13-472

OCD Artesia

Form 3160-3
(April 2004)

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

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No.
SL:V0-6203, BHL:NMNM0553777

6. If Indian, Allotee or Tribe Name
N/A

1a. Type of work: ☑ DRILL ☐ REENTER

7. If Unit or CA Agreement, Name and No.
N/A

1b. Type of Well: ☑ Oil Well ☐ Gas Well ☐ Other ☑ Single Zone ☐ Multiple Zone

8. Lease Name and Well No.
Grave Digger State Com #5H

2. Name of Operator
COG Operating LLC

9. API Well No.
30-015-40412

3a. Address
One Concho Center, 600 W Illinois Ave
Midland TX 79701

3b. Phone No. *(include area code)*
(432) 685-4384

10. Field and Pool, or Exploratory
N Seven Rivers;Glorieta Yeso 97565

4. Location of Well *(Report location clearly and in accordance with any State requirements.*)*
At surface SHL: 205' FNL & 990' FWL, Lot 4
At proposed prod. zone BHL: 330' FSL & 990' FWL, UL M

11. Sec., T. R. M. or Blk. and Survey or Area
Sec 2, T20S, R25E

14. Distance in miles and direction from nearest town or post office*
2.5 miles Northeast of Loco Hills, NM

12. County or Parish
Eddy

13. State
NM

15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any)	16. No. of acres in lease	17. Spacing Unit dedicated to this well
205'	S:321.04 B:280.62	160.48
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.	**19. Proposed Depth**	**20. BLM/BIA Bond No. on file**
591'	TVD: 2859' MD: 7316' Pilot Hole: 4200'	NMB000740; NMB000215
21. Elevations (Show whether DF, KDB, RT, GL, etc.)	**22. Approximate date work will start***	**23. Estimated duration**
3473' GL	11/30/2012	10 days

24. Attachments

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

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

25. Signature	Name *(Printed/Typed)*	Date
	Kelly J Holly	03/01/2013

Title: Permitting Tech

Approved by *(Signature)* /s/ James Stovall	Name *(Printed/Typed)*	Date APR 26 2013
Title FIELD MANAGER	Office CARLSBAD FIELD OFFICE	

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

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

(Instructions on page 2)

Roswell Controlled Water Basin

Approval Subject to General Requirements & Special Stipulations Attached

(Cancels & Supersedes State APD apvd 6-21-12)

RECEIVED
APR 30 2013
NMOCD ARTESIA

SEE ATTACHED FOR CONDITIONS OF APPROVAL

DISTRICT I
1625 N. French Dr., Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720
DISTRICT II
811 S. First St., Artesia, NM 88210
Phone: (575) 748-1283 Fax: (575) 748-9720
DISTRICT III
1000 Rio Brazos Road, 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	Pool Code	Pool Name
30-015-40412	97565	N Seven Rivers; Glorieta Yeso

Property Code	Property Name	Well Number
97565	GRAVE DIGGER STATE COM	5H

OGRID No.	Operator Name	Elevation
229137	COG OPERATING, LLC	3473'

Surface Location

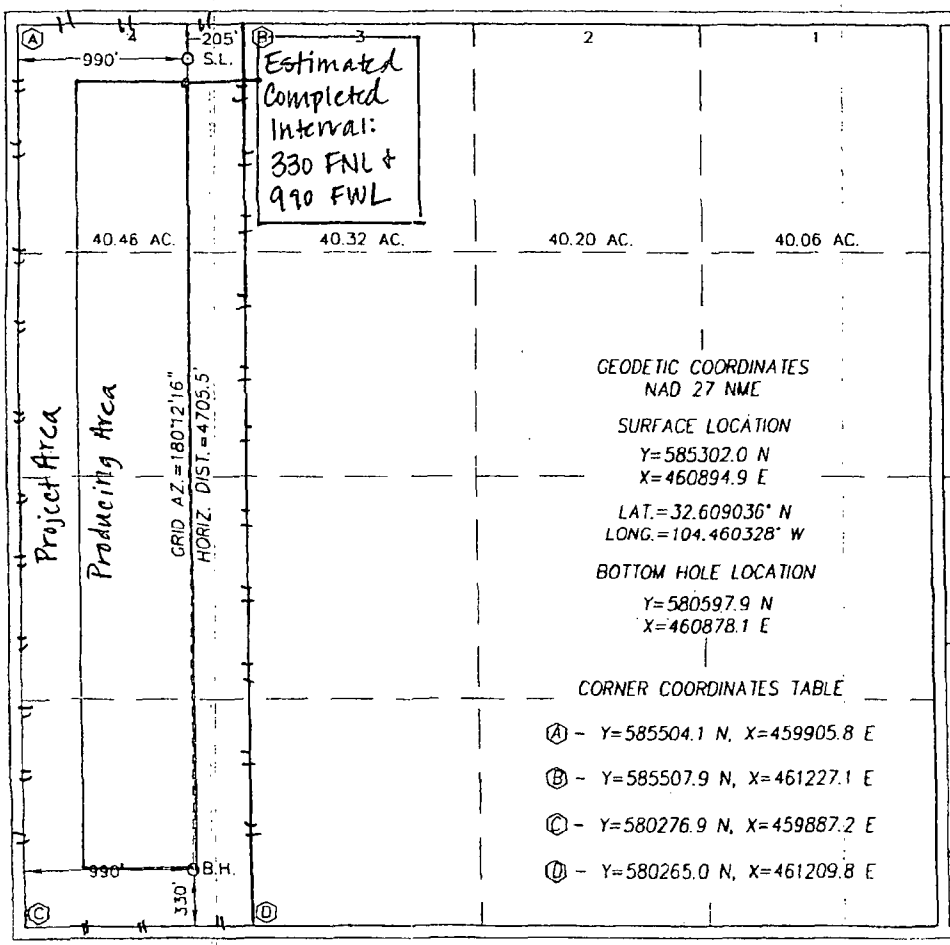
UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
4	2	20-S	25-E		205	NORTH	990	WEST	EDDY

Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
M	2	20-S	25-E		330	SOUTH	990	WEST	EDDY

Dedicated Acres	Joint or Infill	Consolidation Code	Order No.
160.46			

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 unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Signature — Date: 3-1-13

Kelly J. Holly
Printed Name

kholly@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 3, 2012
Date of Survey
Signature & Seal of Professional Surveyor:

RONALD J. EIDSON
NEW MEXICO
3239
REGISTERED PROFESSIONAL SURVEYOR

Ronald J. Eidson 05/21/2012

Certificate Number: Gary L. Eidson 12641
Ronald J. Eidson 3239

DSS — JWSC W.O.: 12.11.0906

I hereby certify that I, or persons under my direct supervision, have inspected the drill site and access road proposed herein; that I am familiar with the conditions that presently exist; that I have full knowledge of State and Federal laws applicable to this operation; that the statements made in this APD package are, to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed in conformity with this APD package and the terms and conditions under which it is approved. I also certify that I, or COG Operating, LLC, am responsible for the operations conducted under this application. These statements are subject to the provisions of 18 U.S.C. 1001 for the filing of false statements. Executed this 19th day of March, 2012.

Signed: Carl Bird

Printed Name: Carl Bird

Position: Drilling Engineer

Address: One Concho Center, 600 W. Illinois, Midland, Texas 79701

Telephone: (432) 683-7443

Field Representative (if not above signatory): Same

E-mail: cbird@concho.com

Form 3160-9
(December 1989)

Number 13DW001
Page 1 of 2

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

NOTICE OF INCIDENTS OF NONCOMPLIANCE

☒ Certified Mail - Return Receipt Requested 70053110000010627281

☐ Hand Delivered Received by

Identification	
IID	
Lease	NMNM0553777
CA	
Unit	
PA	

Bureau of Land Management Office	CARLSBAD FIELD OFFICE
Address	620 E GREENE STREET CARLSBAD NM 88220
Telephone	575-234-5926
Inspector	WHITLOCK

Operator	COG OPERATING LLC
Address	ONE CONCHO CENTER 600 W ILLINOIS AVENUE MIDLAND TX 79701
Attention	
Attn Addr	

Site Name	Well or Facility	1/4 1/4 Section	Township	Range	Meridian	County	State
GRAVE DIGGER STATE COM	5H	NWNW 2	20S	25E	NMP	EDDY	NM
Site Name	Well or Facility	1/4 1/4 Section	Township	Range	Meridian	County	State

THE FOLLOWING VIOLATION WAS FOUND BY BUREAU OF LAND MANAGEMENT INSPECTORS ON THE DATE AND AT THE SITE LISTED ABOVE

Date	Time (24 - hour clock)	Violation	Gravity of Violation
03/07/2013	08:00	43 CFR3162.1(a) 43 CFR 3163.1(b) (2)	MAJOR
Corrective Action To Be Completed By	**Date Corrected**	**Assessment for Noncompliance**	**Assessment Reference**
04/07/2013	4-15-13 JDW	$5000.00	43 CFR 3163.1(b)

Remarks

LOCATION BUILT, WELL DRILLED AND COMPLETED PRIOR TO SUBMITTING AN APD FOR APPROVAL. FOR DRILLING WITHOUT APPROVAL OR FOR CAUSING SURFACE DISTURBANCE ON FEDERAL OR INDIAN SURFACE PRELIMINARY TO DRILLING WITHOUT APPROVAL $500 PER DAY FOR EACH DAY THAT THE VIOLATION EXISTED INCLUDING DAYS THE VIOLATION EXISTED PRIOR TO DISCOVERY, NOT TO EXCEED $5,000:
(Remarks continued on following page(s).)

When violation is corrected, sign this notice and return to above address.

Company Representative Title _____ Signature _____ Date _____

Company Comments _____

WARNING

Incidents of Noncompliance correction and reporting timeframes begin upon receipt of this Notice or 7 business days after the date it is mailed, whichever is earlier. Each violation must be corrected within the prescribed time from receipt of this Notice and reported to the Bureau of Land Management office at the address shown above. Please note that you already may have been assessed for noncompliance (see amount under "Assessment for Noncompliance"). If you do not comply as noted above under "Corrective Action To Be Completed By" you may incur an additional assessment under (43 CFR 3163.1) and may also incur Civil Penalties (43 CFR 3163.2). All self-certified corrections must be postmarked no later than the next business day after the prescribed time for correction.

Section 109(d)(1) of the Federal Oil and Gas Royalty Management Act of 1982, as implemented by the applicable provisions of the operating regulations at Title 43 CFR 3163.2(f)(1), provides that any person who "knowingly or willfully" prepares, maintains, or submits, false, inaccurate, or misleading reports, notices, affidavits, record, data, or other written information required by this part shall be liable for a civil penalty of up to $25,000 per violation for each day such violation continues, not to exceed a maximum of 20 days.

REVIEW AND APPEAL RIGHTS

A person contesting a violation shall request a State Director review of the Incidents of Noncompliance. This request must be filed within 20 working days of receipt of the Incidents of Noncompliance with the appropriate State Director (see 43 CFR 3165.3). The State Director review decision may be appealed to the Interior Board of Lands Appeals, 801 North Quincy Street, Suite 300, Arlington VA 22203 (see 43 CFR 3165.4). Contact the above listed Bureau of Land Management office for further information.

Signature of Bureau of Land Management Authorized Officer	Date	Time
J. D. Whitlock Jr	3/28/13	1315

FOR OFFICE USE ONLY

Number	Date	Assessment	Penalty	Termination
53		$5000.00		
Type of Inspection				
ES				

BLM Remarks, continued

CORRECTIVE ACTION: SHUT WELL IN, SUBMIT APD FOR APPROVAL AND ALL REQUIRED SUNDRY NOTICES TO INCLUDE COMPLETION REPORT PRIOR TO RETURNING WELL TO PRODUCTION. WELL MAY NOT BE RETURNED TO PRODUCTION PRIOR TO APD BEING APPROVED.

WELL SPUD 11/30/2012, WELL TD ON 12/14/2012. COMPLETION WORK STARTED 12/20/12 AND WELL COMPLETED FOR PRODUCTION 1/20/2013.

7005 3110 0000 1062 7281

7005 3110 0000 1062 7281

U.S. Postal Service™ assessment
CERTIFIED MAIL™ RECEIPT
(Domestic Mail Only; No Insurance Coverage Provided)

For delivery information visit our website at www.usps.com®

OFFICIAL USE

Postage	$
Certified Fee	
Return Receipt Fee (Endorsement Required)	
Restricted Delivery Fee (Endorsement Required)	
Total Postage &	

Postmark Here

LD

Sent To
Street, Apt. No.; or PO Box No.
City, State, ZIP+4

COG PRODUCTION LLC
ONE CONCHO CENTER
600 W ILINOIS AVE
MIDLAND TX 79701

PS Form 3800, June 2002

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

COG PRODUCTION LLC
ONE CONCHO CENTER
600 W ILINOIS AVE
MIDLAND TX 79701

LD

assessment

2. Article Number
(Transfer from service label) 7005 3110 0000 1062 7281

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

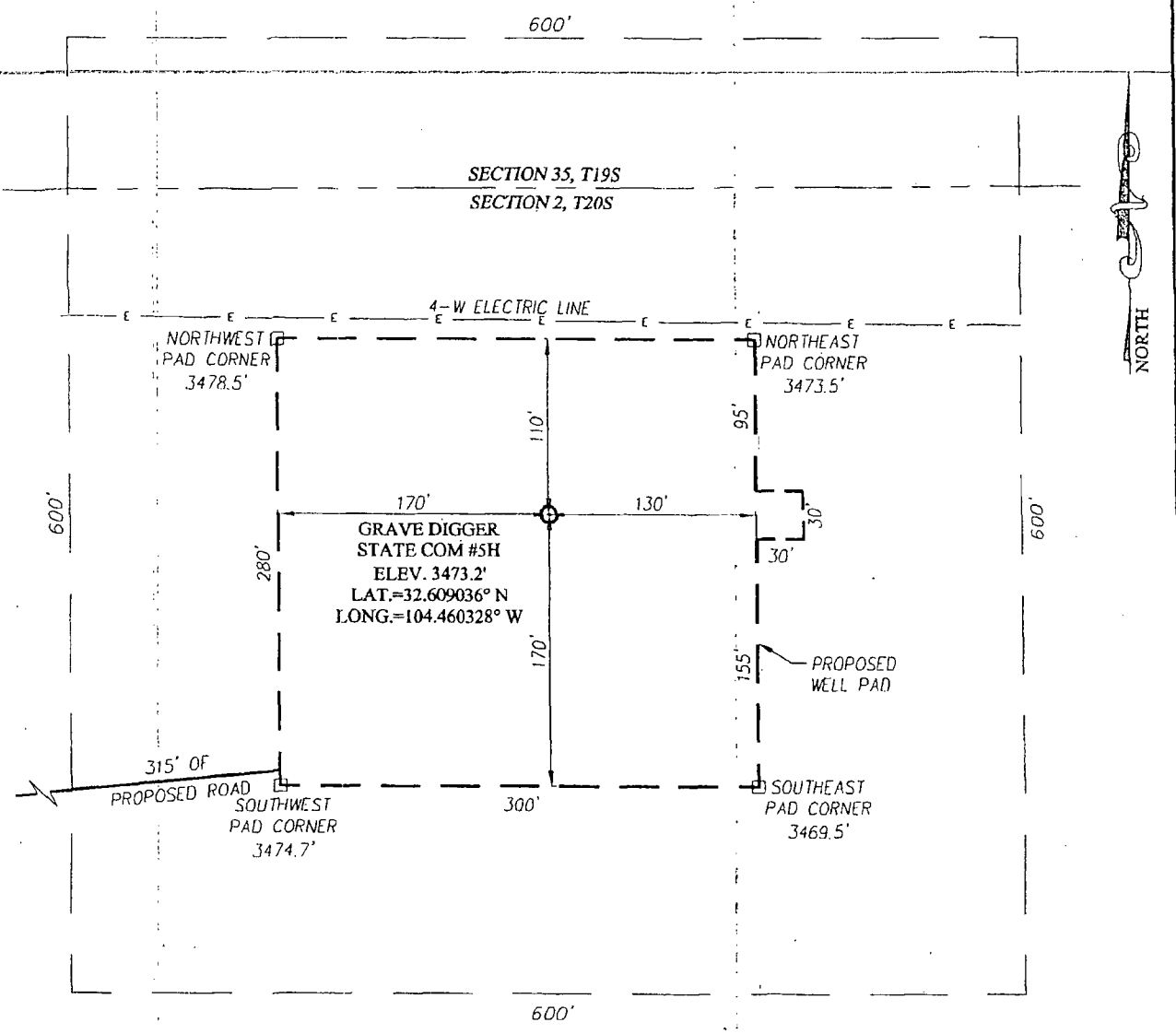
3. Service Type
☒ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? *(Extra Fee)* ☐ Yes

PS Form 3811, February 2004 Domestic Return Receipt 102595-02-M-1540

SECTION 2, TOWNSHIP 20 SOUTH, RANGE 25 EAST, N.M.P.M.

EDDY COUNTY NEW MEXICO



DIRECTIONS TO LOCATION

FROM THE INTERSECTION OF HIGHWAY 285 (SEVEN RIVERS HWY.) AND CO. RD. 23 (ROCK DAISY RD), GO WEST ON CO. RD. 23 APPROX. 3.0 MILES. TURN LEFT AND GO SOUTH APPROX. 1.0 MILE TO THE EXISTING GRAVE DIGGER STATE COM #1H WELL PAD. FROM THE SOUTHEAST CORNER OF THE EXISTING WELL PAD, FOLLOW PROPOSED ROAD SURVEY STAKES EAST APPROX. 315 FEET TO THIS LOCATION.

100 0 100 200 Feet

Scale: 1"=100'

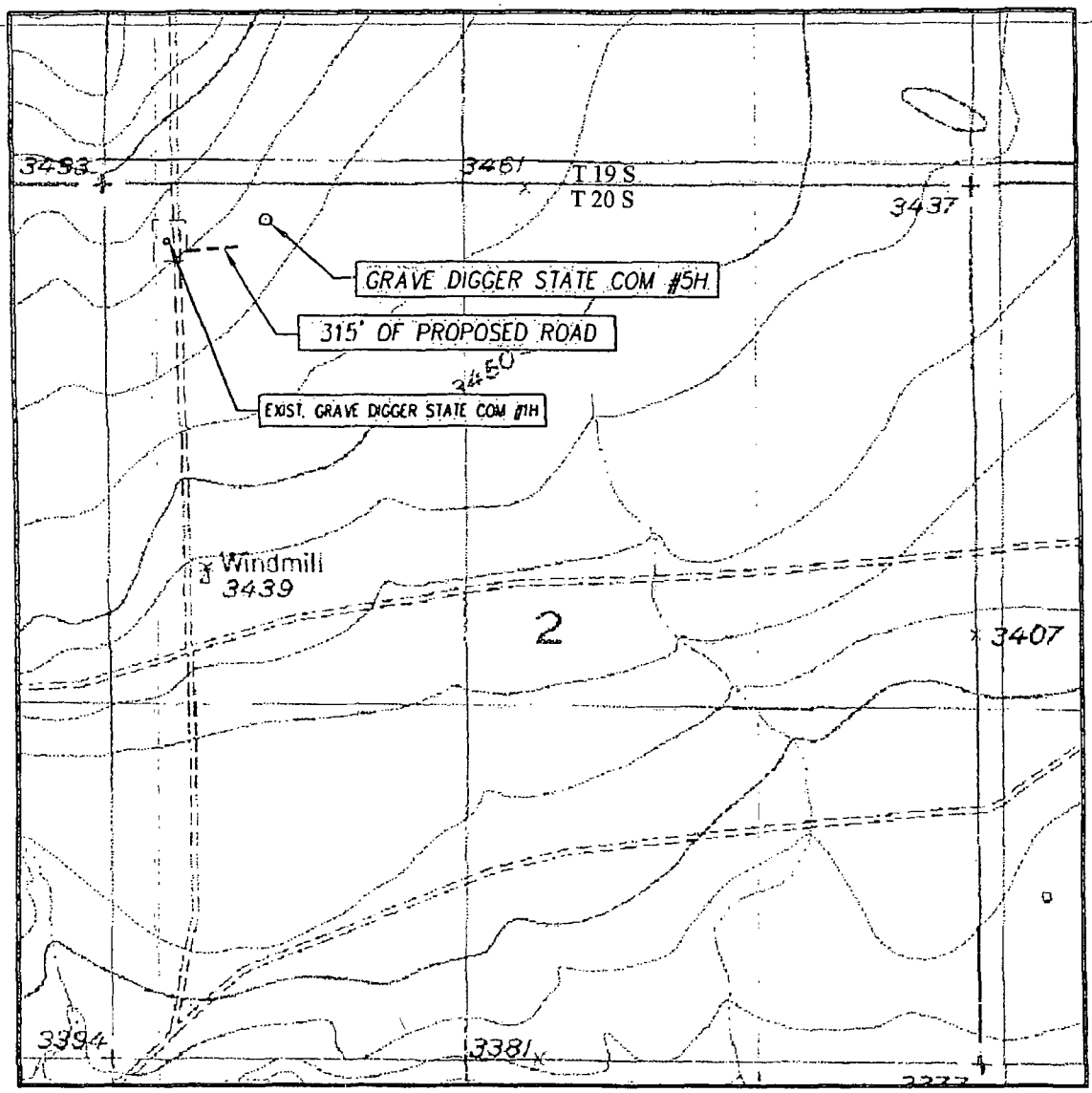
PROVIDING SURVEYING SERVICES SINCE 1946
JOHN WEST SURVEYING COMPANY
412 N. DAL PASO
HOBBS, N.M. 88240
(575) 393-3117 www.jwsc.biz

COG OPERATING, LLC

GRAVE DIGGER STATE COM #5H WELL
LOCATED 205 FEET FROM THE NORTH LINE
AND 990 FEET FROM THE WEST LINE OF SECTION 2,
TOWNSHIP 20 SOUTH, RANGE 25 EAST, N.M.P.M.,
EDDY COUNTY, NEW MEXICO

Survey Date: 5/3/12	CAD Date: 5/18/12	Drawn By: DSS
W.O. No.: 12110906	Rev:	Rel. W.O.:	Sheet 1 of 1

LOCATION VERIFICATION MAP



SCALE: 1" = 1000'

CONTOUR INTERVAL:
SEVEN RIVERS, N.M. - 10'

SEC. 2 TWP. 20-S RGE. 25-E

SURVEY N.M.P.M.

COUNTY EDDY STATE NEW MEXICO

DESCRIPTION 205' FNL & 990' FWL

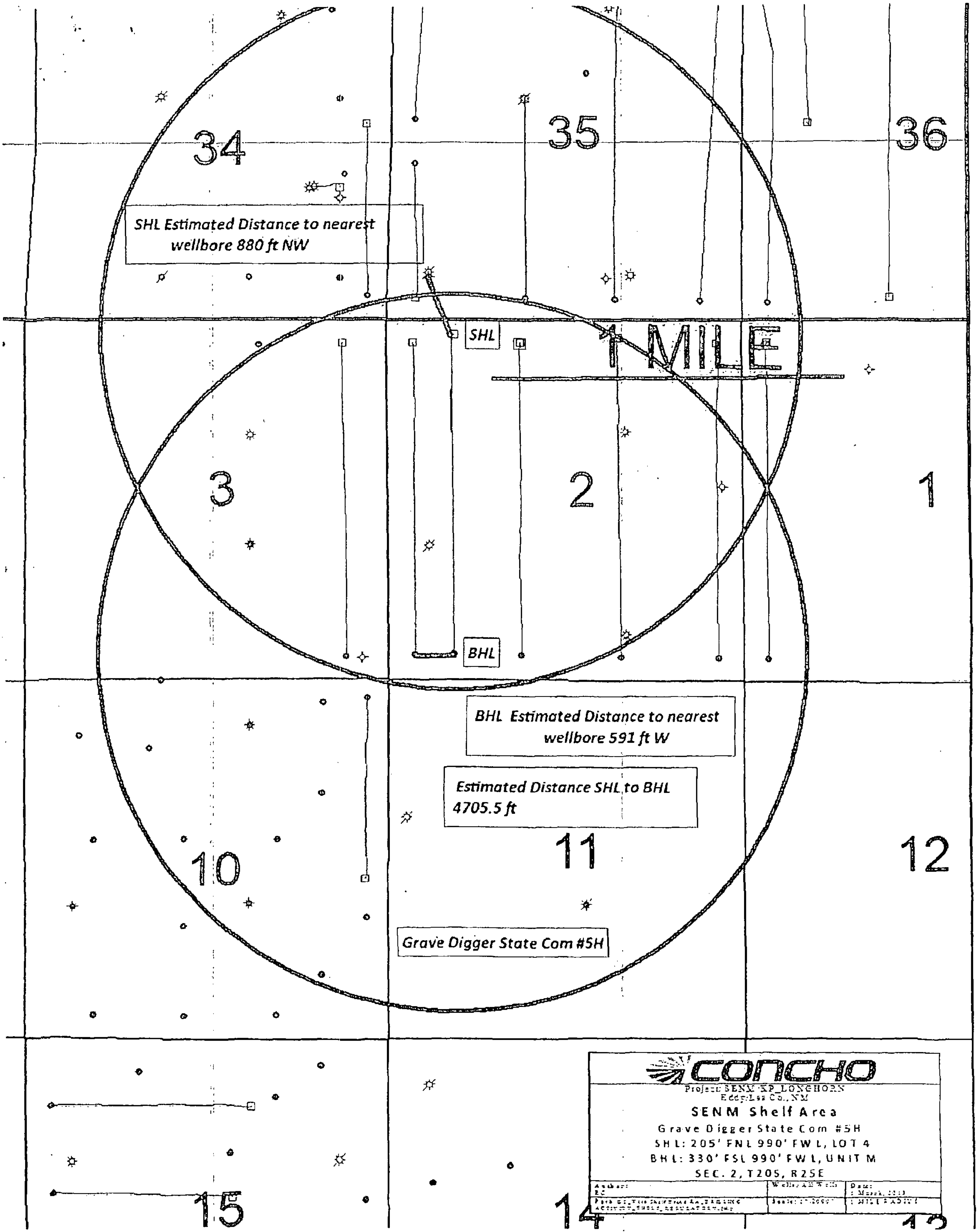
ELEVATION 3473'

OPERATOR COG OPERATING, LLC

LEASE GRAVE DIGGER STATE COM

U.S.G.S. TOPOGRAPHIC MAP
SEVEN RIVERS, N.M.

PROVIDING SURVEYING SERVICES
SINCE 1946
JOHN WEST SURVEYING COMPANY
412 N. DAL PASO
HOBBS, N.M. 88240
(575) 393-3117 www.jwsc.biz


34
35
36
SHL Estimated Distance to nearest wellbore 880 ft NW
SHL
1 MILE
3
2
1
BHL
BHL Estimated Distance to nearest wellbore 591 ft W
Estimated Distance SHL to BHL 4705.5 ft
10
11
12
Grave Digger State Com #5H
15
14
CONCHO
SENM Shelf Area
Grave Digger State Com #5H
SHL: 205' FNL 990' FWL, LOT 4
BHL: 330' FSL 990' FWL, UNIT M
SEC. 2, T20S, R25E

ATTACHMENT TO FORM 3160-3
COG Operating, LLC
Grave Digger State Com #5H
SHL: 250' FNL & 990' FWL, UNIT D
BHL: 330' FSL & 990' FWL, UNIT M
Sec 2, T20S, R25E
Eddy County, NM

1. **Proration Unit Spacing**: 160 Acres

2. **Ground Elevation**: 3473'

3. **Depths**: Horizontal: **EOC (end of curve) TVD=2895' MD= 3307'**
Toe (end of lateral) TVD=2859' MD= 7316'
Pilot Hole TD 4200'

4. **Tops of geological markers:**

Fresh Water	133'
Quaternary alluvial and eolian deposits/ Permian Seven Rivers @ surface	
Queen	88'
Grayburg	470'
San Andres	850'
Glorieta	2405'
Paddock	2460'
Blinebry	3145'
Tubb	3997'

5. **Mineral bearing formations**:

Grayburg	470'	Oil/Gas
San Andres	850'	Oil/Gas
Glorieta	2405'	Oil/Gas
Paddock	2460'	Oil/Gas
Blinebry	3145'	Oil/Gas
Tubb	3997'	Oil/Gas

No other formations with the potential to produce oil, gas or fresh water in measurable quantities were penetrated. 8 5/8" casing was set at 1102' and cement circulated back to the surface (see section #9 for cement details) thus protecting the surface fresh water sand. All the above mentioned zones with the potential of commercial quantities of oil and/or gas, had cement circulated across them (see section #9 for cement details).

6. **Drilling summary:**

The Grave Digger State Com #5H was spudded on 11/30/12 at 0700 hrs. At 502' lost circulation occurred, a LCM pill was spotted across loss zone, reamers were laid down and drilling continued with no returns. AT 554 regained 50% returns and drilled to 698' with 50% returns. AT 698' lost complete returns and drilled with no returns to 813'. Regained partial returns at 813' and continued drilling with partial returns to 1102'. TDd 11" hole at 1102'. 8 5/8" casing was run and cemented as described in cement section of this report. After proper WOC time and BOP testing, drilling was resumed with 7 7/8" hole being drilled to 4200'. At this depth open hole logs along with gyro were run and the well plugged back in two stages to 2090'. At this depth a new 7 7/8" hole was drilled thru KOP (Kick off point), curve and lateral to TD. 5 ½" casing was installed and cemented to surface as described in the cement section of this report.

7. **Mud System**

The well was drilled to TD with a combination of fresh water, cut brine and polymer mud systems. The applicable depths and properties of those systems were as follows:

DEPTH (MD)	TYPE	WEIGHT	VISCOSITY	WATERLOSS
0-1102'	Fresh Water	8.3	28	N.C.
1110'-4200' (pilot Hole TD)	Fresh water Cut Brine	8.55-8.65	30	N.C.
2300'-3199'	Fresh water Cut Brine	8.6-8.65	30	N.C.
3199'-7316'	Fresh water Cut Brine/polymer	8.65-8.8	30	N.C.

Sufficient mud materials were kept at the well site to maintain mud properties and meet minimum lost circulation and weight increase requirements at all times.

Visual and electronic mud monitoring equipment was in place to detect volume changes indicating loss or gain of circulating fluid volume.

The mud program was designed to minimize the volume of H2S circulated to surface. Proper mud weights, safe drilling practices and the use of H2S scavengers will minimize hazards when penetrating H2S bearing zones.

8. **Casing Program**

Hole Size	Interval MD	OD Casing	Weight	Grade	Condition	Jt.	brst/clps/ten
11"	0-1102'	8 5/8" 0'-1102'	32#	J-55	New	LT&C	4.73/4.75/21.1
7 7/8"	1102'-7316'	5 1/2" 0'-7316'	17#	L-80	New	LT&C	3.35/4.18/12.97

Production string was 5 ½" 17# L80 LTC run from surface thru curve to TD.

9. **Cement Program**

8 5/8" SURFACE: Baker Hughes Cementers

Cement surface casing as follows:
1) pump 10 bbls fresh water
2) pump 24 bbls GW-27
3) pump 5 bbls fresh water
4) pump 50 sks Class 'C" plus additives 1.34 cf/sk, 14.8 ppg
5) pump 300 sks Class"H" Thickset 1.49 cf/sk, 14.6 ppg
6) pump 250 sks Class "C" plus additives 1.74 cf/sk,13.5 ppg
7) pump 400 sks Class "C" plus additives 1.74 cf/sk, 13.5 ppg
8) pump 300 sks Class "C" plus additives 1.34 cf/sk, 14.8 ppg
9) displace with 65 bbls fresh water, bump plug to 1105 psig. Circulate 323 sks to pit.

5 ½" PRODUCTION CASING: Halliburton

Cement production casing as follows:
1) pump 30 bbls fresh water
2) pump 400 sks Class "C" plus additives 2.05 cf/sk, 12.5 ppg
3) pump 150 sks Class 'C" plus additives 1.39 cf/sk, 13.5 ppg
5) pump 400 sks ASC (acid soluble cement) Class"H" plus additives 2.55 cf/sk, 15.2 ppg
6) displace with 175 bbls fresh water
7) circulate 246 sks cement to surface

Note: See Attached Halliburton pilot data. Although the yield on this tail cement is high it is not a "junk" cement.

Note: 5 ½" casing was run from surface thru curve and lateral to TD of 7316' MD. Productive intervals were isolated by cement as described above..

Plug back cement as follows: Baker Hughes Cementers

Ran in hole with 4 ½" drill pipe and tag TD at 4200'. Plug back as follows:
1) pump 10 bbls Freshwater spacer
2) pump 500 sks class"C" + 1.50% CD-32 + 0.2% SMS + 5% Salt-wt. 16.8 ppg, yield 1.03 cu.ft./sk. Displace with 34 bbls drlg fluid
3) POH with drill pipe to 3181' and circulate 153 sks cement to pit.
4) WOC 7 hours
5) RBIH and tag TOC at 3190'
6) pump 10 bbls Freshwater spacer

7) pump 500 sks class"C" + 1.50% CD-32 + 0.2% SMS + 5% Salt-wt. 16.8 ppg, yield 1.03 cu.ft./sk. Displace with 22 bbls drlg fluid.
8) POH with drill pipe to 2090' and circulate off cement. Circulate 169 sks to pit.
9) POH and WOC 12 hrs.

10. Pressure Control Equipment:

The blowout preventer equipment (BOP) was 13 5/8" 3000 psi Hydril type annular preventer as provided for in Onshore Order #2. This unit was hydraulically operated. A 11" X 3000 psi X 8 5/8" SOW permanent casing head was installed on the 8 5/8" casing. The BOP was nippled up on the 11" permanent casing head and tested to 2000 psig/250 psig by third party independent testers. This BOP stack was used continuously until total depth was reached. Other accessories to the BOP equipment included a Kelly cock and floor safety valve, choke lines and a choke manifold with a 2000 psi WP rating all of which were also tested to 2000 psig and 250 psig by independent tester .

11. Production Hole Drilling Summary:

Drill pilot hole to 4200', run logs. Plug back with 1000sx Class C to 2090'. Drill 7 7/8" hole to 2300'. Kick off at +/- 2300', building curve at 11°/100' over +/- 800' to inclination of 90°, AZ 180.00° at 3307' MD/2895' TVD. Maintain 90° inclination, 180° azmith for +/-4671' lateral to TD at +/-7406' MD, 2859' TVD. Run 5 ½" casing from surface thru curve and lateral to TD. 5 ½" csg was isolated by a single stage cement job (see section #9 for cement details). Minimum tie back of cement is 200' above 8 5/8" csg shoe. Cement volumes were calculated to surface.

12. Auxiliary Well Control and Monitoring Equipment

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

B. A full opening drill pipe-stabbing valve with proper drill pipe connections will be on the rig floor at all times.

13. Logging, Testing and Coring Program:

A. The following logs will be run in the vertical portion of the hole to KOP: SLB-PEX/HRLA,HNGS.

B. The mud logging program will consist of lagged 10' samples from 8 5/8" casing point to TD .

C. Drill Stem test is not anticipated.

D. No conventional coring is anticipated.

E. Further testing procedures will be determined after the 5 ½" production casing has been cemented at TD based on drill shows and log evaluation.

14. Abnormal Conditions, Pressures, Temperatures and Potential Hazards:

No abnormal pressures or temperatures were encountered. The bottom hole temperature is 90° Fahrenheit. Maximum bottom hole pressure is 1175 psi. This well penetrated formations that are known or could reasonably be expected to contain hydrogen sulfide. Measurable gas volumes or hydrogen sulfide levels were not encountered during drilling operations. However a H2S drilling operations plan was available if needed. If H2S concentrations had exceeded 100 ppm a remote operated choke would have been installed (see diagram #8 & #9) and COG would have complied with the specifics of Onshore Order #6. All BOPE testing companies used by COG have H2S certified employees and will work on H2S locations.

Loss circulation occurred at 502'. (Details described in section #6 drilling summary).

15. Drilling & Completion Time Line ---Starting Date & Ending Date

Drilling operations were commenced on **November 30, 2012** and drilling rig was release on **12/15/12**. Completion operations were completed on **1/23/13.**

JW DRILLING INC. Oil Well Drilling Contractor

Post Office Box 160 Artesia, New Mexico 88211-0160 Office (575) 748-8704 Fax (575) 748-8719

December 10, 2012

COG Operating, LLC
One Concho Center 600 W. Illinois Ave
Midland, Texas 79701

Re: Grave Digger St. Com # 5H
Sec. 2, T-20-S, R-25-E
Eddy County, New Mexico

Attn: Jim Evans

The following is a Deviation Survey on the referenced well in Eddy County, New Mexico:

373' - 1°	1812' - 0.5°	3434' - 0.75°
628' - 1.5°	2310' - 0.75°	3933' - 1°
1043' - 1°	2747' - 0.75°	
1343' - 0.5°	3185' - 1.25°	

Sincerely,

Gary W. Chappell
Contracts Manager

STATE OF NEW MEXICO)
)
COUNTY OF EDDY)

The foregoing was acknowledged before me this 10th day of December, 2012 by Gary W. Chappell.

Barbara M Johnson
NOTARY PUBLIC

Official Seal
BARBARA M. JOHNSON
Notary Public
State of New Mexico
My Commission Expires 1-20-16

HALLIBURTON
Permian Basin, Hobbs

HD Lab Results- Lead

Job Information

Request/Slurry	2009346/3	**Rig Name**	United #40	**Date**	4/FEB/2013
Submitted By	Adam Giovengo	**Job Type**	Production Casing	**Bulk Plant**	
Customer	Cog Operating LLC	**Location**	Eddy	**Well**	Burch Keely Unit #965H

Well Information

Casing/Liner Size	5.5"	**Depth MD**	9122 ft	**BHST**	117 degF
Hole Size	7.875"	**Depth TVD**	4950 ft	**BHCT**	110 degF

Drilling Fluid Information

Mud Supplier Name	Mud Trade Name	Density

Cement Information - Lead Design

Conc	UOM	Cement/Additive	Sample Type	Sample Date	Lot No.
		EconoCem			
12.3	gal/sack	Field (Fresh) Water			
		Hobbs - EconoCem – HLC (65/35) Class C/Poz			
100	% BWOC	Cement Blend			
3	lb/sk	NaCl (Sodium Chloride) Salt			
5	lb/sk	Kol-Seal			
0.35	% BWOC	Econolite (Powder - PB)			
0.4	% BWOC	CFR-3 (PB)			
0.125	lb/sk	Pol-E-Flake			

Cement Properties		
Slurry Density	12.201	lbm/gal
Slurry Yield	2.23	ft3/sack
Water Requirement	12.30	gal/sack
Total Mix Fluid	12.30	gal/sack
Water Source	Field (Fresh) Water	
Water Chloride	N/A	

Operation Test Results Request ID 2009346/3

Thickening Time

Temp (°F)	Pressure (psi)	Reached in (min)	70 Bc (hh:mm)
107	3200	17	3:15

Pilot Test Results Request ID 220155/3

UCA Comp. Strength

End Temp (°F)	Pressure (psi)	500 psi (hh:mm)	12 hr CS (psi)	24 hr CS (psi)
116	1000	26:25	289	468

HALLIBURTON

Permian Basin, Hobbs

HD Lab Results- Tail

Job Information

Request/Slurry	251777/1	**Rig Name**	United #40	**Date**	4/FEB/2013
Submitted By	Adam Giovengo	**Job Type**	Production Casing	**Bulk Plant**	
Customer	Cog Operating LLC	**Location**	Eddy	**Well**	Burch Keely Unit #965H

Well Information

Casing/Liner Size	5.5"	**Depth MD**	9122 ft	**BHST**	117 degF
Hole Size	7.875"	**Depth TVD**	4950 ft	**BHCT**	110 degF

Drilling Fluid Information

Mud Supplier Name	Mud Trade Name	Density

Cement Information - Tail Design

Conc	UOM	Cement/Additive	Sample Type	Sample Date	Lot No.	Cement Properties		
		VersaCem				Slurry Density	14.004	lbm/gal
6.32	gal/sack	Fresh Water				Slurry Yield	1.39	ft3/sack
						Water Requirement	6.32	gal/sack
		Hobbs - VersaCem - C	(50/50) Class C/Poz			Total Mix Fluid	6.32	gal/sack
100	% BWOC	Cement Blend						
3	lb/sk	KCl (Potassium Chloride) Salt				Water Source	Fresh Water	
						Water Chloride	N/A	
3	lb/sk	Kol-Seal						
0.25	% BWOC	Econolite (Powder - PB)						
0.5	% BWOC	LAP-1 (Powdered Latex)						
0.6	% BWOC	CFR-3 (PB)						
0.125	lb/sk	Pol-E-Flake						
0.25	lb/sk	D-Air 5000						

Operation Test Results Request ID 251777/1

Thickening Time

Temp (°F)	Pressure (psi)	Reached in (min)	70 Bc (hh:mm)
107	3100	17	03:06

Pilot Test Results Request ID 220156/2

UCA Comp. Strength

End Temp (°F)	Pressure (psi)	500 psi (hh:mm)	12 hr CS (psi)	24 hr CS (psi)
116	1000	10:50	570	1136

HALLIBURTON

Permian Basin, Hobbs

Lab References- Tail

Job Information

Request/Slurry	258229/1	**Rig Name**	United 40	**Date**	20/FEB/2013
Submitted By	Adam Giovengo	**Job Type**	Production Casing	**Bulk Plant**	
Customer	Cog Operating LLC	**Location**	Eddy	**Well**	Pinto 36 State Com 2H

Well Information

Casing/Liner Size	5.5"	**Depth MD**	9122 ft	**BHST**	117 degF
Hole Size	8.75"	**Depth TVD**	4950 ft	**BHCT**	110 degF

Drilling Fluid Information

Mud Supplier Name	Mud Trade Name	Density

Cement Information - Tail Design

Conc	UOM	Cement/Additive	Sample Type	Sample Date	Lot No.
		SoluCem			
100	% BWOC	Cemex Premium H (Acid Soluable)			
11.15	gal/sack	Fresh Water			

Cement Properties		
Slurry Density	14.997	lbm/gal
Slurry Yield	2.6	ft3/sack
Water Requirement	11.15	gal/sack
Total Mix Fluid	11.15	gal/sack

Water Source	Fresh Water
Water Chloride	N/A

Operation Test Results Request ID 258229/1

Thickening Time

Temp (°F)	Pressure (psi)	Reached in (min)	70 Bc (hh:mm)
100	1769	12	02:45

UCA Comp. Strength

End Temp (°F)	Pressure (psi)	500 psi (hh:mm)	12 hr CS (psi)	24 hr CS (psi)
100	1000	16:45	295	707

HALLIBURTON

Permian Basin, Hobbs

Lab References- Tail

Job Information

Request/Slurry	2019346	**Rig Name**	United 40	**Date**	19/Feb/2013
Submitted By	Nasraldin Alarbi	**Job Type**	Production Casing	**Bulk Plant**	
Customer	Cog Operating LLC	**Location**	Eddy	**Well**	BKU 965H

Well Information

Casing/Liner Size	5.5"	**Depth MD**	9122 ft	**BHST**	117 degF
Hole Size	7.875"	**Depth TVD**	4950 ft	**BHCT**	110 degF

Drilling Fluid Information

Mud Supplier Name	Mud Trade Name	Density

Cement Information - Tail Design

Conc	UOM	Cement/Additive	Sample Type	Sample Date	Lot No.	Cement Properties		
		SoluCem				Slurry Density	15.0	lbm/gal
100	% BWOC	Cemex Premium H				Slurry Yield	2.6	ft3/sack
						Water Requirement	11.15	gal/sack
11.15	gal/sack	Fresh Water				Total Mix Fluid	11.15	gal/sack

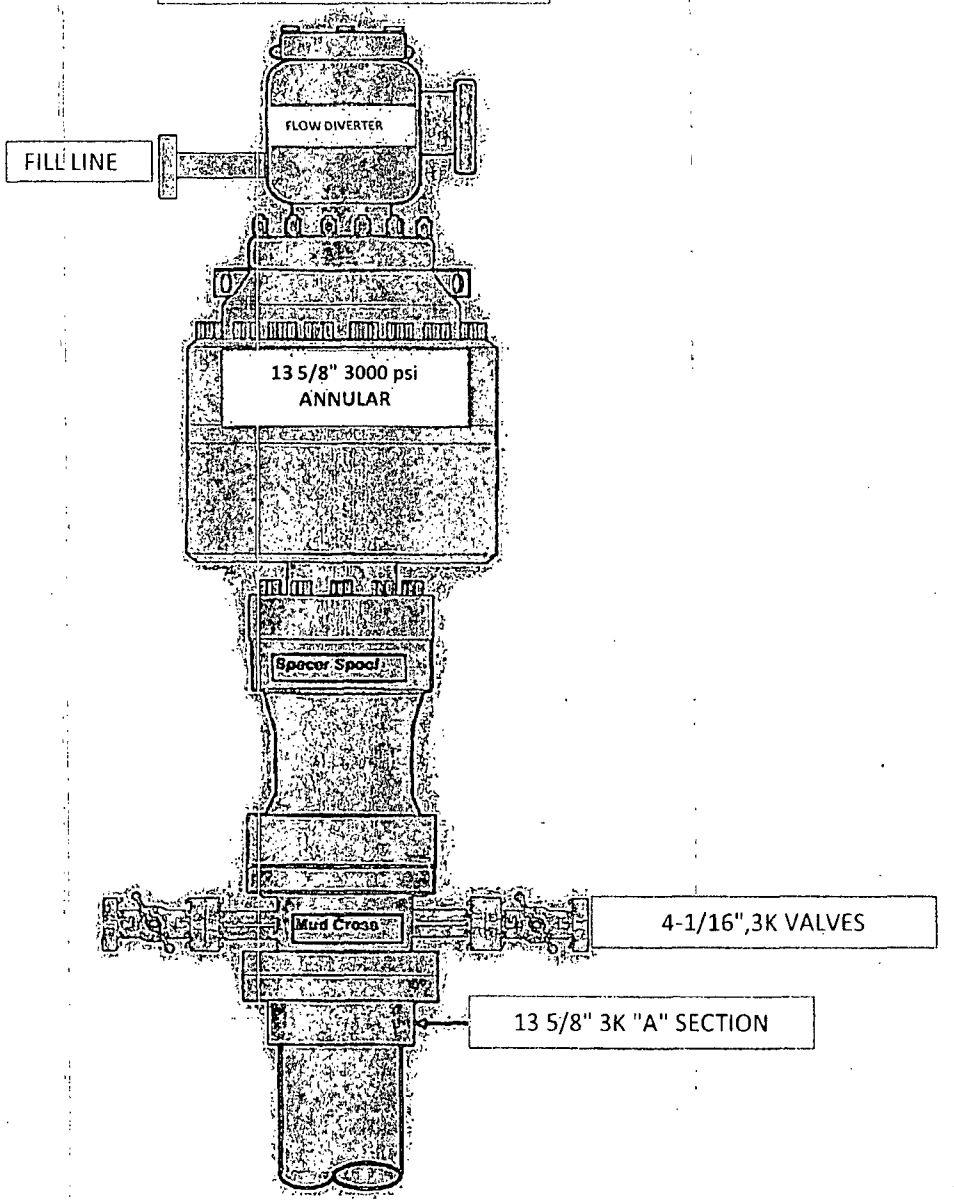
Water Source	Fresh Water
Water Chloride	N/A

Pilot Test Results Request ID 2019346

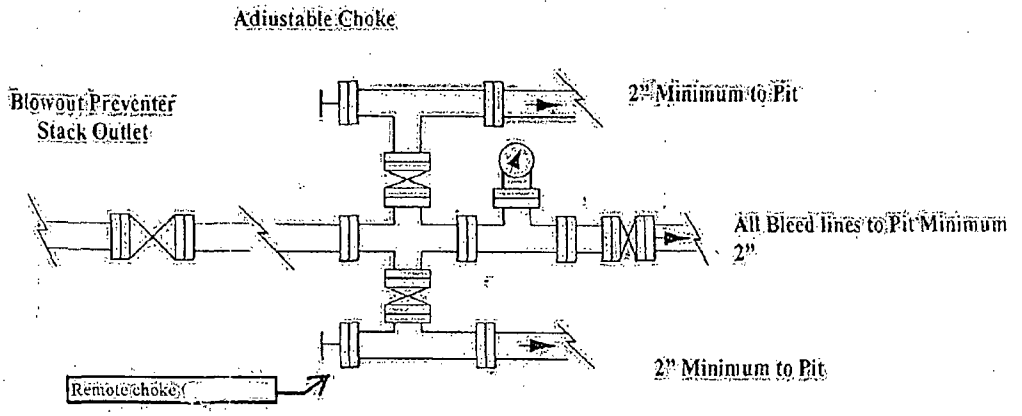
UCA Comp. Strength, Historical Data

End Temp (°F)	Pressure (psi)	500 psi (hh:mm)	12 hr CS (psi)	24 hr CS (psi)	48 hrs CS psi	72 hr CS psi
117	3000	14:45	413	814	1010	1200

13 5/8" 3K ANNULAR BOP



Choke Manifold Requirement (2000 psi WP)



CONCHO

COG Operating LLC

Eddy County, NM (NAD27 NME)
Grave Digger State Com
#5H
OH - Job #32H11121444

Design: OH

SDI Standard Survey Report

This survey is correct to the best of my knowledge and is supported by actual field data.

Notarized this date 7th of December, 2012.

Carrie Reed
Notary Signature
County of Midland
State of Texas

CARRIE REED
My Commission Expires
October 4, 2015

Scientific Drilling

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #5H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	RF @ 3486.00usft (JW #4)
Site:	Grave Digger State Com	MD Reference:	RF @ 3486.00usft (JW #4)
Well:	#5H	North Reference:	Grid
Wellbore:	OH - Job #32H11121444	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM-Regulatory

Project Eddy County, NM (NAD27 NME)

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 Grave Digger State Com

Site Position:		Northing:	585,274.50 usft	Latitude:	32° 36' 32.284 N
From:	Map	Easting:	463,340.80 usft	Longitude:	104° 27' 8.584 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16"	Grid Convergence:	-0.06 °

Well #5H

Well Position	+N/-S	0.00 usft	Northing:	585,302.00 usft	Latitude:	32° 36' 32.528 N
	+E/-W	0.00 usft	Easting:	460,894.90 usft	Longitude:	104° 27' 37.179 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	3,473.00 usft

Wellbore OH - Job #32H11121444

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2012	12/06/12			

Design OH

Audit Notes:

Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	180.33

Survey Program Date 12/14/12

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.00	2,300.00	Gyro (OH - Job #32H11121444)	Keeper	Standard Wireline Keeper ver 1.0.2
2,339.00	7,316.00	MWD (OH - Job #32H11121444)	MWD	MWD - Standard

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.73	284.57	100.00	0.16	-0.62	284.57	0.64
200.00	1.07	286.25	199.98	0.58	-2.13	285.28	2.21
300.00	1.05	291.37	299.97	1.18	-3.88	286.88	4.05
400.00	1.23	273.07	399.95	1.57	-5.80	285.12	6.01
500.00	1.11	265.71	499.93	1.55	-7.84	281.20	7.99
600.00	1.15	261.14	599.91	1.33	-9.80	277.71	9.89
700.00	1.09	257.49	699.89	0.97	-11.72	274.71	11.76
800.00	1.08	253.13	799.87	0.49	-13.55	272.05	13.56
900.00	1.08	255.14	899.85	-0.03	-15.36	269.89	15.36
1,000.00	0.88	261.67	999.84	-0.38	-17.03	268.72	17.04

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #5H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	RF @ 3486.00usft (JW #4)
Site:	Grave Digger State Com	MD Reference:	RF @ 3486.00usft (JW #4)
Well:	#5H	North Reference:	Grid
Wellbore:	OH - Job #32H11121444	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM-Regulatory

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth (usft)	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)
1,100.00	0.76	263.17	1,099.83	-0.57	-18.45	268.22	18.46
1,200.00	0.67	254.47	1,199.82	-0.81	-19.67	267.65	19.69
1,300.00	0.56	277.85	1,299.81	-0.90	-20.72	267.52	20.74
1,400.00	0.44	271.05	1,399.81	-0.82	-21.59	267.82	21.60
1,500.00	0.40	287.27	1,499.81	-0.71	-22.31	268.17	22.32
1,600.00	0.45	267.00	1,599.81	-0.63	-23.03	268.43	23.04
1,700.00	0.41	284.89	1,699.80	-0.56	-23.77	268.65	23.78
1,800.00	0.52	296.05	1,799.80	-0.27	-24.52	269.38	24.52
1,900.00	0.52	296.84	1,899.80	0.14	-25.34	270.31	25.34
2,000.00	0.56	292.45	1,999.79	0.53	-26.19	271.16	26.20
2,100.00	0.59	255.05	2,099.79	0.58	-27.14	271.23	27.15
2,200.00	0.55	247.00	2,199.78	0.26	-28.08	270.53	28.08
2,300.00	0.64	249.10	2,299.78	-0.12	-29.04	269.75	29.04
Tie-In							
2,339.00	3.43	191.61	2,338.75	-1.35	-29.48	267.39	29.51
2,370.00	7.12	188.09	2,369.61	-4.16	-29.94	262.10	30.23
2,402.00	10.29	187.04	2,401.24	-8.96	-30.57	253.67	31.65
2,433.00	12.84	183.44	2,431.61	-15.15	-31.12	244.05	34.61
2,464.00	15.48	175.52	2,461.67	-22.71	-31.00	233.77	38.43
2,495.00	18.73	172.80	2,491.29	-31.78	-30.05	223.40	43.73
2,526.00	21.81	172.36	2,520.37	-42.42	-28.66	214.04	51.20
2,558.00	24.01	174.82	2,549.84	-54.80	-27.28	206.47	61.22
2,589.00	26.56	178.43	2,577.87	-68.01	-26.52	201.30	73.00
2,620.00	29.65	181.27	2,605.22	-82.61	-26.50	197.79	86.76
2,651.00	32.71	182.64	2,631.73	-98.65	-27.06	195.34	102.29
2,683.00	35.88	182.29	2,658.17	-116.66	-27.83	193.42	119.93
2,714.00	38.78	181.59	2,682.82	-135.45	-28.47	191.87	138.40
2,729.80	40.13	181.17	2,695.02	-145.48	-28.71	191.16	148.29
PP=330' FNL GDSC #5H							
2,745.00	41.42	180.79	2,706.53	-155.41	-28.88	190.53	158.07
2,776.00	44.39	180.36	2,729.23	-176.51	-29.09	189.36	178.89
2,807.00	47.64	180.54	2,750.76	-198.81	-29.26	188.37	200.95
2,839.00	50.91	180.71	2,771.63	-223.06	-29.53	187.54	225.00
2,870.00	54.08	181.50	2,790.50	-247.64	-30.01	186.91	249.45
2,901.00	57.33	181.50	2,807.97	-273.24	-30.68	186.41	274.95
2,932.00	60.41	180.62	2,823.99	-299.77	-31.16	185.94	301.38
2,963.00	63.75	179.83	2,838.51	-327.15	-31.27	185.46	328.64
2,995.00	67.09	179.57	2,851.81	-356.25	-31.11	184.99	357.60
3,026.00	70.61	179.57	2,863.00	-385.16	-30.90	184.59	386.39
3,057.00	73.69	180.62	2,872.50	-414.66	-30.95	184.27	415.81
3,088.00	76.68	180.27	2,880.43	-444.62	-31.18	184.01	445.72
3,119.00	80.28	180.62	2,886.62	-474.99	-31.42	183.78	476.03
3,151.00	83.62	181.68	2,891.10	-506.67	-32.05	183.62	507.68
3,182.00	86.61	182.56	2,893.74	-537.53	-33.20	183.53	538.55
3,213.00	88.96	181.99	2,894.93	-568.48	-34.43	183.47	569.52

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #5H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	RF @ 3486.00usft (JW #4)
Site:	Grave Digger State Com	MD Reference:	RF @ 3486.00usft (JW #4)
Well:	#5H	North Reference:	Grid
Wellbore:	OH - Job #32H11121444	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM-Regulatory

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)
3,307.00	91.54	181.41	2,894.52	-662.43	-37.22	183.22	663.47
3,401.00	90.75	181.06	2,892.65	-756.39	-39.24	182.97	757.40
3,494.00	90.66	180.89	2,891.50	-849.37	-40.82	182.75	850.35
3,588.00	91.01	180.84	2,890.13	-943.35	-42.24	182.56	944.29
3,682.00	90.37	179.79	2,889.00	-1,037.34	-42.76	182.36	1,038.22
3,775.00	91.01	179.39	2,887.88	-1,130.33	-42.09	182.13	1,131.11
3,869.00	89.78	179.92	2,887.23	-1,224.32	-41.53	181.94	1,225.02
3,962.00	90.74	180.11	2,886.81	-1,317.32	-41.55	181.81	1,317.97
4,056.00	89.87	178.78	2,886.31	-1,411.31	-40.64	181.65	1,411.89
4,150.00	90.66	178.86	2,885.87	-1,505.29	-38.71	181.47	1,505.78
4,243.00	91.80	178.16	2,883.88	-1,598.23	-36.29	181.30	1,598.64
4,337.00	90.57	178.60	2,881.93	-1,692.17	-33.63	181.14	1,692.51
4,430.00	89.90	179.68	2,881.55	-1,785.16	-32.24	181.03	1,785.45
4,524.00	90.66	179.22	2,881.09	-1,879.15	-31.33	180.96	1,879.41
4,617.00	89.52	179.83	2,880.95	-1,972.15	-30.56	180.89	1,972.38
4,711.00	89.87	179.92	2,881.45	-2,066.15	-30.36	180.84	2,066.37
4,804.00	90.40	179.66	2,881.23	-2,159.14	-30.02	180.80	2,159.35
4,898.00	90.84	179.48	2,880.21	-2,253.14	-29.31	180.75	2,253.33
4,992.00	89.87	180.18	2,879.63	-2,347.13	-29.03	180.71	2,347.31
5,085.00	90.17	180.28	2,879.60	-2,440.13	-29.41	180.69	2,440.31
5,179.00	90.64	180.21	2,878.93	-2,534.13	-29.81	180.67	2,534.30
5,272.00	90.92	179.82	2,877.67	-2,627.12	-29.83	180.65	2,627.29
5,366.00	91.36	179.30	2,875.80	-2,721.10	-29.11	180.61	2,721.25
5,459.00	90.40	179.92	2,874.37	-2,814.08	-28.48	180.58	2,814.23
5,553.00	90.71	180.01	2,873.46	-2,908.08	-28.42	180.56	2,908.22
5,646.00	90.94	179.27	2,872.12	-3,001.07	-27.84	180.53	3,001.19
5,740.00	90.00	180.17	2,871.35	-3,095.06	-27.38	180.51	3,095.18
5,833.00	90.75	179.92	2,870.74	-3,188.06	-27.45	180.49	3,188.17
5,927.00	89.16	180.45	2,870.81	-3,282.05	-27.75	180.48	3,282.17
6,020.00	89.43	179.83	2,871.96	-3,375.05	-27.98	180.47	3,375.16
6,114.00	89.69	179.22	2,872.68	-3,469.04	-27.20	180.45	3,469.15
6,207.00	89.96	180.27	2,872.96	-3,562.04	-26.79	180.43	3,562.14
6,301.00	90.92	181.15	2,872.24	-3,656.02	-27.95	180.44	3,656.13
6,395.00	89.63	180.12	2,871.79	-3,750.01	-28.99	180.44	3,750.13
6,488.00	90.22	180.18	2,871.91	-3,843.01	-29.24	180.44	3,843.12
6,583.00	90.54	179.68	2,871.28	-3,938.01	-29.12	180.42	3,938.12
6,676.00	91.04	179.24	2,870.00	-4,031.00	-28.24	180.40	4,031.10
6,769.00	91.58	180.65	2,867.87	-4,123.97	-28.15	180.39	4,124.07
6,863.00	92.07	180.36	2,864.88	-4,217.92	-28.98	180.39	4,218.02
6,957.00	91.14	181.41	2,862.25	-4,311.87	-30.43	180.40	4,311.97
7,050.00	89.73	181.22	2,861.54	-4,404.84	-32.57	180.42	4,404.96
7,143.00	90.31	181.24	2,861.51	-4,497.82	-34.56	180.44	4,497.95
7,206.00	90.66	180.27	2,860.97	-4,560.81	-35.39	180.44	4,560.94

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #5H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	RF @ 3486.00usft (JW #4)
Site:	Grave Digger State Com	MD Reference:	RF @ 3486.00usft (JW #4)
Well:	#5H	North Reference:	Grid
Wellbore:	OH - Job #32H11121444	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM-Regulatory

Survey

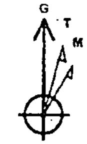
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)
7,268.00	91.04	180.26	2,860.05	-4,622.80	-35.68	180.44	4,622.94
Last MWD Survey							
7,316.00	91.04	180.26	2,859.18	-4,670.79	-35.90	180.44	4,670.93
Projection to Bit - PBHL-GDSC #5H							

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
7,268.00	2,860.05	-4,622.80	-35.68	Last MWD Survey
7,316.00	2,859.18	-4,670.79	-35.90	Projection to Bit

CONCHO

Scientific Drilling



To convert a Magnetic Direction to a Grid Direction, Add 8.01°
To convert a True Direction to a Grid Direction, Add 0.07°

Azimuths to Grid North
True North: 0.07°
Magnetic North: 8.01°

Magnetic Field
Strength: 48577.2snT
Dip Angle: 60.31°
Date: 12/6/2012
Model: BGGM2012

Grave Digger State Com #5H
Eddy County, NM (NAN27 NME)
Northing: (Y) 585302.00
Easting: (X) 460894.90
Plan #3 vs Actual 8-3/4" Hole

WELL DETAILS:

Ground Level: 3473.00

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	585302.00	460894.90	32° 36' 32.528 N	104° 27' 37.179 W

SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
2300.00	0.64	249.10	2299.78	-0.12	-29.04	0.00	0.00	0.29	
2378.50	0.64	249.10	2378.27	-0.43	-29.84	0.00	0.00	0.60	
3197.12	90.50	179.90	2895.03	-525.81	-34.35	11.00	-69.20	525.99	
7385.99	90.50	179.90	2859.00	-4694.52	-26.90	0.00	0.00	4694.60	PBHL

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting
PP=330' FNL GDSC #5H	2712.20	-125.00	-33.14	585177.01	460861.77
PBHL	2859.00	-4694.52	-26.80	580607.90	460868.10

SITE DETAILS: Grave Digger State Com
Site Centre Northing: 585274.50
Easting: 463340.80

Positional Uncertainity: 0.00
Convergence: -0.06
Local North: Grid

PROJECT DETAILS: Eddy County, NM (NAN27 NME)
Geodetic System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: New Mexico East 3001

System Datum: Mean Sea Level

Map System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone Name: New Mexico East 3001

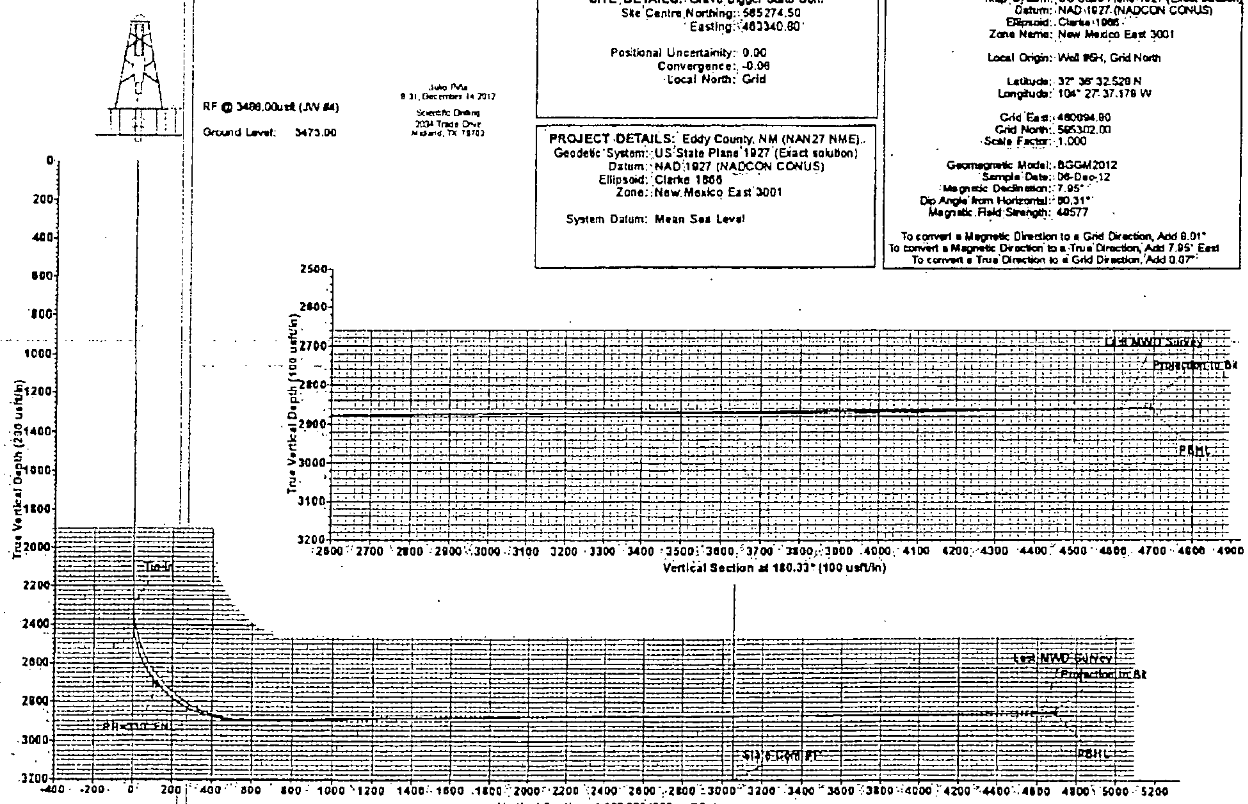
Local Origin: Well #5H, Grid North

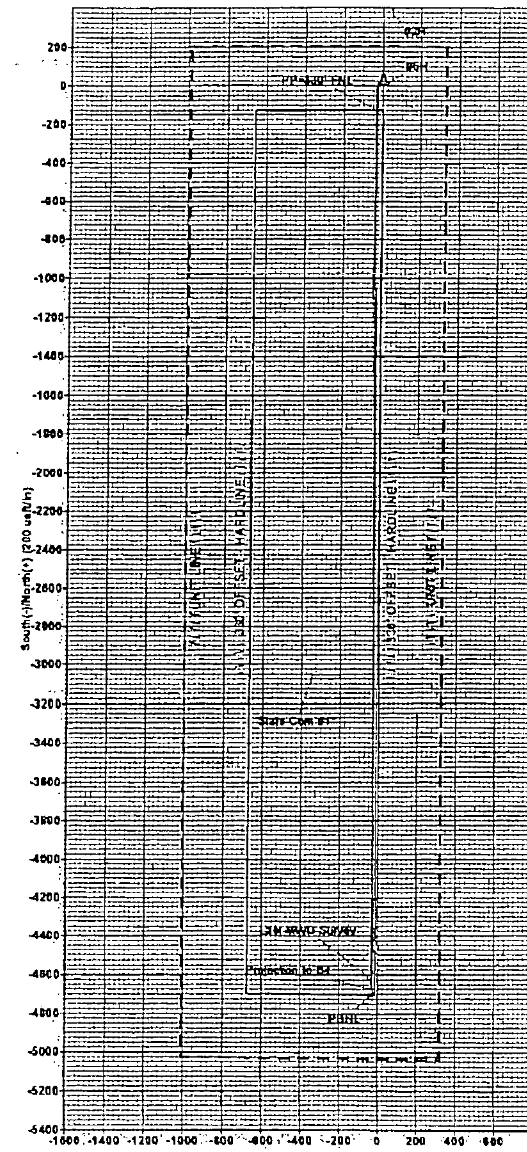
Latitude: 32° 36' 32.528 N
Longitude: 104° 27' 37.179 W

Grid East: 460894.90
Grid North: 585302.00
Scale Factor: 1.000

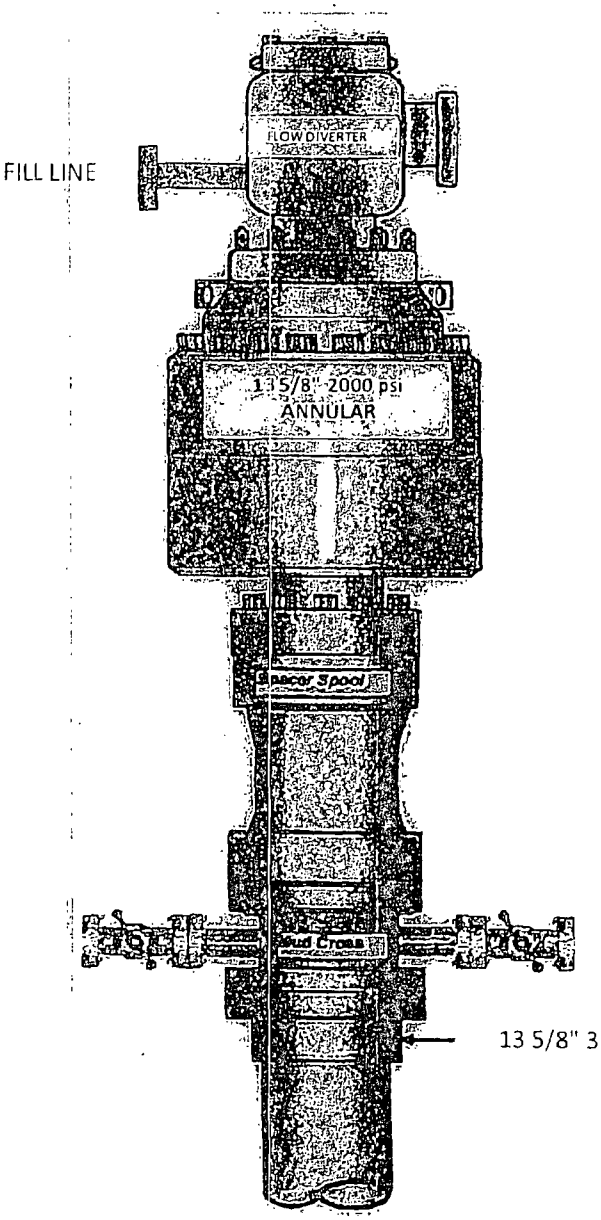
Geomagnetic Model: BGGM2012
Sample Date: 06-Dec-12
Magnetic Declination: 7.95°
Dip Angle from Horizontal: 60.31°
Magnetic Field Strength: 48577

To convert a Magnetic Direction to a Grid Direction, Add 8.01°
To convert a Magnetic Direction to a True Direction, Add 7.95° East
To convert a True Direction to a Grid Direction, Add 0.07°





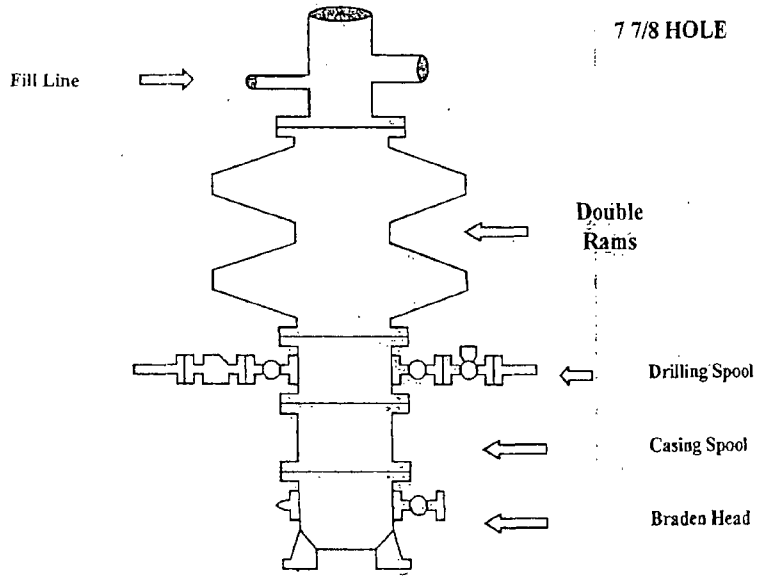
13 5/8" 2K ANNULAR



COG Operating LLC

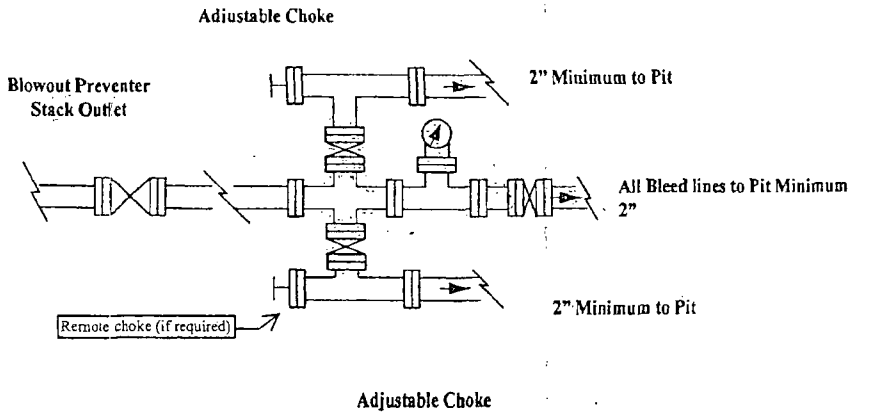
Exhibit #9

BOPE and Choke Schematic



Minimum 4" Nominal choke and kill lines

Choke Manifold Requirement (2000 psi WP)
No Annular Required

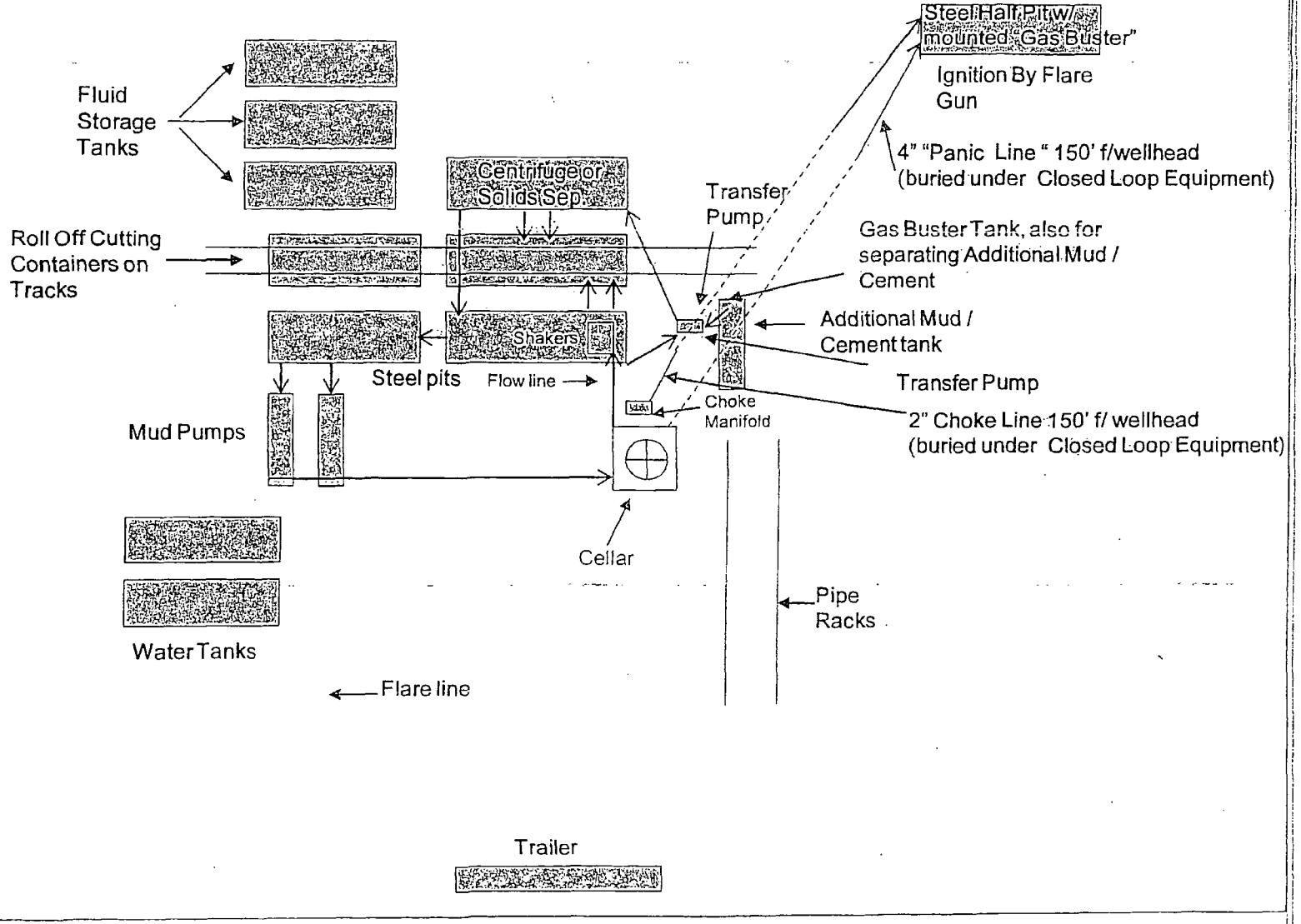


NOTES REGARDING THE BLOWOUT PREVENTERS
Master Drilling Plan
Eddy County, New Mexico

1. Drilling nipple to be so constructed that it can be removed without use of a welder through rotary table opening, with minimum I.D. equal to preventer bore.
2. Wear ring to be properly installed in head.
3. Blow out preventer and all fittings must be in good condition, 2000 psi WP minimum.
4. All fittings to be flanged.
5. Safety valve must be available on rig floor at all times with proper connections, valve to be full 2000 psi WP minimum.
6. All choke and fill lines to be securely anchored especially ends of choke lines.
7. Equipment through which bit must pass shall be at least as large as the diameter of the casing being drilled through.
8. Kelly cock on Kelly.
9. Extension wrenches and hands wheels to be properly installed.
10. Blow out preventer control to be located as close to driller's position as feasible.
11. Blow out preventer closing equipment to include minimum 40-gallon accumulator, two independent sources of pump power on each closing unit installation all API specifications.

COG Operating LLC

Closed Loop Equipment Diagram



Closed Loop Operation & Maintenance Procedure

All drilling fluid circulated over shaker(s) with cuttings discharged into roll off container.

Fluid and fines below shaker(s) are circulated with transfer pump through centrifuge(s) or solids separator with cuttings and fines discharged into roll off container.

Fluid is continuously re-circulated through equipment with polymer added to aid separation of cutting fines.

Roll off containers are lined and de-watered with fluids re-circulated into system.

Additional tank is used to capture unused drilling fluid or cement returns from casing jobs.

This equipment will be maintained 24 hrs./day by solids control personnel and or rig crews that stay on location.

Cuttings will be hauled to either:

CRI (permit number R9166)
or
GMI (permit number 711-019-001)

dependent upon which rig is available to drill this well.

Hydrogen Sulfide Drilling Operation Plan

I. 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:

1. The hazards an characteristics of hydrogen sulfide (H2S)
2. The proper use and maintenance of personal protective equipment and life support systems.
3. The proper use of H2S detectors alarms warning systems, briefing areas, evacuation procedures, and prevailing winds.
4. The proper techniques for first aid and rescue procedures.

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

1. The effects of H2S on metal components. If high tensile tubular are to be used, personnel well be trained in their special maintenance requirements.
2. Corrective action and shut-in procedures when drilling or reworking a well and blowout prevention and well control procedures.
3. The contents and requirements of the H2S Drilling Operations Plan and 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. **The concentrations of H2S of wells in this area from surface to TD are low enough that a contingency plan is not required.**

II. 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 reasonable expected to contain H2S.

1. **Well Control Equipment:**

   A. Flare line.

   B. Choke manifold.

   C. Closed Loop Blow Down Tank

   D. Blind rams and pipe rams to accommodate all pipe sizes with properly sized closing unit.

   E. Auxiliary equipment may include if applicable: annular preventer & rotating head.

2. **Protective equipment for essential personnel:**

   A. SCBA (Self contained breathing apparatus) 30-minute units located in the doghouse and at briefing areas, as indicated on well site diagram.

3. **H2S detection and monitoring equipment:**

   A. Portable H2S monitors positioned on location for best coverage and response. These units have warning lights and audible sirens when H2S levels of 20 PPM are reached.

4. **Visual warning systems:**

   A. Wind direction indicators as shown on well site diagram.

   B. Caution/Danger signs (Exhibit #7) 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.

5. **Mud program:**

   A. The mud program has been designed to minimize the volume of H2S circulated to surface. Proper mud weight, safe drilling practices, and the use of H2S scavengers will minimize hazards when penetrating H2S bearing zones.

6. **Metallurgy:**

   A. All drill strings, casings, tubing, wellhead, blowout preventer, drilling spool, kill lines, choke manifold and lines, and valves shall be suitable for H2S service.

   B. All elastomers used for packing and seals shall be H2S trim.

7. **Communication:**

   A. Radio communications in company vehicles including cellular telephone and 2-way radio.

   B. Land line (telephone) communication at Office.

8. **Well testing:**

   A. Drill stem testing will be performed with a minimum number of personnel in the immediate vicinity, which are necessary to safely and adequately conduct the test. The drill stem testing will be conducted during daylight hours and formation fluids will not be flowed to the surface. All drill-stem-testing operations conducted in an H2S environment will use the closed chamber method of testing.

   B. There will be no drill stem testing.

EXHIBIT #7

WARNING

YOU ARE ENTERING AN H2S

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. **CHECK WITH COG OPERATING FOREMAN AT**

COG OPERATING LLC

1-432-683-7443

1-575-746-2010

EDDY COUNTY EMERGENCY NUMBERS

ARTESIA FIRE DEPT. 575-746-5050
ARTESIA POLICE DEPT. 575-746-5000
EDDY CO. SHERIFF DEPT. 575-746-9888

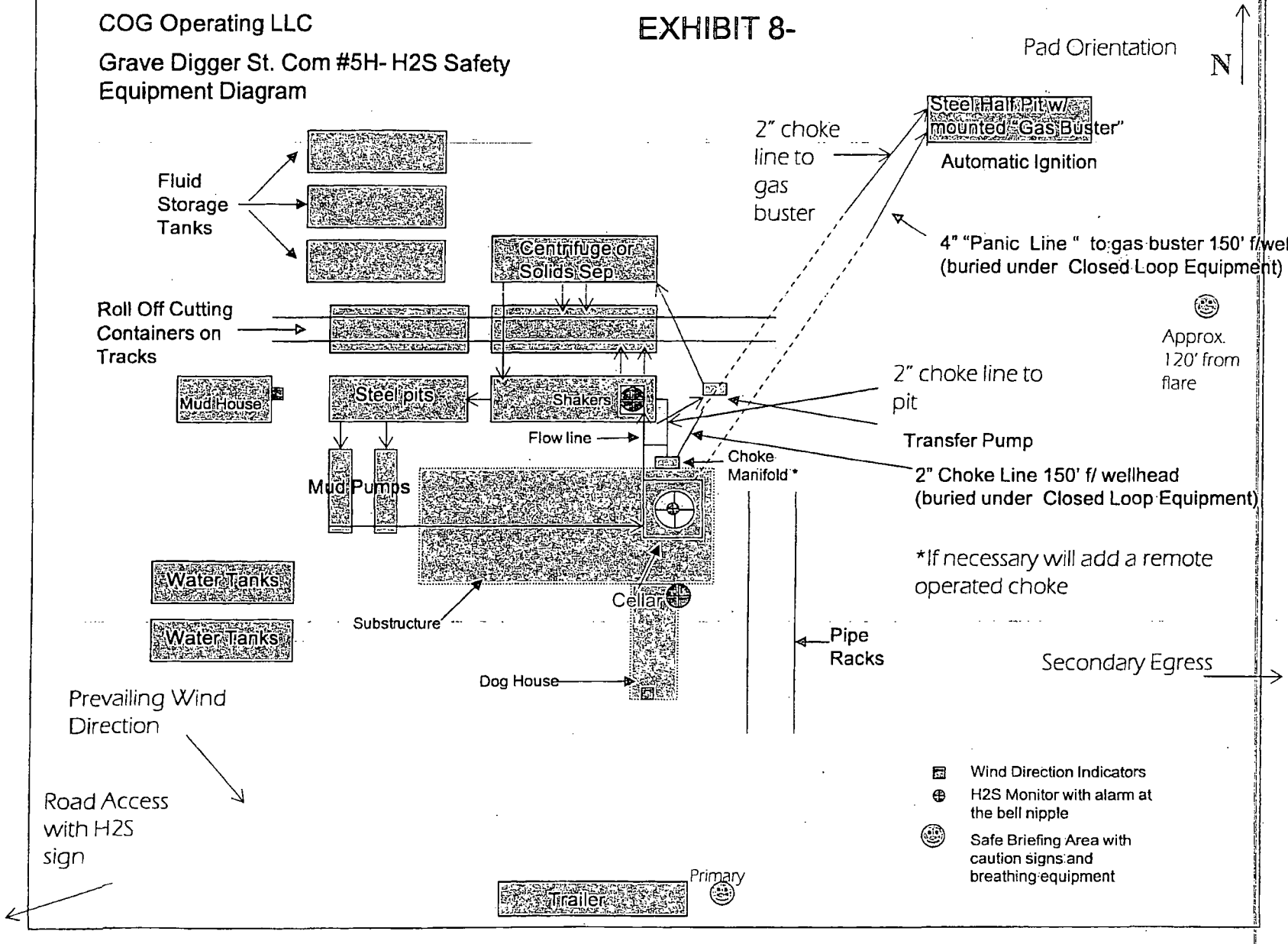
LEA COUNTY EMERGENCY NUMBERS

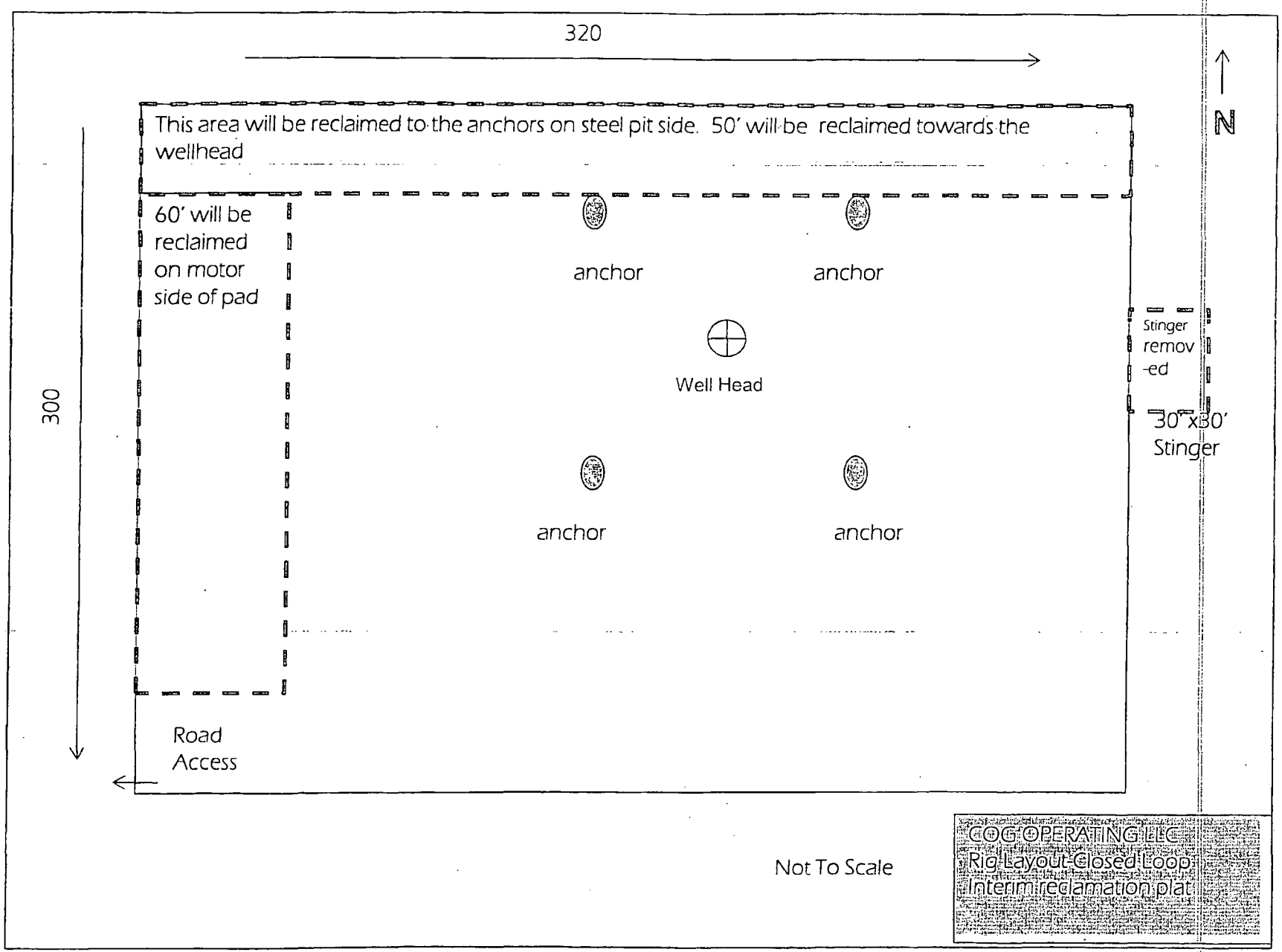
HOBBS FIRE DEPT. 575-397-9308
HOBBS POLICE DEPT. 575-397-9285
LEA CO. SHERIFF DEPT. 575-396-1196

COG Operating LLC

EXHIBIT 8-

Grave Digger St. Com #5H- H2S Safety Equipment Diagram




320
N
This area will be reclaimed to the anchors on steel pit side. 50' will be reclaimed towards the wellhead
60' will be reclaimed on motor side of pad
anchor
anchor
Well Head
Stinger removed
30' x 30' Stinger
300
anchor
anchor
Road Access
Not To Scale
COG OPERATING LLC
Rig Layout Closed Loop
Interim reclamation plat

Surface Use & Operating Plan

Grave Digger State Com #5H

- Surface Tenant: Greg L. Williamson PO Box 498, Artesia, NM 88210
- New Road: approx. 315'
- Flow Line: 315'
- Facilities: Grave Digger State Com #1 Battery

Well Site Information

V Door: East

Topsoil: North

Interim Reclamation: North/West

Notes

-N/A

Onsite: 5/11/2012

John Fast(BLM), Curtis Griffin(COG), Gary Box (J.W.S)

SURFACE USE AND OPERATING PLAN

1. Existing & Proposed Access Roads

A. The well site survey and elevation plat for the proposed well is attached with this application. It was staked by John West Engineering, Hobbs, NM.

B. All roads to the location are shown in the Vicinity Map. The existing lease roads are illustrated and are adequate for travel during drilling and production operations. Upgrading existing roads prior to drilling the well will be done where necessary. The road route to the well site is depicted in Exhibit #2. The road highlighted in Exhibit #2 will be used to access the well.

C. Directions to location: See exhibit #2.

D. Routine grading and maintenance of existing roads will be conducted as necessary to maintain their condition as long as any operations continue on this lease. Roads will be maintained according to specifications in section 2A of this Surface Use and Operating Plan.

2. Proposed Access Road:

The Elevation Plat shows that 315' of new access road will be required for this location. If any road is required it will be constructed as follows:

A. The maximum width of the running surface will be 14'. The road will be crowned, ditched and constructed of 6" rolled and compacted caliche. Ditches will be at 3:1 slope and 4 feet wide. Water will be diverted where necessary to avoid ponding, prevent erosion, maintain good drainage, and to be consistent with local drainage patterns.

B. The average grade will be less than 1%.

C. No turnouts are planned.

D. No culverts, cattleguard, gates, low water crossings or fence cuts are necessary.

E. Surfacing material will consist of native caliche. Caliche will be obtained from the actual well site if available. If not available onsite, caliche will be hauled from the nearest BLM approved caliche pit.

5. Location and Type of Water Supply:

The well will be drilled with combination brine and fresh water mud system as outlined in the drilling program. The water will be obtained from commercial water stations in the area and hauled to location by transport truck over the existing and proposed access roads shown in Exhibit #2. If a commercial fresh water source is nearby, fast line may be laid along existing road ROW's and fresh water pumped to the well. No water well will be drilled on the location.

6. Source of Construction Materials and Location "Turn-Over" Procedure:

Obtaining caliche: The primary way of obtaining caliche to build locations and roads will be by "turning over" the location. This means, caliche will be obtained from the actual well sight. A caliche permit will be obtained from BLM prior to pushing up any caliché. 2400 cu. Yards is max amount of caliche needed for pad and roads. Amount will vary for each pad. The procedure below has been approved by BLM personnel:

A. The top 6 inches of topsoil is pushed off and stockpiled along the side of the location.

B. An approximate 120' X 120' area is used within the proposed well site to remove caliche.

C. Subsoil is removed and piled alongside the 120' by 120' area within the pad site.

D. When caliche is found, material will be stock piled within the pad site to build the location and road.

E. Then subsoil is pushed back in the hole and caliche is spread accordingly across entire location and road.

F. Once well is drilled, the stock piled top soil will be used for interim reclamation and spread along areas where caliche is picked up and the location size is reduced. Neither caliche nor subsoil will be stock piled outside of the well pad. Topsoil will be stockpiled along the edge of the pad as depicted in attached plat.

- In the event that no caliche is found onsite, caliche will be hauled in from a BLM approved caliche pit.

7. Methods of Handling Water Disposal:

A. The well will be drilled utilizing a closed loop mud system. Drill cuttings will be held in roll-off style mud boxes and taken to an NMOCD approved disposal site.

B. Drilling fluids will be contained in steel mud pits.

C. Water produced from the well during completion will be held temporarily in steel tanks and then taken to an NMOCD approved commercial disposal facility.

D. Garbage and trash produced during drilling or completion operations will be collected in a trash bin and hauled to an approved landfill. No toxic waste or hazardous chemicals will be produced by this operation.

E. Human waste and grey water will need to be properly contained and disposed of. Proper disposal and elimination of waste and grey water may include but are not limited to portable septic systems and/or portable waste gathering systems (i.e. portable toilets).

F. After the rig is moved out and the well is either completed or abandoned, all waste materials will be cleaned up within 30 days. In the event of a dry hole only a dry hole marker will remain.

8. Ancillary Facilities:

No airstrip, campsite or other facilities will be built as a result of the operation on this well.

9. Well Site Layout:

A. The drill pad layout, with elevations staked by John West Engineering, is shown in the Elevation Plat. Dimensions of the pad and pits are shown on the Rig Layout. V door direction is East. Topsoil, if available, will be stockpiled per BLM specifications. Because the pad is almost level no major cuts will be required.

B. The Rig Layout Closed-Loop exhibit shows the proposed orientation of closed loop system and access road. No permanent living facilities are planned, but a temporary foreman/toolpusher's trailer will be on location during the drilling operations.

10. Plans for Restoration of the Surface:

A. Interim Reclamation will take place after the well has been completed. The pad will be downsized by reclaiming the areas not needed for production operations. The portions of the pad that are not needed for production operations will be re-contoured to its original state as much as possible. The caliche that is removed will be reused to either build another pad site or for road repairs within the lease. The stockpiled topsoil will then be spread out reclaimed area and reseeded with a BLM approved seed mixture. In the event that the well must be worked over or maintained, it may be necessary to drive, park, and/or operate machinery on reclaimed land. This area will be repaired or reclaimed after work is complete.

B. Final Reclamation: Upon plugging and abandoning the well all caliche for well pad and lease road will be removed and surface will be recountoured to reflect its surroundings as much as possible. Caliche will be recycled for road repair or reused for another well pad within the lease. If any topsoil remains, it will be spread out and the area will be re-seeded with a BLM approved mixture and re-vegetated as per BLM orders.

11.Surface Ownership:

A. The surface is owned by the U.S. Government and is administered by the Bureau of Land Management. The surface is multiple uses with the primary uses of the region for grazing of livestock and the production of oil and gas.

B. The surface tenant is Greg Williamson PO Box 498, Artesia NM 88210.

C. The proposed road routes and surface location will be restored as directed by the BLM

12.Other Information:

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 dwellings within 2 miles of this location. Location is in near Maljamar NM.

D. If needed, a Cultural Resources Examination is being prepared by Boone Arch Services of New Mexico, LLC. Carlsbad, NM, 88220. 506 E Chapman Rd. , phone # 575.887.7667 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. Bond Coverage:

Bond Coverage is Nationwide Bond # 000215

14. Lessee's and Operator's Representative:

The COG Operating LLC representative responsible for assuring compliance with the surface use plan is as follows:

Jim Evans
Drilling Superintendent
COG Operating LLC
One Concho Center
600 W. Illinois
Midland, TX 79701
Phone (432) 685-4304 (office)
(432) 221-0346 (business)

Ray Peterson
Drilling Manager
COG Operating LLC
One Concho Center
600 W. Illinois
Midland, TX 79701
Phone (432) 685-4304 (office)
(432) 818-2254 (business)

Well-Site Evaluation Field Form

Company Name: COG **Well Name** Gravedigger 5H

Location: Section 2, T 20 S. R 25 E. Footage 205 F NL & 940 F WL

Examined by J Fast **Date** 5-3-12

Evaluation: _____

Description & Topography: (cut & fill, etc.) slight slope W to E

Soils: (reseeding stips, etc.) gypson Cave Area: High

Hydrogeology: (wells, playas, floodplain, drainages, erosive soils, plant indicators, etc.)

NA

Wildlife: (habitat, LPC, SDL, etc.)

creosote

Other: (VRM, range, existing structures, etc.) _____

Well Infrastructure

(Oil) Gas Vertical (Horizontal) Directional

V-Door Direction: East

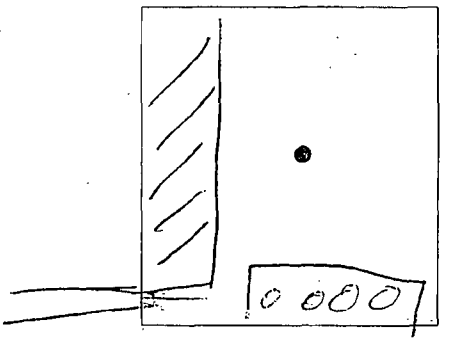
Pad Size: _____

Road Route: SW to west Pad

Pipeline: _____

Production Facility Placement: south side

Interim Reclamation: west



Well-Site Evaluation Field Form

Company Name: COG **Well Name** Gravedigger State Slt

Location: Section 2, T. 20 S. R. 25 E. Footage 205 FNL & 990 FWL

Examined by J Fast **Date** 5-3-12

Evaluation: _____

Description & Topography: (cut & fill, etc.) level ~3'/300' W to E

Soils: (reseeding stips, etc.) gypsom Cave Area: High

Hydrogeology: (wells, playas, floodplain, drainages, erosive soils, plant indicators, etc.)

NA

Wildlife: (habitat, LPC, SDL, etc.) burrograss creosote

Other: (VRM, range, existing structures, etc.) E line 120' N

Well Infrastructure

(Oil) Gas Vertical (Horizontal) Directional

V-Door Direction: east

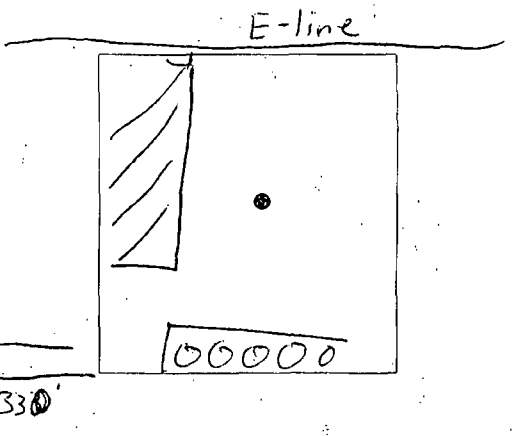
Pad Size: 320 x 300

Road Route: SW to W

Pipeline: _____

Production Facility Placement: southside/possibly offsite

Interim Reclamation: west



PECOS DISTRICT
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	COG OPERATING, LLC
LEASE NO.:	NM0553777
WELL NAME & NO.:	5H-GRAVE DIGGER STATE COM
SURFACE HOLE FOOTAGE:	205' FNL & 990' FWL
BOTTOM HOLE FOOTAGE	330' FSL & 990' FWL
LOCATION:	Section 2, T. 20 S., R 25 E., NMPM
COUNTY:	Eddy County, New Mexico

TABLE OF CONTENTS

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

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/Karst Requirements

Cave and Karst

** 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 pad will be bermed to prevent oil, salt, and other chemical contaminants from leaving the pad. All sides will be bermed.

Tank Battery Liners and Berms:

Tank battery locations 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, situating values 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 values, 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.

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 stockpile the topsoil in a low profile manner in order to prevent wind/water erosion of the topsoil. The topsoil to be stripped is approximately 6 inches in depth. The topsoil will be used 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. 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.

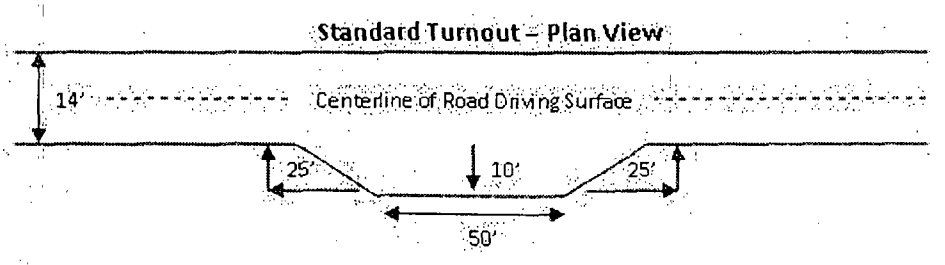
Where possible, no improvements should be made on the unsurfaced access road other than to remove vegetation as necessary, road irregularities, safety issues, or to fill low areas that may sustain standing water.

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.

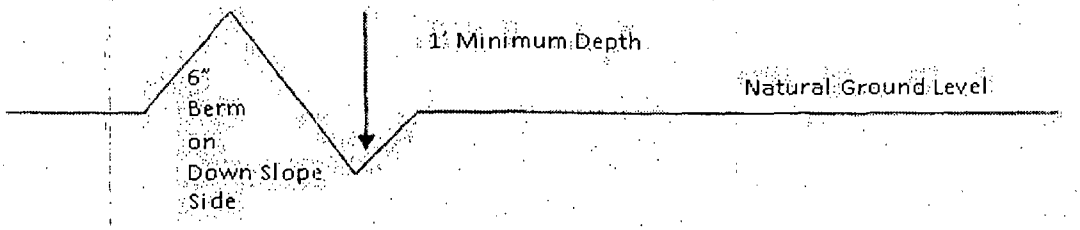
Turnouts
Vehicle turnouts shall be constructed on the road. Turnouts shall be intervisible with interval spacing distance less than 1000 feet. Turnouts shall be constructed on all blind curves. Turnouts shall conform to the following diagram:



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

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

Cross Section of a Typical Lead-off Ditch



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

Formula for Spacing Interval of Lead-off Ditches

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

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

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

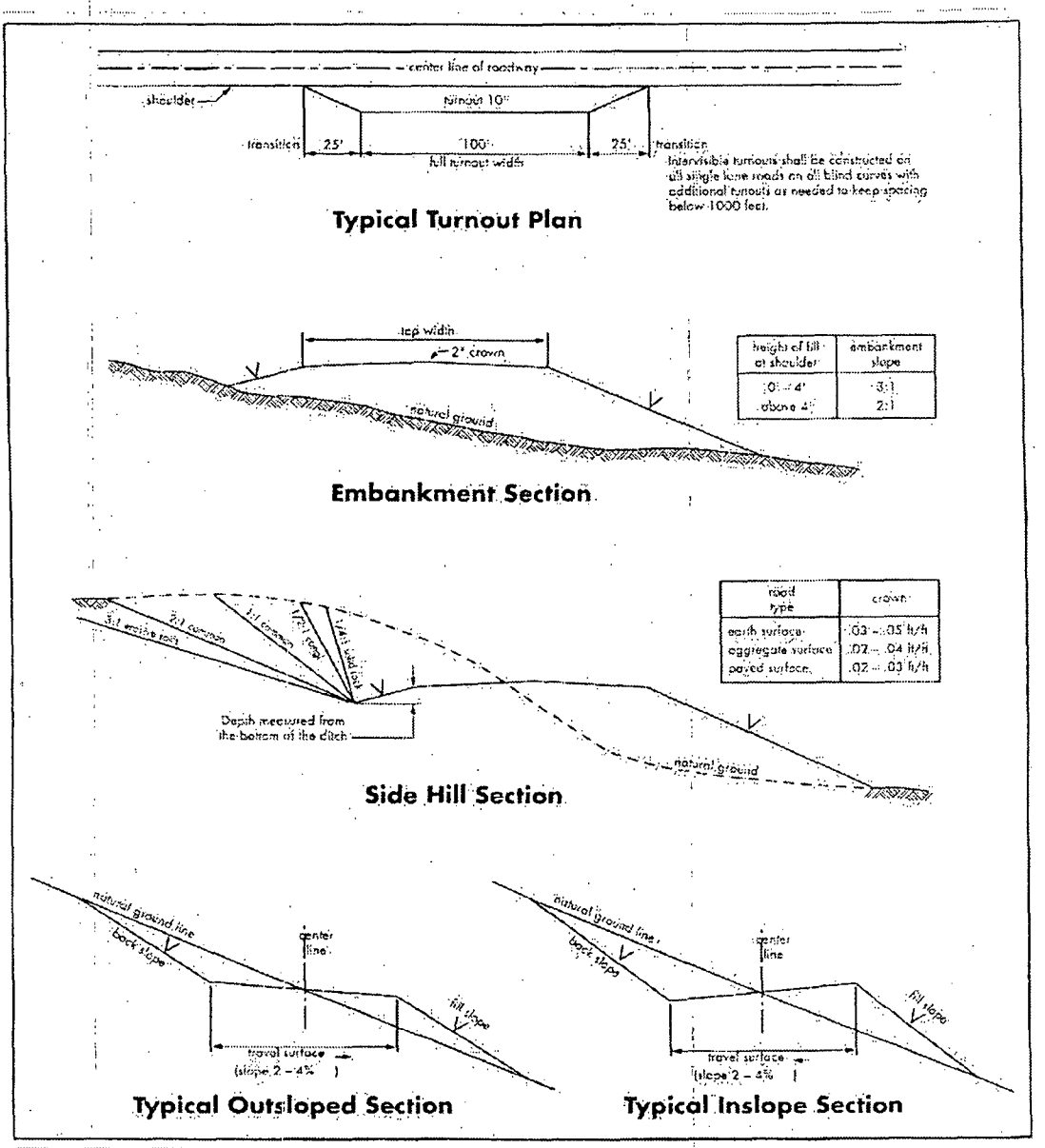
Cattleguards
An appropriately sized cattleguard(s) sufficient to carry out the project shall be installed and maintained at fence crossing(s).

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

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

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

Figure 1 – Cross Sections and Plans For Typical Road Sections



height of fill at shoulder	embankment slope
0' – 4'	3:1
above 4'	2:1

road type	crown
earth surface	.03 – .05 ft/ft
aggregate surface	.02 – .04 ft/ft
paved surface	.02 – .03 ft/ft

VII. DRILLING
(Well drilled and completed without approval from BLM)

A. DRILLING OPERATIONS REQUIREMENTS

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

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

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

1. **Although Hydrogen Sulfide has not been reported in this section, it is always a potential hazard. If Hydrogen Sulfide was encountered, please report measured amounts 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. **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.**

B. CASING

Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size. 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.).

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

Wait on cement (WOC) time prior to drilling out for a primary cement job will be a minimum 18 hours for a water basin, 24 hours in the potash area, or 500 pounds compressive strength, whichever is greater for all casing strings. DURING THIS WOC TIME, NO DRILL PIPE, ETC. SHALL BE RUN IN THE HOLE. Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. See individual casing strings for details regarding lead cement slurry requirements.

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

HIGH CAVE/KARST – CONTINGENCY CASING WILL BE REQUIRED IF LOST CIRCULATION OCCURS WHILE DRILLING THE SURFACE HOLE. THE SURFACE HOLE WILL HAVE TO BE REAMED AND A LARGER CASING INSTALLED.

1. The **8-5/8** inch surface casing was set at 1102 feet and cemented to the surface.

2. The **5-1/2** inch production casing was set at 7316 feet and cemented to the surface.

Pilot hole drilled to 4200' and cemented back to 2090' with 1000 sacks of cement.

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

C. PRESSURE CONTROL

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

2. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **2000 (2M)** psi.

3. 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 (18 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.

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.

CRW 042213

VIII. PRODUCTION (POST DRILLING)

A. WELL STRUCTURES & FACILITIES

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

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

Painting Requirement
All above-ground structures including meter housing that are not subject to safety requirements shall be painted a flat non-reflective paint color, Shale Green from the BLM Standard Environmental Color Chart (CC-001: June 2008).

B. PIPELINES

STANDARD STIPULATIONS FOR SURFACE INSTALLED PIPELINES

A copy of the application (Grant, Sundry Notice, APD) and attachments, including stipulations, survey plat and/or map, will be on location during construction. BLM personnel may request to you a copy of your permit during construction to ensure compliance with all stipulations.

Holder agrees to comply with the following stipulations to the satisfaction of the Authorized Officer:

1. The holder shall indemnify the United States against any liability for damage to life or property arising from the occupancy or use of public lands under this grant.

2. The holder shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, the holder shall comply with the Toxic Substances Control Act of 1976 as amended, 15 USC 2601 et seq. (1982) with regards to any toxic substances that are used, generated by or stored on the right-of-way or on facilities authorized under this right-of-way grant. (See 40 CFR, Part 702-799 and especially, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193.) Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR, Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation, and Liability Act, section 102b. A copy of any report required or requested by any Federal agency or State government as a result of a reportable release or spill of any toxic substances shall be furnished to the authorized officer concurrent with the filing of the reports to the involved Federal agency or State government.

3. The holder agrees to indemnify the United States against any liability arising from the release of any hazardous substance or hazardous waste (as these terms are defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. 9601, et seq. or the Resource Conservation and Recovery Act, 42 U.S.C. 6901, et seq.) on the Right-of-Way (unless the release or threatened release is wholly unrelated to activity of the Right-of-Way holder's activity on the Right-of-Way), or resulting from the activity of the Right-of-Way holder on the Right-of-Way. This agreement applies without regard to whether a release is caused by the holder, its agent, or unrelated third parties.

4. The holder shall be liable for damage or injury to the United States to the extent provided by 43 CFR Sec. 2883.1-4. The holder shall be held to a standard of strict liability for damage or injury to the United States resulting from pipe rupture, fire, or spills caused or substantially aggravated by any of the following within the right-of-way or permit area:

a. Activities of the holder including, but not limited to construction, operation, maintenance, and termination of the facility.
b. Activities of other parties including, but not limited to:
    (1) Land clearing.
    (2) Earth-disturbing and earth-moving work.
    (3) Blasting.
    (4) Vandalism and sabotage.
c. Acts of God.

The maximum limitation for such strict liability damages shall not exceed one million dollars ($1,000,000) for any one event, and any liability in excess of such amount shall be determined by the ordinary rules of negligence of the jurisdiction in which the damage or injury occurred.

This section shall not impose strict liability for damage or injury resulting primarily from an act of war or from the negligent acts or omissions of the United States.

5. If, during any phase of the construction, operation, maintenance, or termination of the pipeline, any oil, salt water, or other pollutant should be discharged from the pipeline system, impacting Federal lands, the control and total removal, disposal, and cleaning up of such oil, salt water, or other pollutant, wherever found, shall be the responsibility of the holder, regardless of fault. Upon failure of the holder to control, dispose of, or clean up such discharge on or affecting Federal lands, or to repair all damages resulting therefrom, on the Federal lands, the Authorized Officer may take such measures as he deems necessary to control and clean up the discharge and restore the area, including, where appropriate, the aquatic environment and fish and wildlife habitats, at the full expense of the holder. Such action by the Authorized Officer shall not relieve the holder of any responsibility as provided herein.

6. All construction and maintenance activity will be confined to the authorized right-of-

way width of 20 feet. If the pipeline route follows an existing road or buried pipeline right-of-way, the surface pipeline must be installed no farther than 10 feet from the edge of the road or buried pipeline right-of-way. If existing surface pipelines prevent this distance, the proposed surface pipeline must be installed immediately adjacent to the outer surface pipeline. All construction and maintenance activity will be confined to existing roads or right-of-ways.

7. No blading or clearing of any vegetation will be allowed unless approved in writing by the Authorized Officer.

8. The holder shall install the pipeline on the surface in such a manner that will minimize suspension of the pipeline across low areas in the terrain. In hummocky of duney areas, the pipeline will be "snaked" around hummocks and dunes rather then suspended across these features.

9. The pipeline shall be buried with a minimum of 24 inches under all roads, "two-tracks," and trails. Burial of the pipe will continue for 20 feet on each side of each crossing. The condition of the road, upon completion of construction, shall be returned to at least its former state with no bumps or dips remaining in the road surface.

10. The holder shall minimize disturbance to existing fences and other improvements on public lands. The holder is required to promptly repair improvements to at least their former state. Functional use of these improvements will be maintained at all times. The holder will contact the owner of any improvements prior to disturbing them. When necessary to pass through a fence line, the fence shall be braced on both sides of the passageway prior to cutting of the fence. No permanent gates will be allowed unless approved by the Authorized Officer.

11. In those areas where erosion control structures are required to stabilize soil conditions, the holder will install such structures as are suitable for the specific soil conditions being encountered and which are in accordance with sound resource management practices.

12. Excluding the pipe, all above-ground structures not subject to safety requirement shall be painted by the holder to blend with the natural color of the landscape. The paint used shall be a color which simulates "Standard Environmental Colors" – **Shale Green**, Munsell Soil Color No. 5Y 4/2; designated by the Rocky Mountain Five State Interagency Committee.

13. The pipeline will be identified by signs at the point of origin and completion of the right-of-way and at all road crossings. At a minimum, signs will state the holder's name, BLM serial number, and the product being transported. Signs will be maintained in a legible condition for the life of the pipeline.

14. The holder shall not use the pipeline route as a road for purposes other than routine maintenance as determined necessary by the Authorized Officer in consultation with the

holder. The holder will take whatever steps are necessary to ensure that the pipeline route is not used as a roadway.

15. Any cultural and/or paleontological resource (historic or prehistoric site or object) discovered by the holder, or any person working on his behalf, on public or Federal land shall be immediately reported to the authorized officer. Holder 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 will be made by the authorized officer to determine appropriate cultural or scientific values. The holder will be responsible for the cost of evaluation and any decision as to proper mitigation measures will be made by the authorized officer after consulting with the holder.

16. 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, powerline 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.

17. Surface pipelines must be less than or equal to 4 inches and a working pressure below 125 psi.

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).

Seed Mixture 1, for Loamy Sites

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

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

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

Species	lb/acre
Plains lovegrass (Eragrostis intermedia)	0.5
Sand dropseed (Sporobolus cryptandrus)	1.0
Sideoats grama (Bouteloua curtipendula)	5.0
Plains bristlegrass (Setaria macrostachya)	2.0

*Pounds of pure live seed:

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