Form 3160-3
(August 2007)

EC

Operator Copy

FORM APPROVED
OMB No 1004-0136
Expires July 31, 2010

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

RECEIVED
FEB 14 2012
NMOCD ARTESIA

APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No. NMNM95630

6. If Indian, Allottee or Tribe Name

1a Type of Work: ☒ DRILL ☐ REENTER

CONFIDENTIAL

7 If Unit or CA Agreement, Name and No.

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

8 Lease Name and Well No.
CROW FLATS 14 16 28 USA 2H [38874]

2. Name of Operator
CHESAPEAKE OPERATING INC
Contact. LINDA GOOD
E-Mail linda good@chk.com
[147179]

9. API Well No.
30-015-39945

3a Address
OKLAHOMA CITY, OK 73154-0496

3b. Phone No. (include area code)
Ph: 405-935-4275

10. Field and Pool, or Exploratory
~~WILDCAT~~
CROW FLATS - Wolfcamp [97102]

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

At surface SWNW 1980FNL 10FWL

At proposed prod. zone SENE 1980FNL 350FEL

UNORTHODOX LOCATION

11. Sec , T., R., M , or Blk. and Survey or Area
Sec 14 T16S R28E Mer NMP
SME: BLM

14. Distance in miles and direction from nearest town or post office*
APPROXIMATELY 18 MILES NE OF ARTESIA, NEW MEXICO

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)
10' FSL

16. No. of Acres in Lease
1760.00

17. Spacing Unit dedicated to this well
160.00

18. Distance from proposed location to nearest well, drilling, completed, applied for, on this lease, ft
4986.51'

19 Proposed Depth
~~0-MD~~ 11237' MD
P.H. 6900' 6626' TVD

20. BLM/BIA Bond No on file
ESB000159

21. Elevations (Show whether DF, KB, RT, GL, etc.
3575 GL

22. Approximate date work will start
03/01/2012

23. Estimated duration
45-60 DAYS

24. Attachments

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

Well plat certified by a registered surveyor
A Drilling Plan
A Surface Use Plan (if the location is on National Forest System Lands, the SUPO shall be filed with the appropriate Forest Service Office).
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
(Electronic Submission)

Name (Printed/Typed)
LINDA GOOD Ph: 405-935-4275

Date
10/20/2011

Title
SR. REGULATORY COMPLIANCE SPEC

Approved by (Signature)

Name (Printed/Typed)
/s/ Don Peterson

Date
2/10/12

Title
FIELD MANAGER

Office
CARLSBAD FIELD OFFICE

pplication approval does not warrant or certify the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct erations thereon
nditions of approval, if any, are attached

APPROVAL FOR TWO YEARS

le 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 ites any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction

Additional Operator Remarks (see next page) ROSWELL CONTROLLED WATER BASIN

Electronic Submission #120933 verified by the BLM Well Information System
For CHESAPEAKE OPERATING INC, sent to the Carlsbad
to AFMSS for processing by KURT SIMMONS on 10/25/2011 (12KMS0139AE)

APPROVAL SUBJECT TO GENERAL REQUIREMENTS AND SPECIAL STIPULATIONS ATTACHED

SEE ATTACHED FOR CONDITIONS OF APPROVAL

** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED **

ONSHORE ORDER NO. 1
Chesapeake Operating, Inc.
Crow Flats 14 16 28 USA 2H
SL: 1980' FNL & 10' FWL
BL: 1980' FNL & 350' FEL
Section 14-16S-28E
Eddy Co., New Mexico

CONFIDENTIAL – TIGHT HOLE
Operator Certification Page

Lease No. NMNM95630

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 17th day of October, 2011

Name: Toby Reid
Toby Reid – Field Representative

Address: 1616 W. Bender, Hobbs, NM 88241

Telephone: 575-725-8497

E-mail: toby.reid@chk.com

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
11885 S. ST. FRANCIS DR., SANTA FE, NM 87505

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

RECEIVED
FEB 14 2012
NMOCD ARTESIA

Form C-102
Revised July 16, 2010
Submit to Appropriate District Office

☐AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number	Pool Code	Pool Name
30-015-39945	97102	CROW FLATS; WOLFCAMP OIL

Property Code	Property Name	Well Number
38874	CROW FLATS 14 16 28 USA	2H

OGRID No.	Operator Name	Elevation
147179	CHESAPEAKE OPERATING, INC.	3575'

Surface Location

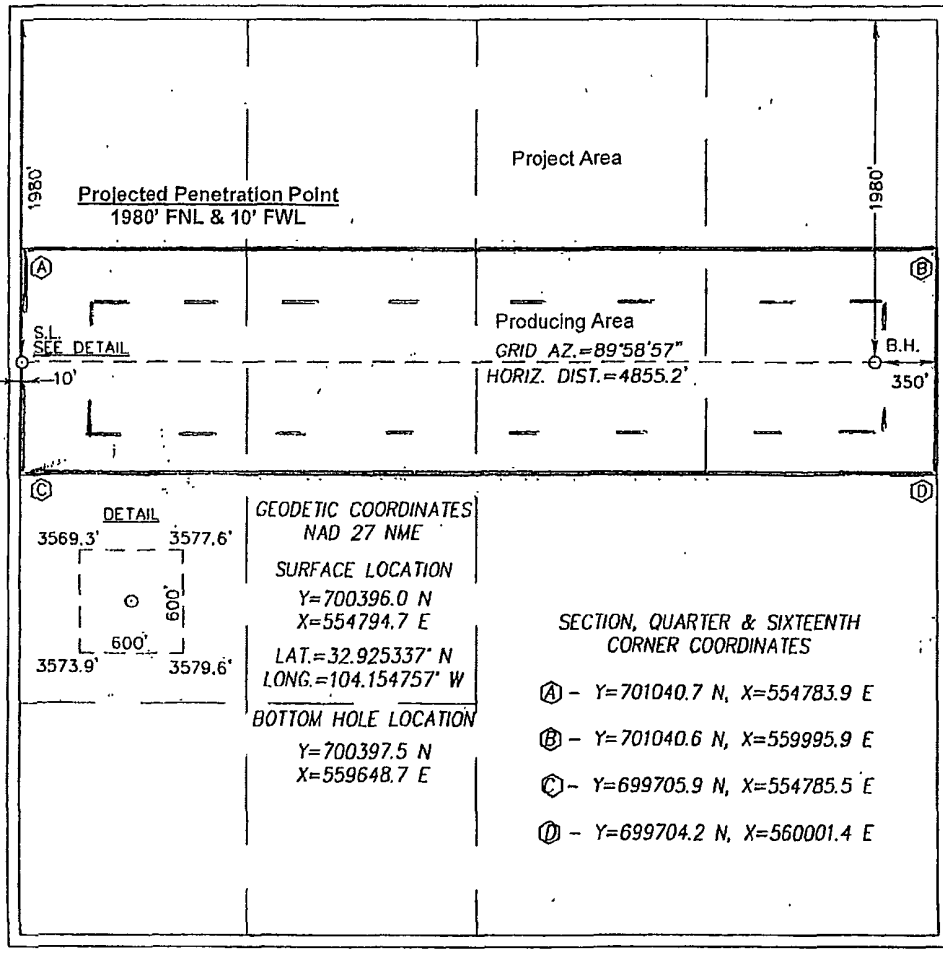
UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
E	14	16-S	28-E		1980	NORTH	10	WEST	EDDY

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
H	14	16-S	28-E		1980	NORTH	350	EAST	EDDY

Dedicated Acres	Joint or Infill	Consolidation Code	Order No.
160			NSL-Pending

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.

Bryan Arrant 10/13/2011
Signature Date

Bryan Arrant
Printed Name

bryan.arrant@chk.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.

OCTOBER 05, 2011
Date of Survey

Signature & Seal of Professional Surveyor:

RONALD J. EIDSON
NEW MEXICO
3239
REGISTERED PROFESSIONAL SURVEYOR

Ronald J. Eidson 10/11/2011

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

AR JWSC W.O.: 11.11.2052

EXHIBIT A-1

Additional Operator Remarks:

- PILOT HOLE DEPTH: 6900'

Chesapeake Operating, Inc. respectfully requests permission to drill a well to 11,237' to test the ~~Bone Spring~~ 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. Wolfcamp per plat of 3160-3 NL- 10/27/11

Please find the Surface Use Plan and Drilling Plan as required by Onshore Order No. 1.

Attached are the Exhibit A-1 to A-4 Survey plats, Exhibit B 1 mile radius plat, Exhibit C Production facility, Exhibit D Latshaw #14 layout, Exhibit E Temporary Transfer Line Map, Exhibit F-1 to F-2 BOP & Choke Manifold and Exhibit G Directional Drill Plan.

Archeological Survey 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.

(CHK PN 615831)

OHSORE OIL & GAS ODER NO. 1

All lease and/or unit operations are to be conducted in such a manner that full compliance is made with the

1. **FORMATION TOPS**

The estimated tops of important geologic markers are as follows:

FORMATION	Sub-sea	Depth
Yates	3174	423
Seven Rivers	3033	564
Queen	2460	1137
Grayburg	2055	1542
San Andres	1695	1902
Glorieta	211	3386
Paddock	177	3420
Blinebry	-708	4305
Tubb	-1015	4612
Drinkard	-1120	4717
Abo	-1775	5372
Top of Wolfcamp/*Wolfcamp Pay	-2935	6532
TVD @ BHL	**-3029**	**6626**
MD @ BHL		**11237**

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

Substance	Formation	Depth
Water	Sand	150
Oil/Gas	San Andres	1902
Oil/Gas	Glorieta	3386
Oil/Gas	Wolfcamp	6527

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

3. BOP EQUIPMENT

Will have a 5000 psi rig stack (see proposed schematic) for drill out below surface casing, but this system will be tested to 3000 psi working pressure and 3000 psi working pressure for the annular preventer; therefore, no shoe tests will be conducted.

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

I. BOP, Annular, Choke Manifold Pressure Test - See Exhibit F-1 and F-2

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
(d) Upper and lower kelly cock valves, inside BOP's and safety valves

B. Frequency
1. All tests shall 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
(d) at least once every 30 days while drilling

C. Frequency
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 a t 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 unless otherwise stated (see above).
6. The "high pressure" test for the annular preventer will be conducted at 70" of the rated working pressure unless otherwise stated (see above).
7. A record of all pressures will be made on a pressure-recording chart.

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 Requency
1. The accumulator is to be tested each time the BO'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:

System Operating Pressure	Precharge Pressure
1500 psi	750 psi
2000 psi	1000 psi
3000 psi	1000 psi

3. Closing times for the annular preventer 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 Operating Pressure	Remaining Pressure After Test
1500 psi	950 psi
2000 psi	1200 psi
3000 psi	1200 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.

3. CASING PROGRAM

a. The proposed casing program will be as follows:

Purpose	From	To	Hole Size	Csg Size	Weight	Grade	Thread	Condition
Surface	0'	350'	17-1/2"	13-3/8"	48 #	H-40	STC	New
Shallow Intermediate	0'	2,000'	12-1/4"	9-5/8"	40 #	J-55	LTC	New
Deep Intermediate	0'	6,856'	8-3/4"	7"	29 #	P-110	LTC	New
Production Liner	5,910'	11,237'	6-1/8"	4-1/2"	13.5 #	P-110	LTC	New

b. Casing design subject to revision based on geologic conditions encountered.

c. Casing Safety Factors

Casing String	Min SF Burst	Min SF Collapse	Min SF Tension
Surface	1.44	5.68	1.65
Shallow Intermediate	1.63	2.97	2.33
Deep Intermediate	1.2	2.9	2.87
Production Liner	1.57	3.29	2.12

Min SF is the smallest of a group of safety factors that include the following considerations:

	Surf	Shallow Int	Deep Int	Prod
Burst Design				
Pressure Test- Surface, Int, Prod Csg P external: Water P internal: Test psi + next section heaviest mud in csg	X	X	X	X
Displace to Gas- Surf Csg P external: Water P internal: Dry Gas from Next Csg Point	X	X	X	
Frac at Shoe, Gas to Surf- Int Csg P external: Water P internal: Dry Gas, 15 ppg Frac Gradient				
Stimulation (Frac) Pressures- Prod Csg P external: Water P internal: Max inj pressure w/ heaviest injected fluid			X	X
Tubing leak- Prod Csg P external: Water P internal: Leak just below surf, 8.7 ppg packer fluid			X	X
Collapse Design				
Full Evacuation P external: Water gradient in cement, mud above TOC P internal: none	X	X	X	X
Cementing- Surf, Int, Prod Csg P external: Wet cement P internal: water	X	X	X	
Tension Design				
100k lb overpull	X	X	X	X

5. CEMENTING PROGRAM

Slurry	Type	Top	Btm	Wt	Yld	%Exc	Sx
Surface				(ppg)	(sx/cu ft)	Open Hole	
Single Slurry	C + 4% Gel	0'	350'	13.5	1.73	150	341
Shallow Int							
Lead	TXI + 5% Salt	0'	1,500'	12	1.8	150	569
Tail	50C/50Poz +5% Salt	1,500'	2,000'	14.2	1.37	150	300
Deep int							
Lead	35/65Poz H +8% Gel	1,500'	5,410'	11.9	2.52	150	540
Tail	50H/50Poz	5,410'	6,856'	14.8	1.33	150	423
Production	Liner Hanger, Liner Top Packers, and Completion Packers and Sleeves- No Cement						
	Info Attached						

1. Final cement volumes will be determined by caliper.
2. Surface casing shall have at least one centralizer installed on each of the bottom three joints starting with the shoe joint.

3. Production casing will have one centralizer on every other joint from TD to KOP (horizontal type) and from KOP to intermediate casing (bowspring type).

Pilot Hole Plugging Plan:
Pilot hole will be plugged back from TD of 6900' to KOP of 6100' with a single balanced plug using tubing that will be cemented in place on the bottom of the Smith Trackmaster OH-Openhole whipstock cmenting system (info attached). This will be accomplished using 385 sx (40% excess) of 17.0 ppg 0.99 cuft/sk yield Class H cement.

6. MUD PROGRAM

From	To	Type	Weight	F. Vis	Filtrate
0'	350'	Spud Mud	8.4 - 8.7	32 - 34	NC - NC
350'	2,000'	Brine	9.8 - 10.1	28 - 29	NC - NC
2,000'	6,856'	Cut Brine	8.4 - 9.5	28 - 30	NC - NC
6,856'	6,900'	Cut Brine	8.4 - 9.5	28 - 30	NC - NC
6,110'	6,856'	Cut Brine	8.4 - 9.5	28 - 30	NC - NC
6,856'	11,237'	Cut Brine	8.4 - 9.5	28 - 30	NC - NC

A closed system will by 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

All fluids and cuttings will be disposed of in accordance with New Mexico Oil Conservation Division rules and regulations.

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

7. TESTING, LOGGING, AND CORING See COA

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 be as follows:

TYPE	Logs	Interval	Timing	Vendor
Mudlog	Mudlog	1000' to TD	1000'	TBD
OH	Triple Combo, Spectral GR	Pilot TD to Int Csg	After Pilot TD	TBD
LWD	MWD/Gamma	Curve/Lateral	While Drilling	TBD

c. Core samples are not planned.
d. A Directional Survey will be run.

8. ABNORMAL PRESSURES AND HYDROGEN SULFIDE

a. No abnormal pressures or temperatures are expected. Estimated BHP is: 3254 psi
b. Hydrogen sulfide gas is not anticipated.

Permian District

NM - Eddy - Wolfcamp (north Eddy)
Crow Flats 14-16-28 USA 2H
Crow Flats 14-16-28 USA 2H Wellbore #1

Crow Flats 14-16-28 USA 2H Wellbore #1

Plan: Planned Design #1

Standard Planning Report

18 October, 2011

EXHIBIT G

Chesapeake Operating

Planning Report

Database:	Drilling Database	Local Co-ordinate Reference:	Site Crow Flats 14-16-28 USA 2H
Company:	Permian District	TVD Reference:	WELL @ 3597.0usft (Original Well Elev)
Project:	NM - Eddy - Wolfcamp (north Eddy)	MD Reference:	WELL @ 3597.0usft (Original Well Elev)
Site:	Crow Flats 14-16-28 USA 2H	North Reference:	Grid
Well:	Crow Flats 14-16-28 USA 2H Wellbore #1	Survey Calculation Method:	Minimum Curvature
Wellbore:	Crow Flats 14-16-28 USA 2H Wellbore #1		
Design:	Planned Design #1		

Project NM - Eddy - Wolfcamp (north Eddy)

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 Crow Flats 14-16-28 USA 2H

Site Position:		Northing:	700,394.59 usft	Latitude:	32.9253335313
From:	Map	Easting:	554,793.59 usft	Longitude:	-104.1547603498
Position Uncertainty:	0.0 usft	Slot Radius:	13 200 in	Grid Convergence:	0.0970703 °

Well Crow Flats 14-16-28 USA 2H Wellbore #1

Well Position	+N/-S	0.0 usft	Northing:	700,394.59 usft	Latitude:	32.9253335313
	+E/-W	0.0 usft	Easting:	554,793.59 usft	Longitude:	-104.1547603498
Position Uncertainty		0.0 usft	Wellhead Elevation:	3,575 0 usft	Ground Level:	3,575.0 usft

Wellbore Crow Flats 14-16-28 USA 2H Wellbore #1

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	10/18/2011	7.8552230	60.7490350	48,975

Design Planned Design #1

Audit Notes:

Version:		Phase:	PROTOTYPE	Tie On Depth:	0.0

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	90.28

Plan Sections

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.0000000	
6,110.0	0.00	0.00	6,110.0	0.0	0.0	0.00	0.00	0.00	0.0000000	
6,856.0	89.50	89.98	6,587.6	0.2	473 4	12.00	12 00	0.00	89.9800000	
11,237.0	89.50	89.98	6,625.8	1.7	4,854.2	0.00	0.00	0.00	0.0000000	

Chesapeake Operating

Planning Report

Database:	Drilling Database	Local Co-ordinate Reference:	Site Crow Flats 14-16-28 USA 2H
Company:	Permian District	TVD Reference:	WELL @ 3597.0usft (Original Well Elev)
Project:	NM - Eddy - Wolfcamp (north Eddy)	MD Reference:	WELL @ 3597.0usft (Original Well Elev)
Site:	Crow Flats 14-16-28 USA 2H	North Reference:	Grid
Well:	Crow Flats 14-16-28 USA 2H Wellbore #1	Survey Calculation Method:	Minimum Curvature
Wellbore:	Crow Flats 14-16-28 USA 2H Wellbore #1		
Design:	Planned Design #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	0.00
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	0.00
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	0.00
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	0.00
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	0.00
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	0.00
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.0	0.00	0.00	0.00
2,300.0	0.00	0.00	2,300.0	0.0	0.0	0.0	0.00	0.00	0.00
2,400.0	0.00	0.00	2,400.0	0.0	0.0	0.0	0.00	0.00	0.00
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.0	0.00	0.00	0.00
2,600.0	0.00	0.00	2,600.0	0.0	0.0	0.0	0.00	0.00	0.00
2,700.0	0.00	0.00	2,700.0	0.0	0.0	0.0	0.00	0.00	0.00
2,800.0	0.00	0.00	2,800.0	0.0	0.0	0.0	0.00	0.00	0.00
2,900.0	0.00	0.00	2,900.0	0.0	0.0	0.0	0.00	0.00	0.00
3,000.0	0.00	0.00	3,000.0	0.0	0.0	0.0	0.00	0.00	0.00
3,100.0	0.00	0.00	3,100.0	0.0	0.0	0.0	0.00	0.00	0.00
3,200.0	0.00	0.00	3,200.0	0.0	0.0	0.0	0.00	0.00	0.00
3,300.0	0.00	0.00	3,300.0	0.0	0.0	0.0	0.00	0.00	0.00
3,400.0	0.00	0.00	3,400.0	0.0	0.0	0.0	0.00	0.00	0.00
3,500.0	0.00	0.00	3,500.0	0.0	0.0	0.0	0.00	0.00	0.00
3,600.0	0.00	0.00	3,600.0	0.0	0.0	0.0	0.00	0.00	0.00
3,700.0	0.00	0.00	3,700.0	0.0	0.0	0.0	0.00	0.00	0.00
3,800.0	0.00	0.00	3,800.0	0.0	0.0	0.0	0.00	0.00	0.00
3,900.0	0.00	0.00	3,900.0	0.0	0.0	0.0	0.00	0.00	0.00
4,000.0	0.00	0.00	4,000.0	0.0	0.0	0.0	0.00	0.00	0.00
4,100.0	0.00	0.00	4,100.0	0.0	0.0	0.0	0.00	0.00	0.00
4,200.0	0.00	0.00	4,200.0	0.0	0.0	0.0	0.00	0.00	0.00
4,300.0	0.00	0.00	4,300.0	0.0	0.0	0.0	0.00	0.00	0.00
4,400.0	0.00	0.00	4,400.0	0.0	0.0	0.0	0.00	0.00	0.00
4,500.0	0.00	0.00	4,500.0	0.0	0.0	0.0	0.00	0.00	0.00
4,600.0	0.00	0.00	4,600.0	0.0	0.0	0.0	0.00	0.00	0.00
4,700.0	0.00	0.00	4,700.0	0.0	0.0	0.0	0.00	0.00	0.00
4,800.0	0.00	0.00	4,800.0	0.0	0.0	0.0	0.00	0.00	0.00
4,900.0	0.00	0.00	4,900.0	0.0	0.0	0.0	0.00	0.00	0.00
5,000.0	0.00	0.00	5,000.0	0.0	0.0	0.0	0.00	0.00	0.00
5,100.0	0.00	0.00	5,100.0	0.0	0.0	0.0	0.00	0.00	0.00
5,200.0	0.00	0.00	5,200.0	0.0	0.0	0.0	0.00	0.00	0.00
5,300.0	0.00	0.00	5,300.0	0.0	0.0	0.0	0.00	0.00	0.00

Chesapeake Operating

Planning Report

Database:	Drilling Database	Local Co-ordinate Reference:	Site Crow Flats 14-16-28 USA 2H
Company:	Permian District	TVD Reference:	WELL @ 3597.0usft (Original Well Elev)
Project:	NM - Eddy - Wolfcamp (north Eddy)	MD Reference:	WELL @ 3597.0usft (Original Well Elev)
Site:	Crow Flats 14-16-28 USA 2H	North Reference:	Grid
Well:	Crow Flats 14-16-28 USA 2H Wellbore #1	Survey Calculation Method:	Minimum Curvature
Wellbore:	Crow Flats 14-16-28 USA 2H Wellbore #1		
Design:	Planned Design #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,400.0	0.00	0.00	5,400.0	0.0	0.0	0.0	0.00	0.00	0.00
5,500.0	0.00	0.00	5,500.0	0.0	0.0	0.0	0.00	0.00	0.00
5,600.0	0.00	0.00	5,600.0	0.0	0.0	0.0	0.00	0.00	0.00
5,700.0	0.00	0.00	5,700.0	0.0	0.0	0.0	0.00	0.00	0.00
5,800.0	0.00	0.00	5,800.0	0.0	0.0	0.0	0.00	0.00	0.00
5,900.0	0.00	0.00	5,900.0	0.0	0.0	0.0	0.00	0.00	0.00
6,000.0	0.00	0.00	6,000.0	0.0	0.0	0.0	0.00	0.00	0.00
6,100.0	0.00	0.00	6,100.0	0.0	0.0	0.0	0.00	0.00	0.00
6,110.0	0.00	0.00	6,110.0	0.0	0.0	0.0	0.00	0.00	0.00
6,200.0	10.80	89.98	6,199.5	0.0	8.5	8.5	12.00	12.00	0.00
6,300.0	22.79	89.98	6,295.0	0.0	37.3	37.3	12.00	12.00	0.00
6,400.0	34.79	89.98	6,382.5	0.0	85.4	85.4	12.00	12.00	0.00
6,500.0	46.79	89.98	6,458.1	0.1	150.6	150.6	12.00	12.00	0.00
6,600.0	58.79	89.98	6,518.4	0.1	230.1	230.1	12.00	12.00	0.00
6,700.0	70.78	89.98	6,561.0	0.1	320.4	320.4	12.00	12.00	0.00
6,800.0	82.78	89.98	6,583.8	0.1	417.6	417.6	12.00	12.00	0.00
6,856.0	89.50	89.98	6,587.6	0.2	473.4	473.4	12.00	12.00	0.00
6,900.0	89.50	89.98	6,587.9	0.2	517.4	517.4	0.00	0.00	0.00
7,000.0	89.50	89.98	6,588.8	0.2	617.4	617.4	0.00	0.00	0.00
7,100.0	89.50	89.98	6,589.7	0.3	717.4	717.4	0.00	0.00	0.00
7,200.0	89.50	89.98	6,590.6	0.3	817.4	817.4	0.00	0.00	0.00
7,300.0	89.50	89.98	6,591.4	0.3	917.4	917.4	0.00	0.00	0.00
7,400.0	89.50	89.98	6,592.3	0.4	1,017.4	1,017.4	0.00	0.00	0.00
7,500.0	89.50	89.98	6,593.2	0.4	1,117.4	1,117.4	0.00	0.00	0.00
7,600.0	89.50	89.98	6,594.0	0.4	1,217.4	1,217.4	0.00	0.00	0.00
7,700.0	89.50	89.98	6,594.9	0.5	1,317.4	1,317.4	0.00	0.00	0.00
7,800.0	89.50	89.98	6,595.8	0.5	1,417.4	1,417.3	0.00	0.00	0.00
7,900.0	89.50	89.98	6,596.7	0.5	1,517.4	1,517.3	0.00	0.00	0.00
8,000.0	89.50	89.98	6,597.5	0.6	1,617.4	1,617.3	0.00	0.00	0.00
8,100.0	89.50	89.98	6,598.4	0.6	1,717.4	1,717.3	0.00	0.00	0.00
8,200.0	89.50	89.98	6,599.3	0.6	1,817.4	1,817.3	0.00	0.00	0.00
8,300.0	89.50	89.98	6,600.2	0.7	1,917.3	1,917.3	0.00	0.00	0.00
8,400.0	89.50	89.98	6,601.0	0.7	2,017.3	2,017.3	0.00	0.00	0.00
8,500.0	89.50	89.98	6,601.9	0.7	2,117.3	2,117.3	0.00	0.00	0.00
8,600.0	89.50	89.98	6,602.8	0.8	2,217.3	2,217.3	0.00	0.00	0.00
8,700.0	89.50	89.98	6,603.6	0.8	2,317.3	2,317.3	0.00	0.00	0.00
8,800.0	89.50	89.98	6,604.5	0.8	2,417.3	2,417.3	0.00	0.00	0.00
8,900.0	89.50	89.98	6,605.4	0.9	2,517.3	2,517.3	0.00	0.00	0.00
9,000.0	89.50	89.98	6,606.3	0.9	2,617.3	2,617.3	0.00	0.00	0.00
9,100.0	89.50	89.98	6,607.1	0.9	2,717.3	2,717.3	0.00	0.00	0.00
9,200.0	89.50	89.98	6,608.0	1.0	2,817.3	2,817.3	0.00	0.00	0.00
9,300.0	89.50	89.98	6,608.9	1.0	2,917.3	2,917.3	0.00	0.00	0.00
9,400.0	89.50	89.98	6,609.8	1.1	3,017.3	3,017.3	0.00	0.00	0.00
9,500.0	89.50	89.98	6,610.6	1.1	3,117.3	3,117.3	0.00	0.00	0.00
9,600.0	89.50	89.98	6,611.5	1.1	3,217.3	3,217.3	0.00	0.00	0.00
9,700.0	89.50	89.98	6,612.4	1.2	3,317.3	3,317.3	0.00	0.00	0.00
9,800.0	89.50	89.98	6,613.2	1.2	3,417.3	3,417.2	0.00	0.00	0.00
9,900.0	89.50	89.98	6,614.1	1.2	3,517.3	3,517.2	0.00	0.00	0.00
10,000.0	89.50	89.98	6,615.0	1.3	3,617.3	3,617.2	0.00	0.00	0.00
10,100.0	89.50	89.98	6,615.9	1.3	3,717.3	3,717.2	0.00	0.00	0.00
10,200.0	89.50	89.98	6,616.7	1.3	3,817.3	3,817.2	0.00	0.00	0.00
10,300.0	89.50	89.98	6,617.6	1.4	3,917.3	3,917.2	0.00	0.00	0.00
10,400.0	89.50	89.98	6,618.5	1.4	4,017.3	4,017.2	0.00	0.00	0.00
10,500.0	89.50	89.98	6,619.4	1.4	4,117.3	4,117.2	0.00	0.00	0.00

Database:	Drilling Database	Local Co-ordinate Reference:	Site Crow Flats 14-16-28 USA 2H
Company:	Permian District	TVD Reference:	WELL @ 3597.0usft (Original Well Elev)
Project:	NM - Eddy - Wolfcamp (north Eddy)	MD Reference:	WELL @ 3597.0usft (Original Well Elev)
Site:	Crow Flats 14-16-28 USA 2H	North Reference:	Grid
Well:	Crow Flats 14-16-28 USA 2H Wellbore #1	Survey Calculation Method:	Minimum Curvature
Wellbore:	Crow Flats 14-16-28 USA 2H Wellbore #1		
Design:	Planned Design #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
10,600.0	89.50	89.98	6,620.2	1.5	4,217.3	4,217.2	0.00	0.00	0.00
10,700.0	89.50	89.98	6,621.1	1.5	4,317.3	4,317.2	0.00	0.00	0.00
10,800.0	89.50	89.98	6,622.0	1.5	4,417.3	4,417.2	0.00	0.00	0.00
10,900.0	89.50	89.98	6,622.8	1.6	4,517.2	4,517.2	0.00	0.00	0.00
11,000.0	89.50	89.98	6,623.7	1.6	4,617.2	4,617.2	0.00	0.00	0.00
11,100.0	89.50	89.98	6,624.6	1.6	4,717.2	4,717.2	0.00	0.00	0.00
11,200.0	89.50	89.98	6,625.5	1.7	4,817.2	4,817.2	0.00	0.00	0.00
11,237.0	89.50	89.98	6,625.8	1.7	4,854.2	4,854.2	0.00	0.00	0.00

Crow Flats 14-16-28 USA 2H
Plan: Planned Design #1
Longitude: -104.1547603498
Latitude: 32.9253335313
Northing: 700394.60
Easting: 554793.59
N/S Section Line: 0.0 FSL
E/W Section Line: 0.0 FWL
Ground: 3575.0
Elevation: WELL @ 3597.0usft (Original Well Elev)
VS Reference: User Defined (0.0N, 0.0E)

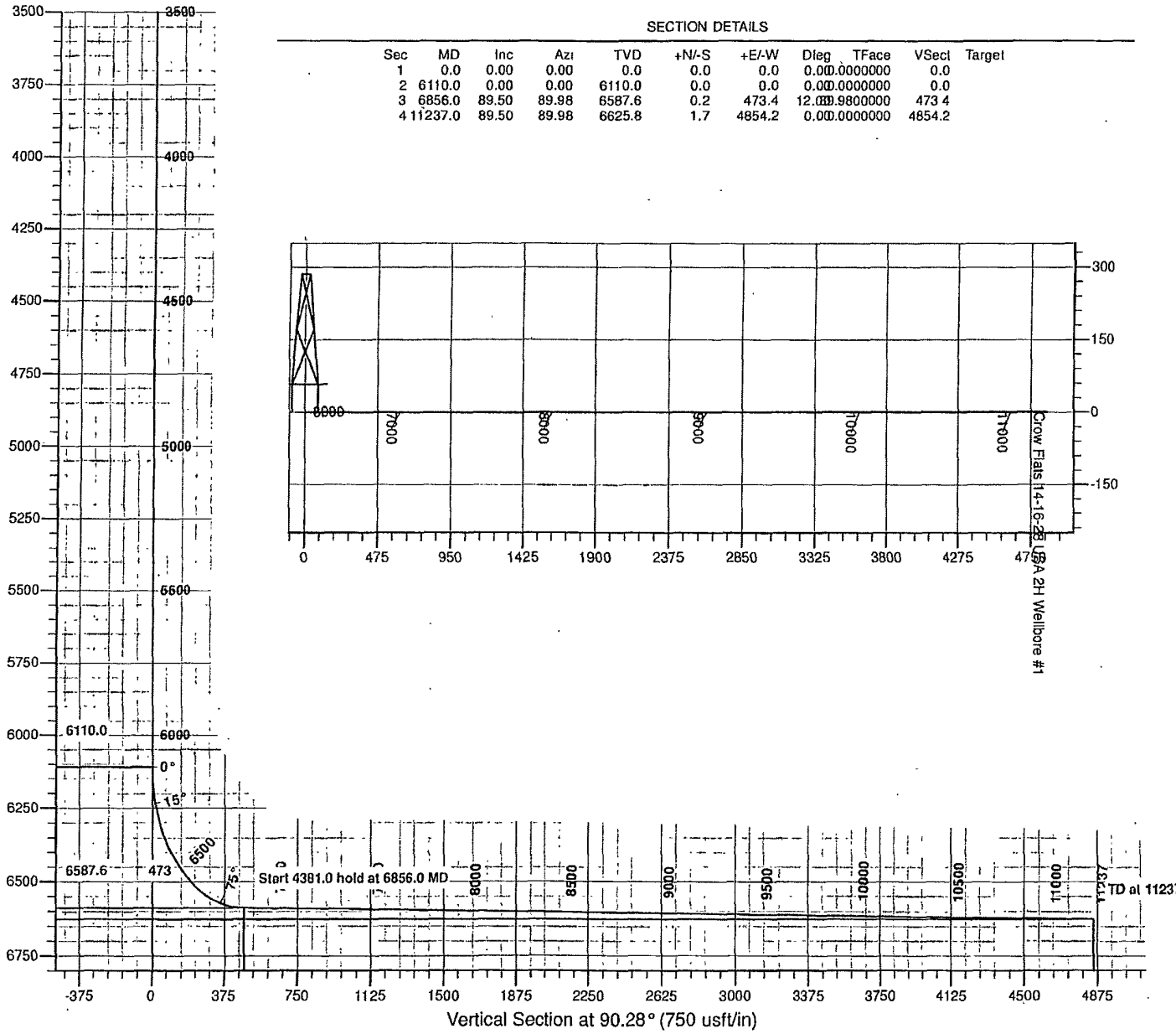
Geodetic System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: New Mexico East 3001
System Datum: Mean Sea Level

Azimuths to Grid North
True North: -0.10°
Magnetic North: 7.76°

Magnetic Field
Strength: 48975.2snT
Dip Angle: 60.75°
Date: 10/18/2011
Model: IGRF200510

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.0000000	0.0	
2	6110.0	0.00	0.00	6110.0	0.0	0.0	0.00	0.0000000	0.0	
3	6856.0	89.50	89.98	6587.6	0.2	473.4	12.00	89.9800000	473.4	
4	11237.0	89.50	89.98	6625.8	1.7	4854.2	0.00	0.0000000	4854.2	

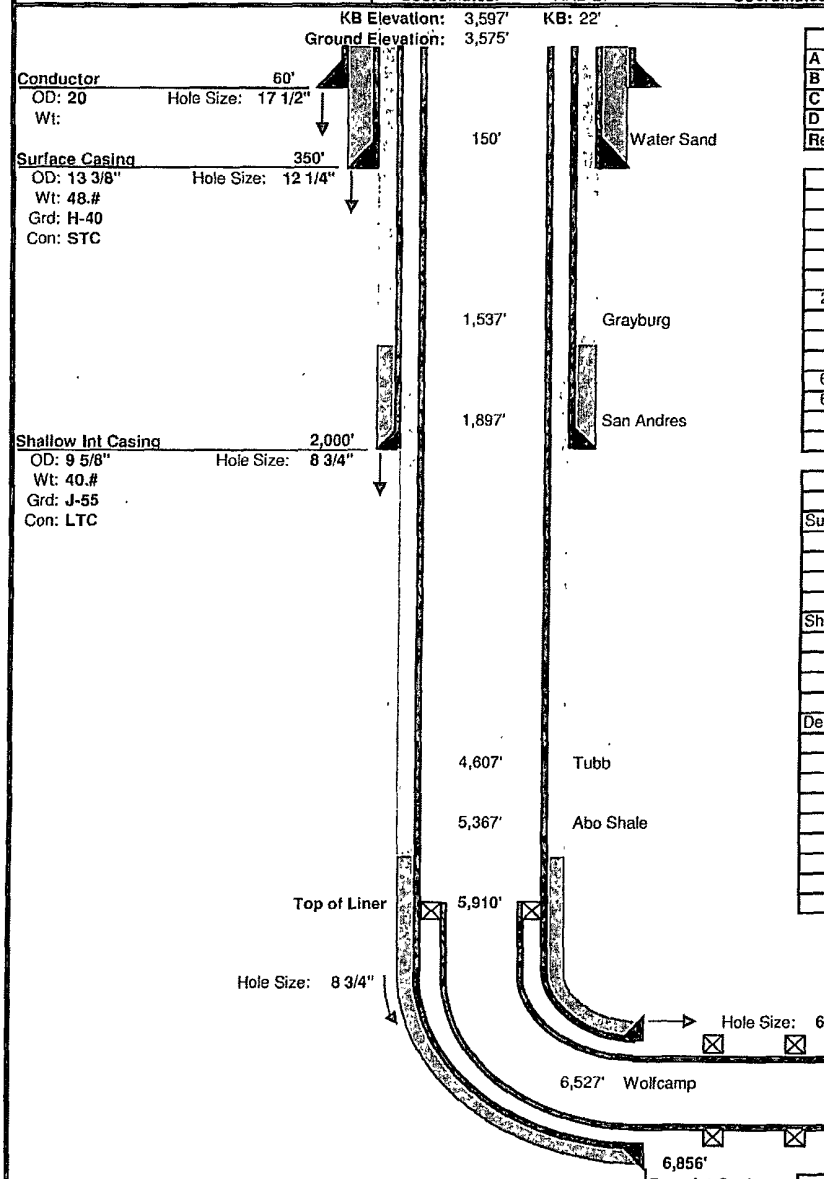


Chesapeake ENERGY

Drilling Engineer:	Chris Gray
Superintendent:	Rolando Davila
Geologist:	Robert Martin

Well Name:	Crow Flats 14-16-28 USA 2H		
Target:	Wolfcamp		
County, State:	Eddy, NM		
Surface Location:	1,980' FNL 10' FWL, Section 14, Township 16S, Range 28 E		
BH Location:	1,980' FNL 350' FEL, Section 14, Township 16S, Range 28 E		
SHL Latitude:	32.925337	SHL North:	554795
SHL Longitude:	-104.154757	SHL East:	700396
BHL Latitude:		BHL North:	559649
BHL Longitude:		BHL East:	700398
Coordinates:	NAD 27	Coordinates:	NME

Drilling Rig:	Latshaw 14
Directional-Surface:	N/A
Directional-Curve:	TBD
Drilling Mud:	TBD
Cement:	TBD
Wellhead:	TBD
Property Number:	615831
AFE Number:	144573



Wellhead Equipment	
A Section	13-3/8" x 13-5/8" 5K SOW w/5K gate valve
B Section	13-5/8" 5K X 11" 5K w/5k gate valve
C Section	11" 5K X 7-1/16" 10K w/10k gate valve
D Section	N/A
Required BOP Stack	13-5/8" 10K- Triple, Annular, Rot Head w/orbit valve

Mud				
Depth	Type	Weight	F. Vis	FL
0' - 350'	Spud Mud	8.4 - 8.7	32 - 34	NC - NC
350' - 2,000'	Brine	9.8 - 10.1	28 - 29	NC - NC
2,000' - 6,856'	Cut Brine	8.4 - 9.5	28 - 30	NC - NC
6,110' - 6,856'	Cut Brine	8.4 - 9.5	28 - 30	NC - NC
6,856' - 11,237'	Cut Brine	8.4 - 9.5	28 - 30	NC - NC

Cement							
Slurry	Top	Btm	Wt	Yld	%Exc	Bbl	Sx
Surface							
Single Slurry	0'	350'	13.5	1.73	150	105	341
Shallow Int							
Lead	0'	1,500'	12.0	1.8	150	182	569
Tail	1,500'	2,000'	14.2	1.37	150	73	300
Deep Int							
Lead	1,500'	5,410'	11.9	2.52	150	242	540
Tail	5,410'	6,856'	14.8	1.33	150	100	423

LOGS	Type	Logs	Interval	Vendor
	Mudlog	Mudlog	1000' to TD	TBD
	OH	Triple Combo, Spectral GR	Pilot TD to Int Csg	TBD
	LWD	MWD/Gamma	Curve/Lateral	TBD

Directional Plan						
Target Line:	6484' TVD w/0.0 deg updip					
Target Window:	10' above and 10' below					
	MD	INC	AZM	TVD	VS	DLS
KOP	6,110'	0.00	0.00	6,110'	0'	0.00
EOB	6,856'	89.50	89.98	6,587'	473'	12.00
TD	11,237'	89.50	89.98	6,626'	4,854'	0.00
Hardlines:	Lateral- 330' from all lease lines. Vertical- Actual Lease Lines					
Notes:	Please note SHL and BHL distance from lease lines					

BLOWOUT PREVENTER SCHEMATIC

CHESAPEAKE OPERATING INC

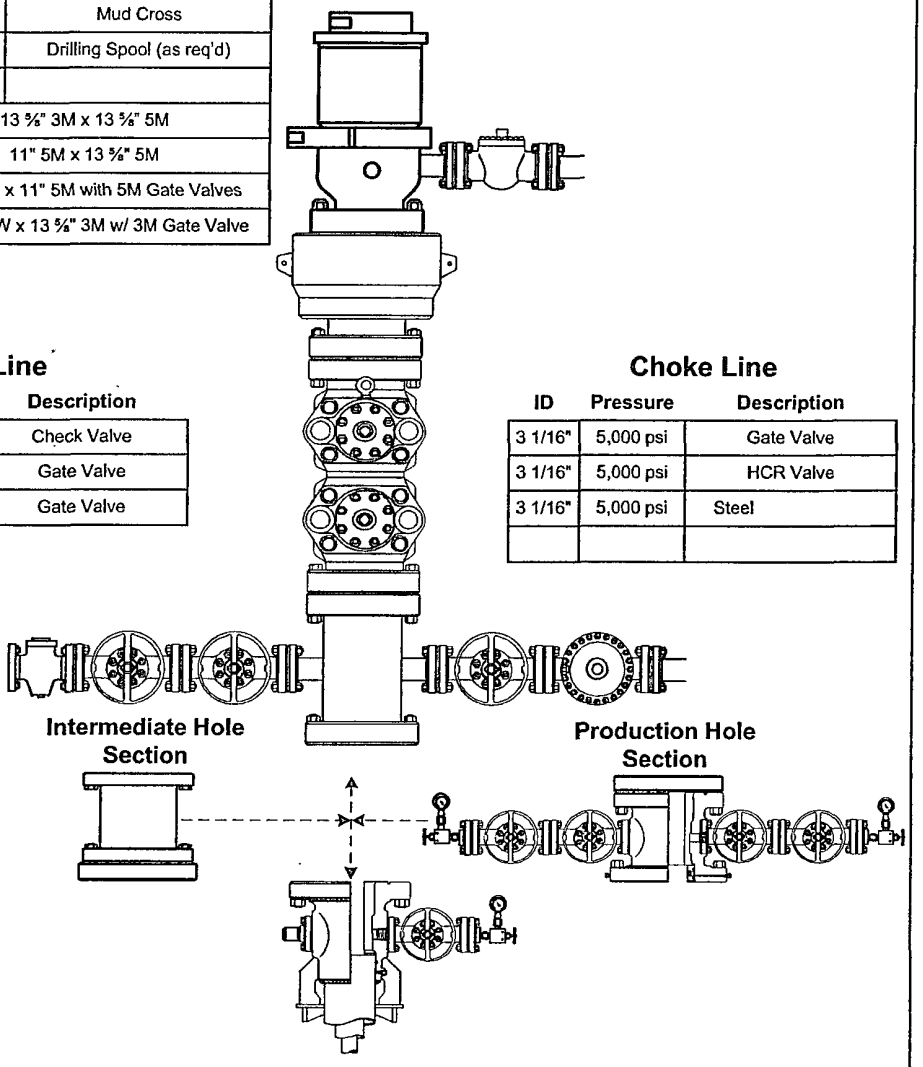
WELL : **Permian District**
FIELD : **Avalon**
RIG :
COUNTY : **STATE** :
OPERATION : **Intermediate and Production Hole Sections** **REVISION** : : / /

Component Descriptions

	Size	Pressure	Description
A	13 ⅝"	LP	Rotating Head w/ Orbit Valve
B	13 ⅝"	5,000 psi	Annular
C	13 ⅝"	5,000 psi	Pipe Ram
D	13 ⅝"	5,000 psi	Blind Ram
E	13 ⅝"	5,000 psi	Mud Cross
F	13 ⅝"	5,000 psi	Drilling Spool (as req'd)
G			
DSA (Int)	13 ⅝" 3M x 13 ⅝" 5M		
DSA (Prod)	11" 5M x 13 ⅝" 5M		
B Sec	13 ⅝" 3M x 11" 5M with 5M Gate Valves		
A Sec	13 ⅜" SOW x 13 ⅝" 3M w/ 3M Gate Valve		

Exception	Reference

Trip Tank Required: Yes [X] No [ ]



Kill Line

ID	Pressure	Description
2 1/16"	5,000 psi	Check Valve
2 1/16"	5,000 psi	Gate Valve
2 1/16"	5,000 psi	Gate Valve

Choke Line

ID	Pressure	Description
3 1/16"	5,000 psi	Gate Valve
3 1/16"	5,000 psi	HCR Valve
3 1/16"	5,000 psi	Steel

Testing Requirements

Item	Pressure	Frequency
Rotating Head	250 psi	Once prior to DO shoe
Annular	250 / 3,500 psi	Every 21 Days
Rams	250 / 5,000 psi	Every 21 Days
Choke Manifold	250 / 5,000 psi	Every 21 Days

- Function test on trips
- H_2S service trim required

Approved by	Date
DEM	
VP	
B&C	

EXHIBIT

CHOKE MANIFOLD SCHEMATIC

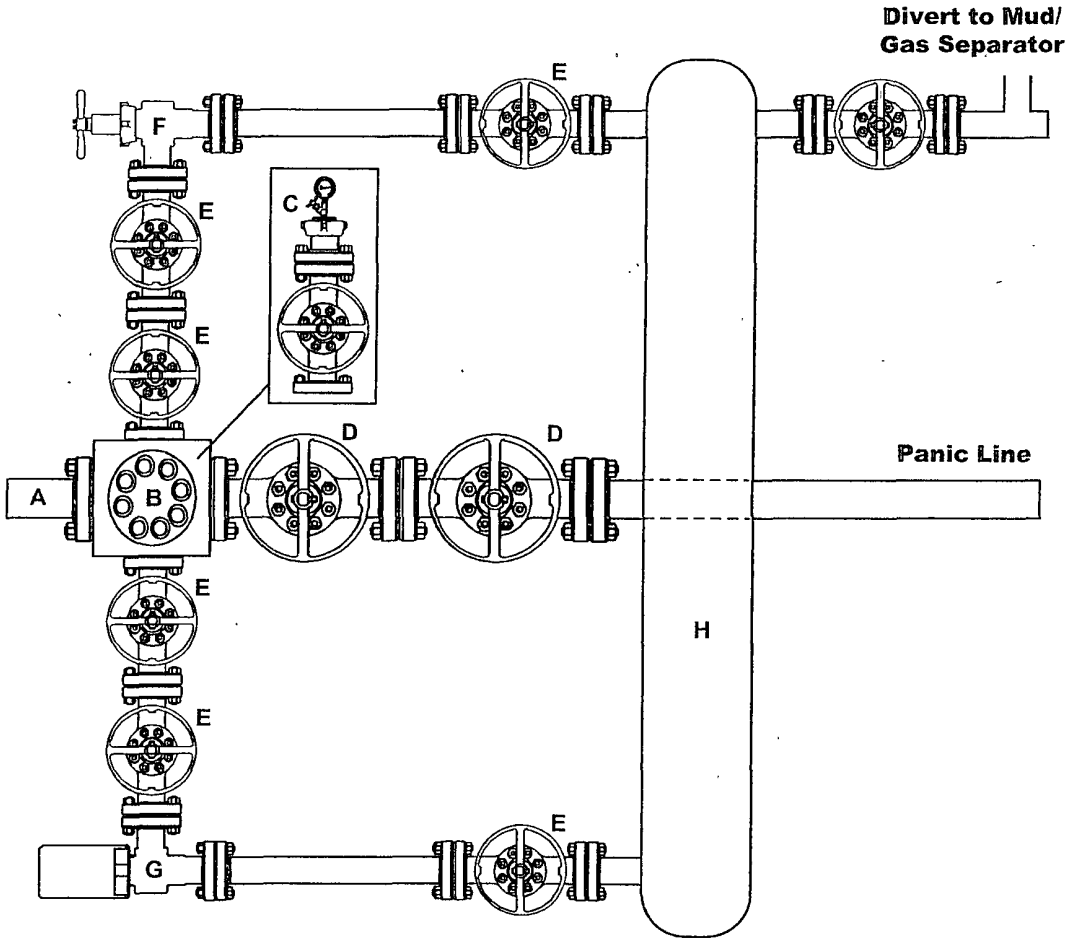
CHESAPEAKE OPERATING INC

WELL : Permian District
FIELD : Avalon
RIG :
COUNTY :
STATE :
OPERATION :
REVISION : : / /

Component Descriptions

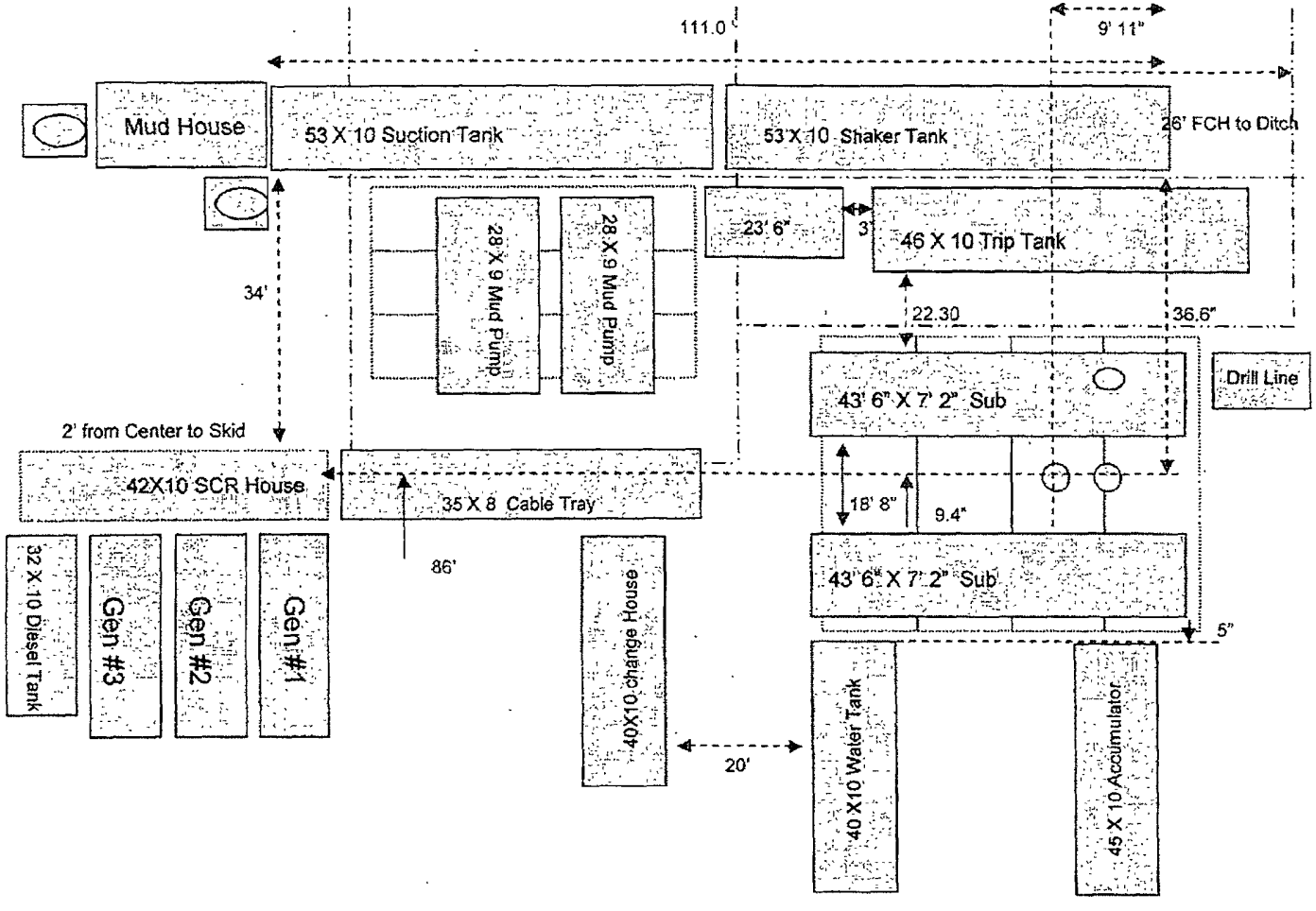
	Size	Pressure	Description
A	3 1/16"	5,000 psi	Steel
B	3 1/16" x 2 1/16"	5,000 psi	Block T
C	2 1/16"	5,000 psi	Top Valve
D	3 1/16"	5,000 psi	Gate Valve
E	2 1/16"	5,000 psi	Gate Valve
F	2 1/16"	5,000 psi	Manual Choke
G	2 1/16"	5,000 psi	Hydraulic Choke
H	8" minimum		Buffer Chamber

Exception	Reference



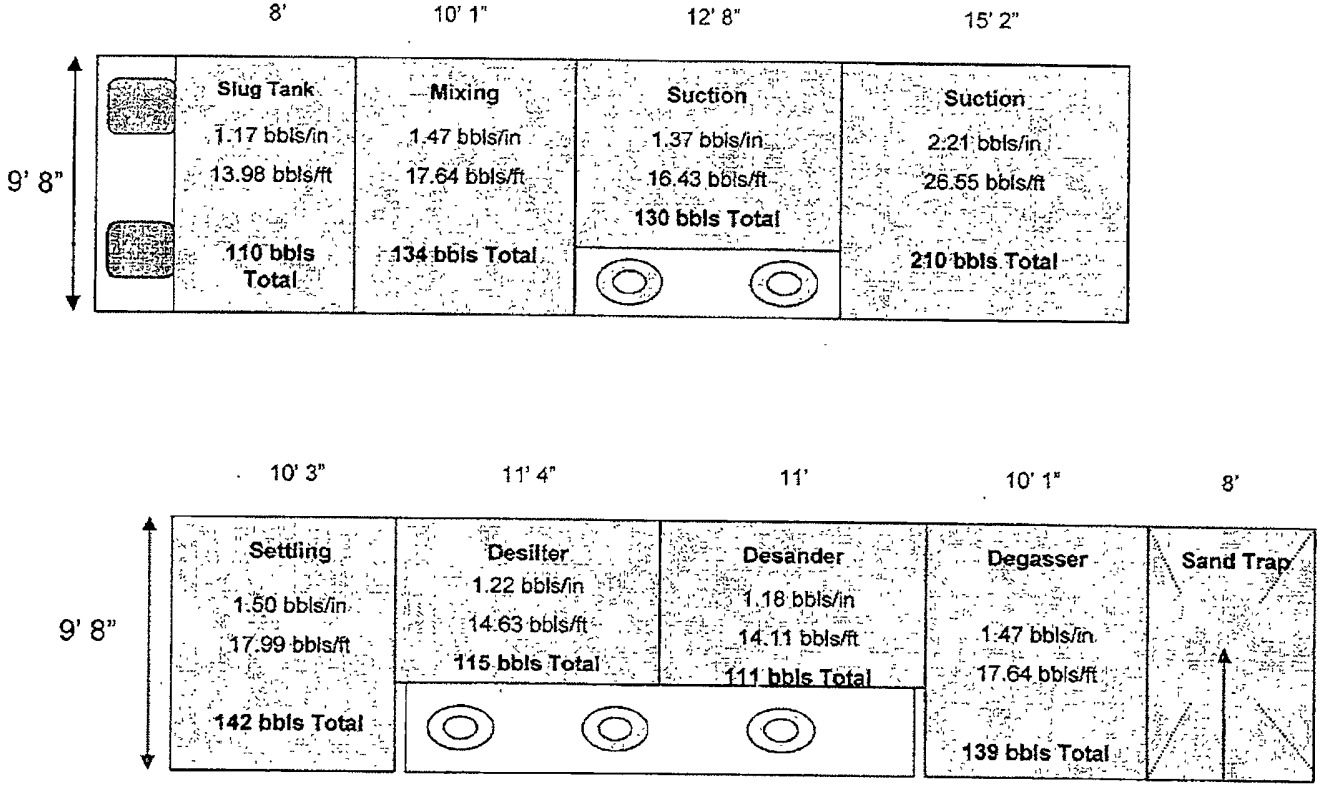
Approved by	Date
DEM	
VP	
B&C	

Revised EXHIBIT F-2



Latshaw14 – Layout Plat revised 3.14.09

EXHIBIT D-1



1091 BBLS TOTAL

EXHIBIT D-2

Crow Flats14-16-28 USA 2H

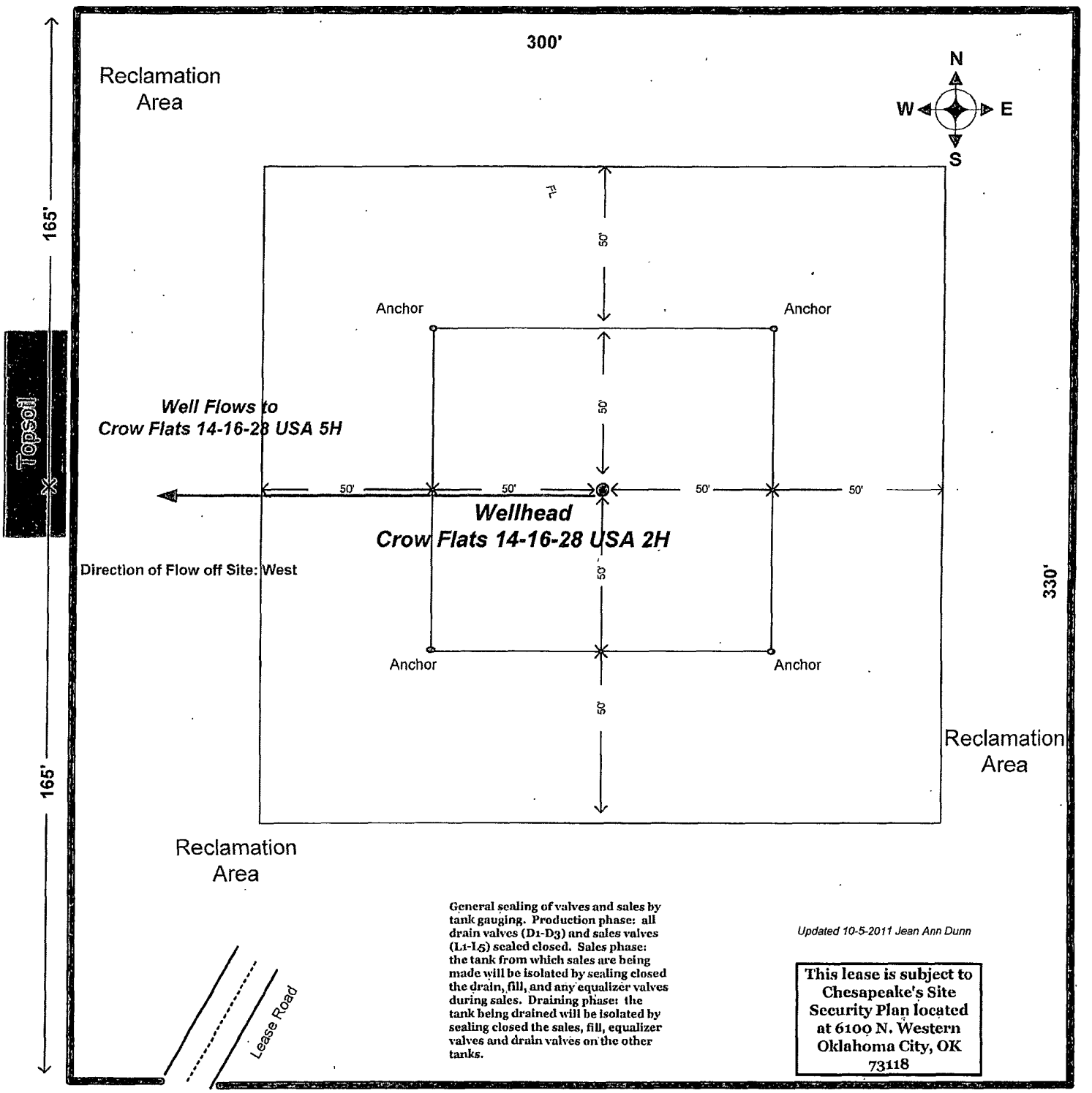
Property # 615831

1980 FNL & 200 FEL of Section 14-16S-28E, NMPM

Lat.: 32.925226 – Long.: -104.153872

Eddy County, New Mexico

Drawing not to scale



General sealing of valves and sales by tank gauging. Production phase: all drain valves (D1-D3) and sales valves (L1-L5) sealed closed. Sales phase: the tank from which sales are being made will be isolated by sealing closed the drain, fill, and any equalizer valves during sales. Draining phase: the tank being drained will be isolated by sealing closed the sales, fill, equalizer valves and drain valves on the other tanks.

Updated 10-5-2011 Jean Ann Dunn

This lease is subject to Chesapeake's Site Security Plan located at 6100 N. Western Oklahoma City, OK 73118

EXHIBIT C-1

PECOS DISTRICT
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	Chesapeake Operating Inc.
LEASE NO.:	NM-95630
WELL NAME & NO.:	Crow Flats 14 16 28 #2H
SURFACE HOLE FOOTAGE:	1980' FNL & 0010' FWL
BOTTOM HOLE FOOTAGE	1980' FNL & 0350' FEL
LOCATION:	Section 14, T. 16 S., R. 28 E., NMPM
COUNTY:	Eddy County, New Mexico

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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)

Protecting a Playa:

- A ditch 12 inches deep needs to be constructed on the edge of the entire south and east sides of the well pad. The ditch shall be no wider than 2 feet wide outside the berm. The operator shall not remove any vegetation or disturb any land more than 3 feet off the edge of the well pad. Ditch shall divert water around pad.
- The entire perimeter of the well pad will be bermed to prevent oil, salt, and other chemical contaminants from leaving the well pad.
    - The berm shall be constructed at a minimum of 12 inches high with impermeable mineral material (e.g. caliche).
    - No water flow from the uphill side(s) of the pad shall be allowed to enter the well pad.
    - The topsoil stockpile shall be located outside the bermed well pad.
    - Topsoil, either from the well pad or surrounding area, shall not be used to construct the berm.
    - No storm drains, tubing or openings shall be placed in the berm.
    - If fluid collects within the bermed area, the fluid must be vacuumed into a safe container and disposed of properly at a state approved facility.
    - The integrity of the berm shall be maintained around the surfaced pad throughout the life of the well and after interim reclamation has been completed.
    - Any access road entering the well pad shall be constructed so that the integrity of the berm height surrounding the well pad is not compromised. (Any access road crossing the berm cannot be lower than the berm height.)
- Any water erosion that may occur due to the construction of the well pad during the life of the well will be quickly corrected and proper measures will be taken to prevent future erosion.
- Stockpiling of topsoil is required. The top soil shall be stockpiled in an appropriate location to prevent loss of soil due to water or wind erosion and not used for berming or erosion control.

Low Water Crossings:

The new access road shall not disrupt the flow of water through natural drainages. The access road must incorporate low water crossings where the road travels across drainage.

The low water crossing shall be at the same grade as the natural ground and shall be constructed of gravel, cobble, or other coarse material.

Pipeline and Electric Line NOT Approved with this APD

The operator must submit a sundry notice for approval.

Conditions of Approval 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.

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.

Conditions of Approval Archeology

Historic properties in the vicinity of this project are protected by federal law. In order to ensure that they are not damaged or destroyed by construction activities, the project proponent and construction supervisors shall ensure that the following stipulations are implemented.

Date of Issue: 12/20/2011 **BLM Report No.:** 12-0160

Project Name: Crow Flats 14-16-28 USA #2H loc & access

1. Professional archaeological monitoring. Contact your project archaeologist, or BLM's Cultural Resources Section at (575) 234-2228, 5917, 5986, or 5967.

These stipulations must be given to your monitor at least 5 days prior to the start of

No construction, including vegetation removal or other site prep may begin prior to the arrival of the monitor.

2. The archaeological monitor will:

Observe all ground-disturbing activities within 100 feet of cultural site no. LA:171772

Other

Site Protection and Employee Education: It is the responsibility of the project proponent and his construction supervisor to inform all employees and subcontractors that cultural and archaeological sites are to be avoided by all personnel, vehicles, and equipment; and that it is illegal to collect, damage, or disturb cultural resources on Public Lands.

For assistance, contact BLM Cultural Resources:

Bruce Boeke (575) 234-5917
James Smith (575) 234-5986
Martin Stein (575) 234-5967
James Renn (575) 234-6231

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) 234-6235 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 (20) 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.

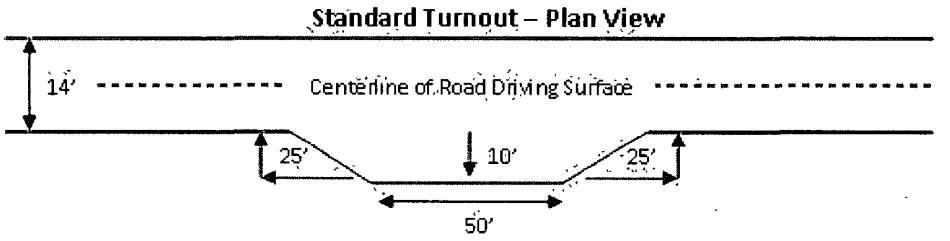
Where possible, no improvements should be made on the unsurfaced access road other than to remove vegetation as necessary, road irregularities, safety issues, or to fill low areas that may sustain standing water.

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.

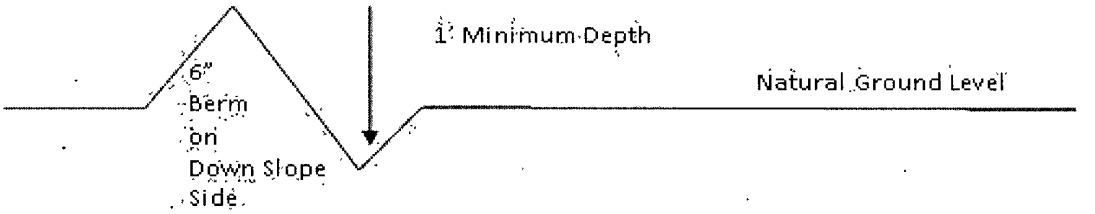
Turnouts
Vehicle turnouts shall be constructed on the road. Turnouts shall be intervisible with interval spacing distance less than 1000 feet. Turnouts shall be constructed on all blind curves. Turnouts shall conform to the following diagram:



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:

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

Cattleguards

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

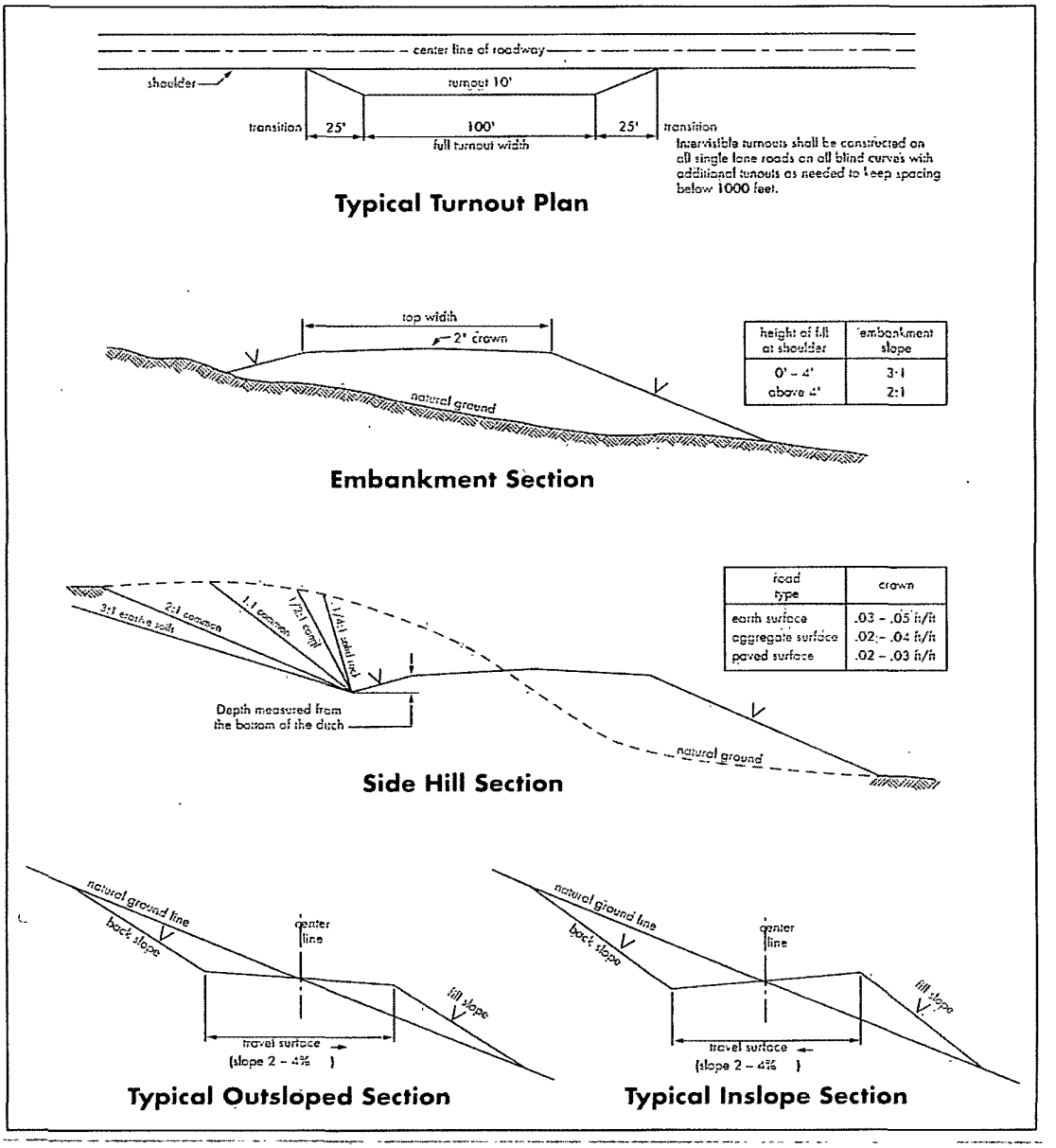
Any existing cattleguard(s) on the access road shall be repaired or replaced if they are damaged or have deteriorated beyond practical use. The operator shall be responsible for the condition of the existing cattleguard(s) that are in place and are utilized during lease operations.

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



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 and formations to the BLM.**

2. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval. **If the drilling rig is removed without approval – an Incident of Non-Compliance will be written and will be a "Major" violation.**

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

4. **The record of the drilling rate along with the GR/N well log run from TD to surface (horizontal well – vertical portion of hole) shall be submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper copies.**

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
Possible lost circulation in the Grayburg and San Andres.

1. The **13-3/8** inch surface casing shall be set at **approximately 350 feet (within the Tansill)** 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 surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.

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

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

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

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

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

If 75% or greater lost circulation occurs while drilling the intermediate casing hole, the cement on the production casing must come to surface.

The pilot hole plugging procedure is approved as written.

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

   ☒ Cement should tie-back at least 500 feet into previous casing string. Operator shall provide method of verification.

4. Cement not required on the **4-1/2"** liner. **Packer system being used.**

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

C. PRESSURE CONTROL

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

2. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **3000 (3M)** psi. **5M tested as a 3M system.**

   a. **For surface casing only:** If the BOP/BOPE is to be tested against casing, the wait on cement (WOC) time for that casing is to be met (see WOC statement at start of casing section). Independent service company required.

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

d. 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.**

e. 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.

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 020912

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

No pipeline or electric line is approved with this APD.

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 2, for Sandy 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
Sand dropseed (Sporobolus cryptandrus)	1.0
Sand love grass (Eragrostis trichodes)	1.0
Plains bristlegrass (Setaria macrostachya)	2.0

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