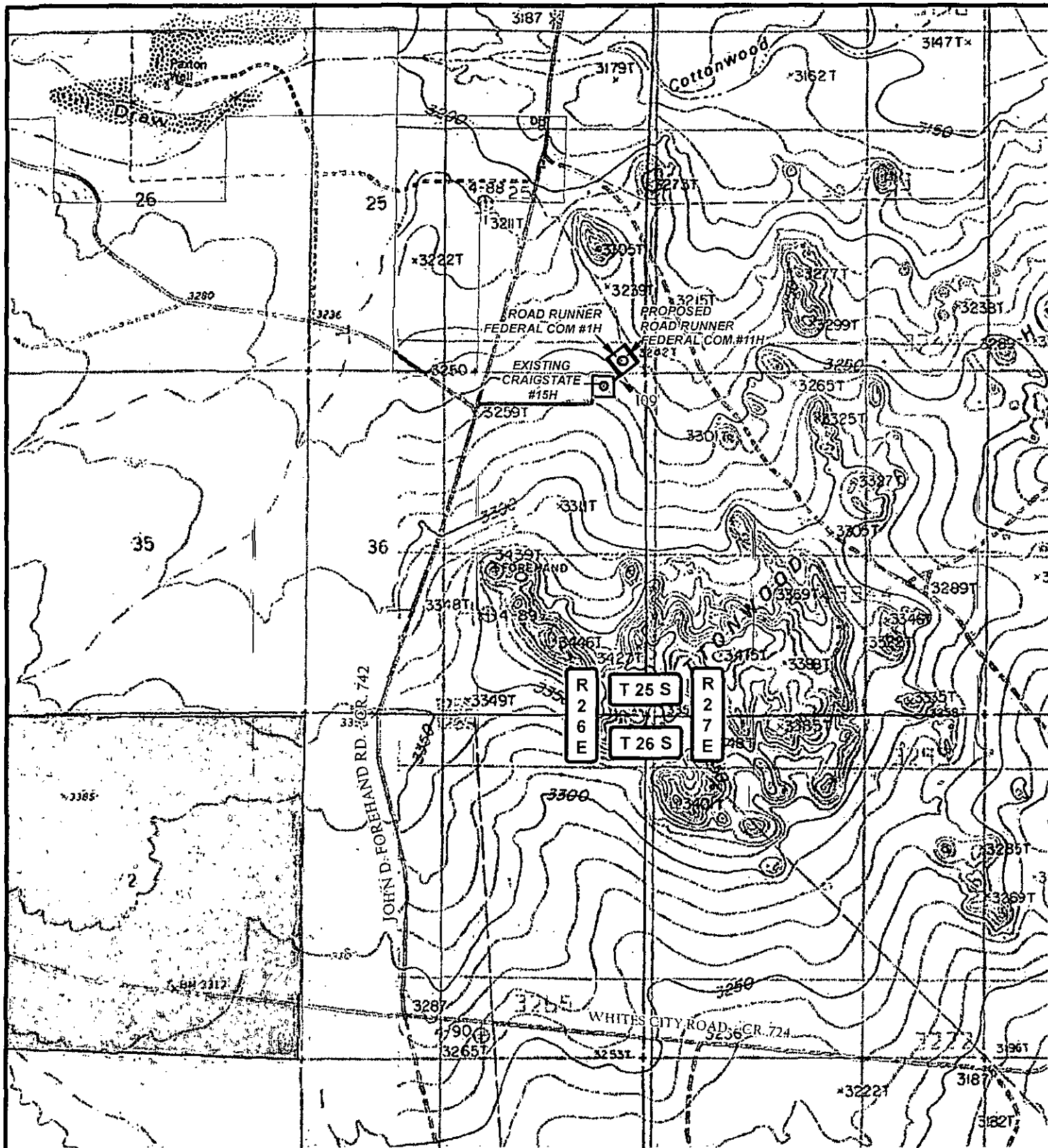
ROAD RUNNER FEDERAL COM #11H

SEC: 25 TWP: 25 S. RGE: 26 E. ELEVATION: 3250.2'
 STATE: NEW MEXICO COUNTY: EDDY 190' FSL & 380' FEL
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LEGEND

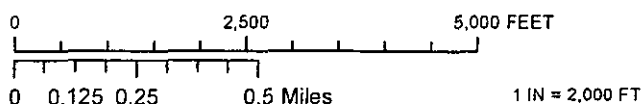
- WELL
- WELLPAD
- EXISTING ROAD
- PROPOSED ROAD
- US BLM

ROAD RUNNER FEDERAL COM #1H

SEC: 25 TWP: 25 S. RGE: 26 E. ELEVATION: 3250.2'

STATE: NEW MEXICO COUNTY: EDDY 190' FSL & 380' FEL

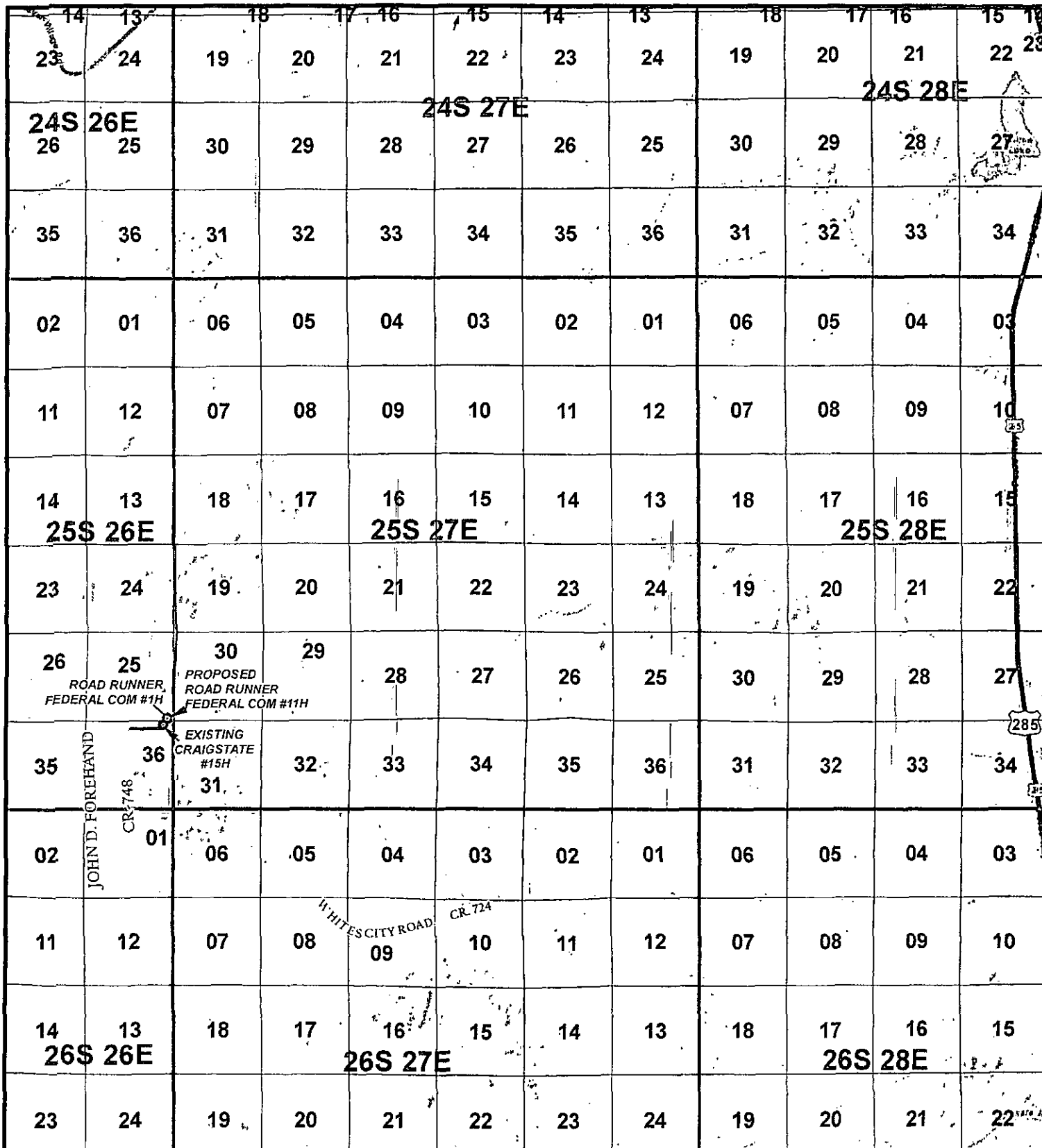
W.O. # 15-551 LEASE: ROAD RUNNER FED SURVEY: N.M.P.M



LOCATION MAP LAND STATUS AND ZONING

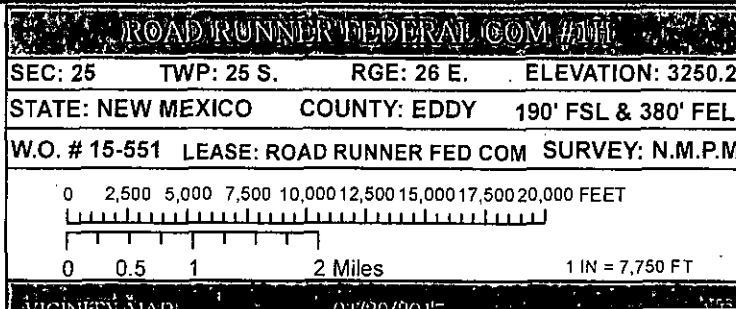
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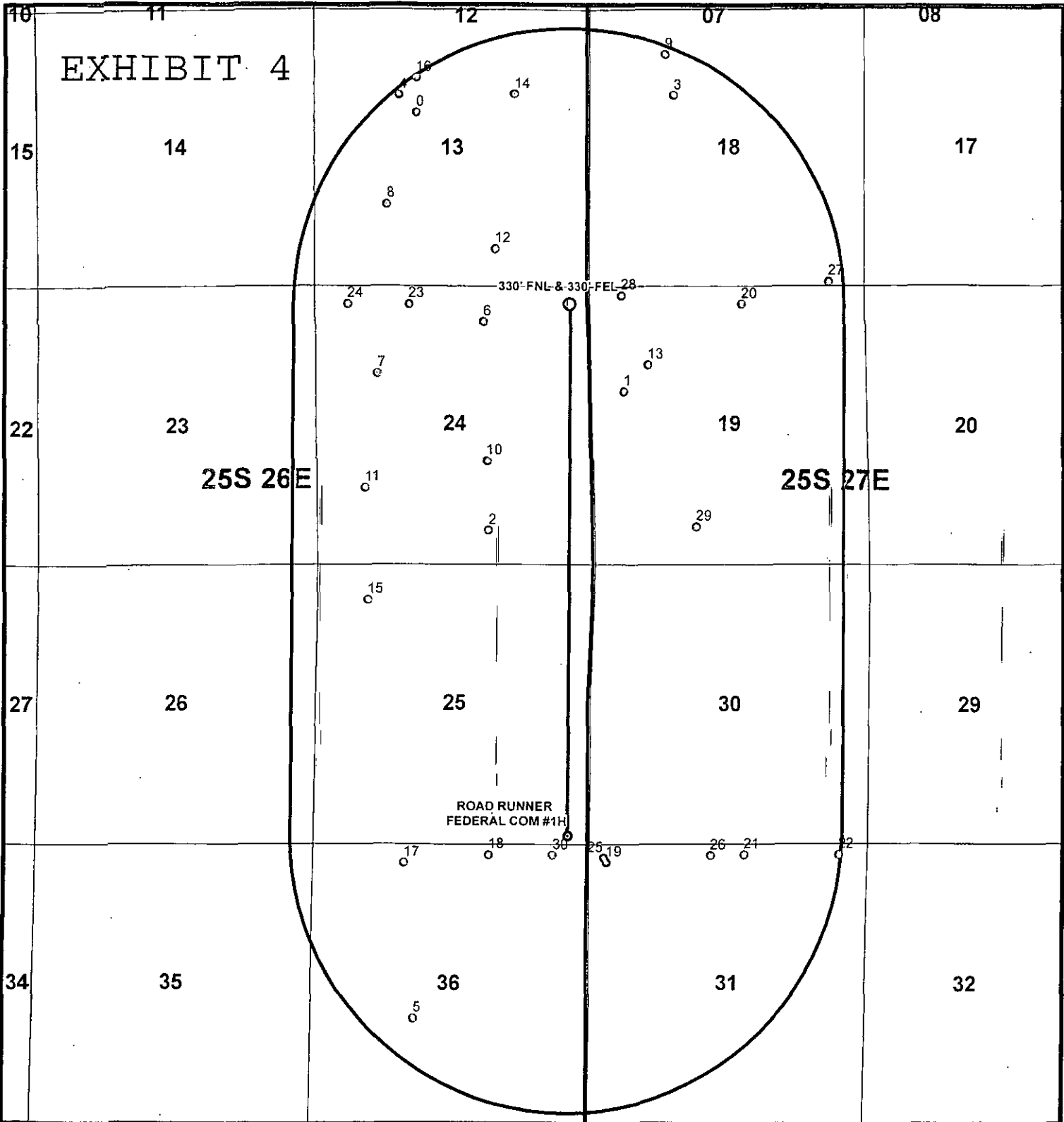
LEGEND

- WELL
- WELLPAD
- EXISTING ROAD
- PROPOSED ROAD



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03 DATA FOR "WELLS WITHIN 1 MI." IS TAKEN FROM THE NEW MEXICO EMNRD WEBSITE. THE DATA HAS BEEN UPDATED THROUGH JANUARY 12, 2015.

- LEGEND**
- WELL
 - BOTTOMHOLE
 - WELLS WITHIN 1 MI.
 - 1 MI. BUFFER

ROAD RUNNER FEDERAL COM #1H			
SEC: 25	TWP: 26 S.	RGE: 26 E.	ELEVATION: 3250.3'
STATE: NEW MEXICO		COUNTY: EDDY	190' FSL & 380' FEL
W.O. # 15-551		LEASE: ROAD RUNNER FED COM	SURVEY: N.M.P.M

1 IN = 2,500 FT

CONCHO

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Road Runner Federal Com #1H

WVD Shape *	OPERATOR	WELL_NAME	LATITUDE	LONGITUDE	API	SECTION	TOWNSHIP	RANGE	FTG_NS	NS_CD	FTG_EW	EW_CD	TVD_DEPT	COMPL_STAT
0 Point	BILL & PATSY RICH	SULPHATE SISTER 001	32.13177	-104.249	3E+09	13	25.05	26E	1980 N		1980 W		1987 Plugged	
1 Point	ROBERT N ENFIELD	BOLTON FEDERAL 001	32.11717	-104.236	3E+09	19	25.05	27E	1980 N		660 W		0 Plugged	
2 Point	BEARD OIL CO	GRIFFITH FED 001	32.10993	-104.244	3E+09	24	25.05	26E	660 S		1980 E		0 Plugged	
3 Point	ROBERT N ENFIELD	MONA LISA COM 001	32.13267	-104.233	3E+09	18	25.05	27E	1650 N		1650 W		0 Plugged	
4 Point	CHEVRON U S A INC	FEDERAL 13 COM 001	32.13268	-104.25	3E+09	13	25.05	26E	1650 N		1650 W		0 Plugged	
5 Point	COG OPERATING LLC	COTTONWOOD 36 STATE SWD 001	32.08448	-104.249	3E+09	36	25.05	26E	1980 S		1980 W		5850 Plugged	
6 Point	COG OPERATING LLC	LIGHTNING 24 FEDERAL COM 001	32.12082	-104.244	3E+09	24	25.05	26E	660 N		1980 E		12075 Active	
7 Point	CIMAREX ENERGY CO. OF COLORADO	LIBERTY 24 FEDERAL 001	32.11813	-104.251	3E+09	24	25.05	26E	1650 N		1200 W		12300 Active	
8 Point	CIMAREX ENERGY CO. OF COLORADO	FEDERAL 13 COM 002	32.12697	-104.25	3E+09	13	25.05	26E	1565 S		1400 W		12310 Active	
9 Point	CIMAREX ENERGY CO. OF COLORADO	GADWALL 18 FEDERAL COM 001	32.13486	-104.233	3E+09	18	25.05	27E	850 N		1490 W		12250 Active	
10 Point	COG OPERATING LLC	LIGHTNING 24 FEDERAL COM 002	32.11356	-104.244	3E+09	24	25.05	26E	1980 S		1980 E		9 Active	
11 Point	CIMAREX ENERGY CO. OF COLORADO	LIBERTY 24 FEDERAL COM 002	32.11218	-104.252	3E+09	24	25.05	26E	1475 S		940 W		12339 Active	
12 Point	CIMAREX ENERGY CO. OF COLORADO	FEDERAL 13 COM 003	32.11856	-104.234	3E+09	13	25.05	27E	725 S		1750 E		12184 Active	
13 Point	OXY USA INC	MARINE 19 FEDERAL 001	32.13273	-104.242	3E+09	19	25.05	26E	1480 N		1130 W		12080 Active	
14 Point	CIMAREX ENERGY CO. OF COLORADO	FEDERAL 13 COM 004	32.12462	-104.244	3E+09	13	25.05	26E	1620 N		1400 E		12373 Active	
15 Point	CIMAREX ENERGY CO. OF COLORADO	FREEDOM 25 FEE 001C	32.10631	-104.252	3E+09	25	25.05	26E	660 N		990 W		0 New (Not drilled or compl)	
16 Point	CIMAREX ENERGY CO. OF COLORADO	FEDERAL 13 COM 006	32.13361	-104.249	3E+09	13	25.05	26E	1310 N		1980 W		10565 New (Not drilled or compl)	
17 Point	COG OPERATING LLC	CRAIG STATE 003H	32.09259	-104.249	3E+09	36	25.05	26E	350 N		1770 W		7351 New (Not drilled or compl)	
18 Point	COG OPERATING LLC	CRAIG STATE 004H	32.09301	-104.244	3E+09	36	25.05	26E	190 N		1870 E		0 New (Not drilled or compl)	
19 Point	COG OPERATING LLC	JACK FEDERAL 001H	32.09262	-104.237	3E+09	31	25.05	27E	330 N		380 W		9654 New (Not drilled or compl)	
20 Point	OXY USA INC	PEACHES 19 FEDERAL 001H	32.12177	-104.228	3E+09	19	25.05	27E	330 N		2310 E		7819 New (Not drilled or compl)	
21 Point	COG OPERATING LLC	JACK FEDERAL 004H	32.09305	-104.228	3E+09	31	25.05	27E	190 N		500 E		0 New (Not drilled or compl)	
22 Point	COG OPERATING LLC	JACK FEDERAL 005H	32.09307	-104.222	3E+09	31	25.05	27E	190 N		1830 W		0 New (Not drilled or compl)	
23 Point	CIMAREX ENERGY CO. OF COLORADO	LIBERTY 24 FEDERAL COM 003H	32.12175	-104.249	3E+09	24	25.05	26E	330 N		660 W		0 New (Not drilled or compl)	
24 Point	CIMAREX ENERGY CO. OF COLORADO	LIBERTY 24 FEDERAL COM 004H	32.12177	-104.253	3E+09	24	25.05	26E	330 N		330 W		0 New (Not drilled or compl)	
25 Point	COG OPERATING LLC	JACK FEDERAL 002H	32.09286	-104.237	3E+09	31	25.05	27E	240 N		230 W		3487 New (Not drilled or compl)	
26 Point	COG OPERATING LLC	JACK FEDERAL 003H	32.093	-104.23	3E+09	31	25.05	27E	206 N		2360 W		0 New (Not drilled or compl)	
27 Point	OXY USA INC	PEACHES 19 FEDERAL 002H	32.12296	-104.223	3E+09	18	25.05	27E	90 S		642 E		0 New (Not drilled or compl)	
28 Point	OXY USA INC	PEACHES 19 FEDERAL 004H	32.1222	-104.236	3E+09	19	25.05	27E	150 N		660 W		0 New (Not drilled or compl)	
29 Point	OXY USA INC	PEACHES 19 FEDERAL 003H	32.11014	-104.231	3E+09	19	25.05	27E	730 S		1980 W		0 New (Not drilled or compl)	
30 Point	COG OPERATING LLC	CRAIG STATE 005H	32.093	-104.24	3E+09	36	25.05	26E	190 N		660 E		0 New (Not drilled or compl)	

COG Operating LLC, Road Runner Federal Com 1H

1. Geologic Formations

TVD of target	7376'	Pilot hole depth	NA
MD at TD:	17237'	Deepest expected fresh water:	NA

Basin

Formation	Depth (TVD) from KB	Water/Mineral Bearing/ Target Zone?	Hazards
Quaternary Fill	Surface	Water	
Rustler	196'	Water	
Top of Salt	333'	Salt	
Lamar	1958'	Barren	
Delaware Group	2002'	Oil/Gas	Possible lost circ
Bone Spring	5521'	Oil/Gas	
2 nd Bone Spring Sand	7171'	Target Zone	
Wolfcamp	8662'	Oil/Gas	

2. Casing Program

See CoA

Hole Size	Casing Interval		Csg. Size	Weight (lbs)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
	From	To							
17.5"	0'	260' 375'	13.375"	48	H40	STC	6.08	1.87	25.80
12.25"	0'	1980' 1950'	9.625"	36	J55	LTC	2.18	1.02	6.36
8.75"	0'	17237'	5-1/2"	17	P110	BTC	2.17	3.08	1.86D
BLM Minimum Safety Factor							1.125	1.00	1.6 Dry 1.8 Wet

- All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h
- BLM standard formulas were used on all SF calculations.
- Used 9.0 PPG for pore pressure calculations

COG Operating LLC, Road Runner Federal Com 1H

	Y or N
Is casing new? If used, attach certification as required in Onshore Order #1	Y
Does casing meet API specifications? If no, attach casing specification sheet.	Y
Is premium or uncommon casing planned? If yes attach casing specification sheet.	N
Does the above casing design meet or exceed BLM's minimum standards? If not provide justification (loading assumptions, casing design criteria).	Y
Will the intermediate pipe be kept at a minimum 1/3 fluid filled to avoid approaching the collapse pressure rating of the casing?	Y
Is well located within Capitan Reef?	N
If yes, does production casing cement tie back a minimum of 50' above the Reef?	
Is well within the designated 4 string boundary.	
Is well located in SOPA but not in R-111-P?	N
If yes, are the first 2 strings cemented to surface and 3 rd string cement tied back 500' into previous casing?	
Is well located in R-111-P and SOPA?	N
If yes, are the first three strings cemented to surface?	
Is 2 nd string set 100' to 600' below the base of salt?	
Is well located in high Cave/Karst?	N
If yes, are there two strings cemented to surface?	
(For 2 string wells) If yes, is there a contingency casing if lost circulation occurs?	
Is well located in critical Cave/Karst?	N
If yes, are there three strings cemented to surface?	

3. Cementing Program

Casing	#/Sks	Wt. lb/gal	Yld. ft ³ /sack	H ₂ O gal/sk	500# Comp. Strength (hours)	Slurry Description
Surf.	-	-	-	-	-	Lead: No lead
	285	14.8	1.34	6.4	6	Tail: Class C + 2% CaCl ₂
Inter.	500	13.5	1.75	9.2	13	Lead: Class C + 4% Gel + 1% CaCl ₂
	200	14.8	1.34	6.4	6	Tail: Class C + 1% CaCl ₂
Prod.	850	10.3	3.52	21.3	75	Lead: Halliburton Tuned Lite w/ 2# kolseal, 1.5# salt, 1/4# D-Air 5000, 1/8# PEF, etc
	2480	14.4	1.25	5.7	22	Tail: 50:50:2 H blend (FR, Retarder, FL adds as necessary)

Lab reports with the 500 psi compressive strength time for the cement will be onsite for review.

COG Operating LLC, Road Runner Federal Com 1H

Casing String	TOC	% Excess
Surface	0'	111%
Intermediate	0'	93%
Production	0'	43%

Pilot hole depth: NA

KOP: 6899'

4. Pressure Control Equipment

BOP installed and tested before drilling which hole?	Size	Min. Required WP	Type	✓	Tested to:
12-1/4"	13-5/8"	2M	Annular	x	50% of working pressure
			Blind Ram		2M
			Pipe Ram		
			Double Ram		
			Other*		
8-3/4"	13-5/8"	3M	Annular	x	50% testing pressure
			Blind Ram		3M
			Pipe Ram		
			Double Ram	x	
			Other*		

* Actual equipment is 13-5/8" 5M Cameron Annular, will use for 2M WP System.

** - Actual equipment is 13-5/8" 5M Cameron Annular & 13-5/8" 5M Cameron double ram, will use for 3M WP System.

BOP/BOPE will be tested by an independent service company to 250 psi low and the high pressure indicated above per Onshore Order 2 requirements. The System may be upgraded to a higher pressure but still tested to the working pressure listed in the table above. If the system is upgraded all the components installed will be functional and tested.

Pipe rams will be operationally checked each 24 hour period. Blind rams will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets. Other accessories to the BOP equipment will include a Kelly cock and floor safety valve (inside BOP) and choke lines and choke manifold. See attached schematics.

COG Operating LLC, Road Runner Federal Com 1H

See
COA

Y	Formation integrity test will be performed per Onshore Order #2. On Exploratory wells or on that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.i.
Y	A variance is requested for the use of a flexible choke line from the BOP to Choke Manifold. See attached for specs and hydrostatic test chart.
	Are anchors required by manufacturer? No.
N	A multibowl wellhead is being used. The BOP will be tested per Onshore Order #2 after installation on the surface casing which will cover testing requirements for a maximum of 30 days. If any seal subject to test pressure is broken the system must be tested. See attached schematic.

5. Mud Program

Depth		Type	Weight (ppg)	Viscosity	Water Loss
From	To				
0	Surf. shoe	FW Gel	8.6 - 9.0	28-34	N/C
Surf csg	Int shoe	Saturated Brine	10.0 - 10.2	28-34	N/C
Int shoe	TMD	Cut Brine	8.6 - 9.3	28-34	N/C

Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept on location at all times.

What will be used to monitor the loss or gain of fluid?	Pason PVT
---	-----------

6. Logging and Testing Procedures

Logging, Coring and Testing	
X	Will run GR/CNL from TD to surface (horizontal well -- vertical portion of hole). Stated logs run will be in the Completion Report and submitted to the BLM.
	No Logs are planned based on well control or offset log information.
	Drill stem test? If yes, explain
	Coring? If yes, explain

Additional logs planned	Interval

COG Operating LLC, Road Runner Federal Com 1H

7. Drilling Conditions

Condition	Specify what type and where?
BH Pressure at deepest TVD	3452 psi – 2 nd Bone Spring Sand (7376' TVD)
Abnormal Temperature	No

Mitigation measure for abnormal conditions.

- Lost circulation material/sweeps/mud scavengers.
- Maintain stock of LCM and weighting materials onsite.

Hydrogen Sulfide (H₂S) monitors will be installed prior to drilling out the surface shoe. If H₂S is detected in concentrations greater than 100 ppm, the operator will comply with the provisions of Onshore Oil and Gas Order #6. If Hydrogen Sulfide is encountered, measured values and formations will be provided to the BLM.

N	H ₂ S is present
Y	H ₂ S Plan attached

8. Other facets of operation

Is this a walking operation? Yes. Will share pad with Road Runner Federal 11H (1st well).

Will be pre-setting casing? No.

Attachments

- Directional Plan
- BOP & Choke Schematics
- C102 and supporting maps
- Rig plat
- H₂S schematic
- H₂S contingency plan
- Interim reclamation plat
- Variance for Flex Hose



COG Operating, LLC

Eddy County, NM (NAD 27)

Sec 25, T25-S, R26-E

Road Runner Federal Com #1H

Wellbore #1

Plan: Design #1

DDC Well Planning Report

28 April, 2015





HP
Well Planning Report



Database:	Compass	Local Co-ordinate Reference:	Well Road Runner Federal Com #1H
Company:	COG Operating, LLC	TVD Reference:	Well @ 3276.0usft (Scandril Freedom)
Project:	Eddy County, NM (NAD 27)	MD Reference:	Well @ 3276.0usft (Scandril Freedom)
Site:	Sec 25, T25-S, R26-E	North Reference:	Grid
Well:	Road Runner Federal Com #1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Project:	Eddy County, NM (NAD 27)		
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:	Sec 25, T25-S, R26-E		
Site Position:	Northing:	397,906.10 usft	Latitude: 32° 5' 38.128 N
From: Map	Easting:	529,335.90 usft	Longitude: 104° 14' 18.971 W
Position Uncertainty:	0.0 usft	Slot Radius: 13-3/16 "	Grid Convergence: 0.05 °

Well:	Road Runner Federal Com #1H		
Well Position	+N/-S	0.0 usft	Northing: 397,906.10 usft
	+E/-W	-29.9 usft	Easting: 529,306.00 usft
Position Uncertainty	0.0 usft	Wellhead Elevation:	0.0 usft
		Ground Level:	3,250.0 usft

Wellbore:	Wellbore #1		
Magnetics	Model Name	Sample Date	Declination
	IGRF2015	4/21/2015	7.48
			Dip Angle
			59.86
			Field Strength
			48,010

Design:	Design #1		
Audit Notes:			
Version:	Phase:	PLAN	Tie On Depth: 0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.0	0.0	0.0
			Direction
			0.27

Plan Sections										
Measured	Vertical	Dogleg	Build	Turns						
Depth	Inclination	Azimuth	Depth	+N/-S	+E/-W	Rate	Rate	Rate	TFO	Target
(usft)	(°)	(°)	(usft)	(usft)	(usft)	(°/100usft)	(°/100usft)	(°/100usft)	(°)	
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
6,898.6	0.00	0.00	6,898.6	0.0	0.0	0.00	0.00	0.00	0.00	
7,652.4	90.46	0.27	7,376.0	481.3	2.2	12.00	12.00	0.04	0.27	
17,236.7	90.46	0.27	7,299.0	10,065.1	46.7	0.00	0.00	0.00	0.00	Road Runner Federal



HP
Well Planning Report



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Site:	Sec 25, T25-S, R26-E	North Reference:	Grid
Well:	Road Runner Federal Com #1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
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)
Build 12° / 100'									
6,898.6	0.00	0.00	6,898.6	0.0	0.0	0.0	0.00	0.00	0.00
6,900.0	0.17	0.27	6,900.0	0.0	0.0	0.0	12.00	12.00	0.00
7,000.0	12.17	0.27	6,999.2	10.7	0.0	10.7	12.00	12.00	0.00
7,100.0	24.17	0.27	7,094.1	41.8	0.2	41.9	12.00	12.00	0.00
SBSG_sand									
7,187.7	34.69	0.27	7,170.3	84.9	0.4	84.9	12.00	12.00	0.00
7,200.0	36.17	0.27	7,180.4	92.0	0.4	92.0	12.00	12.00	0.00
7,300.0	48.17	0.27	7,254.4	159.0	0.7	159.0	12.00	12.00	0.00
7,400.0	60.17	0.27	7,312.8	239.9	1.1	239.9	12.00	12.00	0.00
7,500.0	72.17	0.27	7,353.1	331.2	1.5	331.3	12.00	12.00	0.00
7,600.0	84.17	0.27	7,373.6	428.9	2.0	428.9	12.00	12.00	0.00
EOB @ 90.46° Inc / 0.27° Azm / 7376' TVD									
7,652.4	90.46	0.27	7,376.0	481.3	2.2	481.3	12.00	12.00	0.00
7,700.0	90.46	0.27	7,375.7	528.9	2.5	528.9	0.00	0.00	0.00
7,800.0	90.46	0.27	7,374.9	628.9	2.9	628.9	0.00	0.00	0.00
7,900.0	90.46	0.27	7,374.1	728.8	3.4	728.9	0.00	0.00	0.00
8,000.0	90.46	0.27	7,373.3	828.8	3.8	828.9	0.00	0.00	0.00
8,100.0	90.46	0.27	7,372.5	928.8	4.3	928.9	0.00	0.00	0.00
8,200.0	90.46	0.27	7,371.6	1,028.8	4.8	1,028.8	0.00	0.00	0.00
8,300.0	90.46	0.27	7,370.8	1,128.8	5.2	1,128.8	0.00	0.00	0.00
8,400.0	90.46	0.27	7,370.0	1,228.8	5.7	1,228.8	0.00	0.00	0.00
8,500.0	90.46	0.27	7,369.2	1,328.8	6.2	1,328.8	0.00	0.00	0.00
8,600.0	90.46	0.27	7,368.4	1,428.8	6.6	1,428.8	0.00	0.00	0.00
8,700.0	90.46	0.27	7,367.6	1,528.8	7.1	1,528.8	0.00	0.00	0.00
8,800.0	90.46	0.27	7,366.8	1,628.8	7.6	1,628.8	0.00	0.00	0.00
8,900.0	90.46	0.27	7,366.0	1,728.8	8.0	1,728.8	0.00	0.00	0.00
9,000.0	90.46	0.27	7,365.2	1,828.8	8.5	1,828.8	0.00	0.00	0.00
9,100.0	90.46	0.27	7,364.4	1,928.8	8.9	1,928.8	0.00	0.00	0.00
9,200.0	90.46	0.27	7,363.6	2,028.8	9.4	2,028.8	0.00	0.00	0.00
9,300.0	90.46	0.27	7,362.8	2,128.8	9.9	2,128.8	0.00	0.00	0.00
9,400.0	90.46	0.27	7,362.0	2,228.8	10.3	2,228.8	0.00	0.00	0.00
9,500.0	90.46	0.27	7,361.2	2,328.8	10.8	2,328.8	0.00	0.00	0.00
9,600.0	90.46	0.27	7,360.4	2,428.8	11.3	2,428.8	0.00	0.00	0.00
9,700.0	90.46	0.27	7,359.6	2,528.8	11.7	2,528.8	0.00	0.00	0.00
9,800.0	90.46	0.27	7,358.8	2,628.8	12.2	2,628.8	0.00	0.00	0.00
9,900.0	90.46	0.27	7,358.0	2,728.8	12.7	2,728.8	0.00	0.00	0.00
10,000.0	90.46	0.27	7,357.2	2,828.8	13.1	2,828.8	0.00	0.00	0.00
10,100.0	90.46	0.27	7,356.4	2,928.8	13.6	2,928.8	0.00	0.00	0.00
10,200.0	90.46	0.27	7,355.6	3,028.7	14.1	3,028.8	0.00	0.00	0.00
10,300.0	90.46	0.27	7,354.8	3,128.7	14.5	3,128.8	0.00	0.00	0.00
10,400.0	90.46	0.27	7,354.0	3,228.7	15.0	3,228.8	0.00	0.00	0.00
10,500.0	90.46	0.27	7,353.2	3,328.7	15.4	3,328.8	0.00	0.00	0.00
10,600.0	90.46	0.27	7,352.4	3,428.7	15.9	3,428.8	0.00	0.00	0.00
10,700.0	90.46	0.27	7,351.5	3,528.7	16.4	3,528.8	0.00	0.00	0.00
10,800.0	90.46	0.27	7,350.7	3,628.7	16.8	3,628.8	0.00	0.00	0.00
10,900.0	90.46	0.27	7,349.9	3,728.7	17.3	3,728.8	0.00	0.00	0.00
11,000.0	90.46	0.27	7,349.1	3,828.7	17.8	3,828.8	0.00	0.00	0.00
11,100.0	90.46	0.27	7,348.3	3,928.7	18.2	3,928.8	0.00	0.00	0.00
11,200.0	90.46	0.27	7,347.5	4,028.7	18.7	4,028.8	0.00	0.00	0.00
11,300.0	90.46	0.27	7,346.7	4,128.7	19.2	4,128.7	0.00	0.00	0.00
11,400.0	90.46	0.27	7,345.9	4,228.7	19.6	4,228.7	0.00	0.00	0.00
11,500.0	90.46	0.27	7,345.1	4,328.7	20.1	4,328.7	0.00	0.00	0.00



HP
Well Planning Report



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Wellbore:	Wellbore #1		
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)	
11,600.0	90.46	0.27	7,344.3	4,428.7	20.5	4,428.7	0.00	0.00	0.00	
11,700.0	90.46	0.27	7,343.5	4,528.7	21.0	4,528.7	0.00	0.00	0.00	
11,800.0	90.46	0.27	7,342.7	4,628.7	21.5	4,628.7	0.00	0.00	0.00	
11,900.0	90.46	0.27	7,341.9	4,728.7	21.9	4,728.7	0.00	0.00	0.00	
12,000.0	90.46	0.27	7,341.1	4,828.7	22.4	4,828.7	0.00	0.00	0.00	
12,100.0	90.46	0.27	7,340.3	4,928.7	22.9	4,928.7	0.00	0.00	0.00	
12,200.0	90.46	0.27	7,339.5	5,028.7	23.3	5,028.7	0.00	0.00	0.00	
12,300.0	90.46	0.27	7,338.7	5,128.7	23.8	5,128.7	0.00	0.00	0.00	
12,400.0	90.46	0.27	7,337.9	5,228.7	24.3	5,228.7	0.00	0.00	0.00	
12,500.0	90.46	0.27	7,337.1	5,328.7	24.7	5,328.7	0.00	0.00	0.00	
12,600.0	90.46	0.27	7,336.3	5,428.6	25.2	5,428.7	0.00	0.00	0.00	
12,700.0	90.46	0.27	7,335.5	5,528.6	25.7	5,528.7	0.00	0.00	0.00	
12,800.0	90.46	0.27	7,334.7	5,628.6	26.1	5,628.7	0.00	0.00	0.00	
12,900.0	90.46	0.27	7,333.9	5,728.6	26.6	5,728.7	0.00	0.00	0.00	
13,000.0	90.46	0.27	7,333.1	5,828.6	27.0	5,828.7	0.00	0.00	0.00	
13,100.0	90.46	0.27	7,332.3	5,928.6	27.5	5,928.7	0.00	0.00	0.00	
13,200.0	90.46	0.27	7,331.5	6,028.6	28.0	6,028.7	0.00	0.00	0.00	
13,300.0	90.46	0.27	7,330.6	6,128.6	28.4	6,128.7	0.00	0.00	0.00	
13,400.0	90.46	0.27	7,329.8	6,228.6	28.9	6,228.7	0.00	0.00	0.00	
13,500.0	90.46	0.27	7,329.0	6,328.6	29.4	6,328.7	0.00	0.00	0.00	
13,600.0	90.46	0.27	7,328.2	6,428.6	29.8	6,428.7	0.00	0.00	0.00	
13,700.0	90.46	0.27	7,327.4	6,528.6	30.3	6,528.7	0.00	0.00	0.00	
13,800.0	90.46	0.27	7,326.6	6,628.6	30.8	6,628.7	0.00	0.00	0.00	
13,900.0	90.46	0.27	7,325.8	6,728.6	31.2	6,728.7	0.00	0.00	0.00	
14,000.0	90.46	0.27	7,325.0	6,828.6	31.7	6,828.7	0.00	0.00	0.00	
14,100.0	90.46	0.27	7,324.2	6,928.6	32.1	6,928.7	0.00	0.00	0.00	
14,200.0	90.46	0.27	7,323.4	7,028.6	32.6	7,028.7	0.00	0.00	0.00	
14,300.0	90.46	0.27	7,322.6	7,128.6	33.1	7,128.6	0.00	0.00	0.00	
14,400.0	90.46	0.27	7,321.8	7,228.6	33.5	7,228.6	0.00	0.00	0.00	
14,500.0	90.46	0.27	7,321.0	7,328.6	34.0	7,328.6	0.00	0.00	0.00	
14,600.0	90.46	0.27	7,320.2	7,428.6	34.5	7,428.6	0.00	0.00	0.00	
14,700.0	90.46	0.27	7,319.4	7,528.6	34.9	7,528.6	0.00	0.00	0.00	
14,800.0	90.46	0.27	7,318.6	7,628.6	35.4	7,628.6	0.00	0.00	0.00	
14,900.0	90.46	0.27	7,317.8	7,728.5	35.9	7,728.6	0.00	0.00	0.00	
15,000.0	90.46	0.27	7,317.0	7,828.5	36.3	7,828.6	0.00	0.00	0.00	
15,100.0	90.46	0.27	7,316.2	7,928.5	36.8	7,928.6	0.00	0.00	0.00	
15,200.0	90.46	0.27	7,315.4	8,028.5	37.3	8,028.6	0.00	0.00	0.00	
15,300.0	90.46	0.27	7,314.6	8,128.5	37.7	8,128.6	0.00	0.00	0.00	
15,400.0	90.46	0.27	7,313.8	8,228.5	38.2	8,228.6	0.00	0.00	0.00	
15,500.0	90.46	0.27	7,313.0	8,328.5	38.6	8,328.6	0.00	0.00	0.00	
15,600.0	90.46	0.27	7,312.2	8,428.5	39.1	8,428.6	0.00	0.00	0.00	
15,700.0	90.46	0.27	7,311.4	8,528.5	39.6	8,528.6	0.00	0.00	0.00	
15,800.0	90.46	0.27	7,310.5	8,628.5	40.0	8,628.6	0.00	0.00	0.00	
15,900.0	90.46	0.27	7,309.7	8,728.5	40.5	8,728.6	0.00	0.00	0.00	
16,000.0	90.46	0.27	7,308.9	8,828.5	41.0	8,828.6	0.00	0.00	0.00	
16,100.0	90.46	0.27	7,308.1	8,928.5	41.4	8,928.6	0.00	0.00	0.00	
16,200.0	90.46	0.27	7,307.3	9,028.5	41.9	9,028.6	0.00	0.00	0.00	
16,300.0	90.46	0.27	7,306.5	9,128.5	42.4	9,128.6	0.00	0.00	0.00	
16,400.0	90.46	0.27	7,305.7	9,228.5	42.8	9,228.6	0.00	0.00	0.00	
16,500.0	90.46	0.27	7,304.9	9,328.5	43.3	9,328.6	0.00	0.00	0.00	
16,600.0	90.46	0.27	7,304.1	9,428.5	43.7	9,428.6	0.00	0.00	0.00	
16,700.0	90.46	0.27	7,303.3	9,528.5	44.2	9,528.6	0.00	0.00	0.00	
16,800.0	90.46	0.27	7,302.5	9,628.5	44.7	9,628.6	0.00	0.00	0.00	
16,900.0	90.46	0.27	7,301.7	9,728.5	45.1	9,728.6	0.00	0.00	0.00	



HP
Well Planning Report



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Company:	COG Operating, LLC	TVD Reference:	Well @ 3276.0usft (Scandrift Freedom)
Project:	Eddy County, NM (NAD 27)	MD Reference:	Well @ 3276.0usft (Scandrift Freedom)
Site:	Sec 25, T25-S, R26-E	North Reference:	Grid
Well:	Road Runner Federal Com #1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
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)
17,000.0	90.46	0.27	7,300.9	9,828.5	45.6	9,828.6	0.00	0.00	0.00
17,100.0	90.46	0.27	7,300.1	9,928.5	46.1	9,928.6	0.00	0.00	0.00
17,200.0	90.46	0.27	7,299.3	10,028.4	46.5	10,028.6	0.00	0.00	0.00
PBHL @ 17237' MD / 7299' TVD									
17,236.7	90.46	0.27	7,299.0	10,065.1	46.7	10,065.2	0.00	0.00	0.00

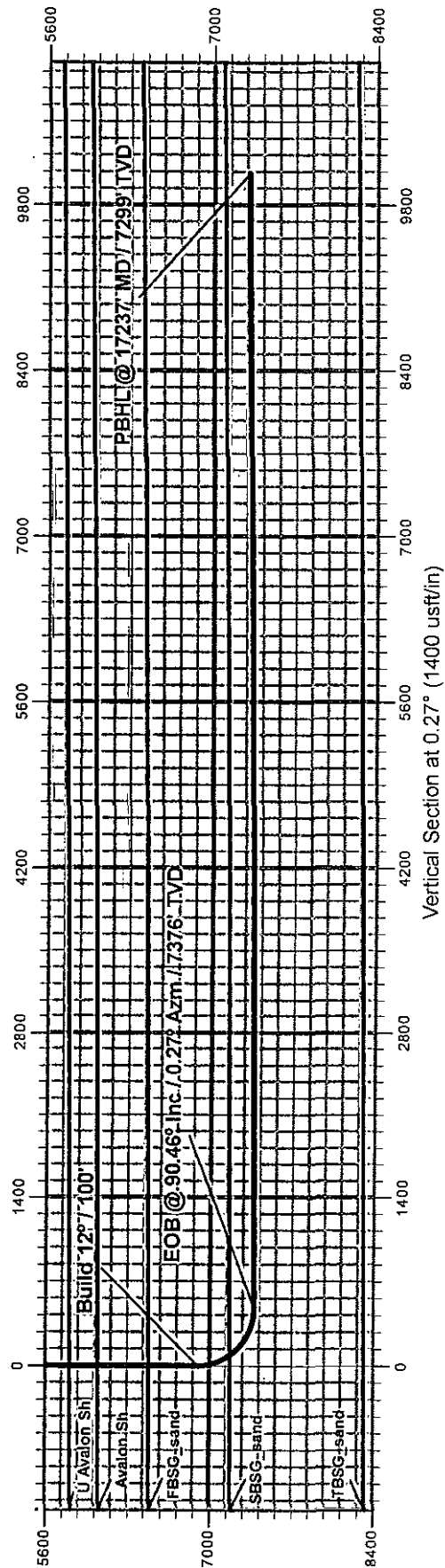
Design Targets									
Target Name	hit/miss target	Dip Angle (°)	Dip Dir (°)	TVD (usft)	N-S (usft)	E-W (usft)	Northing (usft)	Easting (usft)	
Road Runner Federal #1		0.00	0.00	7,299.0	10,065.1	46.7	407,971.20	529,352.70	32° 7' 17.738 N 104° 14' 18.673 W
- plan hits target center									
- Point									

Formations						Dip Direction	
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Direction (°)		
196.0	196.0	Rustler		-0.46	0.27		
333.0	333.0	TOS		-0.46	0.27		
1,766.0	1,766.0	BOS (Fletcher)		-0.46	0.27		
1,958.0	1,958.0	LMAR (Top Delaware)		-0.46	0.27		
2,002.0	2,002.0	BLCN		-0.46	0.27		
2,859.0	2,859.0	CYCN		-0.46	0.27		
3,948.0	3,948.0	BYCN		-0.46	0.27		
5,521.0	5,521.0	Bone Sprg (BSGL)		-0.46	0.27		
5,807.0	5,807.0	U Avalon Sh		-0.46	0.27		
6,050.0	6,050.0	LAvalon Sh		-0.46	0.27		
6,482.0	6,482.0	FBSG_sand		-0.46	0.27		
7,187.7	7,170.3	SBSG_sand		-0.46	0.27		

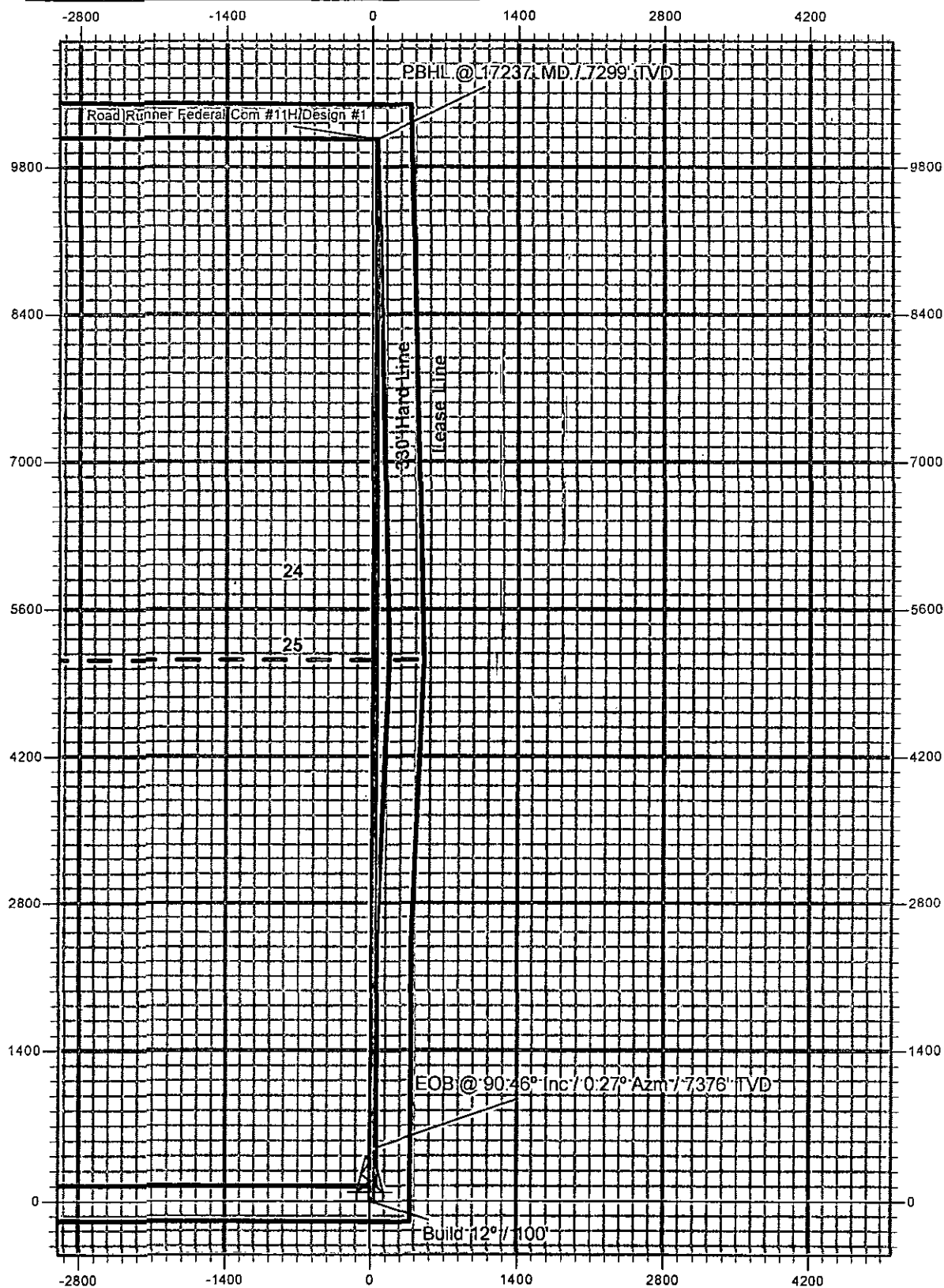
Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
6,898.6	6,898.6	0.0	0.0	Build 12° / 100'	
7,652.4	7,376.0	481.3	2.2	EOB @ 90.46° Inc / 0.27° Azm / 7376' TVD	
17,236.7	7,299.0	10,065.1	46.7	PBHL @ 17237' MD / 7299' TVD	



Eddy County, NM (NAD 27)
Sec 25, T25-S, R26-E
Road Runner Federal Com #1H
Design #1



Eddy County, NM (NAD 27)
Sec 25, T25-S, R26-E
Road Runner Federal Com #1H
Design #1





GATES E & S NORTH AMERICA, INC
DU-TEX
134 44TH STREET
CORPUS CHRISTI, TEXAS 78405

PHONE: 361-887-9807
FAX: 361-887-0812
EMAIL: crpe&s@gates.com
WEB: www.gates.com

10K CHOKE & KILL ASSEMBLY PRESSURE TEST CERTIFICATE

Customer :	SPECIALTY SALES, INC.	Test Date:	11/21/2013
Customer Ref. :	49680-S	Hose Serial No.:	D-112113-8
Invoice No. :	197465	Created By:	Norma M.

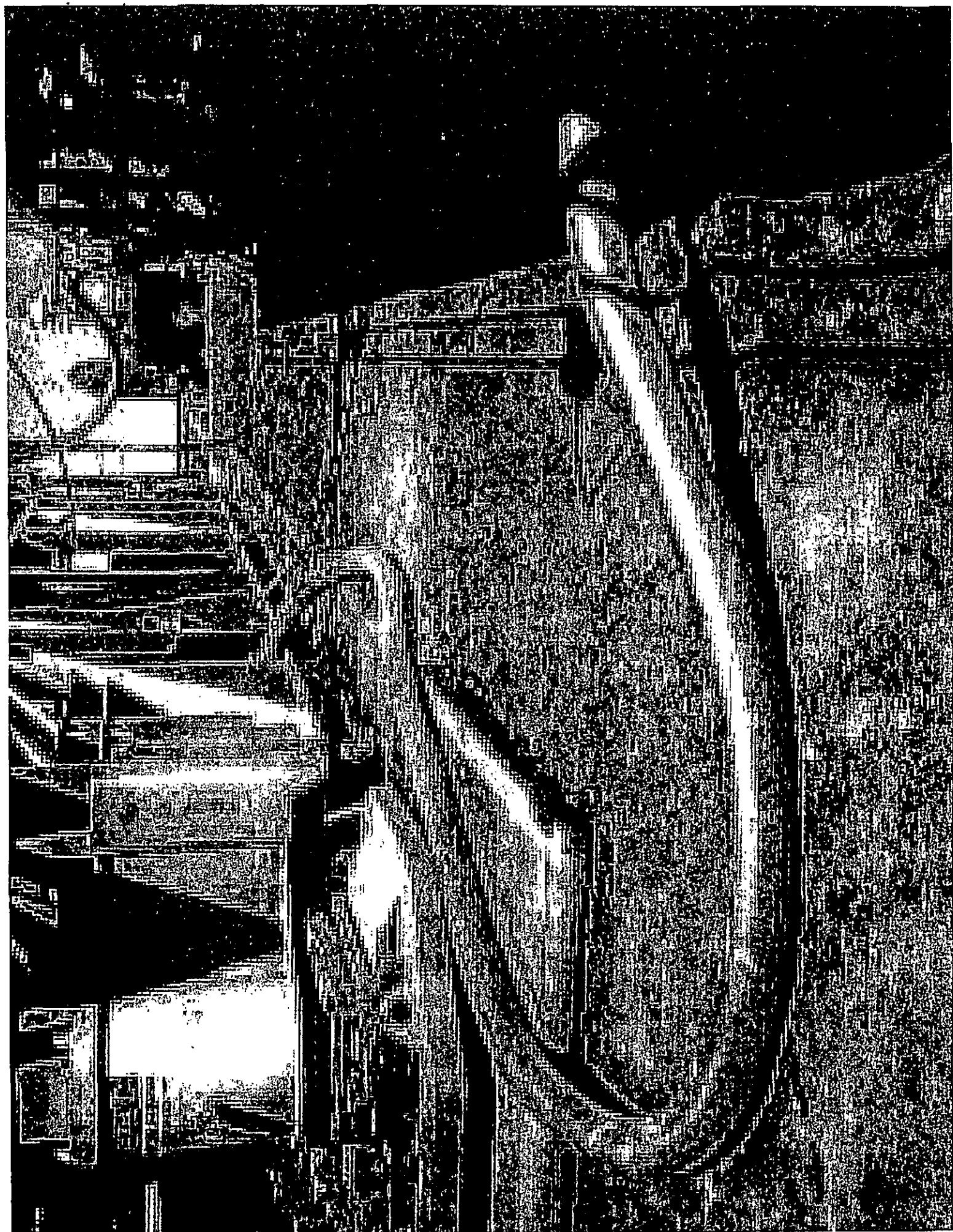
Product Description:	10K3.050.0CK31/1610KFLGE/E
----------------------	----------------------------

End Fitting 1 :	3 1/16 10K FLG	End Fitting 2 :	3 1/16 10K FLG
Gates Part No. :	47773-4290	Assembly Code :	L34558092713D-112113-8
Working Pressure :	10,000 PSI	Test Pressure :	15,000 PSI

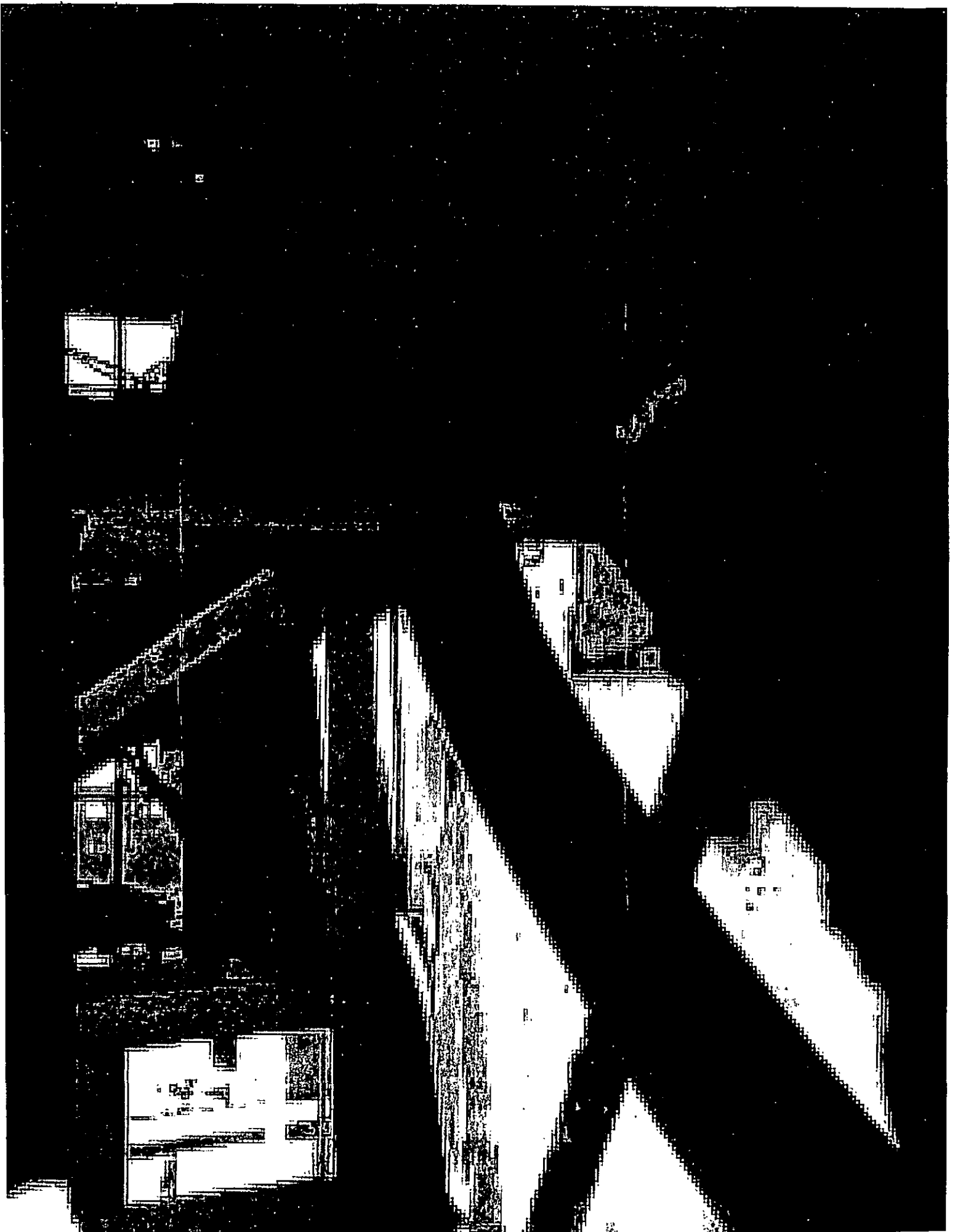
Gates E & S North America, Inc. certifies that the following hose assembly has been tested to the Gates Oilfield Roughneck Agreement/Specification requirements and passed the 15 minute hydrostatic test per API Spec 7K/Q1, Fifth Edition, June 2010, Test pressure 9.6.7 and per Table 9 to 15,000 psi in accordance with this product number. Hose burst pressure 9.6.7.2 exceeds the minimum of 2:5 times the working pressure per Table 9.

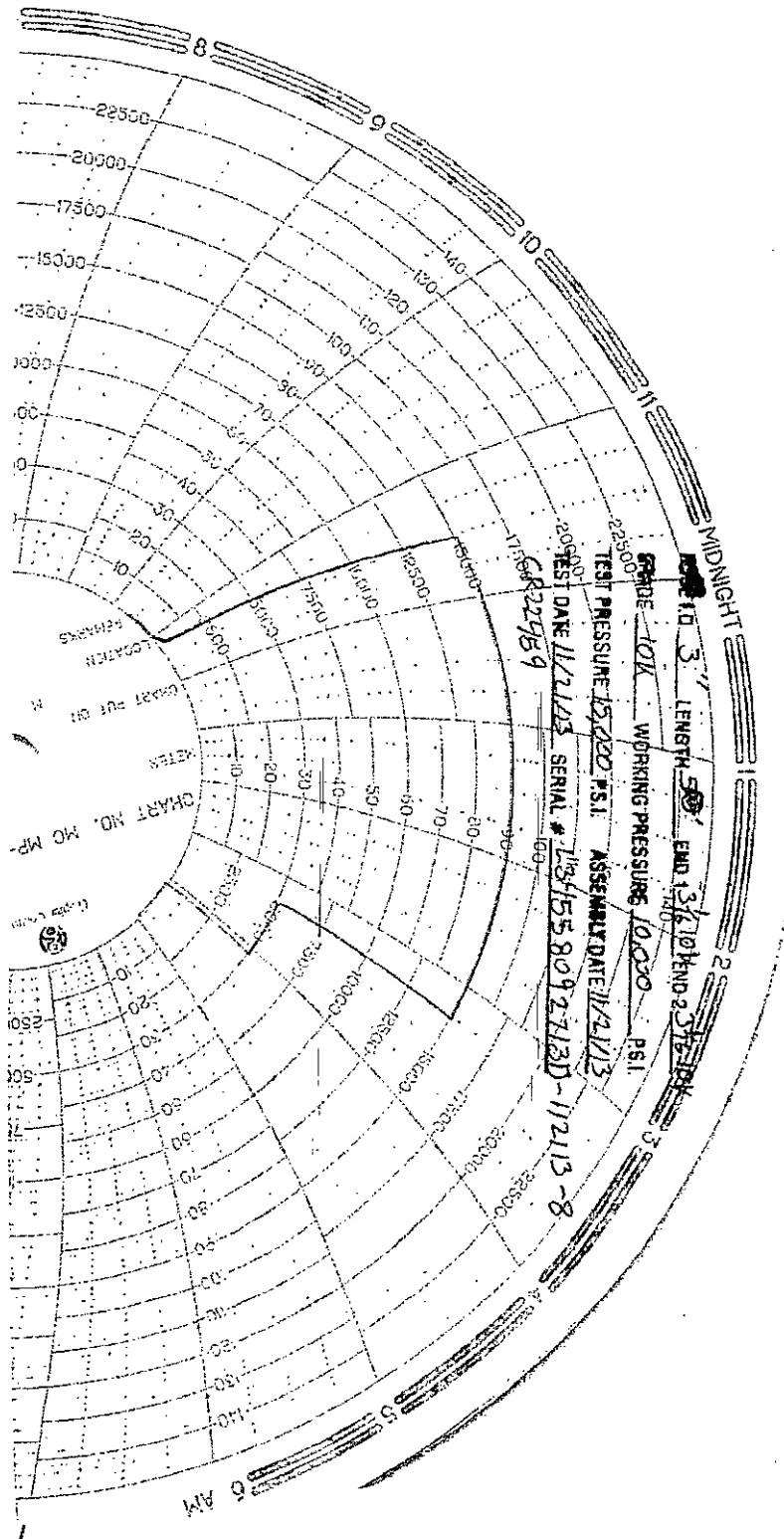
Quality Manager :	QUALITY
Date :	11/22/2013
Signature :	

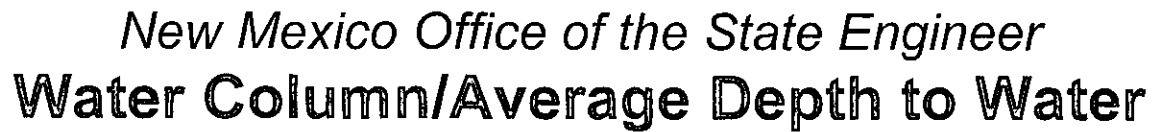
Technical Supervisor :	PRODUCTION
Date :	11/22/2013
Signature :	











(In feet)

WATER COLUMN/ AVERAGE



New Mexico Office of the State Engineer Water Column/Average Depth to Water

(A CLW##### in the
POD suffix indicates the
POD has been replaced
& no longer serves a
water right file.)

(R=POD has
been replaced,

O=orphaned,

C=the file is (quarters are 1=NW 2=NE 3=SW 4=SE)

closed) (quarters are smallest to largest) (NAD83 UTM in meters) (In feet)

POD Number	POD Sub	Code	basin	County	Q	Q	Q	Sec	Tws	Rng	X	Y	Depth Well	Depth Water	Water Column
C 01013	C	ED			4	25	25S	26E			571505	3551456*	245		
C 02221	CUB	ED			4	3	2	25	25S	26E	571412	3551961*	35		

Average Depth to Water: --

Minimum Depth: --

Maximum Depth: --

Record Count: 2

PLSS Search:

Section(s): 25

Township: 25S

Range: 26E

*UTM location was derived from PLSS - see Help

The data is furnished by the NMOSE/ISC and is accepted by the recipient with the expressed understanding that the OSE/ISC make no warranties, expressed or implied, concerning the accuracy, completeness, reliability, usability, or suitability for any particular purpose of the data.



New Mexico Office of the State Engineer

Water Column/Average Depth to Water

(A CLW##### in the
POD suffix indicates the
POD has been replaced
& no longer serves a
water right file.)

(R=POD has
been replaced,
O=orphaned,
C=the file is
closed)

(quarters are 1=NW 2=NE 3=SW 4=SE)

(quarters are smallest to largest) (NAD83 UTM in meters)

(In feet)

POD Number	POD Sub	basin	County	Q 64	Q 16	Q 4	Sec	Tws	Rng	X	Y	Depth Well	Depth Water	Water Column
C 01013	C	ED		4	25	25S	26E			571505	3551456*	245		
C 01089	C	ED		3	4	1	03	25S	26E	567505	3558398*	96	45	51
C 01368	C	ED		1	1	22	25S	26E		567261	3554059*	143	118	25
C 02220	CUB	ED		3	1	2	26	25S	26E	569598	3552352*	35		
C 02221	CUB	ED		4	3	2	25	25S	26E	571412	3551961*	35		
C 02675	C	ED		1	4	1	09	25S	26E	565907	3556978*	180	45	135
C 03285	C	ED		4	4	2	07	25S	26E	563713	3556658	84	60	24
C 03569 POD1	CUB	ED		2	1	1	14	25S	26E	568862	3555746	30	0	30
C 03654 POD1	CUB	ED		2	3	1	24	25S	26E	570654	3553773			
C 03654 POD2	CUB	ED		2	3	1	24	25S	26E	554766	3562304			
C 03655 POD1	CUB	ED		4	22	25S	26E			550692	3561324			
C 03655 POD2	CUB	ED		4	22	25S	26E			550732	3561337			
C 03655 POD3	CUB	ED		1	4	4	22	25S	26E	568458	3553019			
C 03655 POD4	CUB	ED		4	22	25S	26E			550684	3561362			

Average Depth to Water: 53 feet

Minimum Depth: 0 feet

Maximum Depth: 118 feet

Record Count: 14

PLSS Search:

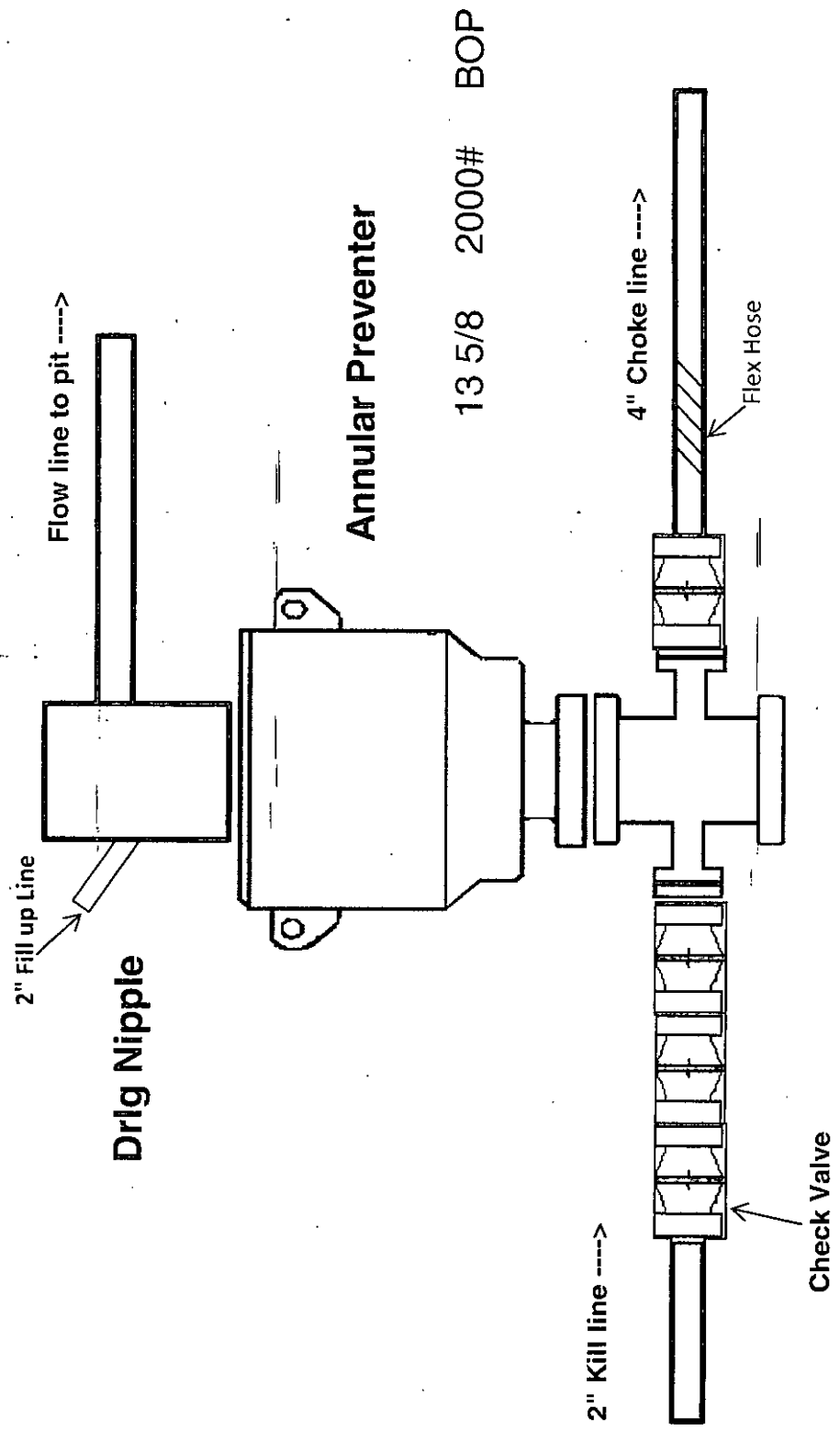
Township: 25S

Range: 26E

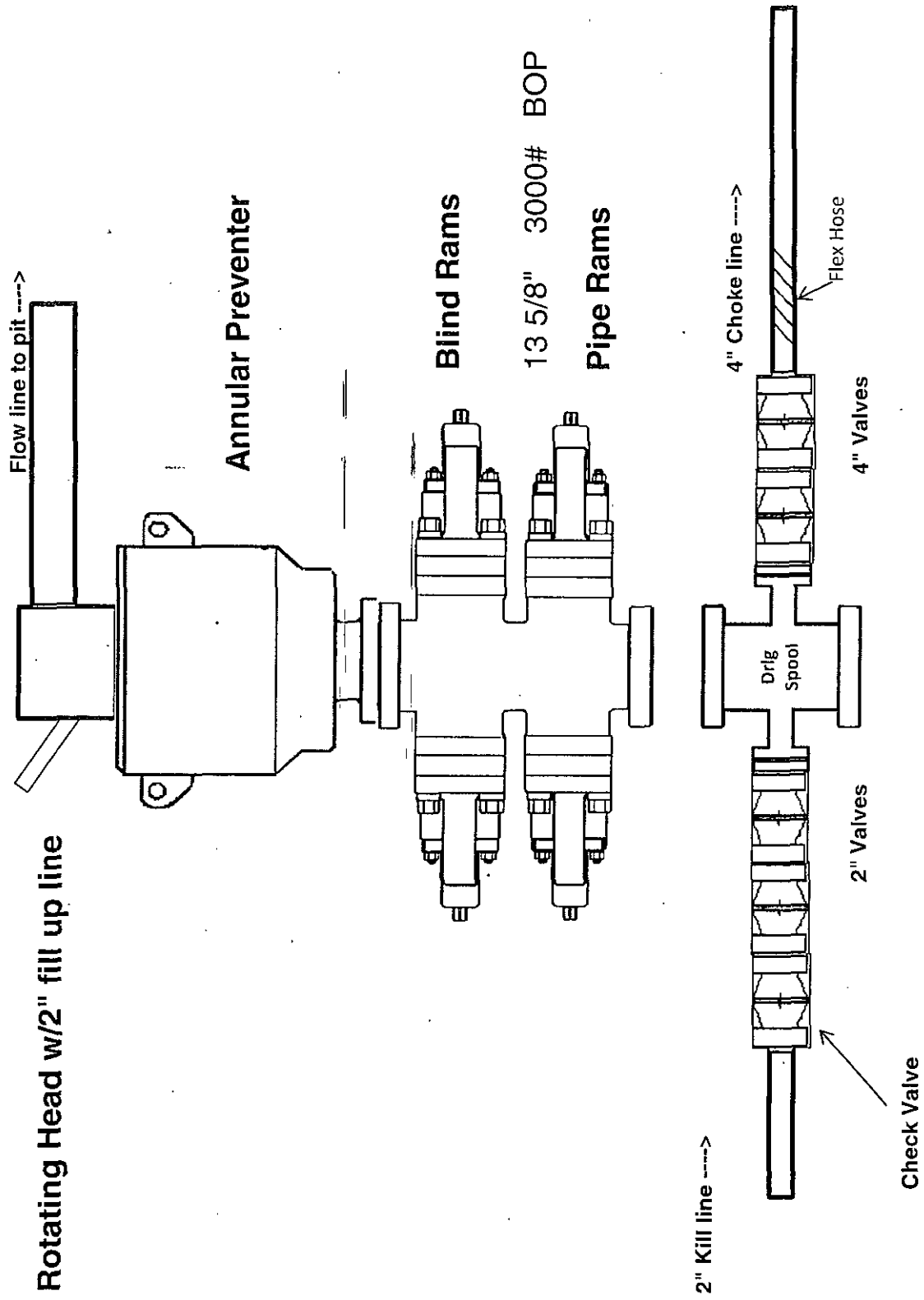
*UTM location was derived from PLSS - see Help

The data is furnished by the NMOSE/ISC and is accepted by the recipient with the expressed understanding that the OSE/ISC make no warranties, expressed or implied, concerning the accuracy, completeness, reliability, usability, or suitability for any particular purpose of the data.

2,000 psi BOP Schematic

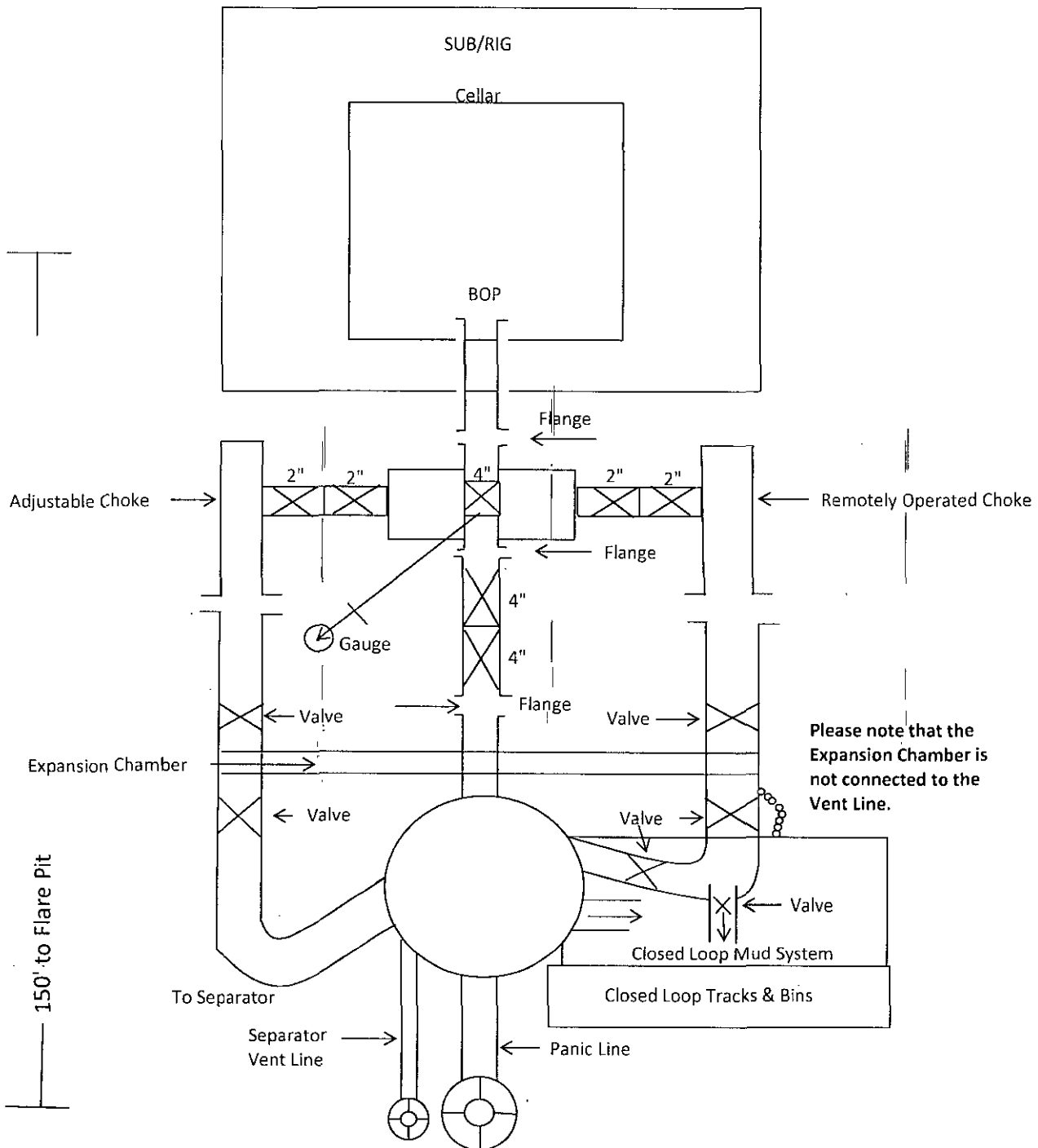


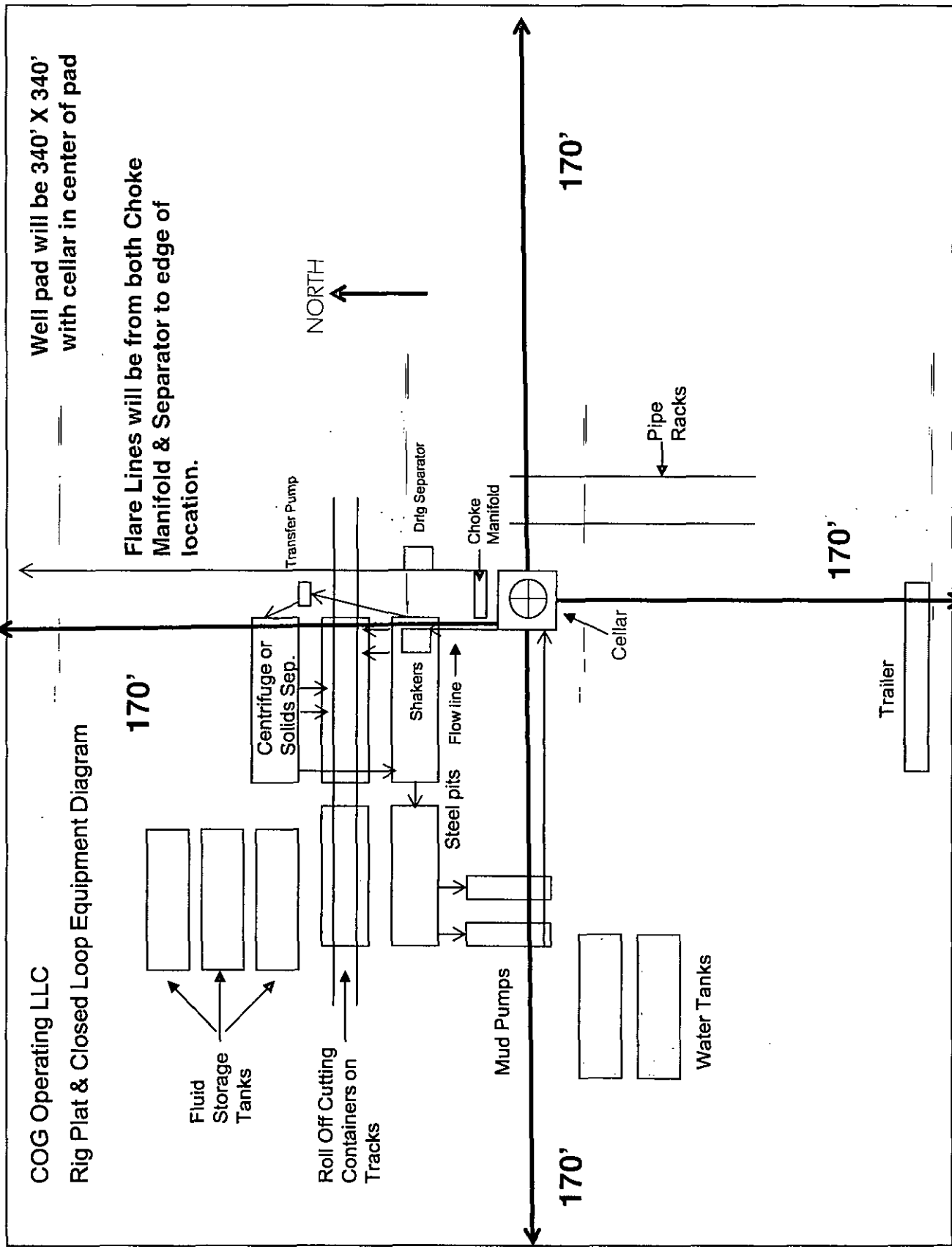
3,000 psi BOP Schematic





3M Choke Manifold Equipment





"I further certify that COG will comply with Rule 19.15.17 NMAC by using a Closed Loop System."

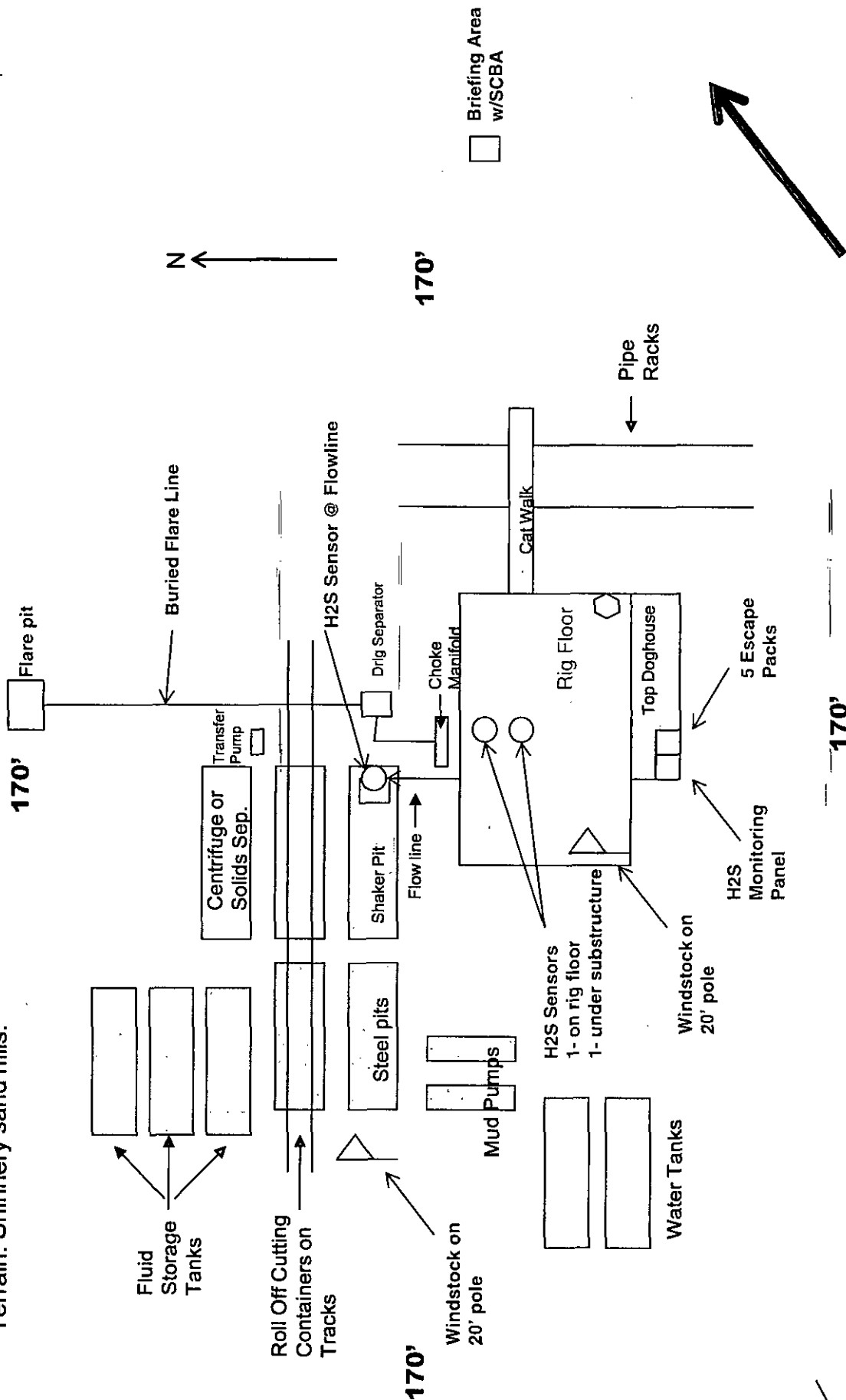
COG Operating LLC

H₂S Equipment Schematic

Terrain: Shinnery sand hills.

Well pad will be 340' X 340'
with cellar in center of pad

Secondary egress.



COG OPERATING LLC
HYDROGEN SULFIDE DRILLING OPERATIONS PLAN

1. 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 this well:

- a. The hazards and characteristics of hydrogen sulfide (H₂S).
- b. The proper use and maintenance of personal protective equipment and life support systems.
- c. The proper use of H₂S detectors, alarms, warning systems, briefing areas, evacuation procedures, and prevailing winds.
- d. The proper techniques for first aid and rescue procedures.

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

- a. The effects of H₂S on metal components. If high tensile tubulars are to be used, personnel will be trained in their special maintenance requirements.
- b. Corrective action and shut-in procedures when drilling or reworking a well and blowout prevention and well control procedures.
- c. The contents and requirements of the H₂S Drilling Operations Plan and the Public Protection Plan.

There will be an initial training session just prior to encountering a known or probable H₂S zone (within 3 days or 500 feet) and weekly H₂S and well control drills for all personnel in each crew. The initial training session shall include a review of the site specific H₂S Drilling Operations Plan and the Public Protection Plan. This plan shall be available at the well site. All personnel will be required to carry documentation that they have received the proper training.

2. H₂S SAFETY EQUIPMENT AND SYSTEMS

Note: All H₂S safety equipment and systems will be installed, tested, and operational when drilling reaches a depth of 500 feet above, or three days prior to penetrating the first zone containing or reasonably expected to contain H₂S. If H₂S greater than 100 ppm is encountered in the gas stream we will shut in and install H₂S equipment.

- a. Well Control Equipment:
 - Flare line.
 - Choke manifold with remotely operated choke.
 - Blind rams and pipe rams to accommodate all pipe sizes with properly sized closing unit.
 - Auxiliary equipment to include: annular preventer, mud-gas separator, rotating head.

- b. Protective equipment for essential personnel:
Mark II Surviveair 30-minute units located in the dog house and at briefing areas.
- c. H2S detection and monitoring equipment:
2 - portable H2S monitor positioned on location for best coverage and response. These units have warning lights and audible sirens when H2S levels of 20 ppm are reached.
- d. Visual warning systems:
Caution/Danger signs shall be posted on roads providing direct access to location. Signs will be painted a high visibility yellow with black lettering of sufficient size to be readable at a reasonable distance from the immediate location. Bilingual signs will be used, when appropriate. See example attached.
- e. Mud Program:
The mud program has been designed to minimize the volume of H2S circulated to the surface.
- f. Metallurgy:
All drill strings, casings, tubing, wellhead, blowout preventers, drilling spool, kill lines, choke manifold and lines, and valves shall be suitable for H2S service.
- g. Communication:
Company vehicles equipped with cellular telephone.

COG OPERATING LLC has conducted a review to determine if an H2S contingency plan is required for the above referenced well. We were able to conclude that any potential hazardous volume would be minimal. H2S concentrations of wells in this area from surface to TD are low enough; therefore, we do not believe that an H2S contingency plan is necessary.

W A R N I N G

**YOU ARE ENTERING AN H₂S AREA
AUTHORIZED PERSONNEL ONLY**

- 1. BEARDS OR CONTACT LENSES NOT ALLOWED***
- 2. HARD HATS REQUIRED***
- 3. SMOKING IN DESIGNATED AREAS ONLY***
- 4. BE WIND CONSCIOUS AT ALL TIMES***
- 5. CK WITH COG OPERATING LLC FOREMAN AT MAIN OFFICE***

COG OPERATING LLC

1-575-748-6940

EMERGENCY CALL LIST

	<u>OFFICE</u>	<u>MOBILE</u>
COG OPERATING LLC OFFICE	575-748-6940	
SHERYL BAKER	575-748-6940	432-934-1873
SETH WILD	432-683-7443	432-528-3633
WALTER ROYE	575-748-6940	432-934-1886

EMERGENCY RESPONSE NUMBERS

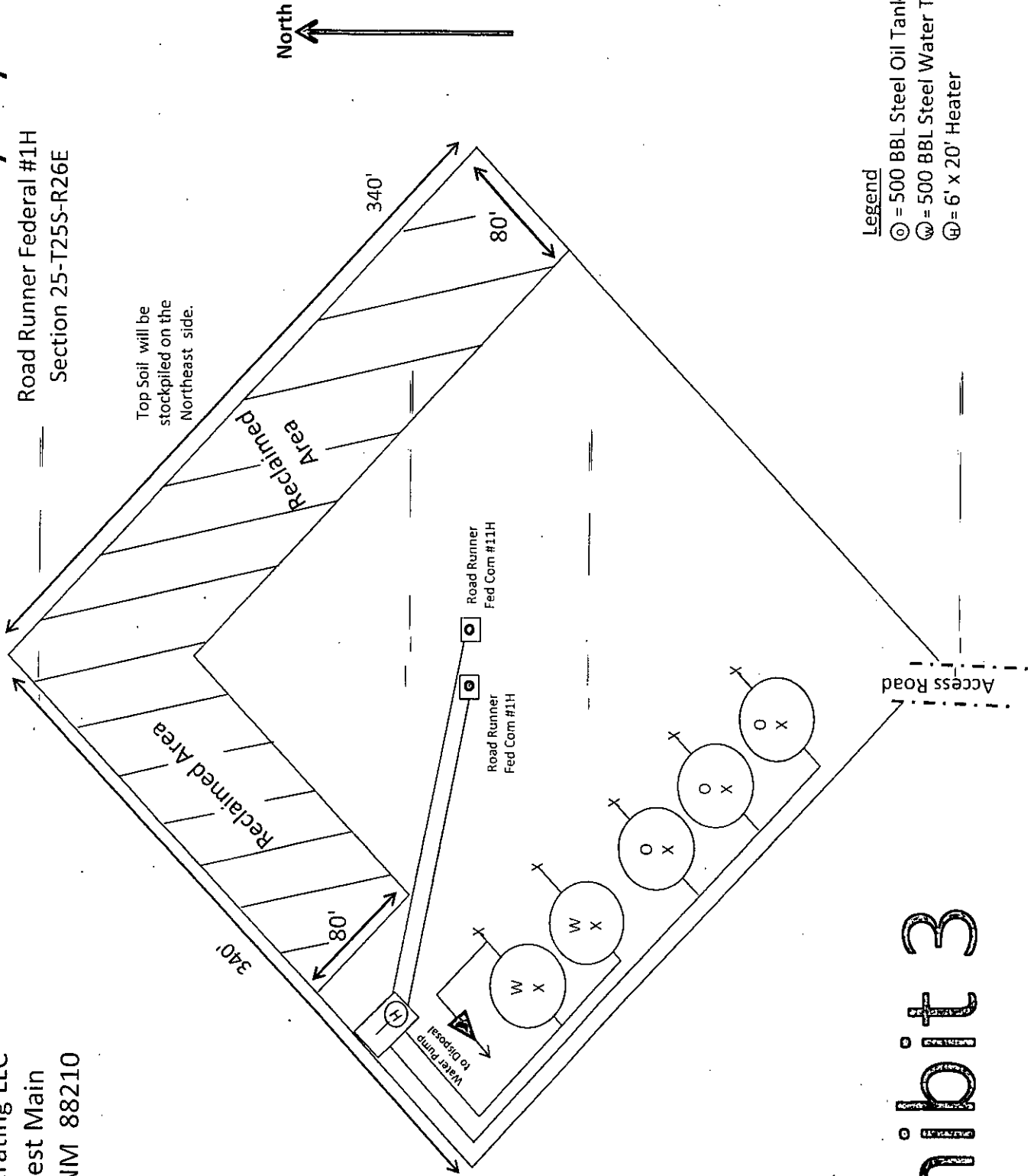
	<u>OFFICE</u>
STATE POLICE	575-748-9718
EDDY COUNTY SHERIFF	575-746-2701
EMERGENCY MEDICAL SERVICES (AMBULANCE)	911 or 575-746-2701
EDDY COUNTY EMERGENCY MANAGEMENT (HARRY BURGESS)	575-887-9511
STATE EMERGENCY RESPONSE CENTER (SERC)	575-476-9620
CARLSBAD POLICE DEPARTMENT	575-885-2111
CARLSBAD FIRE DEPARTMENT	575-885-3125
NEW MEXICO OIL CONSERVATION DIVISION	575-748-1283
INDIAN FIRE & SAFETY	800-530-8693
HALLIBURTON SERVICES	800-844-8451



COG Operating LLC
2208 West Main
Artesia, NM 88210

Production Facility Layout

Road Runner Federal #1H
Section 25-T25S-R26E



- Legend**
- ⊙ = 500 BBL Steel Oil Tank
 - ⊗ = 500 BBL Steel Water Tank
 - ⊕ = 6' x 20' Heater

Exhibit 3

Surface Use Plan of Operations

Introduction

The following surface use plan of operations will be followed and carried out once the APD is approved. No other disturbance will be created other than what was submitted in this surface use plan. If any other surface disturbance is needed after the APD is approved, a BLM approved sundry notice or right of way application will be acquired prior to any new surface disturbance.

Before any surface disturbance is created, stakes or flagging will be installed to mark boundaries of permitted areas of disturbance, including soils storage areas. As necessary, slope, grade, and other construction control stakes will be placed to ensure construction in accordance with the surface use plan. All boundary markers will be maintained in place until final construction cleanup is completed. If disturbance boundary markers are disturbed or knocked down, they will be replaced before construction proceeds.

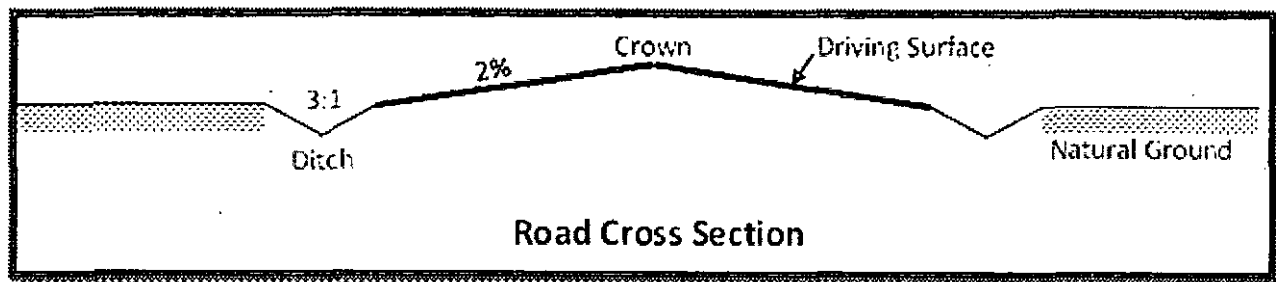
If terms and conditions are attached to the approved APD and amend any of the proposed actions in this surface use plan, we will adhere to the terms and conditions.

1. Existing Roads

- a. The existing access road route to the proposed project is depicted on Exhibit 2. Improvements to the driving surface will be done where necessary. No new surface disturbance will be done, unless otherwise noted in the New or Reconstructed Access Roads section of this surface use plan.
- b. The existing access road route to the proposed project does cross lease boundaries and a BLM road right-of-way will be acquired from the BLM prior to construction activities.
- c. The operator will improve or maintain existing roads in a condition the same as or better than before operations begin. The operator will repair pot holes, clear ditches, repair the crown, etc. All existing structures on the entire access route such as cattleguards, other range improvement projects, culverts, etc. will be properly repaired or replaced if they are damaged or have deteriorated beyond practical use.
- d. We will prevent and abate fugitive dust as needed, whether created by vehicular traffic, equipment operations, or wind events. BLM written approval will be acquired before application of surfactants, binding agents, or other dust suppression chemicals on roadways.

2. New or Reconstructed Access Roads

- a. An access road will be needed for this proposed project. See the survey plat for the location of the access road.
- b. The length of access road needed to be constructed for this proposed project is about 109 feet.
- c. The maximum driving width of the access road will be 14 feet. The maximum width of surface disturbance when constructing the access road will not exceed 25 feet. All areas outside of the driving surface will be revegetated.
- d. The access road will be constructed with 6 inches of compacted Caliche.
- e. When the road travels on fairly level ground, the road will be crowned and ditched with a 2% slope from the tip of the road crown to the edge of the driving surface. The ditches will be 3 feet wide with 3:1 slopes. See Road Cross Section diagram below.



- f. The access road will be constructed with a ditch on each side of the road.
- g. The maximum grade for the access road will be 1 percent.
- h. No turnouts will be constructed on the proposed access road.
- i. No cattleguards will be installed for this proposed access road.
- j. Since the proposed access road crosses lease boundaries, a right-of-way will be required for this access road. A right-of-way grant will be applied for through the BLM. The access road will not be constructed until an approved BLM right-of-way grant is acquired.
- k. No culverts will be constructed for this proposed access road.
- l. No low water crossings will be constructed for the access road.
- m. Lead-off ditches will be constructed on the access road to divert water and prevent excessive erosion. Each lead-off ditch will be 6 inches deep and have a 6 inch berm above natural ground on the down hill slope. Each lead-off ditch will be graded to drain water with a 1 percent minimum to 3 percent maximum ditch slope. Lead-off ditches will not extend more than 10 feet off the road edge.
- n. Newly constructed or reconstructed roads, on surface under the jurisdiction of the Bureau of Land Management, will be constructed as outlined in the BLM "Gold Book" and to meet the standards of the anticipated traffic flow and all anticipated weather requirements as needed. Construction will include ditching, draining, crowning and capping or sloping and dipping the roadbed as necessary to provide a well-constructed and safe road.

3. Location of Existing Wells

- a. Exhibit 4 of the APD depicts all known wells within a one mile radius of the proposed well.
- b. 1 mile well data

4. Location of Existing and/or Proposed Production Facilities

- a. All permanent, lasting more than 6 months, above ground structures including but not limited to pumpjacks, storage tanks, barrels, pipeline risers, meter housing, etc. that are not subject to safety requirements will be painted a non-reflective paint color, Shale Green, from the BLM Standard Environmental Colors chart, unless another color is required in the APD Conditions of Approval.
- b. If any type of production facilities are located on the well pad, they will be strategically placed to allow for maximum interim reclamation, recontouring, and revegetation of the well location.
- c. A production facility is proposed to be installed on the proposed well location. Production from the well will be processed on site in the production facility. Exhibit 3 depicts the location of the production facilities as they relate to the well and well pad.

d. The proposed production facility will have a secondary containment structure that is constructed to hold the capacity of 1-1/2 times the largest tank, plus freeboard to account for precipitation, unless more stringent protective requirements are deemed necessary.

e. There is no other diagram that depicts production facilities.

If any plans change regarding the production facility or other infrastructure (pipeline, electric line, etc.), we will submit a sundry notice or right of way (if applicable) prior to installation or construction.

Electric Line(s)

a. No electric line will be applied for with this APD.

5. Location and Types of Water

a. The location of the water well is as follows: Contractors water well.

b. The operator will use established or constructed oil and gas roads to transport water to the well site. The operator will try to utilize the identified access route in the surface use plan.

6. Construction Material

a. Caliche from an approved State or Federal pit.

7. Methods for Handling Waste

a. Drilling fluids and produced oil and water from the well during drilling and completion operations will be stored safely and disposed of properly in an NMOCD approved disposal facility.

b. Garbage and trash produced during drilling and completion operations will be collected in a trash container and disposed of properly at a state approved disposal facility. All trash on and around the well site will be collected for disposal.

c. Human waste and grey water will be properly contained and disposed of properly at a state approved disposal facility.

d. After drilling and completion operations, trash, chemicals, salts, frac sand and other waste material will be removed and disposed of properly at a state approved disposal facility.

e. The well will be drilled utilizing a closed loop system. Drill cutting will be properly disposed of into steel tanks and taken to an NMOCD approved disposal facility.

8. Ancillary Facilities

a. No ancillary facilities will be needed for this proposed project.

9. Well Site Layout

a. The following information is presented in the well site survey plat or diagram:

- i. reasonable scale (near 1":50')
- ii. well pad dimensions
- iii. well pad orientation

- iv. drilling rig components
 - v. proposed access road
 - vi. elevations of all points
 - vii. topsoil stockpile
 - viii. reserve pit location/dimensions if applicable
 - ix. other disturbances needed (flare pit, stinger, frac farm pad, etc.)
 - x. existing structures within the 600' x 600' archaeological surveyed area (pipelines, electric lines, well pads, etc)
- b. The proposed drilling pad was staked and surveyed by a professional surveyor. The attached survey plat of the well site depicts the drilling pad layout as staked.
- c. The submitted survey plat does depict all the necessary information required by Onshore Order No. 1.
- d. Topsoil Salvaging
- i. Grass, forbs, and small woody vegetation, such as mesquite will be excavated as the topsoil is removed. Large woody vegetation will be stripped and stored separately and respread evenly on the site following topsoil resspreading. Topsoil depth is defined as the top layer of soil that contains 80% of the roots. In areas to be heavily disturbed, the top 6 inches of soil material, will be stripped and stockpiled on the perimeter of the well location and along the perimeter of the access road to control run-on and run-off, to keep topsoil viable, and to make redistribution of topsoil more efficient during interim reclamation. Stockpiled topsoil should include vegetative material. Topsoil will be clearly segregated and stored separately from subsoils. Contaminated soil will not be stockpiled, but properly treated and handled prior to topsoil salvaging.

10. Plans for Surface Reclamation

Reclamation Objectives

- i. The objective of interim reclamation is to restore vegetative cover and a portion of the landform sufficient to maintain healthy, biologically active topsoil; control erosion; and minimize habitat and forage loss, visual impact, and weed infestation; during the life of the well or facilities.
- ii. The long-term objective of final reclamation is to return the land to a condition similar to what existed prior to disturbance. This includes restoration of the landform and natural vegetative community, hydrologic systems, visual resources, and wildlife habitats. To ensure that the long-term objective will be reached through human and natural processes, actions will be taken to ensure standards are met for site stability, visual quality, hydrological functioning, and vegetative productivity.
- iii. The BLM will be notified at least 3 days prior to commencement of any reclamation procedures.
- iv. If circumstances allow, interim reclamation and/or final reclamation actions will be completed no later than 6 months from when the final well on the location has been completed or plugged. We will gain written permission from the BLM if more time is needed.
- v. Interim reclamation will be performed on the well site after the well is drilled and completed. Exhibit 3 depicts the location and dimensions of the planned interim reclamation for the well site.

Interim Reclamation Procedures (If performed)

1. Within 30 days of well completion, the well location and surrounding areas will be cleared of, and maintained free of, all materials, trash, and equipment not required for production.
2. In areas planned for interim reclamation, all the surfacing material will be removed and returned to

the original mineral pit or recycled to repair or build roads and well pads.

3. The areas planned for interim reclamation will then be recontoured to the original contour if feasible, or if not feasible, to an interim contour that blends with the surrounding topography as much as possible. Where applicable, the fill material of the well pad will be backfilled into the cut to bring the area back to the original contour. The interim cut and fill slopes prior to re-seeding will not be steeper than a 3:1 ratio, unless the adjacent native topography is steeper. Note: Constructed slopes may be much steeper during drilling, but will be recontoured to the above ratios during interim reclamation.

4. Topsoil will be evenly respread and aggressively revegetated over the entire disturbed area not needed for all-weather operations including cuts & fills. To seed the area, the proper BLM seed mixture, free of noxious weeds, will be used. Final seedbed preparation will consist of contour cultivating to a depth of 4 to 6 inches within 24 hours prior to seeding, dozer tracking, or other imprinting in order to break the soil crust and create seed germination micro-sites.

5. Proper erosion control methods will be used on the area to control erosion, runoff and siltation of the surrounding area.

6. The interim reclamation will be monitored periodically to ensure that vegetation has reestablished and that erosion is controlled.

Final Reclamation (well pad, buried pipelines, etc.)

1. Prior to final reclamation procedures, the well pad, road, and surrounding area will be cleared of material, trash, and equipment.

2. All surfacing material will be removed and returned to the original mineral pit or recycled to repair or build roads and well pads.

3. All disturbed areas, including roads, pipelines, pads, production facilities, and interim reclaimed areas will be recontoured to the contour existing prior to initial construction or a contour that blends indistinguishably with the surrounding landscape. Topsoil that was spread over the interim reclamation areas will be stockpiled prior to recontouring. The topsoil will be redistributed evenly over the entire disturbed site to ensure successful revegetation.

4. After all the disturbed areas have been properly prepared, the areas will be seeded with the proper BLM seed mixture, free of noxious weeds. Final seedbed preparation will consist of contour cultivating to a depth of 4 to 6 inches within 24 hours prior to seeding, dozer tracking, or other imprinting in order to break the soil crust and create seed germination micro-sites.

5. Proper erosion control methods will be used on the entire area to control erosion, runoff and siltation of the surrounding area.

6. All unused equipment and structures including pipelines, electric line poles, tanks, etc. that serviced the well will be removed.

7. All reclaimed areas will be monitored periodically to ensure that revegetation occurs, that the area is not redisturbed, and that erosion is controlled.

11. Surface Ownership

- a. The surface ownership of the proposed project is Federal.

12. Other Information

- a. A. The area around the well site is grassland and the topsoil is sandy. The vegetation is moderately sparse with native prairie grasses, some mesquite and shinnery oak. No wildlife was observed but it is likely that mule deer, rabbits, coyotes and rodents traverse the area.
- B. There is no permanent or live water in the immediate area.
- C. There are no dwellings within 2 miles of this location.
- D. If needed, a Cultural Resources Examination is being prepared by Boone Arch Services of NM, LLC., 2030 North Canal, Carlsbad, New Mexico, 88220, phone # 575-885-1352 and the results will be forwarded to your office in the near future. Otherwise, COG will be participating in the Permian Basin MOA Program.

13. Maps and Diagrams

- Exhibit 2 - Existing Road
- Exhibit 4 - Wells Within One Mile
- Exhibit 3 - Production Facilities Diagram
- Exhibit 3 - Interim Reclamation

PECOS DISTRICT CONDITIONS OF APPROVAL

OPERATOR'S NAME:	COG Operating, LLC.
LEASE NO.:	NMNM-109748
WELL NAME & NO.:	Road Runner Federal Com 11H
SURFACE HOLE FOOTAGE:	0190' FSL & 0350' FEL
BOTTOM HOLE FOOTAGE	0330' FNL & 0330' FEL Sec. 24, T. 25 S., R 26 E.
LOCATION:	Section 25, T. 25 S., R 26 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.

- ☐ **General Provisions**
- ☐ **Permit Expiration**
- ☐ **Archaeology, Paleontology, and Historical Sites**
- ☐ **Noxious Weeds**
- ☒ **Special Requirements**
 - Communitization Agreement
 - Cave/Karst
 - Watershed
- ☐ **Construction**
 - Notification
 - Topsoil
 - Closed Loop System
 - Federal Mineral Material Pits
 - Well Pads
 - Roads
- ☐ **Road Section Diagram**
- ☒ **Drilling**
 - Cement Requirements
 - High Cave/Karst
 - Logging Requirements
 - Waste Material and Fluids
- ☐ **Production (Post Drilling)**
 - Well Structures & Facilities
- ☐ **Interim Reclamation**
- ☐ **Final Abandonment & Reclamation**

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)

Communitization Agreement

A Communitization Agreement covering the acreage dedicated to this well must be filed for approval with the BLM. The effective date of the agreement shall be prior to any sales. In addition, the well sign shall include the surface and bottom hole lease numbers. *If the Communitization Agreement number is known, it shall also be on the sign. If not, it shall be placed on the sign when the sign is replaced.*

Cave and Karst Conditions of Approval

****** Depending on location, additional Drilling, Casing, and Cementing procedures may be required by engineering to protect critical karst groundwater recharge areas.

Cave/Karst Surface Mitigation

The following stipulations will be applied to minimize impacts during construction, drilling and production.

Construction:

In the advent that any underground voids are opened up during construction activities, construction activities will be halted and the BLM will be notified immediately.

No Blasting:

No blasting will be utilized for pad construction. The pad will be constructed and leveled by adding the necessary fill and caliche.

Pad Berming:

The entire perimeter of the well pad will be bermed to prevent oil, salt, and other chemical contaminants from leaving the well pad.

- The compacted berm shall be constructed at a minimum of 12 inches high with impermeable mineral material (e.g. caliche).
- No water flow from the uphill side(s) of the pad shall be allowed to enter the well pad.
- The topsoil stockpile shall be located outside the bermed well pad.
- Topsoil, either from the well pad or surrounding area, shall not be used to construct the berm.
- No storm drains, tubing or openings shall be placed in the berm.
- If fluid collects within the bermed area, the fluid must be vacuumed into a safe container and disposed of properly at a state approved facility.
- The integrity of the berm shall be maintained around the surfaced pad throughout the life of the well and around the downsized pad after interim reclamation has been completed.
- Any access road entering the well pad shall be constructed so that the integrity of the berm height surrounding the well pad is not compromised. (Any access road crossing the berm cannot be lower than the berm height.)

Tank Battery Liners and Berms:

Tank battery locations and all facilities will be lined and bermed. A 20 mil permanent liner will be installed with a 4 oz. felt backing to prevent tears or punctures. Tank battery berms must be large enough to contain 1 ½ times the content of the largest tank.

Leak Detection System:

A method of detecting leaks is required. The method could incorporate gauges to measure loss, siting valves and lines so they can be visually inspected, or installing electronic sensors to alarm when a leak is present. Leak detection plan will be submitted to BLM for approval.

Automatic Shut-off Systems:

Automatic shut off, check valves, or similar systems will be installed for pipelines and tanks to minimize the effects of catastrophic line failures used in production or drilling.

Cave/Karst Subsurface Mitigation

The following stipulations will be applied to protect cave/karst and ground water concerns:

Rotary Drilling with Fresh Water:

Fresh water will be used as a circulating medium in zones where caves or karst features are expected. SEE ALSO: Drilling COAs for this well.

Directional Drilling:

Kick off for directional drilling will occur at least 100 feet below the bottom of the cave occurrence zone. SEE ALSO: Drilling COAs for this well.

Lost Circulation:

ALL lost circulation zones from the surface to the base of the cave occurrence zone will be logged and reported in the drilling report.

Regardless of the type of drilling machinery used, if a void of four feet or more and circulation losses greater than 70 percent occur simultaneously while drilling in any cave-bearing zone, the BLM will be notified immediately by the operator. The BLM will assess the situation and work with the operator on corrective actions to resolve the problem.

Abandonment Cementing:

Upon well abandonment in high cave karst areas additional plugging conditions of approval may be required. The BLM will assess the situation and work with the operator to ensure proper plugging of the wellbore.

Pressure Testing:

Annual pressure monitoring will be performed by the operator on all casing annuli and reported in a sundry notice. If the test results indicated a casing failure has occurred, remedial action will be undertaken to correct the problem to the BLM's approval.

Powerlines:

Smaller powerlines will be routed around sinkholes and other karst features to avoid or lessen the possibility of encountering near surface voids and to minimize changes to runoff or possible leaks and spills from entering karst systems. Larger powerlines will adjust their pole spacing to avoid cave and karst features. The BLM, Carlsbad Field Office, will be informed immediately if any subsurface drainage channels, cave passages, or voids are penetrated during construction and no further construction will be done until clearance has been issued by the Authorized Officer. Special restoration stipulations or realignment may be required.

Avoid the pasture fence.

Watershed

- **The entire well pad will be bermed to prevent oil, salt, and other chemical contaminants from leaving the well pad. Topsoil shall not be used to construct the berm. No water flow from the uphill side(s) of the pad shall be allowed to enter the well pad. The berm shall be maintained through the life of the well and after interim reclamation has been completed.**
- **Any water erosion that may occur due to the construction of the well pad during the life of the well will be corrected within two weeks and proper measures will be taken to prevent future erosion.**

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) 234-5909 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 strip the top portion of the soil (root zone) from the entire well pad area and stockpile the topsoil along the edge of the well pad as depicted in the APD. The root zone is typically six (6) inches in depth. All the stockpiled topsoil will be redistributed over the interim reclamation areas. Topsoil shall not be used for berming the pad or facilities. For final reclamation, the topsoil shall be spread over the entire pad area for seeding preparation.

Other subsoil (below six inches) stockpiles must be completely segregated from the topsoil stockpile. Large rocks or subsoil clods (not evident in the surrounding terrain) must be buried within the approved area for interim and final reclamation.

C. CLOSED LOOP SYSTEM

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

Payment shall be made to the BLM prior to removal of any federal mineral materials. 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. EXCLOSURE FENCING (CELLARS & PITS)

Exclosure Fencing

The operator will install and maintain exclosure fencing for all open well cellars to prevent access to public, livestock, and large forms of wildlife before and after drilling operations until the pit is free of fluids and the operator initiates backfilling. (For examples of exclosure fencing design, refer to BLM's Oil and Gas Gold Book, Exclosure Fence Illustrations, Figure 1, Page 18.)

G. 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 twenty-five (25) 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

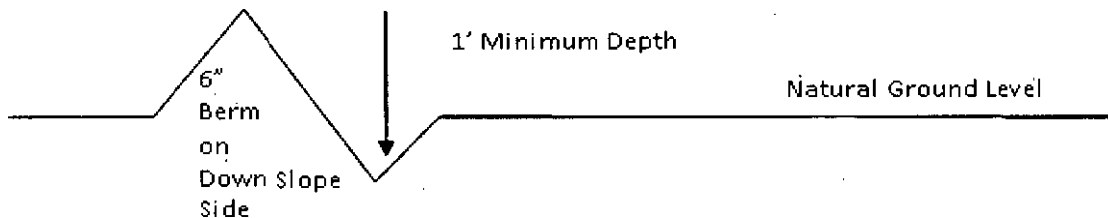
Vehicle turnouts shall be constructed on the road. Turnouts shall be intervisible with interval spacing distance less than 1000 feet. Turnouts shall conform to Figure 1; cross section and plans for typical road construction.

Drainage

Drainage control systems shall be constructed on the entire length of road (e.g. ditches, sidehill outslowing 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:

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

Cattleguards

An appropriately sized cattleguard sufficient to carry out the project shall be installed and maintained at fence/road crossings. Any existing cattleguards on the access road route 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 cattleguards that are in place and are utilized during lease operations.

Fence Requirement

Where entry is granted 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 fences.

Public Access

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

Construction Steps

1. Salvage topsoil
2. Construct road

3. Redistribute topsoil
4. Revegetate slopes

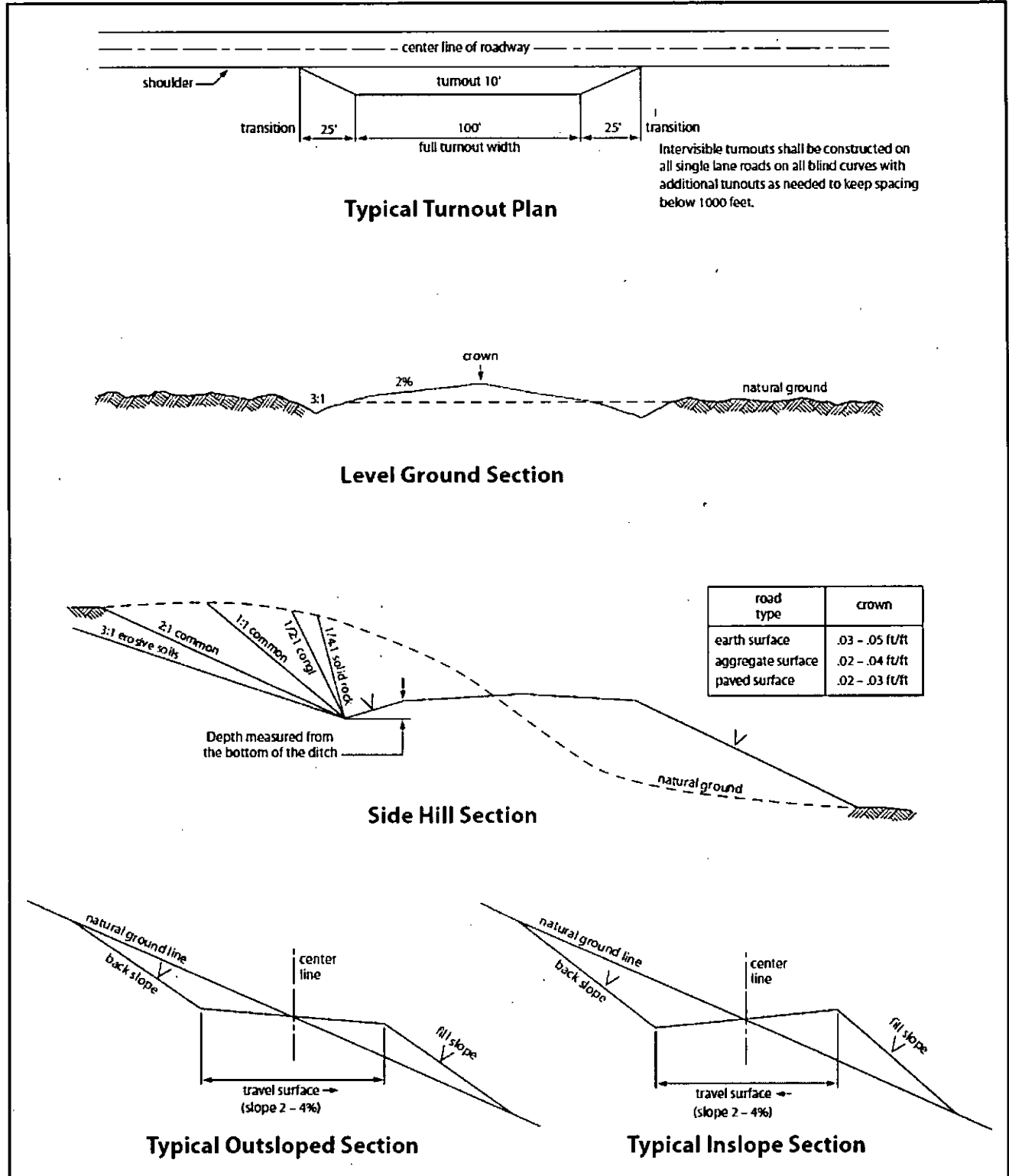


Figure 1. Cross-sections and plans for typical road sections representative of BLM resource or FS local and higher-class roads.

VII. DRILLING

A. DRILLING OPERATIONS REQUIREMENTS

The BLM is to be notified in advance for a representative to witness:

- a. Spudding well (minimum of 24 hours)
- b. Setting and/or Cementing of all casing strings (minimum of 4 hours)
- c. BOPE tests (minimum of 4 hours)

☒ **Eddy County**

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

1. **Hydrogen Sulfide (H₂S) monitors shall be installed prior to drilling out the surface shoe. If H₂S is detected in concentrations greater than 100 ppm, the Hydrogen Sulfide area shall meet Onshore Order 6 requirements, which includes equipment and personnel/public protection items. If Hydrogen Sulfide is encountered, 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. **If the drilling rig is removed without approval – an Incident of Non-Compliance will be written and will be a “Major” violation.**
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 is located, this does not include the dog house or stairway area.
4. **The record of the drilling rate along with the GR/N well log run from TD to surface (horizontal well – vertical portion of hole) shall be submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper copies. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.**

B. CASING

Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size or are Non-API. The Operator can exchange the components of the proposal with that of superior strength (i.e. changing from J-55 to N-80, or from 36# to 40#). Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc.). The initial wellhead installed on the well will remain on the well with spools used as needed.

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

Wait on cement (WOC) for Water Basin:

After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi at the shoe, 2) until cement has been in place at least 8 hours. WOC time will be recorded in the driller's log. 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.

High Cave/Karst

Possibility of water flows in the Salado and Castile.

Possibility of lost circulation in the Salado and Delaware.

A MINIMUM OF TWO CASING STRINGS CEMENTED TO SURFACE IS REQUIRED IN HIGH CAVE/KARST AREAS. THE CEMENT MUST BE IN A SOLID SHEATH. THEREFORE, ONE INCH OPERATIONS ARE NOT SUFFICIENT TO PROTECT CAVE KARST RESOURCES. A CASING DESIGN THAT HAS A ONE INCH JOB PERFORMED DOES NOT COUNT AS A SOLID SHEATH. IF THE PRIMARY CEMENT JOB ON THE SURFACE CASING DOES NOT CIRCULATE, THEN THE NEXT TWO CASING STRINGS MUST BE CEMENTED TO SURFACE.

1. The 13-3/8 inch surface casing shall be set at approximately 375 feet (a minimum of 25 feet into the Rustler Anhydrite and above the salt) and cemented to the surface. **If salt is encountered, set casing at least 25 feet above the salt. Excess calculates to 21% - Additional cement may be required.**
 - 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 surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.
 - 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, which shall be set at approximately 1980 feet (**basal anhydrite of the Castile formation or the Lamar Limestone**), 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 cave/karst.**

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

3. The minimum required fill of cement behind the **5-1/2** inch production casing is:
☒ Cement to surface. If cement does not circulate, contact the appropriate BLM office.
4. 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 53.
2. Variance approved to use flex line from BOP to choke manifold. Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. **Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review. These documents shall be posted in the company man's trailer and on the rig floor.** If the BLM inspector questions the straightness of the hose, a BLM engineer will be contacted and will review in the field or via picture supplied by inspector to determine if changes are required (operator shall expect delays if this occurs).
3. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **2000 (2M) psi (Installing 2M annular)**.
- a. **For surface casing only:** If the BOP/BOPE is to be tested against casing, the wait on cement (WOC) time for that casing is to be met (see WOC statement at start of casing section). Independent service company required.
4. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the **9-5/8** intermediate casing shoe shall be **3000 (3M) psi**.

5. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.
- a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).
 - b. The tests shall be done by an independent service company utilizing a test plug **not a cup or J-packer**. The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to Onshore Order 2 with the pressure not to exceed 70% of the burst rating for the casing. Any test against the casing must meet the WOC time for water basin (8 hours) or potash (24 hours) or 500 pounds compressive strength, whichever is greater, prior to initiating the test (see casing segment as lead cement may be critical item).
 - c. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE. If a linear chart is used, it shall be a one hour chart. A circular chart shall have a maximum 2 hour clock. If a twelve hour or twenty-four hour chart is used, tester shall make a notation that it is run with a two hour clock.
 - d. The results of the test shall be reported to the appropriate BLM office.
 - e. 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.**
 - f. 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. This test shall be performed prior to the test at full stack pressure.

D. DRILL STEM TEST

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

E. WASTE MATERIAL AND FLUIDS

All waste (i.e. drilling fluids, trash, salts, chemicals, sewage, gray water, etc.) created as a result of drilling operations and completion operations shall be safely contained and disposed of properly at a waste disposal facility. No waste material or fluid shall be disposed of on the well location or surrounding area.

Porto-johns and trash containers will be on-location during fracturing operations or any other crew-intensive operations.

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.

Exclosure Netting (Open-top Tanks)

Immediately following active drilling or completion operations, the operator will take actions necessary to prevent wildlife and livestock access, including avian wildlife, to all open-topped tanks that contain or have the potential to contain salinity sufficient to cause harm to wildlife or livestock, hydrocarbons, or Resource Conservation and Recovery Act of 1976-exempt hazardous substances. At a minimum, the operator will net, screen, or cover open-topped tanks to exclude wildlife and livestock and prevent mortality. If the operator uses netting, the operator will cover and secure the open portion of the tank to prevent wildlife entry. The operator will net, screen, or cover the tanks until the operator removes the tanks from the location or the tanks no longer contain substances that could be harmful to wildlife or livestock. Use a maximum netting mesh size of 1 ½ inches. The netting must not be in contact with fluids and must not have holes or gaps.

Chemical and Fuel Secondary Containment and Exclosure Screening

The operator will prevent all hazardous, poisonous, flammable, and toxic substances from coming into contact with soil and water. At a minimum, the operator will install and maintain an impervious secondary containment system for any tank or barrel containing hazardous, poisonous, flammable, or toxic substances sufficient to contain the contents of the tank or barrel and any drips, leaks, and anticipated precipitation. The operator will dispose of fluids within the containment system that do not meet applicable state or U. S. Environmental Protection Agency livestock water standards in accordance with state law; the operator must not drain the fluids to the soil or ground. The operator will design, construct, and maintain all secondary containment systems to prevent wildlife and livestock exposure to harmful substances. At a minimum, the operator will install effective wildlife and livestock exclosure systems such as fencing, netting, expanded metal mesh, lids, and grate covers. Use a maximum netting mesh size of 1 ½ inches.

Open-Vent Exhaust Stack Exclosures

The operator will construct, modify, equip, and maintain all open-vent exhaust stacks on production equipment to prevent birds and bats from entering, and to discourage perching, roosting, and nesting. (*Recommended exclosure structures on open-vent exhaust stacks are in the shape of a cone.*) Production equipment includes, but may not be limited to, tanks, heater-treaters, separators, dehydrators, flare stacks, in-line units, and compressor mufflers.

Containment Structures

Proposed production facilities such as storage tanks and other vessels will have a secondary containment structure that is constructed to hold the capacity of 1.5 times the largest tank, plus freeboard to account for precipitation, unless more stringent protective requirements are deemed necessary.

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** from the BLM Standard Environmental Color Chart (CC-001: June 2008).

IX. 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.

Within six (6) months of well completion, operators should work with BLM surface management specialists (Jim Amos: 575-234-5909) to devise the best strategies to reduce the size of the location. Interim reclamation 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 that is free of contaminants 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.

All disturbed areas after they have been satisfactorily prepared need to be reseeded with the seed mixture provided below.

Upon completion of interim reclamation, the operator shall submit a Sundry Notices and Reports on Wells, Subsequent Report of Reclamation (Form 3160-5).

X. FINAL ABANDONMENT & RECLAMATION

At final abandonment, well locations, production facilities, and access roads must undergo "final" reclamation so that the character and productivity of the land are restored.

Earthwork for final reclamation must be completed within six (6) months of well plugging. All pads, pits, facility locations and roads must be reclaimed to a satisfactory revegetated, safe, and stable condition, unless an agreement is made with the landowner or BLM to keep the road and/or pad intact.

After all disturbed areas have been satisfactorily prepared, these areas need to be revegetated with the seed mixture provided below. Seeding should be accomplished by drilling on the contour whenever practical or by other approved methods. Seeding may need to be repeated until revegetation is successful, as determined by the BLM.

Operators shall contact a BLM surface protection specialist prior to surface abandonment operations for site specific objectives (Jim Amos: 575-234-5909).

Mixture 4, for Gypsum Sites

The holder shall seed all the 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 by the authorized officer.

Seed will be planted using a drill equipped with a 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 (smaller/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
Alkli Sacaton (<i>Sporobolus airoides</i>)	1.5
DWS Four-wing saltbush (<i>Atriplex canescens</i>)	18.0
DWS: DeWinged Seed	

*Pounds of pure live seed:

Pounds of seed x percent purity x percent germination = pounds pure live seed

NMOCD CONDITION OF APPROVAL

The *New!* Gas Capture Plan (GCP) notice is posted on the NMOCD website under Announcements. The Plan became effective May 1, 2016. A copy of the GCP form is included with the NOTICE and is also in our FORMS section under Unnumbered Forms. Please review filing dates for all applicable activities currently approved or pending and submit accordingly. Failure to file a GCP may jeopardize the operator's ability to obtain C-129 approval to flare gas after the initial 60-day completion period.