CK VAM 7031

OCD-ARTESIA

ATS-08-155

175

CONFIDENTIAL

FEB 11 2008

OCD-ARTESIA

Form 3160-3
(April 2004)

Split Estate

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

S

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

R-111-POTASH

APPLICATION FOR PERMIT TO DRILL OR REENTER

1a. Type of work. ☑ DRILL ☐ REENTER	5 Lease Serial No. NMNM119272 (PENDING)
	6. If Indian, Allotee or Tribe Name
	7 If Unit or CA Agreement, Name and No. PENDING
1b. Type of Well: ☑ Oil Well ☐ Gas Well ☐ Other ☐ Single Zone ☐ Multiple Zone	8. Lease Name and Well No. 36999 IMC 21 FEDERAL COM 2H
2 Name of Operator CHESAPEAKE OPERATING, INC. 147179 LINDA GOOD	9 API Well No. 30-015-36109
3a. Address P. O. BOX 18496 OKLAHOMA CITY, OK 73154-0496 / 3b. Phone No. (include area code) 405-767-4275	10 Field and Pool, or Exploratory NE 96878 Harroun Ranch; Delaware, Oil Pool
4. Location of Well (Report location clearly and in accordance with any State requirements.*) At surface 460' FNL & 410' FEL, NENE At proposed prod zone 330' FSL & 650' FEL, SESE Carlsbad Controlled Water Basin	11. Sec., T. R. M. or Blk. and Survey or Area 21-23S-29E
14 Distance in miles and direction from nearest town or post office*	12. County or Parish EDDY CO. / 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 120	
18 Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. / 19 Proposed Depth ~~10,235'~~ 6536 TVD 10186' MD / 20 BLM/BIA Bond No. on file NM #2634 Per drilling Plan 1-14-08	
21 Elevations (Show whether DF, KDB, RT, GL, etc.) 2957' GL (EST) / 22. Approximate date work will start* / 23. Estimated duration	

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) Paul Hagemeier	Date 11/12/07
Title Vice President - Regulatory Compliance		
Approved by (Signature) /s/ Jesse J. Juen	Name (Printed/Typed) /s/ Jesse J. Juen	Date FEB 6 2008
Title STATE DIRECTOR	Office NM STATE 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)

SEE ATTACHED FOR CONDITIONS OF APPROVAL

APPROVAL SUBJECT TO GENERAL REQUIREMENTS AND SPECIAL STIPULATIONS ATTACHED

DISTRICT I
1625 N. FRENCH DR., HOBBS, NM 88240

DISTRICT II
1301 W. GRAND AVENUE, ARTESIA, NM 88210

DISTRICT III
1000 Rio Brazos Rd., Aztec, NM 87410

DISTRICT IV
1220 S. ST. FRANCIS DR., SANTA FE, NM 87505

State of New Mexico
Energy, Minerals and Natural Resources Department

OIL CONSERVATION DIVISION
1220 SOUTH ST. FRANCIS DR.
Santa Fe, New Mexico 87505

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

WELL LOCATION AND ACREAGE DEDICATION PLAT

☐ AMENDED REPORT

API Number	Pool Code	Pool Name
	96878 NE	Harroun Ranch; Delaware, Oil Pool

Property Code	Property Name	Well Number
	IMC 21 FEDERAL COM	2H

OGRID No.	Operator Name	Elevation
147179	CHESAPEAKE OPERATING INC.	2960'

Surface Location

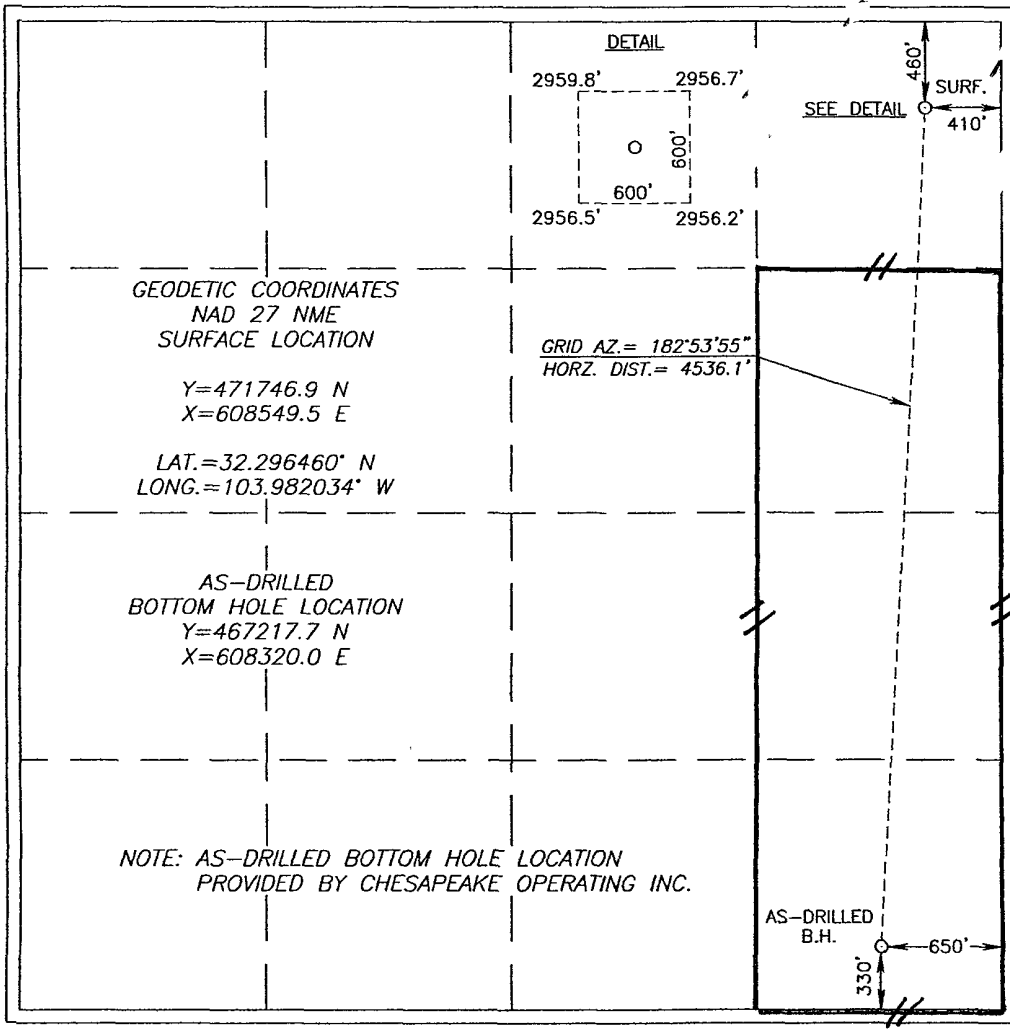
UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
A	21	23-S	29-E		460	NORTH	410	EAST	EDDY

Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
P	21	23-S	29-E		330	SOUTH	650	EAST	EDDY

Dedicated Acres	Joint or Infill	Consolidation Code	Order No.
120			

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.

Craig Barnard 11/5/07
Signature Date

CRAIG BARNARD
Printed Name

SURVEYOR CERTIFICATION

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

MAY 9, 2007
NEW MEXICO
REGISTERED PROFESSIONAL SURVEYOR
3239
07.13.1558

Date Surveyed MEXICO REV. 11/1/07
Signature & Seal of Professional Surveyor
Ronald J. Eidson 11/01/07

Certificate No. GARY EIDSON 12641
RONALD J. EIDSON 3239

EXHIBIT A-1

Chesapeake Operating Inc.
IMC 21 Federal Com 2H
SL: 460' FNL & 410' FEL
BL: 330' FSL & 650' FEL
Section 21-23S-29E
Eddy County, NM

Confidential – Tight Hole
Lease No. NMNM 119272 (PENDING)

#24 Attachment to Application for Permit to Drill or Re-enter

Chesapeake Operating, Inc. respectfully requests permission to drill a well to 10,235' to test the Delaware formation. If productive, casing will be run and the well completed. If dry, the well will be plugged and abandoned as per BLM and New Mexico Oil Conservation Division requirements.

Please find the Surface Use Plan and Drilling Plan as required by Onshore Order No. 1. The Archeological Survey (Exhibit E) will be delivered to the BLM when completed.

Chesapeake Operating, Inc. has an agreement with the grazing lessee.

Please be advised that Chesapeake Operating, Inc. is considered to be the Operator of the above mentioned well. Chesapeake Operating, Inc. agrees to be responsible under the terms and conditions of the lease for the operations conducted upon the lease lands.

ONSHORE OIL & GAS ORDER NO. 1
Approval of Operations on Onshore Federal and Indian Oil and Gas Leases

All lease and/or unit operations are to be conducted in such a manner that full compliance is made with the applicable laws, regulations (CFR 43, Part 3160) and the approved Application for Permit to Drill. The operator is considered fully responsible for the actions of his subcontractors. A copy of the approved APD must be on location during construction, drilling and completion operations.

Approval of this application 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.

1. FORMATION TOPS

The estimated tops of important geologic markers are as follows:

Formation	Subsea	Depth
DELAWARE MTN. GROUP	8'	2,968'
BELL CANYON	-25'	3,000'
CHERRY CANYON	-861'	3,836'
MANZANITA MARKER	-989'	3,964'
BRUSHY CANYON	-2,068'	5,043'
LWR BRSC "B"	-3,491'	6,466'
****LWR BRSC "BC" Target Top**	**-3,553'**	**6,528'**
****LWR BRSC "BC" Target Base**	**-3,568'**	**6,543'**
*LWR BRSC "C"	-3,604'	6,579'
BASAL BRUSHY SHALE	-2,949'	6,648'
BONE SPRING LIME	-3,696'	6,671'
***Potentially productive zones**		
	TD (TVD)	**6,543'**

2. ESTIMATED DEPTH OF WATER, OIL, GAS & OTHER MINERAL BEARING FORMATIONS

The estimated depths at which the top and bottom of the anticipated water, oil, gas or other mineral bearing formations are expected to be encountered are as follows:

Substance	Formation	Depth
	Cherry Canyon	3,836-5,043
Oil/Gas		
	Brushy Canyon	5,043-6,671
Oil/Gas		

All shows of fresh water and minerals will be reported and protected.

3. BOP EQUIPMENT:

Will have a 3000 psi simplified rental stack (see proposed schematic) for drill out below surface casing; this system will be tested to 2000 psi working pressure.

Will have a 5000 psi rig stack (see proposed schematic) for drill out below intermediate casing; this system will be tested to 3000 psi working pressure.

Chesapeake Operating, Inc.'s minimum specifications for pressure control equipment are as follows:

I. BOP, Annular, Choke Manifold, Pressure Test – (See Exhibit F-1 to F-3).

A. Equipment
1. The equipment to be tested includes all of the following that is installed on the well:
   (a) Ram-type and annular preventers,
   (b) Choke manifolds and valves,
   (c) Kill lines and valves, and
   (d) Upper and lower kelly cock valves, inside BOP's and safety valves.

B. Test Frequency
1. All tests should be performed with clear **water**,
   (a) when installed,
   (b) before drilling out each casing string,
   (c) at any time that there is a repair requiring a pressure seal to be broken in the assembly, and
   (d) at least once every **30 days** while drilling.

C. Test Pressure
1. In some drilling operations, the pressures to be used for low and high-pressure testing of preventers and casing may be different from those given below due to governmental regulations, or approved local practices.
2. If an individual component does not test at the low pressure, **do not,** test to the high pressure and then drop back down to the low pressure.
3. All valves located downstream of a valve being tested must be placed in the open position.
4. All equipment will be tested with an initial "low pressure" test at 250 psi.
5. The subsequent "high pressure" test will be conducted at the rated working pressure of the equipment for all equipment except the annular preventer.
6. The "high pressure" test for the annular preventer will be conducted at 70% of
7. the rated working pressure.
8. A record of all pressures will be made on a pressure-recording chart.

3. BOP EQUIPMENT: 3,000# System

Replaced

Chesapeake Operating, Inc.'s minimum specifications for pressure control equipment are as follows:

I. BOP, Annular, Choke Manifold, Pressure Test – (See Exhibit F-1 to F-3).

A. Equipment
1. The equipment to be tested includes all of the following that is installed on the well:
   (a) Ram-type and annular preventers,
   (b) Choke manifolds and valves,
   (c) Kill lines and valves, and
   (d) Upper and lower kelly cock valves, inside BOP's and safety valves.

B. Test Frequency
1. All tests should be performed with clear **water**,
   (a) when installed,
   (b) before drilling out each casing string,
   (c) at any time that there is a repair requiring a pressure seal to be broken in the assembly, and
   (d) at least once every **30 days** while drilling.

C. Test Pressure
1. In some drilling operations, the pressures to be used for low and high-pressure testing of preventers and casing may be different from those given below due to governmental regulations, or approved local practices.
2. If an individual component does not test at the low pressure, **do not,** test to the high pressure and then drop back down to the low pressure.
3. All valves located downstream of a valve being tested must be placed in the open position.
4. All equipment will be tested with an initial "low pressure" test at 250 psi.
5. The subsequent "high pressure" test will be conducted at the rated working pressure of the equipment for all equipment except the annular preventer.
6. The "high pressure" test for the annular preventer will be conducted at 70% of
7. the rated working pressure.
8. A record of all pressures will be made on a pressure-recording chart.

Need

D. Test Duration
1. In each case, the individual components should be monitored for leaks for **5 minutes,** with no observable pressure decline, once the test pressure as been applied.

Need

II. Accumulator Performance Test

A. Scope

1. The purpose of this test is to check the capabilities of the BOP control systems, and to detect deficiencies in the hydraulic oil volume and recharge time.

B. Test Frequency

1. The accumulator is to be tested each time the BOP's are tested, or any time a major repair is performed.

C. Minimum Requirements

1. The accumulator should be of sufficient volume to supply 1.5 times the volume to close and hold all BOP equipment in sequence, **without recharging** and the **pump turned off**, and have remaining pressures of **200 PSI above the precharge pressure**.

2. Minimum precharge pressures for the various accumulator systems per **manufacturers recommended specifications** are as follows:

3.

System Operating Pressures	Precharge Pressure
1500 PSI	750 PSI
2000 PSI	1,000 PSI
3000 PSI	1,000 PSI

3. Closing times for the Hydril should be less than **20 seconds**, and for the ram-type preventers less than **10 seconds**.

4. System Recharge time should not exceed **10 minutes**.

D. Test Procedure

1. Shut accumulator pumps off and record accumulator pressure.

2. In sequence, close the annular and one set of properly sized pipe rams, and open the HCR valve.

3. Record time to close or open each element and the remaining accumulator pressure after each operation.

4. Record the remaining accumulator pressure at the end of the test sequence. Per the previous requirement, this pressure **should not be less** than the following pressures:

System Pressure	Remaining Pressure At Conclusion of Test
1,500 PSI	950 PSI
2,000 PSI	1,200 PSI
3,000 PSI	1,200 PSI

5. Turn the accumulator pumps on and record the recharge time. This time should not exceed **10 minutes.**

6. Open annular and ram-type preventers. Close HCR valve.

7. Place all 4-way control valves in **full open** or **full closed** position. **Do not leave in neutral position**.

4. CASING AND CEMENTING PROGRAM – (See Exhibit I)

a. The proposed casing program will be as follows:

Purpose	Interval	Hole Size	Casing Size	Weight	Grade	Thread	Condition
Surface	0' – 345'	17.5"	13-3/8"	48.0	H-40	ST&C	new
Intermediate	0' – 3000'	11.0"	8-5/8"	32.0	J-55	ST&C	new
Production	0' – 10,~~235~~'	7.875"	5-1/2"	17.0	N-80	LT&C	new

18b- Per drilling Plan

b. Casing design subject to revision based on geologic conditions encountered.
c. The cementing program will be as follows:

Interval	Type	Amount	Yield	Washout	Excess
0' – 345'	35:65 Poz:C	149	2.10 1.34	0	100
	Class C (145' – sect TD)	204		0	70
0' – 3000'	35:65 Poz:C	567	2.10 1.34	0	75
	Class C (2400' – sect TD)	192		0	50
2600' – 10,235'	TXI LW (2600' – sect TD)	1,268	1.26	0	20

5. MUD PROGRAM

see COA

a. The proposed circulating mediums to be used in drilling are as follows:

Interval	Mud Type	Mud Weight	Viscosity	Fluid Loss
0' – 345'	water	8.4 – 9.2	28 - 32	NC
345' – 3000'	brine	9.9 – 10.1	30 – 32	NC
3000' – 10,235'	water base	8.6 – 9.3	28 - 36	5 - 10

A closed system will be utilized consisting of above ground steel tanks. All wastes accumulated during drilling operations will be contained in a portable trash cage and removed from location and deposited in an approved sanitary landfill.

A mud test shall be performed every 24 hours after mudding up to determine, as applicable: density, viscosity, gel strength, filtration, and pH.

6. TESTING, LOGGING AND CORING
   The anticipated type and amount of testing, logging and coring are as follows:

   a. Drill stem tests are not planned.
   b. The logging program will consist of Natural GR, Density-Neutron, PE & Dual Laterolog from TD to surface casing; Neutron-GR surface casing to surface.
   c. Cores samples are not planned.

7. ABNORMAL PRESSURES AND HYDROGEN SULFIDE
   a. The estimated bottom hole pressure is 2945 psi (0.45 psi/ft @ 6543' TVD. No abnormal pressures or temperatures are anticipated.
   b. Hydrogen sulfide gas is not anticipated

8. Proposed directional drill survey – See Exhibit G.

9. Proposed Well Schematic – See Exhibit H.

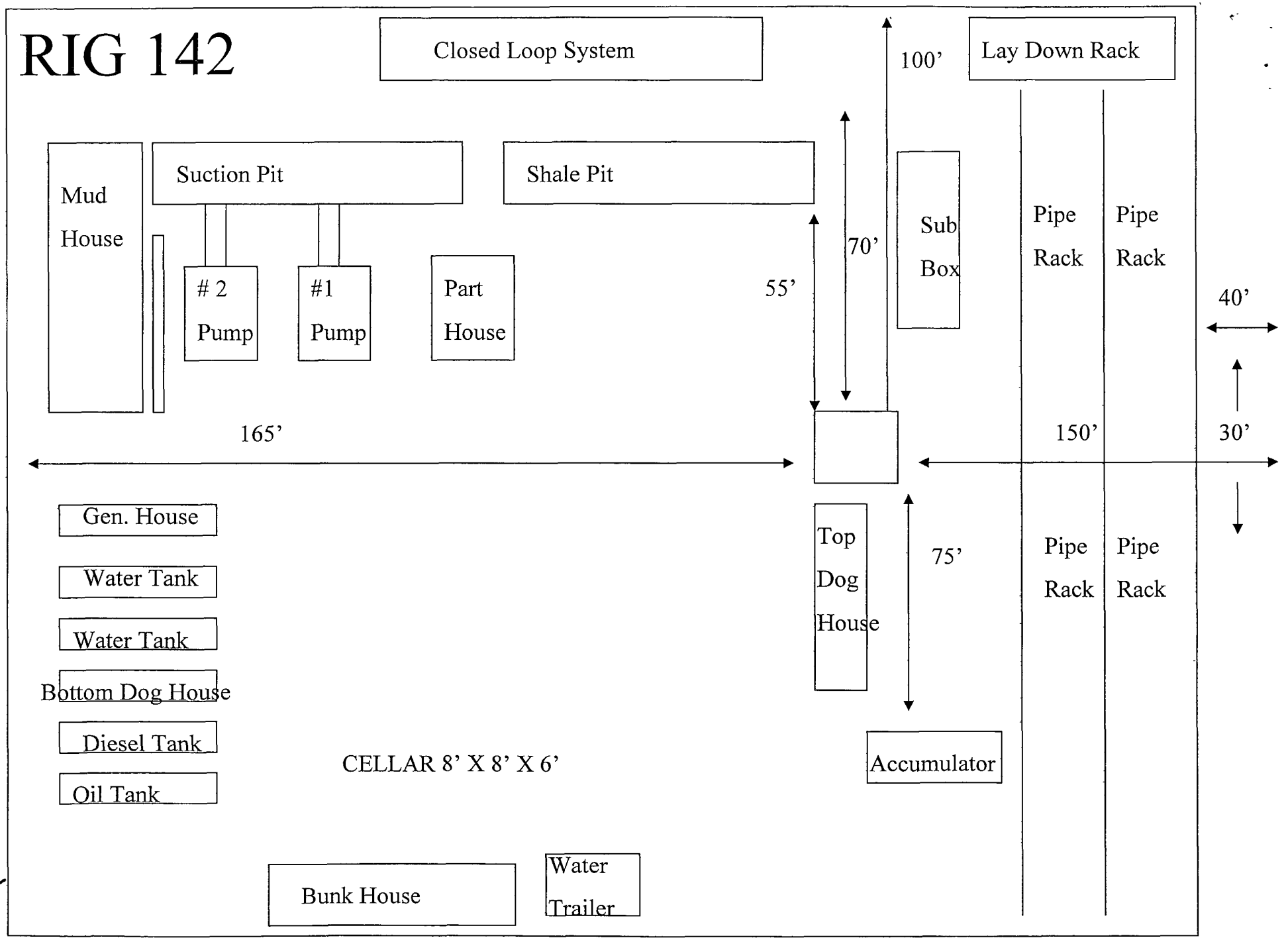

RIG 142
Closed Loop System
100'
Lay Down Rack
Mud House
Suction Pit
Shale Pit
Sub Box
Pipe Rack
Pipe Rack
2 Pump
#1 Pump
Part House
70'
55'
40'
165'
150'
30'
Gen. House
Water Tank
Water Tank
Bottom Dog House
Diesel Tank
Oil Tank
Top Dog House
75'
Pipe Rack
Pipe Rack
CELLAR 8' X 8' X 6'
Accumulator
Bunk House
Water Trailer

EXHIBIT 1

BLOWOUT PREVENTOR SCHEMATIC

CHESAPEAKE OPERATING INC

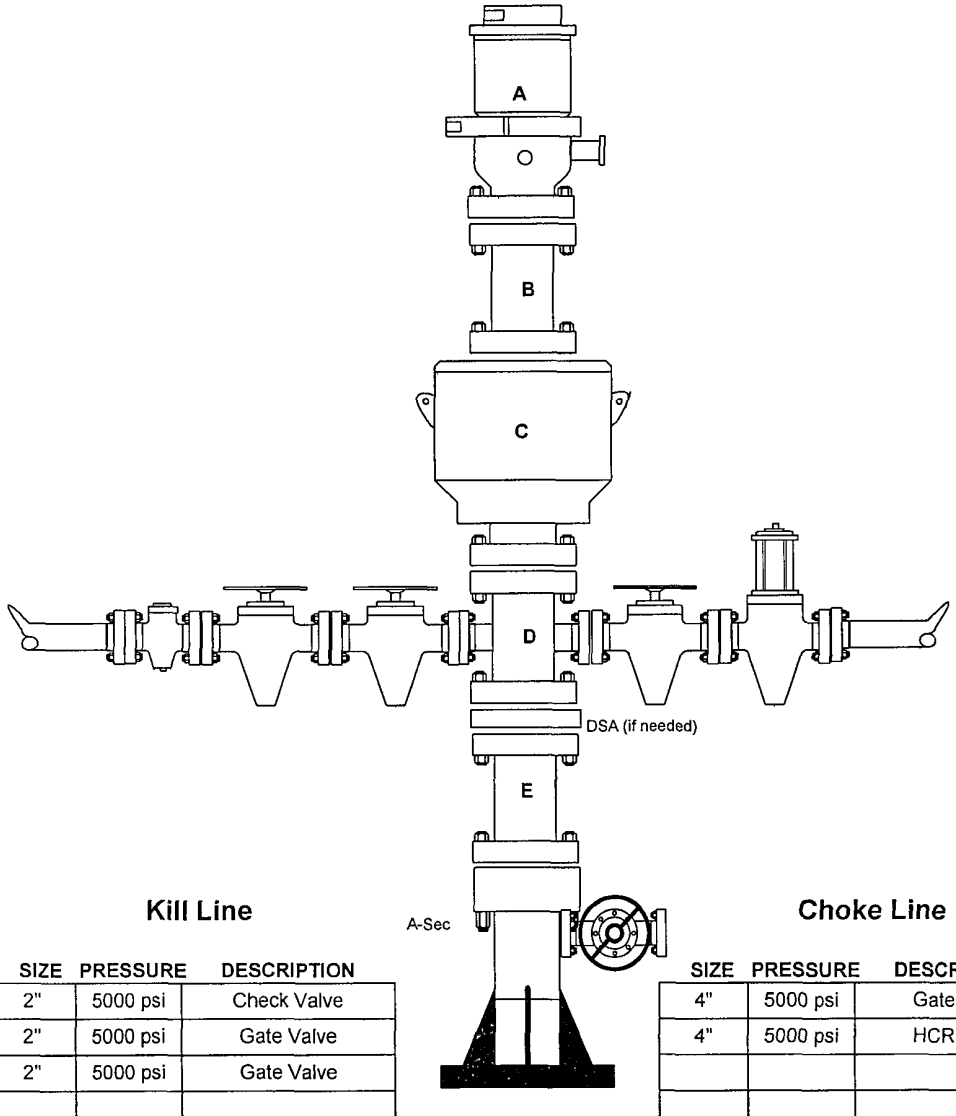
WELL : **IMC 21 Fed Com 2H**

RIG : **Patterson 142**

COUNTY : **Eddy** **STATE: New Mexico**

OPERATION: Drill out below 13-3/8" Casing (11" hole size)

	SIZE	PRESSURE	DESCRIPTION
A	13-5/8"	500 psi	Rot Head
B	13-5/8"	3000 psi	Spacer Spool
C	13-5/8"	3000 psi	Annular
D	13-5/8"	3000 psi	Mud Cross
E	13-5/8"	3000 psi	Spacer Spool
DSA	13-5/8" 3M x 13-5/8" 3M (if needed)		
A-Sec	13-3/8" SOW x 13-5/8" 3M		



Kill Line

SIZE	PRESSURE	DESCRIPTION
2"	5000 psi	Check Valve
2"	5000 psi	Gate Valve
2"	5000 psi	Gate Valve

Choke Line

SIZE	PRESSURE	DESCRIPTION
4"	5000 psi	Gate Valve
4"	5000 psi	HCR Valve

EXHIBIT F-1

BLOWOUT PREVENTOR SCHEMATIC

CHESAPEAKE OPERATING INC

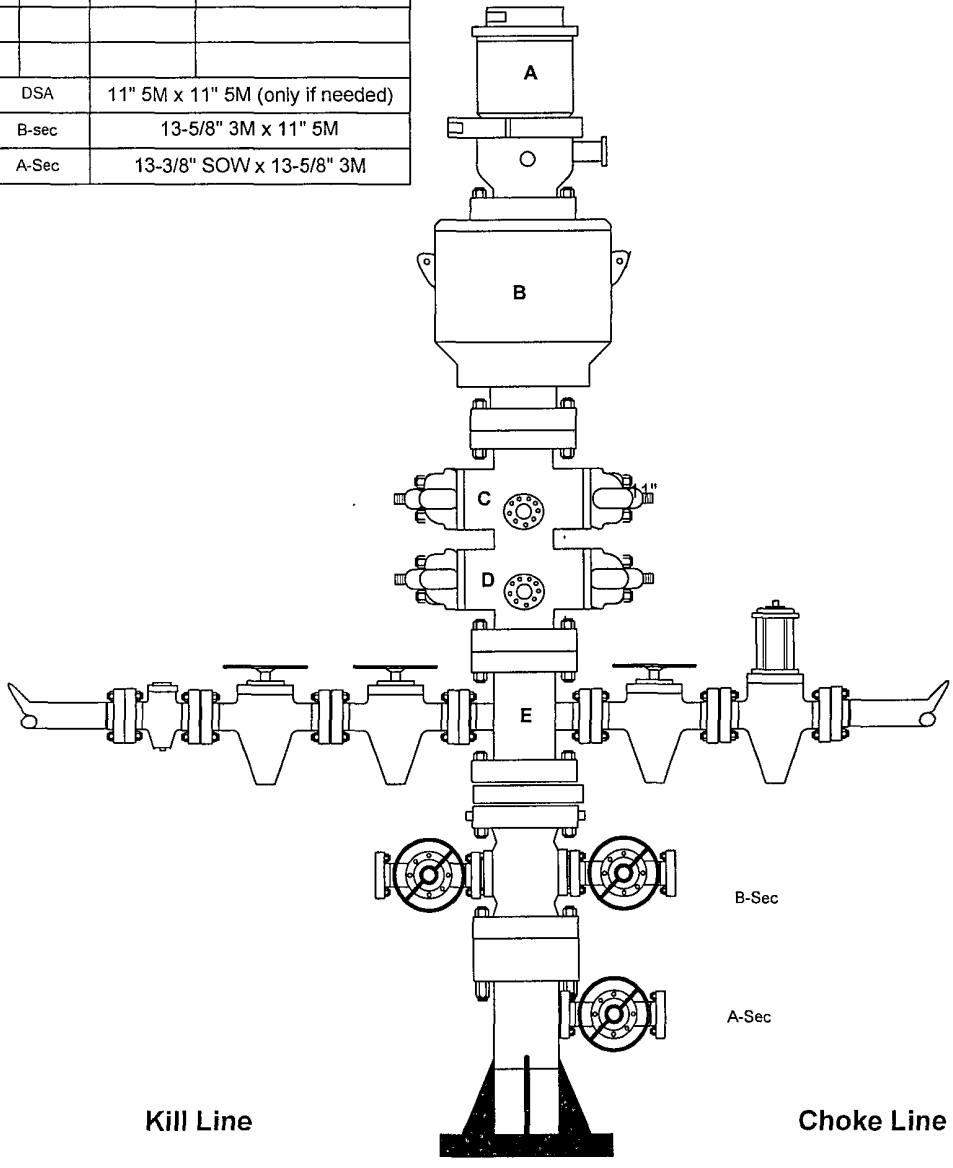
WELL : **IMC 21 Fed Com 2H**

RIG : **Patterson 142**

COUNTY : **Eddy** **STATE: New Mexico**

OPERATION: Drill out below 8-5/8" Casing (7-7/8" hole size)

	SIZE	PRESSURE	DESCRIPTION
A	11"	500 psi	Rot Head
B	11"	5000 psi	Annular
C	11"	5000 psi	Pipe Rams
D	11"	5000 psi	Blind Rams
E	11"	5000 psi	Mud Cross
DSA	11" 5M x 11" 5M (only if needed)		
B-sec	13-5/8" 3M x 11" 5M		
A-Sec	13-3/8" SOW x 13-5/8" 3M		



Kill Line

SIZE	PRESSURE	DESCRIPTION
2"	5000 psi	Check Valve
2"	5000 psi	Gate Valve
2"	5000 psi	Gate Valve

Choke Line

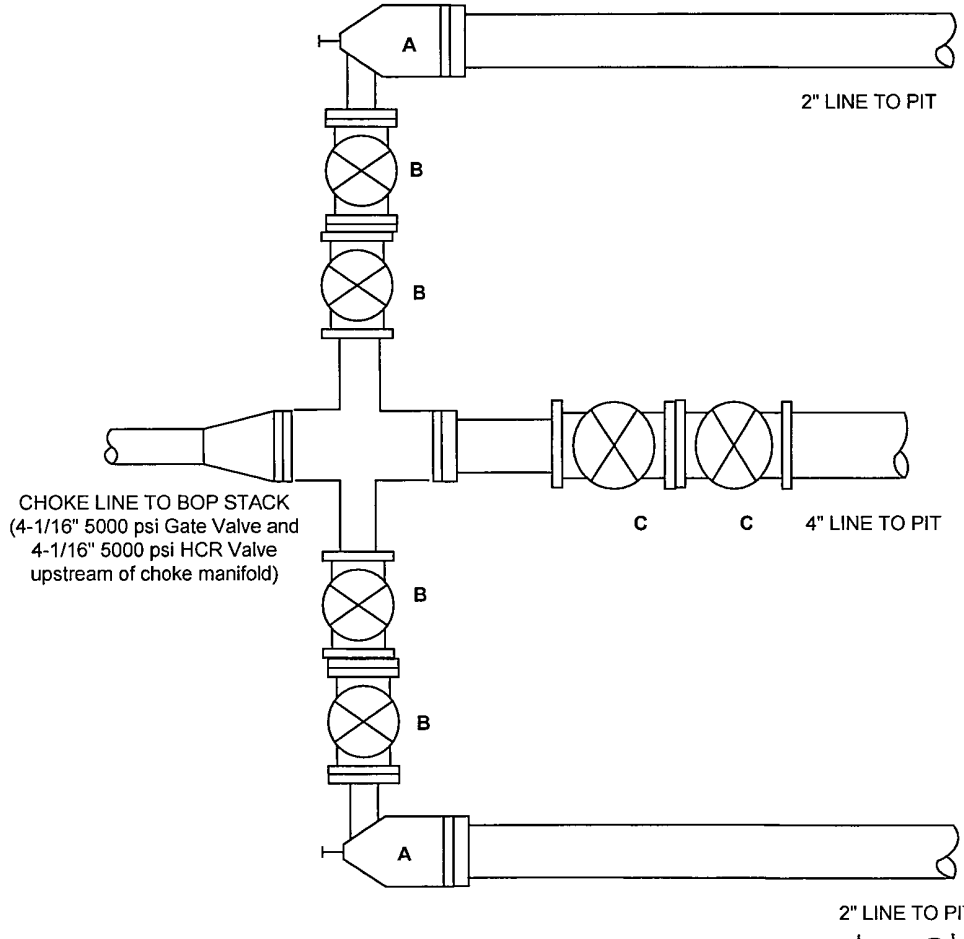
SIZE	PRESSURE	DESCRIPTION
4"	5000 psi	Gate Valve
4"	5000 psi	HCR Valve

EXHIBIT C-2

CHOKE MANIFOLD SCHEMATIC

CHESAPEAKE OPERATING, INC.

WELL : **IMC 21 Fed Com 2H**
RIG : **Patterson #142**
COUNTY : **Eddy** **STATE** : **New Mexico**
OPERATION: **Drilling below/beyond 13-3/8" surface casing**



5M requires one remote choke

	SIZE	PRESSURE	DESCRIPTION
A	2-1/16"	5000 psi	Manual Choke
B	2-1/16"	5000 psi	Gate Valve
C	4-1/16"	5000 psi	Gate Valve

EXHIBIT F-3

Casing Program

IMC 21 Fed Com 2H

Proposed TD: 10,235' MD

(6,536' est. max TVD)

SHL: 330' FNL & 650' FEL
BHL: 330' FSL & 650' FEL
Section 21 - 23S - 29E

Eddy County, New Mexico

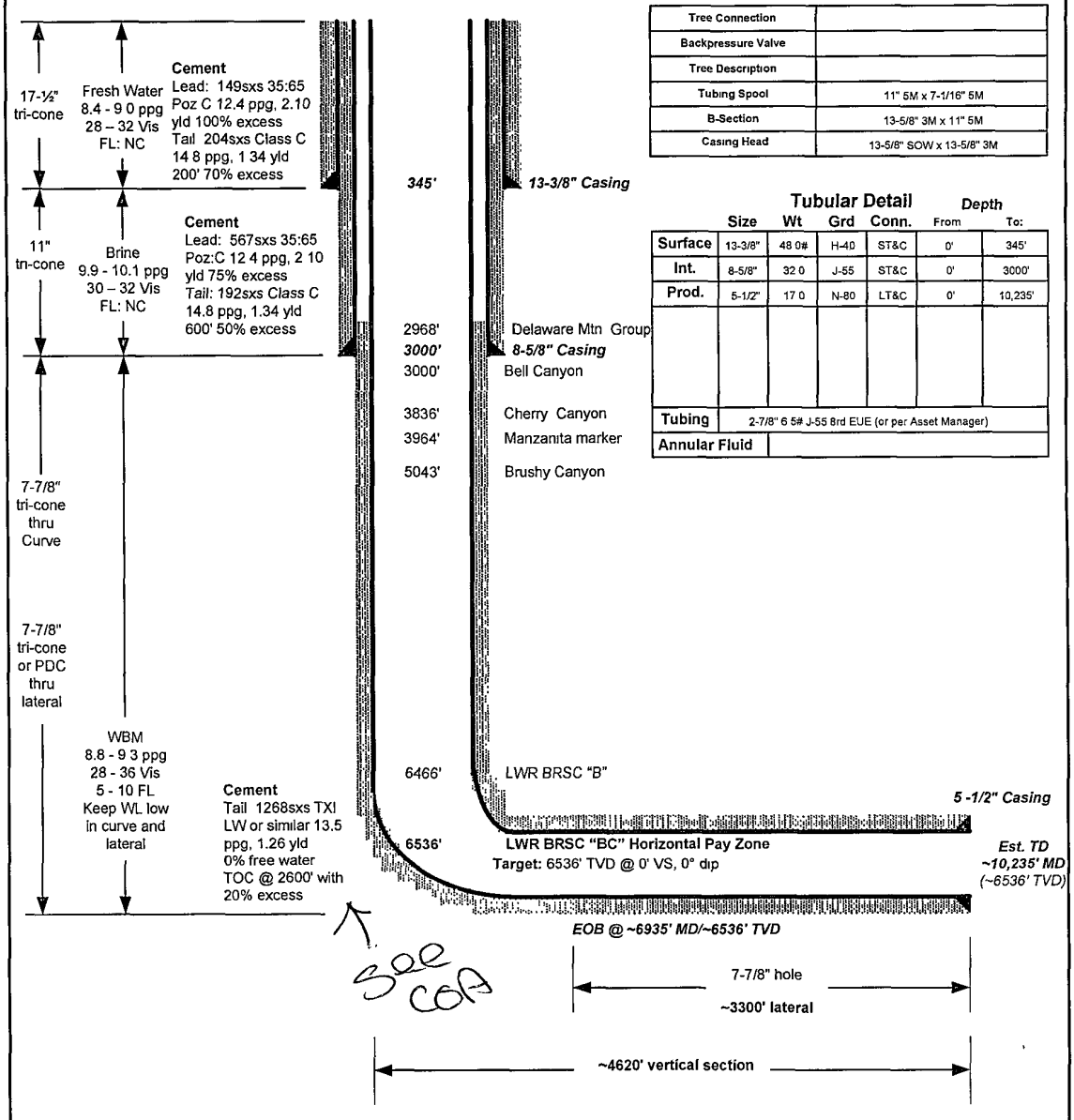
YHC/RLP
10/30/2007

EXHIBIT I

Chesapeake Operating Inc	Proposed Well Schematic (drilling)

Well : **IMC 21 Fed Com 2H**
Field : **SE Eddy – Teledyne Prospect**
County : **Eddy** **State** : **NM**
Surf Locat : **Section 21-23S-29E, 330' FNL & 650' FEL**
BH Locat : **Section 21-23S-29E, 330' FSL & 650' FEL**
KB Elev : **2,975' est** **Grd Elev** : **2,957' est**

Chesapeake ENERGY



Wellhead Equipment

Tree Connection	
Backpressure Valve	
Tree Description	
Tubing Spool	11" 5M x 7-1/16" 5M
B-Section	13-5/8" 3M x 11" 5M
Casing Head	13-5/8" SOW x 13-5/8" 3M

Tubular Detail

	Size	Wt	Grd	Conn.	Depth From	Depth To:
Surface	13-3/8"	48 0#	H-40	ST&C	0'	345'
Int.	8-5/8"	32 0	J-55	ST&C	0'	3000'
Prod.	5-1/2"	17 0	N-80	LT&C	0'	10,235'
Tubing	2-7/8" 6 5# J-55 8rd EUE (or per Asset Manager)					
Annular Fluid						

Note: ***All Depths are TVD unless otherwise indicated***

Drawn by.	Date:		Revised by:	Date:
YHC	10/29/07		-	-

EXHIBIT H

IMC 21 Fed Com 2H
17-1/2" Hole Section
0' – 345'

Casing Design:

Size	Interval	Length	Weight	Grade	Conn	Sec. Weight
13-3/8"	0' – 345'	345'	48 ppf	H-40	ST&C	14.3 Klbs

Recommended Make-up Torque: 3220 ft-lbs (Opt)
2420 ft-lbs (Minimum)
4030 ft-lbs (Maximum)

- Minimum collapse safety factor of 4.6 (complete evacuation; 10.0 ppg mud on backside). 100% collapse value of 740 psi.
- Minimum burst safety factor of 1.4 (Testing casing at 1200 psi). 100% burst value of 1730 psi.
- Minimum tension safety factor of 9.4 (casing full of 12.4 ppg cement without backup). 100% tension value of 322,000 lbs.

11" Hole Section
345' – 3000'

Casing Design:

Size	Interval	Length	Weight	Grade	Conn	Sec. Weight
8-5/8"	0' – 3000'	3000'	32 ppf	J-55	ST&C	81.3 Klbs

Recommended Make-up Torque: 3720 ft-lbs (Opt)
2790 ft-lbs (Minimum)
4650 ft-lbs (Maximum)

- Minimum collapse safety factor of 2.2 (50% evacuation; 10.0 ppg on backside). 100% collapse value of 1370 psi.
- Minimum burst safety factor of 1.3 (Casing test to 2200 psi). 100% burst value of 2950 psi.
- Minimum tension safety factor of 2.7 (casing full of 12.4 ppg cement without backup). 100% tension value of 244,000 lbs.

7-7/8" Hole Section
3000' – 10,235'

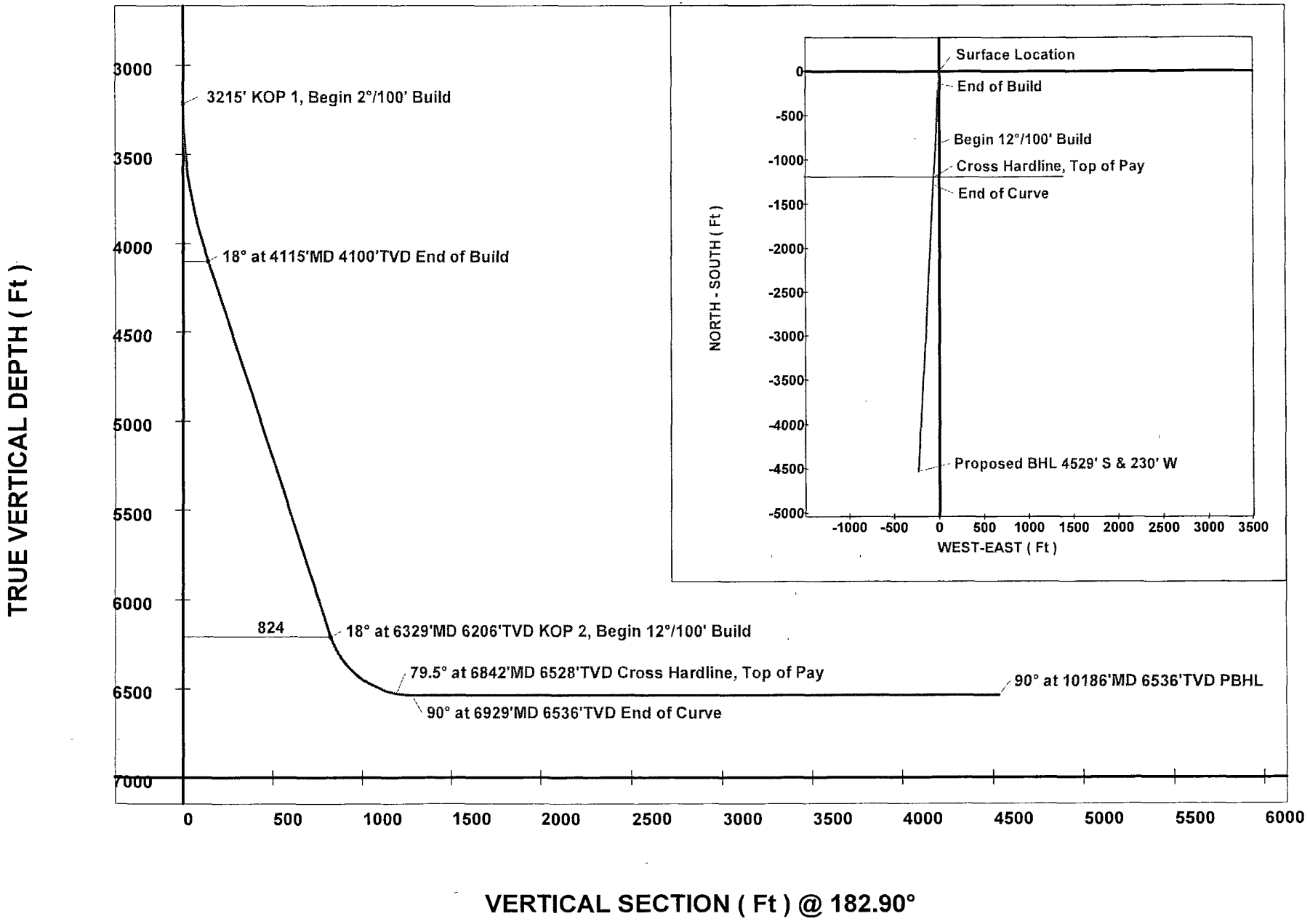
Casing Design:

Size	Interval	Length	Weight	Grade	Conn	Sec. Weight
5-1/2"	0' –10,235'	10,235'	17 ppf	N-80	LT&C	149.3 Klbs

Recommended Make-up Torque: 3480 ft-lbs (Opt)
2610 ft-lbs (Minimum)
4350 ft-lbs (Maximum)

- Minimum collapse safety factor of 1.3 (complete evacuation; 9.3 ppg on backside). 100% collapse value of 6290 psi.
- Minimum burst safety factor of 1.9 (surface pressure of 4000 psi, testing or treating). 100% burst value of 7740 psi.
- Minimum tension safety factor of 1.8 (casing full of 13.5 ppg cement without backup). 100% tension value of 348,000 lbs

Company: Chesapeake Operating, Inc.
Lease/Well: IMC 21 Fed. Com. #2H
Location: Eddy County
State/Country: New Mexico



THE DIRECTIONAL DRILLING COMPANY

Job Number: MI-
Company: Chesapeake Operating, Inc.
Lease/Well: IMC 21 Fed. Com. #2H
Location: Eddy County
Rig Name: []
RKB: est. 2978'
G.L. or M.S.L.: 2960'

State/Country: New Mexico
Declination: 8.19392
Grid: -0.18
File name: C:\DOCUME~1\RICKMA~1\MYDOCU~1\PROPOS~1\CHI
Date/Time: 30-Nov-07 / 10:03
Curve Name: Preliminary Plan B

The Directional Drilling Company

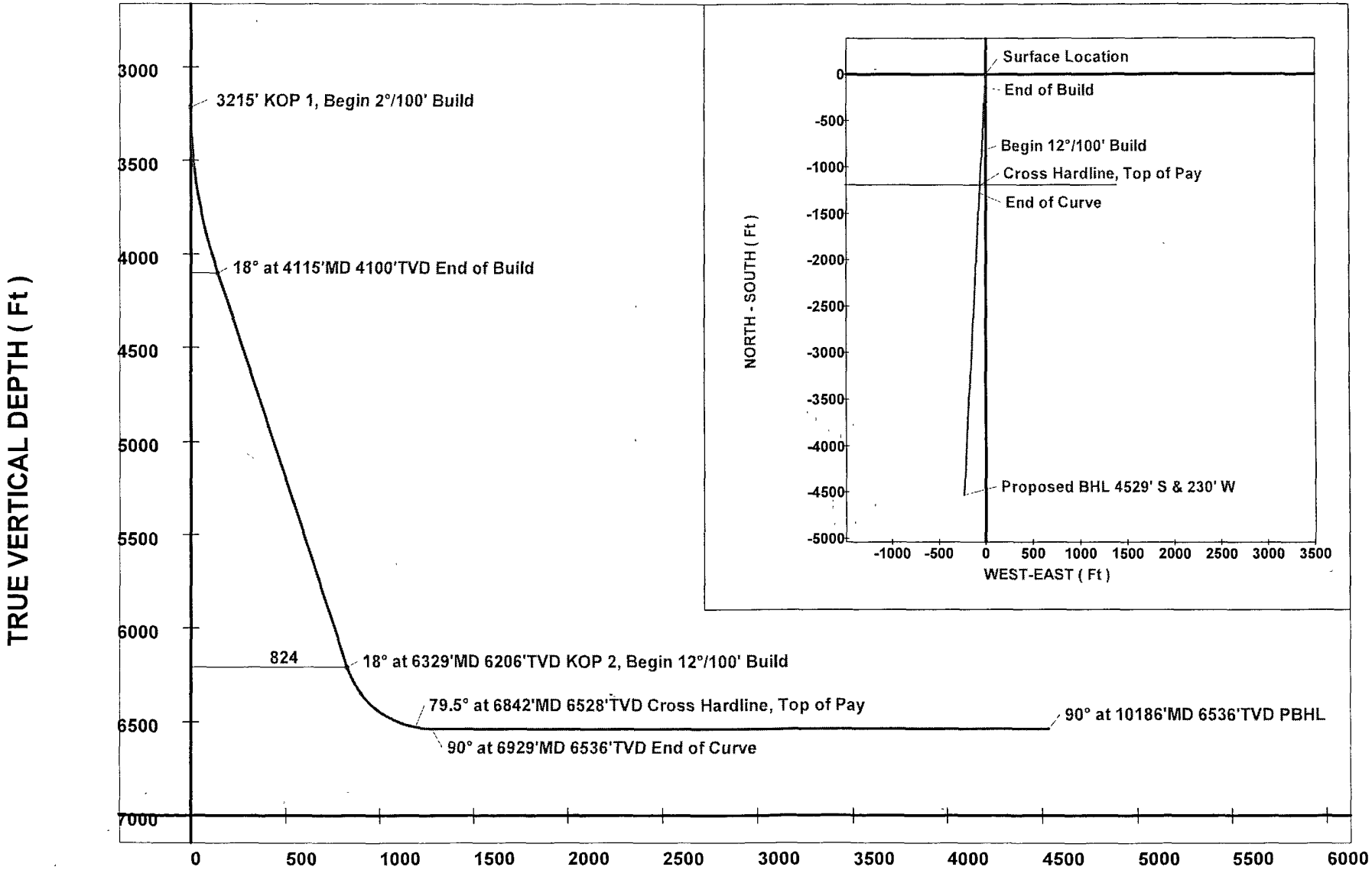
WINSERVE PROPOSAL REPORT
Minimum Curvature Method
Vertical Section Plane 182.90
Vertical Section Referenced to Wellhead
Rectangular Coordinates Referenced to Wellhead

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	Vertical Section FT	N-S FT	E-W FT	CLOSURE Distance FT	CLOSURE Direction Deg	Dogleg Severity Deg/100
KOP 1, Begin 2°/100' Build									
3215.00	.00	.00	3215.00	.00	.00	.00	.00	.00	.00
3265.00	1.00	182.90	3265.00	.44	-.44	-.02	.44	182.90	2.00
3315.00	2.00	182.90	3314.98	1.75	-1.74	-.09	1.75	182.90	2.00
3365.00	3.00	182.90	3364.93	3.93	-3.92	-.20	3.93	182.90	2.00
3415.00	4.00	182.90	3414.84	6.98	-6.97	-.35	6.98	182.90	2.00
3465.00	5.00	182.90	3464.68	10.90	-10.89	-.55	10.90	182.90	2.00
3515.00	6.00	182.90	3514.45	15.69	-15.67	-.79	15.69	182.90	2.00
3565.00	7.00	182.90	3564.13	21.35	-21.33	-1.08	21.35	182.90	2.00
3615.00	8.00	182.90	3613.70	27.88	-27.84	-1.41	27.88	182.90	2.00
3665.00	9.00	182.90	3663.15	35.27	-35.23	-1.78	35.27	182.90	2.00
3715.00	10.00	182.90	3712.47	43.52	-43.47	-2.20	43.52	182.90	2.00
3765.00	11.00	182.90	3761.63	52.63	-52.57	-2.66	52.63	182.90	2.00
3815.00	12.00	182.90	3810.62	62.60	-62.52	-3.17	62.60	182.90	2.00
3865.00	13.00	182.90	3859.44	73.42	-73.33	-3.71	73.42	182.90	2.00
3915.00	14.00	182.90	3908.06	85.10	-84.99	-4.31	85.10	182.90	2.00
3965.00	15.00	182.90	3956.46	97.62	-97.49	-4.94	97.62	182.90	2.00
4015.00	16.00	182.90	4004.64	110.98	-110.84	-5.61	110.98	182.90	2.00
4065.00	17.00	182.90	4052.58	125.18	-125.02	-6.33	125.18	182.90	2.00
End of Build									
4115.06	18.00	182.90	4100.33	140.23	-140.05	-7.09	140.23	182.90	2.00
4215.06	18.00	182.90	4195.43	171.14	-170.92	-8.66	171.14	182.90	.00
4315.06	18.00	182.90	4290.54	202.04	-201.78	-10.22	202.04	182.90	.00
4415.06	18.00	182.90	4385.64	232.94	-232.65	-11.79	232.94	182.90	.00
4515.06	18.00	182.90	4480.75	263.85	-263.51	-13.35	263.85	182.90	.00

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	Vertical Section FT	N-S FT	E-W FT	CLOSURE Distance FT	CLOSURE Direction Deg	Dogleg Severity Deg/100
4615.06	18.00	182.90	4575.85	294.75	-294.37	-14.91	294.75	182.90	.00
4715.06	18.00	182.90	4670.96	325.66	-325.24	-16.48	325.66	182.90	.00
4815.06	18.00	182.90	4766.06	356.56	-356.10	-18.04	356.56	182.90	.00
4915.06	18.00	182.90	4861.17	387.46	-386.97	-19.60	387.46	182.90	.00
5015.06	18.00	182.90	4956.27	418.37	-417.83	-21.17	418.37	182.90	.00
5115.06	18.00	182.90	5051.38	449.27	-448.70	-22.73	449.27	182.90	.00
5215.06	18.00	182.90	5146.48	480.17	-479.56	-24.29	480.17	182.90	.00
5315.06	18.00	182.90	5241.59	511.08	-510.42	-25.86	511.08	182.90	.00
5415.06	18.00	182.90	5336.69	541.98	-541.29	-27.42	541.98	182.90	.00
5515.06	18.00	182.90	5431.80	572.89	-572.15	-28.98	572.89	182.90	.00
5615.06	18.00	182.90	5526.90	603.79	-603.02	-30.55	603.79	182.90	.00
5715.06	18.00	182.90	5622.01	634.69	-633.88	-32.11	634.69	182.90	.00
5815.06	18.00	182.90	5717.11	665.60	-664.75	-33.67	665.60	182.90	.00
5915.06	18.00	182.90	5812.22	696.50	-695.61	-35.24	696.50	182.90	.00
6015.06	18.00	182.90	5907.32	727.41	-726.47	-36.80	727.41	182.90	.00
6115.06	18.00	182.90	6002.43	758.31	-757.34	-38.37	758.31	182.90	.00
6215.06	18.00	182.90	6097.53	789.21	-788.20	-39.93	789.21	182.90	.00
6315.06	18.00	182.90	6192.64	820.12	-819.07	-41.49	820.12	182.90	.00
KOP 2, Begin 12°/100' Build									
6329.21	18.00	182.90	6206.09	824.49	-823.43	-41.71	824.49	182.90	.00
6379.21	24.00	182.90	6252.75	842.40	-841.32	-42.62	842.40	182.90	12.00
6429.21	30.00	182.90	6297.28	865.09	-863.98	-43.77	865.09	182.90	12.00
6479.21	36.00	182.90	6339.19	892.31	-891.17	-45.14	892.31	182.90	12.00
6529.21	42.00	182.90	6378.03	923.76	-922.58	-46.74	923.76	182.90	12.00
6579.21	48.00	182.90	6413.37	959.10	-957.88	-48.52	959.10	182.90	12.00
6629.21	54.00	182.90	6444.82	997.94	-996.67	-50.49	997.94	182.90	12.00
6679.21	60.00	182.90	6472.04	1039.86	-1038.53	-52.61	1039.86	182.90	12.00
6729.21	66.00	182.90	6494.73	1084.39	-1083.00	-54.86	1084.39	182.90	12.00
6779.21	72.00	182.90	6512.64	1131.05	-1129.60	-57.22	1131.05	182.90	12.00
6829.21	78.00	182.90	6525.57	1179.32	-1177.81	-59.67	1179.32	182.90	12.00
Cross Hardline, Top of Pay									
6841.66	79.50	182.90	6528.00	1191.53	-1190.00	-60.28	1191.53	182.90	12.00
6891.66	85.50	182.90	6534.53	1241.08	-1239.49	-62.79	1241.08	182.90	12.00
End of Curve									
6929.17	90.00	182.90	6536.00	1278.55	-1276.91	-64.69	1278.55	182.90	12.00
7029.17	90.00	182.90	6536.00	1378.55	-1376.79	-69.75	1378.55	182.90	.00
7129.17	90.00	182.90	6536.00	1478.55	-1476.66	-74.81	1478.55	182.90	.00
7229.17	90.00	182.90	6536.00	1578.55	-1576.53	-79.87	1578.55	182.90	.00
7329.17	90.00	182.90	6536.00	1678.55	-1676.40	-84.93	1678.55	182.90	.00
7429.17	90.00	182.90	6536.00	1778.55	-1776.27	-89.99	1778.55	182.90	.00
7529.17	90.00	182.90	6536.00	1878.55	-1876.15	-95.05	1878.55	182.90	.00
7629.17	90.00	182.90	6536.00	1978.55	-1976.02	-100.11	1978.55	182.90	.00
7729.17	90.00	182.90	6536.00	2078.55	-2075.89	-105.18	2078.55	182.90	.00
7829.17	90.00	182.90	6536.00	2178.55	-2175.76	-110.24	2178.55	182.90	.00

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	Vertical Section FT	N-S FT	E-W FT	CLOSURE Distance FT	CLOSURE Direction Deg	Dogleg Severity Deg/100
7929.17	90.00	182.90	6536.00	2278.55	-2275.63	-115.30	2278.55	182.90	.00
8029.17	90.00	182.90	6536.00	2378.55	-2375.50	-120.36	2378.55	182.90	.00
8129.17	90.00	182.90	6536.00	2478.55	-2475.38	-125.42	2478.55	182.90	.00
8229.17	90.00	182.90	6536.00	2578.55	-2575.25	-130.48	2578.55	182.90	.00
8329.17	90.00	182.90	6536.00	2678.55	-2675.12	-135.54	2678.55	182.90	.00
8429.17	90.00	182.90	6536.00	2778.55	-2774.99	-140.60	2778.55	182.90	.00
8529.17	90.00	182.90	6536.00	2878.55	-2874.86	-145.66	2878.55	182.90	.00
8629.17	90.00	182.90	6536.00	2978.55	-2974.74	-150.73	2978.55	182.90	.00
8729.17	90.00	182.90	6536.00	3078.55	-3074.61	-155.79	3078.55	182.90	.00
8829.17	90.00	182.90	6536.00	3178.55	-3174.48	-160.85	3178.55	182.90	.00
8929.17	90.00	182.90	6536.00	3278.55	-3274.35	-165.91	3278.55	182.90	.00
9029.17	90.00	182.90	6536.00	3378.55	-3374.22	-170.97	3378.55	182.90	.00
9129.17	90.00	182.90	6536.00	3478.55	-3474.10	-176.03	3478.55	182.90	.00
9229.17	90.00	182.90	6536.00	3578.55	-3573.97	-181.09	3578.55	182.90	.00
9329.17	90.00	182.90	6536.00	3678.55	-3673.84	-186.15	3678.55	182.90	.00
9429.17	90.00	182.90	6536.00	3778.55	-3773.71	-191.21	3778.55	182.90	.00
9529.17	90.00	182.90	6536.00	3878.55	-3873.58	-196.28	3878.55	182.90	.00
9629.17	90.00	182.90	6536.00	3978.55	-3973.45	-201.34	3978.55	182.90	.00
9729.17	90.00	182.90	6536.00	4078.55	-4073.33	-206.40	4078.55	182.90	.00
9829.17	90.00	182.90	6536.00	4178.55	-4173.20	-211.46	4178.55	182.90	.00
9929.17	90.00	182.90	6536.00	4278.55	-4273.07	-216.52	4278.55	182.90	.00
10029.17	90.00	182.90	6536.00	4378.55	-4372.94	-221.58	4378.55	182.90	.00
10129.17	90.00	182.90	6536.00	4478.55	-4472.81	-226.64	4478.55	182.90	.00
Proposed BHL									
10185.63	90.00	182.90	6536.00	4535.01	-4529.20	-229.50	4535.01	182.90	.00

Company: Chesapeake Operating, Inc.
Lease/Well: IMC 21 Fed. Com. #2H
Location: Eddy County
State/Country: New Mexico



ONSHORE OIL & GAS ORDER NO. 1
Approval of Operations on Onshore
Federal and Indian Oil and Gas Leases

1. EXISTING ROADS

a. Existing county and lease roads will be used to enter proposed access road.
b. Location, access, and vicinity plats attached hereto. See Exhibits A-1 to A-4.
c. In order to level the location, cut and fill will be required. Please see attached Well Location and Acreage Dedication Plat – Exhibits A-1 to A-4.
d. A locking gate will be installed at the site entrance.
e. Any fences cut will be repaired. Cattle guards will be installed, if needed.
f. Surface disturbance and vehicular travel will be limited to the approved location and approved access route. Any additional area needed will be approved in advance.
g. Driving directions are from the intersection of St Hwy #128 & Co. Rd. #793 (Rawhide) go South on Co. Rd. #793 approx. 3.9 miles. Turn right and go West approx. 3.0 miles. Turn right and go North approx 1.5 miles. Turn left and go 0.2 miles to location.

2. LOCATION OF EXISTING WELLS WITHIN A 1-MILE RADIUS OF THE PROPOSED LOCATION – see Exhibit B.

3. LOCATION OF PRODUCTION FACILITIES
It is anticipated that production facilities will be located on the well pad. – See Exhibit C

4. LOCATION AND TYPE OF WATER SUPPLY
Water will be obtained from a private water source. Chesapeake Operating, Inc. will ensure all proper notifications and filings are made with the state.

5. CONSTRUCTION MATERIALS

No construction materials will be used from Section 21-23S-29E. All material (i.e. shale) will be acquired from private or commercial sources.

6. METHODS FOR HANDLING WASTE DISPOSAL
A closed system will be utilized consisting of above ground steel tanks. All wastes accumulated during drilling operations will be contained in a portable trash cage and removed from location and deposited in an approved sanitary landfill.

7. ANCILLARY FACILITIES
None

8. WELLSITE LAYOUT
The proposed site layout plat is attached showing the Patterson Rig #142 orientation and equipment location. See Exhibit D. Also see Exhibit A-2 for the size of the pad.

9. PLANS FOR RECLAMATION OF THE SURFACE
The location will be restored to as near as original condition as possible. Reclamation of the surface shall be done in strict compliance with the existing New Mexico Oil Conservation Division regulations.

Backfilling leveling, and contouring are planned as soon as the drilling rig and steel tanks are removed. Wastes and spoils materials will be buried immediately after drilling is completed. If production is obtained, the unused area will be restored as soon as possible. The rehabilitation will begin after the drilling rig is removed.

11. MINERAL OWNERSHIP
United States of America
Department of Interior
Bureau of Land Management

SURFACE OWNERSHIP
Mosaic Potash
1361 Potash Mines Rd.
Carlsbad, NM 88220

505-887-2871
Scott Vail

(Chesapeake Operating, Inc. has an agreement with the surface owner)

12. ADDITIONAL INFORMATION
A Class III cultural resource inventory report was prepared by Boone Archaeological Services, Carlsbad, New Mexico for the proposed location. A copy of the report has been sent to the BLM office under separate cover and is also attached for reference. See Exhibit E.

Chesapeake Operating, Inc. agrees to be responsible under the terms and conditions of the lease for the operations conducted upon the lease lands.

13. OPERATOR'S REPRESENTATIVES

Drilling and Completion Operations
Jarvis Hensley
District Manager – Northern Permian
P.O. Box 18496
Oklahoma City, OK 73154
(405) 879-7863 (OFFICE)
(405) 879-9529 (FAX)
jhensley@chkenergy.com

Sr. Drilling Engineer
Randy Patterson
P.O. Box 14896
Oklahoma City, OK 73154
(405) 767-4056 (OFFICE)
(405) 767-4225 (FAX)
(405) 388-9002 (MOBILE)
rpatterson@chkenergy.com

Field Representative
Curtis Griffin
1616 W. Bender
Hobbs, NM
505-391-1462 (OFFICE)
505-391-6679 (FAX)
cgriffin@chkenergy.com

Assett Manager
Jeff Finnell
P.O. Box 18496
Oklahoma City, OK 73154-0496
405-767-4347 (OFFICE)
405-879-7930 (FAX)
jfinnell@chkenergy.com

Regulatory Compliance
Linda Good
Regulatory Analyst
P.O. Box 18496
Oklahoma City, OK 73154
(405) 767-4275 (OFFICE)
(405) 753-5468 (FAX)
lgood@chkenergy.com

CERTIFICATION

I hereby certify that I, or someone under my direct supervision, have inspected the drill site and access route proposed herein; that I am familiar with the conditions which currently 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 will be performed in conformity with this APD package and the terms and conditions under which it is approved. I also certify that I, or the company I represent, am responsible for the operations conducted under this application. These statements are subject to the provisions of 18 U.S.C. 1001 for the filing of a false statement.

Executed this 12th day of November, 2007.

Name: _____
Paul Hagemeier, Vice President – Regulatory Compliance

Address: P.O. Box 18496, Oklahoma City, OK 73154-0496

Telephone: 405-848-8000

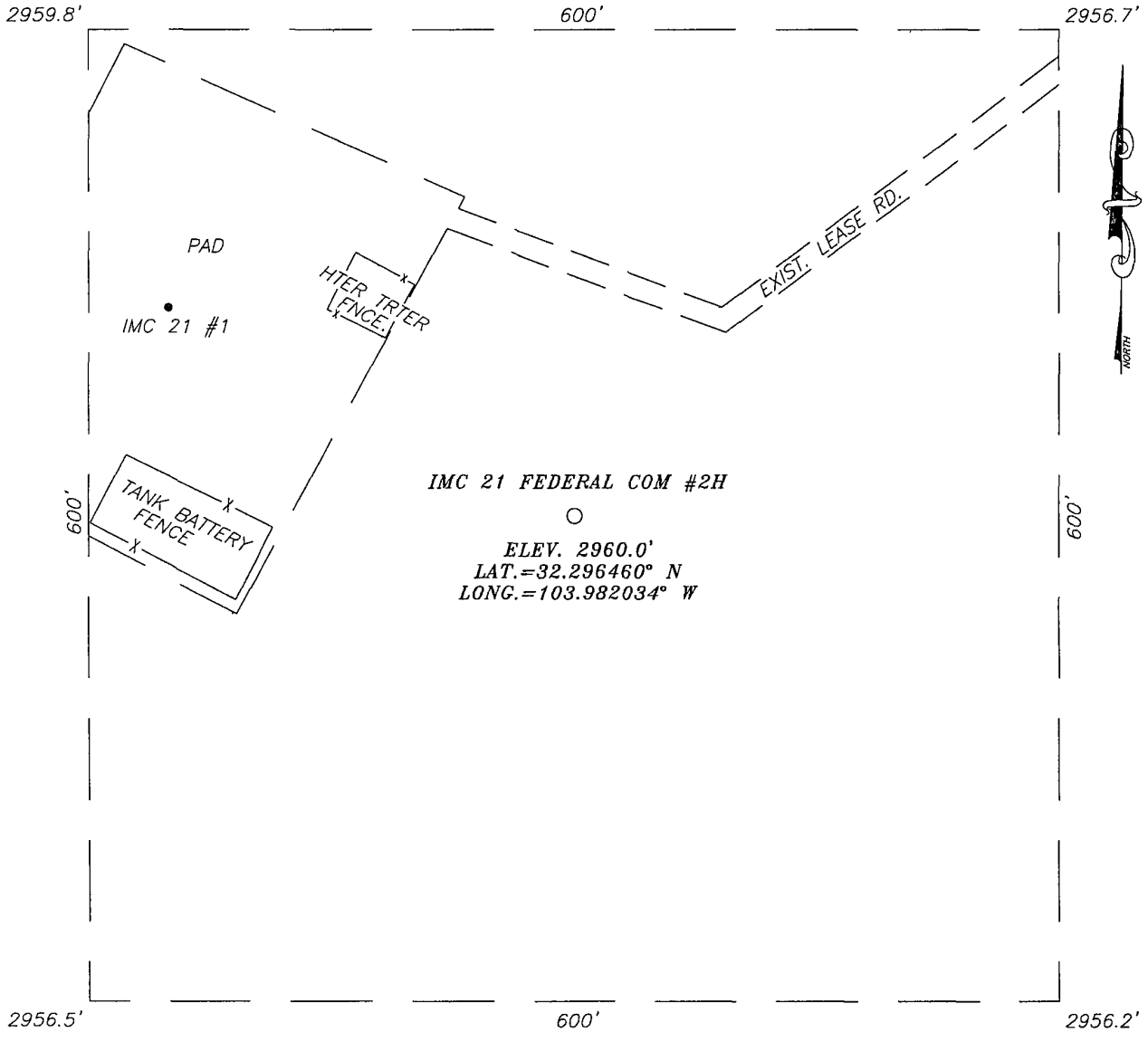
Field Representative: Curtis Griffin

Telephone: 505-391-1462 Ext. 6238

E-mail: cgriffin@chkenergy.com

SECTION 21, TOWNSHIP 23 SOUTH, RANGE 29 EAST, N.M.P.M.,

EDDY COUNTY, NEW MEXICO



DIRECTIONS TO LOCATION

FROM THE INTERSECTION OF HWY. #128 AND CO. RD. #793 (RAWHIDE). GO SOUTH ON CO. RD. #793 (RAWHIDE) APPROX. 3.2 MILES. TURN RIGHT AND GO WEST ON LEASE RD. APPROX. 3.0 MILES. TURN RIGHT AND GO NORTH AT CHESAPEAKE IMC 21 #1 SIGN GO NORTH APPROX. 1.5 MILES. THIS LOCATION IS APPROX. 600 FEET LEFT AND 100 FEET SOUTH OF ROAD.

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

(505) 393-3117

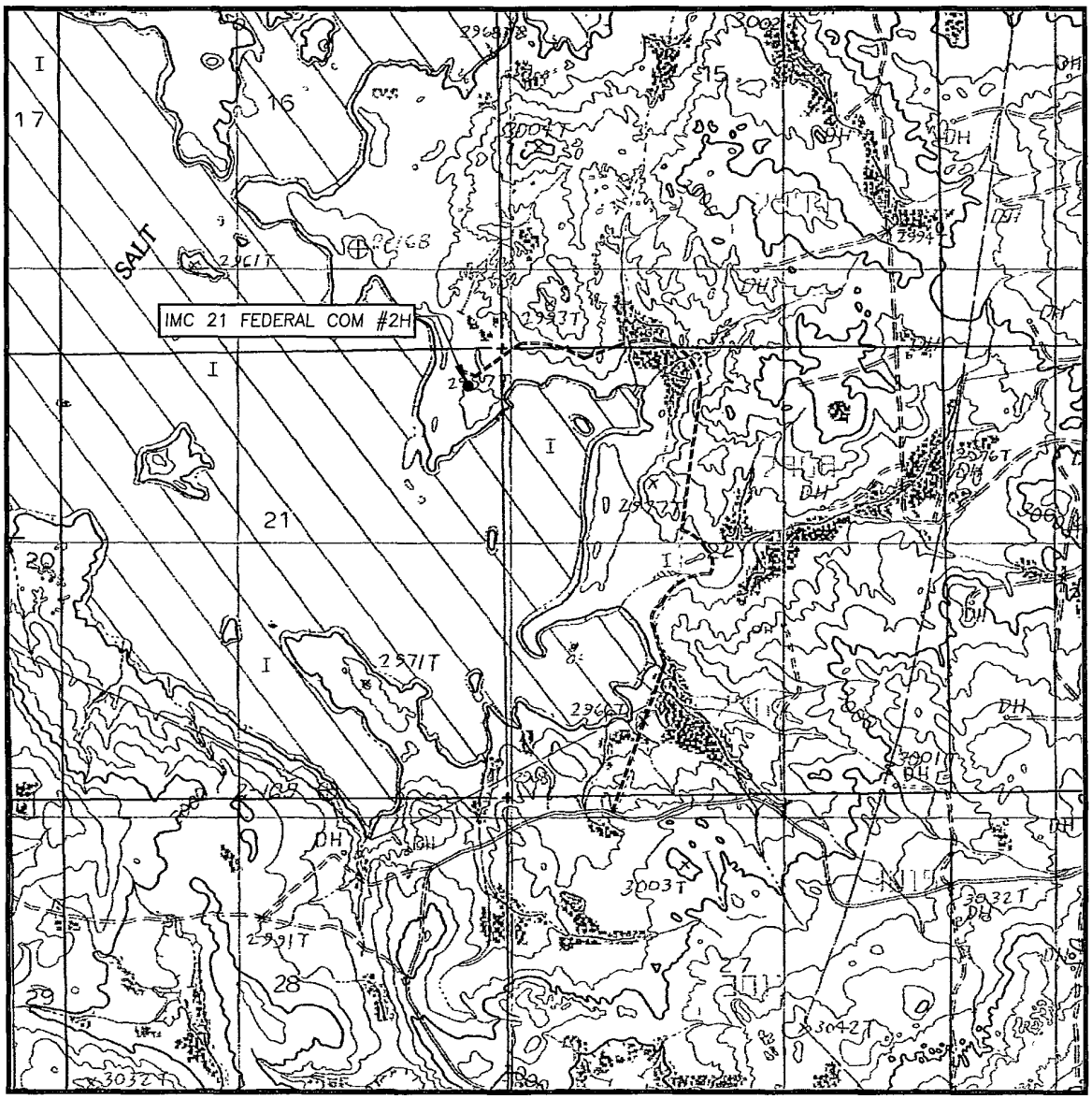
CHESAPEAKE OPERATING INC.

IMC 21 FEDERAL COM #2H WELL
LOCATED 460 FEET FROM THE NORTH LINE
AND 410 FEET FROM THE EAST LINE OF SECTION 21,
TOWNSHIP 23 SOUTH, RANGE 29 EAST, N.M.P.M.,
EDDY COUNTY, NEW MEXICO.

Survey Date: 05/10/07	Sheet 1 of 1 Sheets		
W.O. Number: 07.13.1558	Dr By: LA		Rev 1: 11/6/07
Date: 11/6/07	Disk:	07131558	Scale:1"=100'

EXHIBIT A-2

LOCATION VERIFICATION MAP



SCALE: 1" = 2000'

CONTOUR INTERVAL:
REMUDA BASIN, N.M. – 10'

SEC. 21 TWP. 23-S RGE. 29-E

SURVEY N.M.P.M.

COUNTY EDDY STATE NEW MEXICO

DESCRIPTION 460' FNL & 410' FEL

ELEVATION 2960'

OPERATOR CHESAPEAKE OPERATING INC.

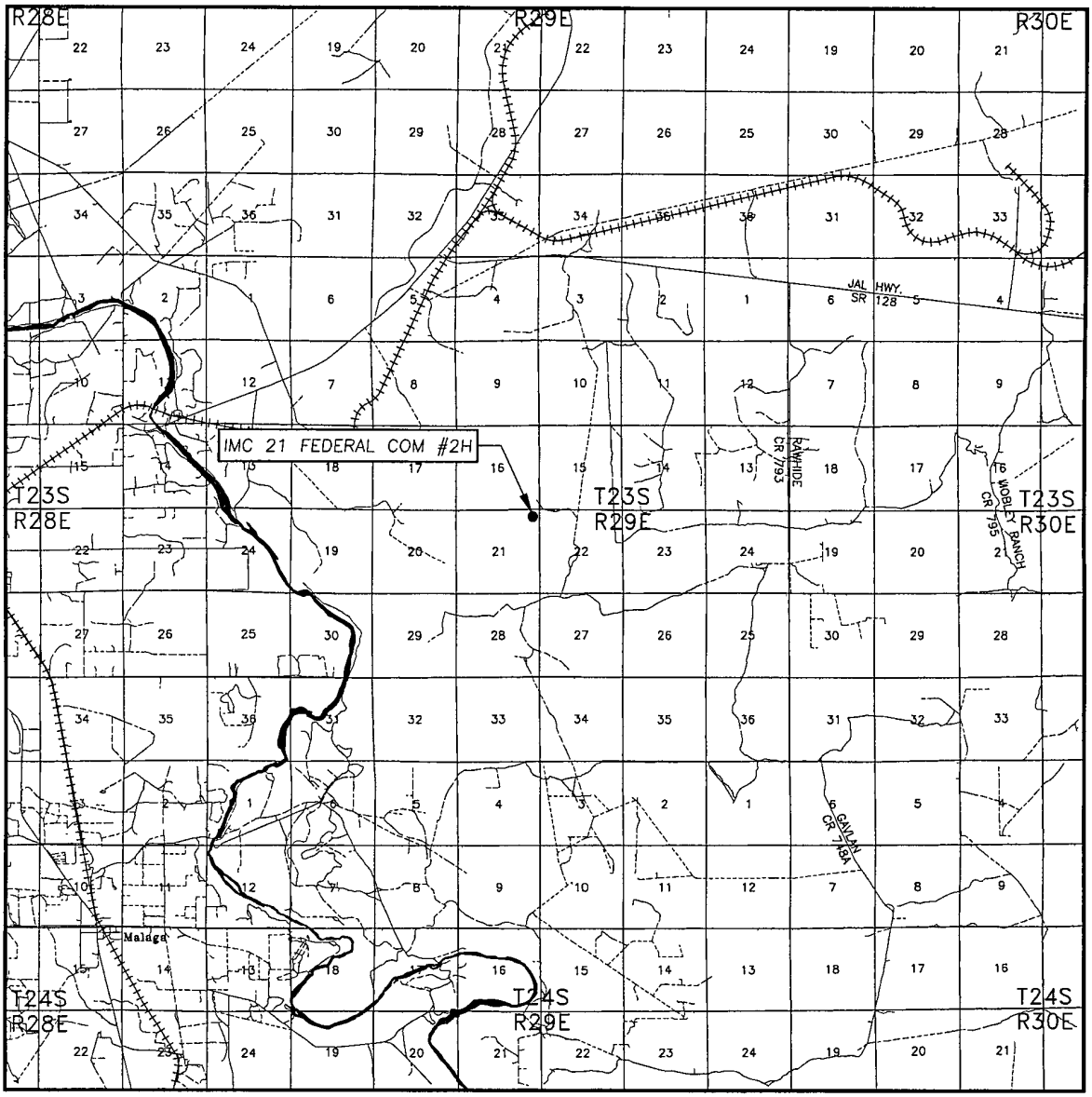
LEASE IMC 21 FEDERAL COM

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

PROVIDING SURVEYING SERVICES
SINCE 1946
JOHN WEST SURVEYING COMPANY
412 N. DAL PASO
HOBBS, N.M. 88240
(505) 393-3117

EXHIBIT A-3

VICINITY MAP



SCALE: 1" = 2 MILES

SEC. 21 TWP. 23-S RGE. 29-E

SURVEY N.M.P.M.

COUNTY EDDY STATE NEW MEXICO

DESCRIPTION 460' FNL & 410' FEL

ELEVATION 2960'

OPERATOR CHESAPEAKE OPERATING INC.

LEASE IMC 21 FEDERAL COM

PROVIDING SURVEYING SERVICES
SINCE 1946
JOHN WEST SURVEYING COMPANY
412 N. DAL PASO
HOBBS, N.M. 88240
(505) 393-3117

EXHIBIT A-4

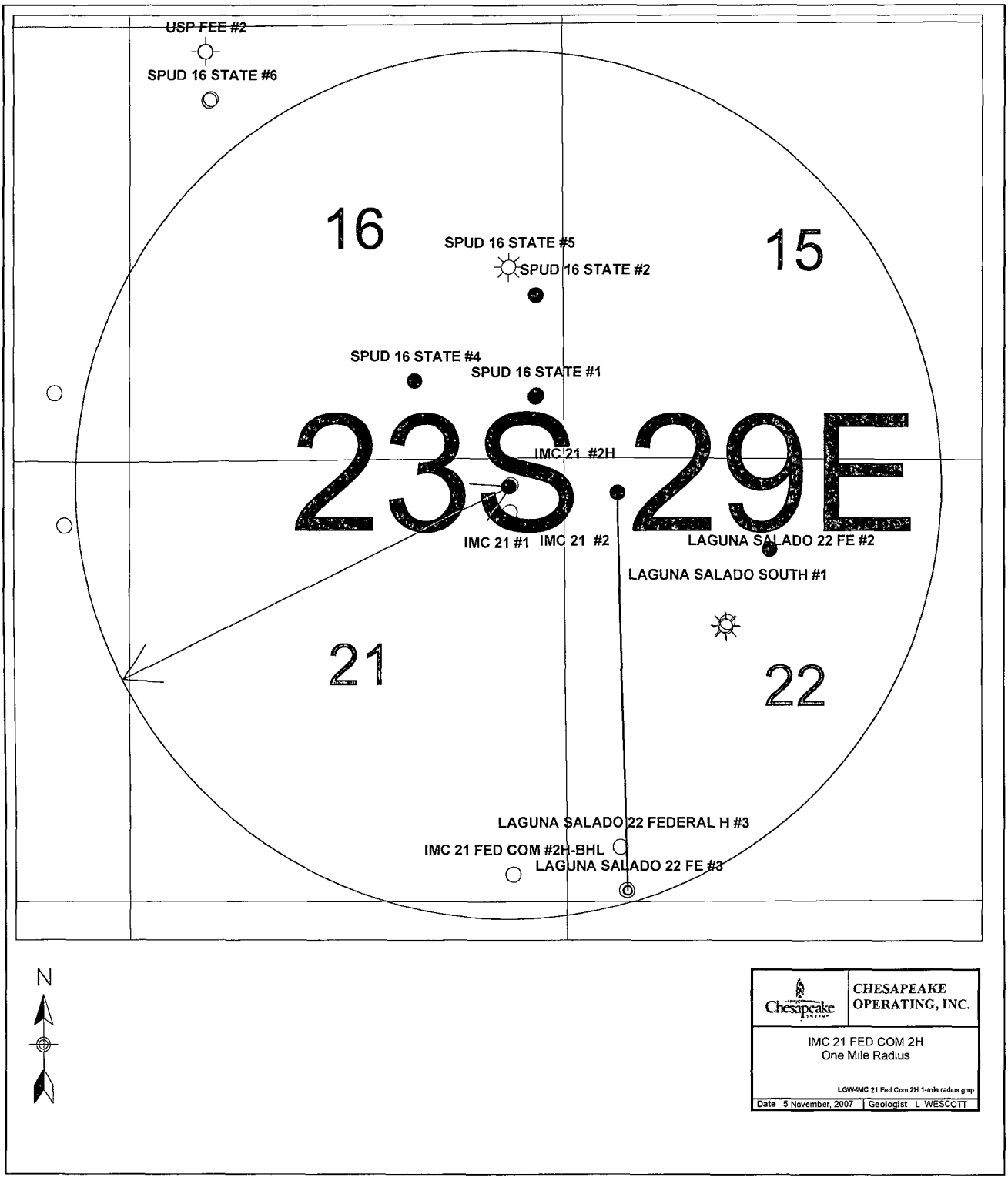
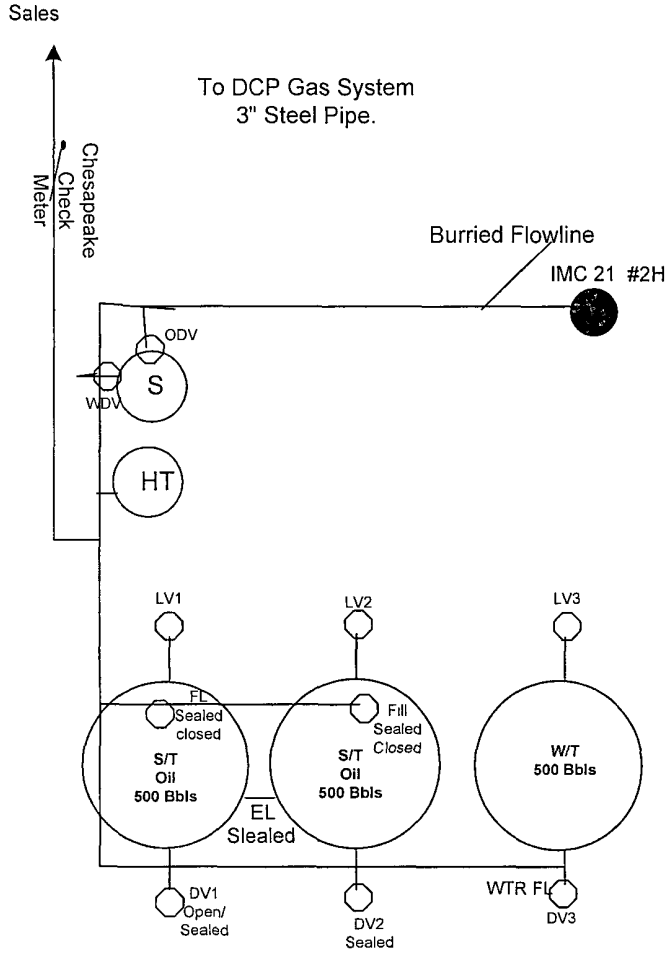

USP FEE #2
SPUD 16 STATE #6
16
SPUD 16 STATE #5
SPUD 16 STATE #2
15
SPUD 16 STATE #4
SPUD 16 STATE #1
23S.29E
IMC 21 #2H
IMC 21 #1
IMC 21 #2
LAGUNA SALADO 22 FE #2
LAGUNA SALADO SOUTH #1
21
22
LAGUNA SALADO 22 FEDERAL H #3
IMC 21 FED COM #2H-BHL
LAGUNA SALADO 22 FE #3
N
Chesapeake
CHESAPEAKE OPERATING, INC.
IMC 21 FED COM 2H
One Mile Radius
LGW-IMC 21 Fed Com 2H 1-mile radius gmp
Date 5 November, 2007
Geologist L WESCOTT

EXHIBIT B

CHESAPEAKE OPERATING, INC.

IMC 21 #2H
21-23S-29E
EDDY CO., NM



N

IMC 21 #2H Well Located 460 Feet From the North Line And 410 Feet From the East Line Of Section 21, Township 23 South, Range 29 East, N.M.P.M., Eddy County, New Mexico.

From The Intersection Of Hwy. #128 And Co. Rd. #793 (Rawhide). Go South On Co. Rd. #793 (Rawhide) Approx. 3.2 Miles. Turn Right And Go West On Lease Rd. Approx. 3.0 Miles. Turn Right And Go North At Chesapeake IMC 21 #1 Sign Go North Approx. 1.5 Miles. This Location Is Approx. 600 Feet Left And 100 Feet South Of Road.

IMC 21 #2H

Direction of Flow off Site: SW

Prepared by: DEBBIE HERNANDEZ
Date: 11-9-2007

Approved by:
Date:

EXHIBIT C

PECOS DISTRICT
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	Chesapeake Operating
LEASE NO.:	NM119272
WELL NAME & NO.:	IMC 21 Federal Com No 2H
SURFACE HOLE FOOTAGE:	460' FNL & 410' FEL
BOTTOM HOLE FOOTAGE	330' FSL & 650' FSL
LOCATION:	Section 21, T. 23 S., R 29 E., NMPM
COUNTY:	Eddy County, New Mexico

TABLE OF CONTENTS

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

I. GENERAL PROVISIONS

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

II. PERMIT EXPIRATION

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

III. ARCHAEOLOGICAL, PALEONTOLOGY & HISTORICAL SITES

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

IV. NOXIOUS WEEDS

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

V. SPECIAL REQUIREMENT(S)

Cave and Karst

Cave/Karst Surface Mitigation
The following stipulations will be applied to minimize impacts during construction, drilling and production.

Berming:
Any tank batteries will be constructed and bermed large enough to contain any spills that may occur.

Bermed areas will be lined with rip-stop padding to prevent tears or punctures in liners and lined with a permanent 20 mil plastic liner.

The pad's edge should be bermed to retain any leaks that may occur. Berming should also include the road access.

Closed Mud System Using Steel Tanks with All Fluids and Cuttings Hauled Off.

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

Rotary Drilling with Fresh Water:
Rotary drilling techniques in cave or karst areas will include the use of fresh water as a circulating medium in zones where caves or karst features are expected. Use depth to the deepest expected fresh water as listed in the geologist report.

Directional Drilling:
Kick off for directional drilling will occur at least 100 feet below the bottom of the cave occurrence zone as identified in the geologic report.

Casing:
All casing will meet or exceed National Association of Corrosion Engineers specifications pertaining to the geology of the location and be run to American Petroleum Institute and BLM standards.

Lost Circulation:
ALL lost circulation zones from the surface to the base of the cave occurrence zone will be logged and reported.

Regardless of the type of drilling machinery used, if a void (bit drops) of four feet or more and circulation losses greater then 75 percent occur simultaneously while drilling in

any cave-bearing zone, drilling operations will immediately stop and the BLM will be notified by the operator. The BLM will assess the consequences of the situation and work with operator on corrective actions to resolve the problem.

Abandonment Cementing:
Upon well abandonment the well bore will be cemented completely from 100 feet below the bottom of the cave bearing zone to the surface.

Record Keeping:
The Operator will track customary drilling activities, including the rate of penetration, pump pressure, weight on bit, bit drops, percent of mud returns, and presence of absence of cuttings returning to the surface. As part of customary record keeping, each detectable void or sudden increase in the rate of penetration not attributable to a change in the formation type should be documented and evaluated as it is encountered.

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 (505) 234-5972 at least 3 working days prior to commencing construction of the access road and/or well pad.

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

B. TOPSOIL

There is no measurable soil on this well pad to stockpile. No topsoil stockpile is required.

C. RESERVE PITS

Tanks are required for drilling operations: No Pits.

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

D. FEDERAL MINERAL MATERIALS PIT

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

Payment shall be made to the BLM prior to removal of any additional federal mineral materials from any site other than the reserve pit. Call the
Carlsbad Field Office at (505) 234-5972.

E. WELL PAD SURFACING

Surfacing of the well pad is not required.

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

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

F. ON LEASE ACCESS ROADS

Road Width

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

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

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

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

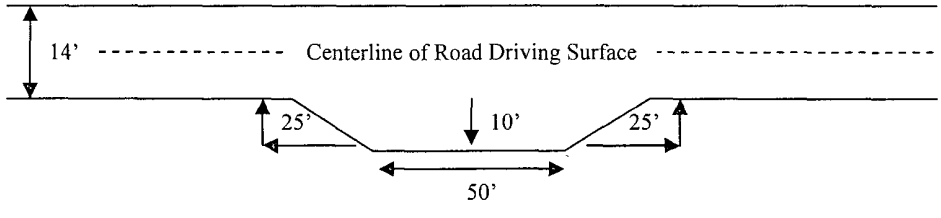
Crowning
Crowning shall be done on the access road driving surface. The road crown shall have a grade of approximately 2% (i.e., a 1" crown on a 14' wide road). The road shall conform to Figure 1; cross section and plans for typical road construction.

Ditching

Ditching shall be required on both sides of the road.

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

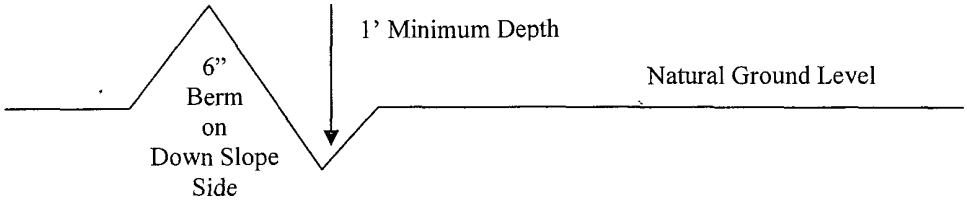
Standard Turnout – Plan View



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

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

Cross Section of a Typical Lead-off Ditch



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

Formula for Spacing Interval of Lead-off Ditches

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

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

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

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

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

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

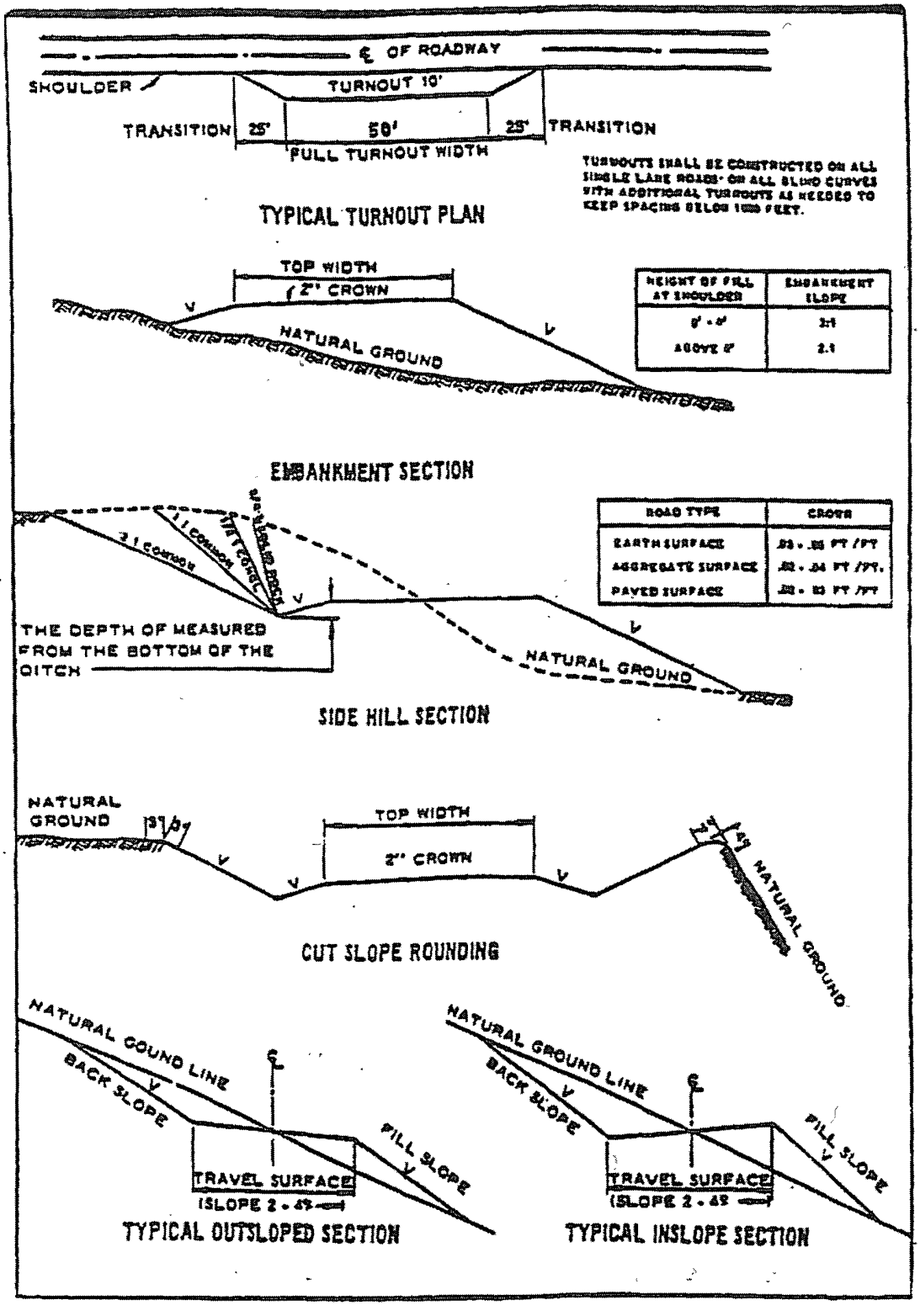
Fence Requirement

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

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

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

Figure 1 – Cross Sections and Plans For Typical Road Sections



VII. DRILLING

A. DRILLING OPERATIONS REQUIREMENTS

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

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

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

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

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

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

4. Gamma-Ray/Neutron logs shall be run from the base of the Salado formation to the surface. The logs shall be run at a speed which allows the logs to be legible and no faster than manufactures of the logging tools recommended speed. (R-111-P area only).

5. **This well is orthodox from 6842' MD to total depth using proposed drilling plan.**

B. CASING

1. The **13-3/8** inch surface casing shall be set **a minimum of 25 feet into the Rustler Anhydrite and above the salt at approximately 345** feet and cemented to the surface.

    a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature

survey with a surface log readout will be used or a cement bond log shall be run to verify the top of the cement.

b. Wait on cement (WOC) time for a primary cement job will be a minimum 18 hours for a water basin, **24 hours in the potash area**, or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement). **Please provide WOC times to inspector for cement slurries.**

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

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

High cave/karst.
Possible lost circulation in the Delaware and Bone Spring formations.

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

   ☒ Cement to surface. If cement does not circulate see B.1.a-d above. **Please provide WOC times to inspector for cement slurries.**

3. The minimum required fill of cement behind the **5-1/2** inch production casing is:

   ☒ Cement to surface. If cement does not circulate, contact the appropriate BLM office. **Please provide WOC times to inspector for cement slurries. Additional cement will be required as the cement on this casing must circulate due to the well being in R-111-P potash.**

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

5. Whenever a casing string is cemented in the R-111-P potash area, the NMOCD requirements shall be followed.

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

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

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

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

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

Engineer on call phone (after hours): **Carlsbad: (575) 706-2779**

WWI 011408

VIII. PRODUCTION (POST DRILLING)

A. WELL STRUCTURES & FACILITIES

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

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

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

IX. INTERIM RECLAMATION & RESERVE PIT CLOSURE

A. INTERIM RECLAMATION

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

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

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

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

Seed Mixture 4, for Gypsum 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 of planting where drilling is possible. The seed mixture will be evenly and uniformly planted over the disturbed area (smaller/heavier seeds have a tendency to drop the bottom of the drill and are planted first). The holder shall take appropriate measures to ensure this does not occur. Where drilling is not possible, seed will be broadcast and the area shall be raked or chained to cover the seed. When broadcasting the seed, the pounds per acre are to be doubled. The seeding will be repeated until a satisfactory stand is established as determined by the authorized officer. Evaluation of growth will not be made before completion of at least one full growing season after seeding.

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

Species	lb/acre
Alkali Sacaton (Sporobolus airoides)	1.0
DWS⊆ Four-wing saltbush (Atriplex canescens)	5.0

⊆DWS: DeWinged Seed

*Pounds of pure live seed:

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

(Insert Seed Mixture Here)

X. FINAL ABANDONMENT & REHABILITATION REQUIREMENTS

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

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