District I
1625 N. French Dr., Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone: (575) 748-1283 Fax: (575) 748-9720
District III
1000 Rio Brazos Road, Aztec, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

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

HOBBS OCD
OCT 01 2014
RECEIVED

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

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

[1] API Number	[2] Pool Code	[3] Pool Name
30-025-42463	14865	CRUZ 2nd BONE SPRING SAND, BONE SPRING

[4] Property Code	[5] Property Name	[6] Well Number
38639	BLACK MAMBA 15 STATE COM	4H

[7] OGRID No.	[8] Operator Name	[9] Elevation
6137	DEVON ENERGY PRODUCTION COMPANY, L.P.	3704.9

[10] Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
B	15	23 S	33 E		450	NORTH	2370	EAST	LEA

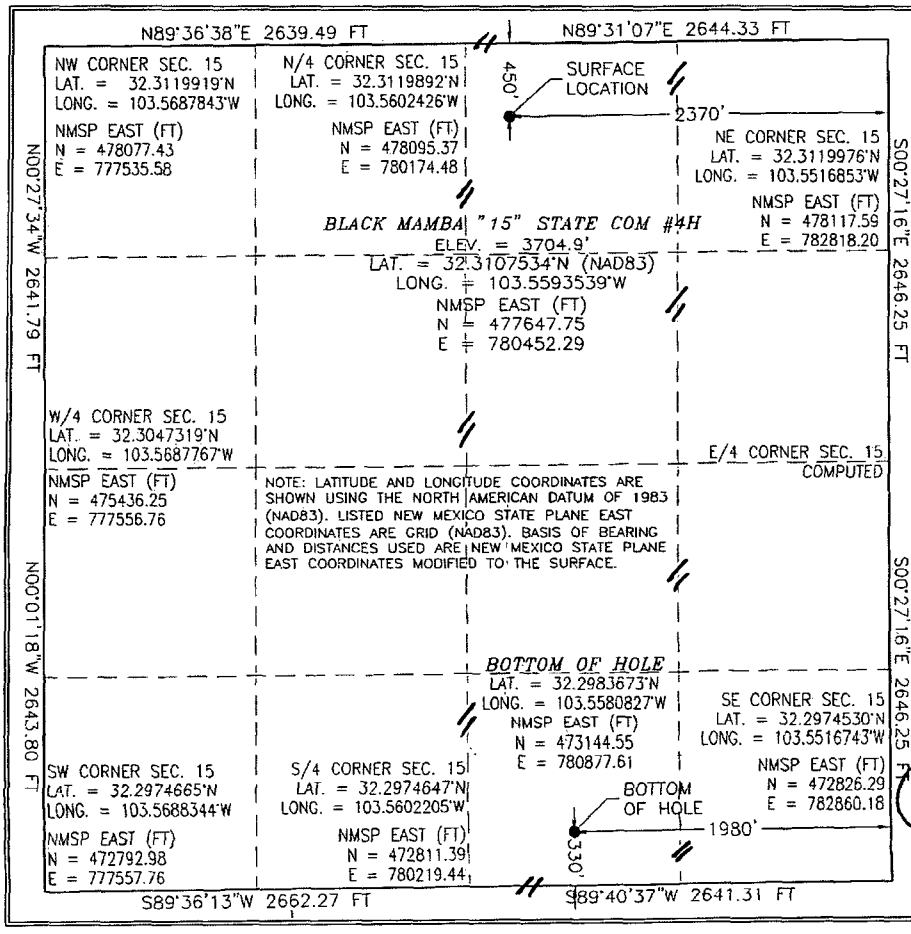
[11] Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
O	15	23 S	33 E		330	SOUTH	1980	EAST	LEA

[12] Dedicated Acres	[13] Joint or Infill	[14] Consolidation Code	[15] Order No.
160			

No allowable will be assigned to this completion until all interests have been consolidated or a non-standard unit has been approved by the division.

PP: 450 FNL & 2370 FEL



[17] OPERATOR CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Signature — Date: 9/30/2014

David H. Cook — Regulatory Specialist
Printed Name

david.cook@dvn.com
E-mail Address

[18] 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.

APRIL 3, 2013
Date of Survey

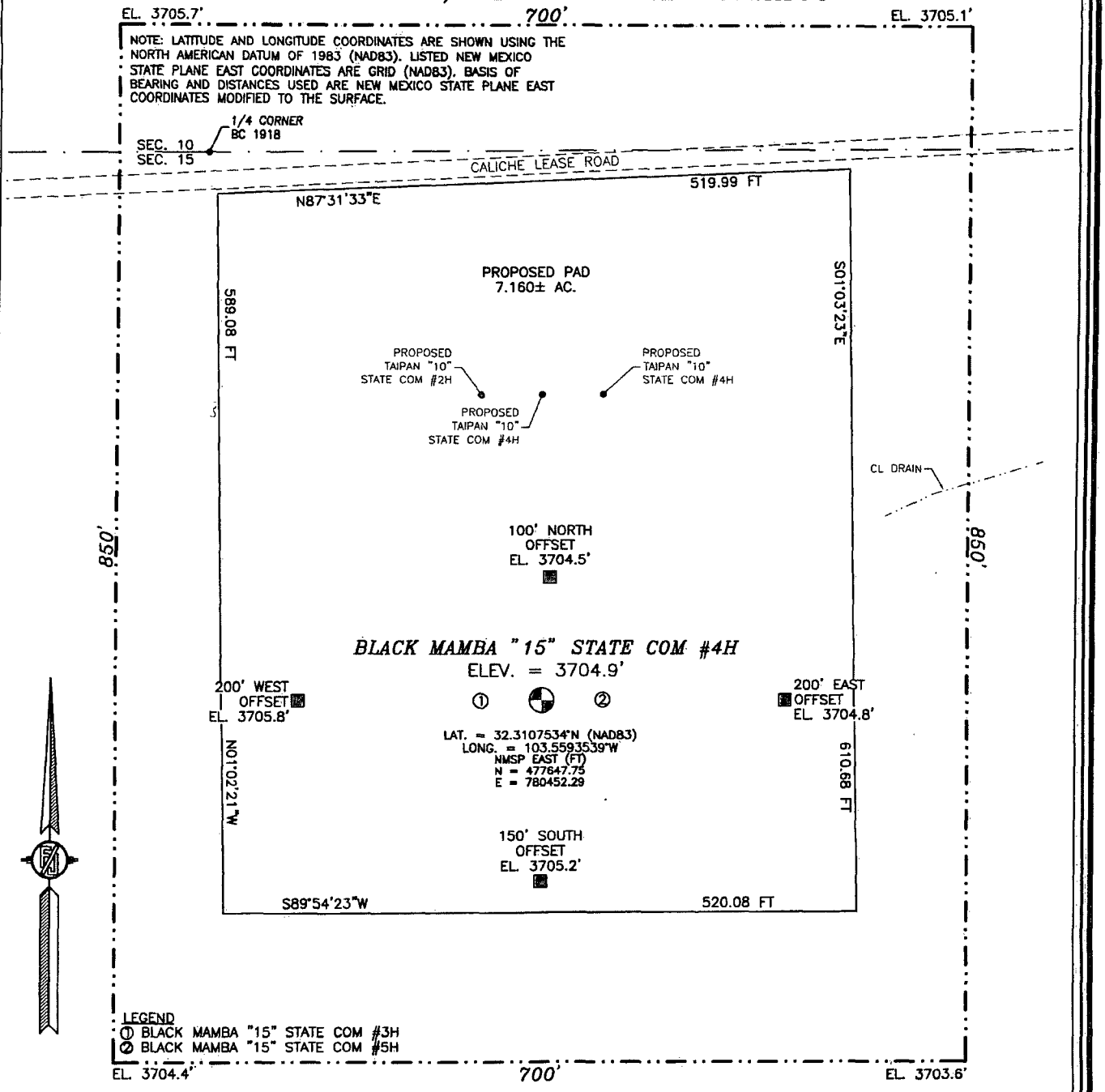
Signature and Seal of Professional Surveyor

Certificate Number: FILIMON F. JARAMILLO, PLS 12797

SURVEY NO. 1727

OCT 01 2014

SECTION 15, TOWNSHIP 23 SOUTH, RANGE 33 EAST, N.M.P.M.
LEA COUNTY, STATE OF NEW MEXICO



010 50 100 200

SCALE 1" = 100'

DIRECTIONS TO LOCATION

FROM INTERSECTION OF HWY 128 & DELAWARE BASIN ROAD GO NORTH ON DELAWARE BASIN ROAD APPROX. 6.0 MILES TO A LEASE ROAD ON LEFT (WEST) OF ROAD. TURN LEFT (WEST) ON LEASE ROAD GO APPROX. 2.4 MILES TO A LEASE ROAD ON RIGHT (NORTH) TURN RIGHT (NORTH) GO APPROX. 1.0 MILE TO LEASE ROAD ON LEFT (WEST) TURN LEFT (WEST) GO APPROX 0.4 MILE TO LOCATIONS ON LEFT (SOUTH) OF ROAD.

DEVON ENERGY PRODUCTION COMPANY, L.P.

BLACK MAMBA "15" STATE COM #4H

LOCATED 450 FT. FROM THE NORTH LINE AND 2370 FT. FROM THE EAST LINE OF SECTION 15, TOWNSHIP 23 SOUTH, RANGE 33 EAST, N.M.P.M. LEA COUNTY, STATE OF NEW MEXICO

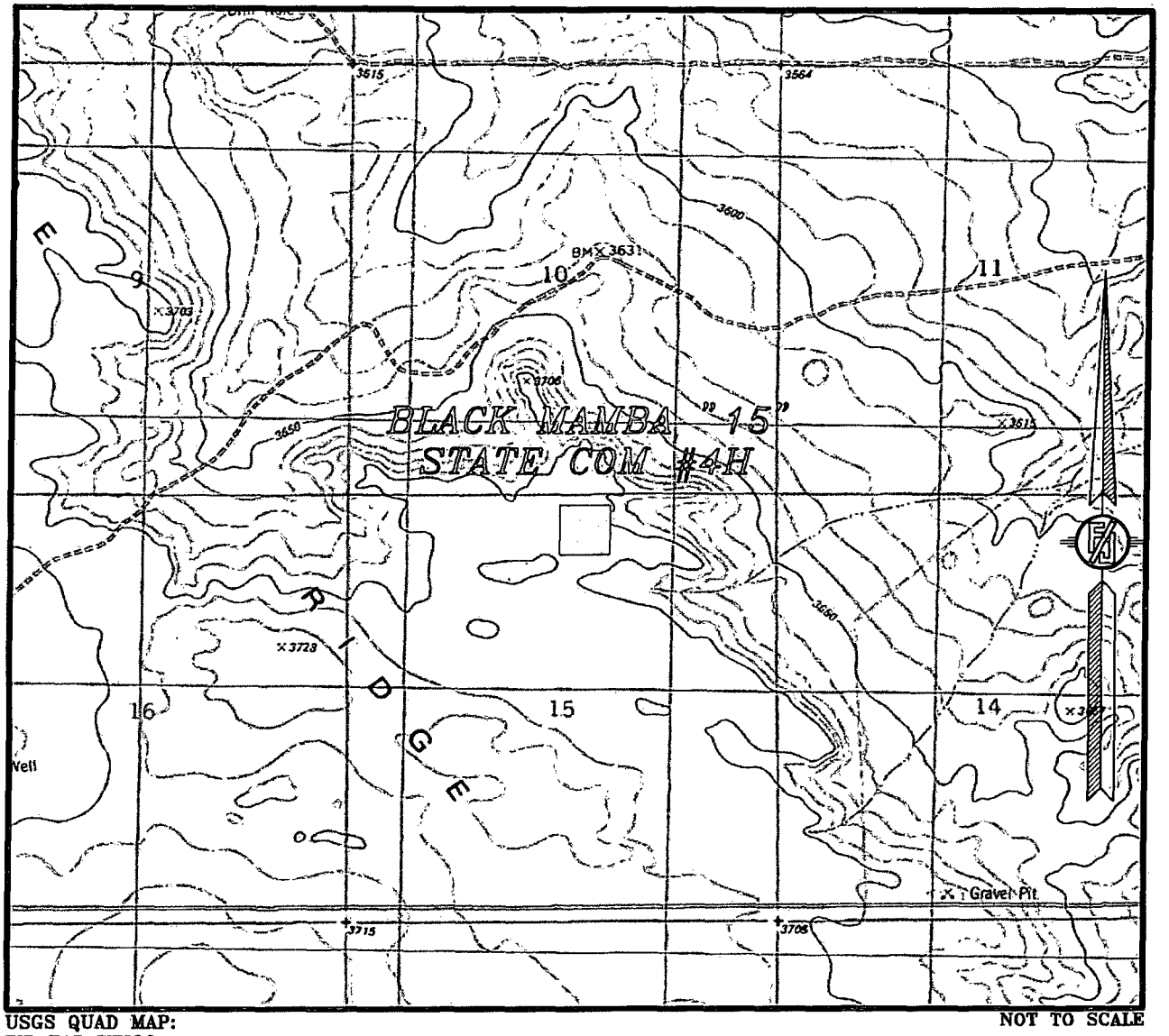
APRIL 3, 2013

SURVEY NO. 1727

MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 *CARLSBAD, NEW MEXICO*

SECTION 15, TOWNSHIP 23 SOUTH, RANGE 33 EAST, N.M.P.M.
LEA COUNTY, STATE OF NEW MEXICO

LOCATION VERIFICATION MAP



USGS QUAD MAP:
TIP TOP WELLS

NOT TO SCALE

DEVON ENERGY PRODUCTION COMPANY, L.P.

BLACK MAMBA "15" STATE COM #4H

LOCATED 450 FT. FROM THE NORTH LINE
AND 2370 FT. FROM THE EAST LINE OF
SECTION 15, TOWNSHIP 23 SOUTH,
RANGE 33 EAST, N.M.P.M.
LEA COUNTY, STATE OF NEW MEXICO

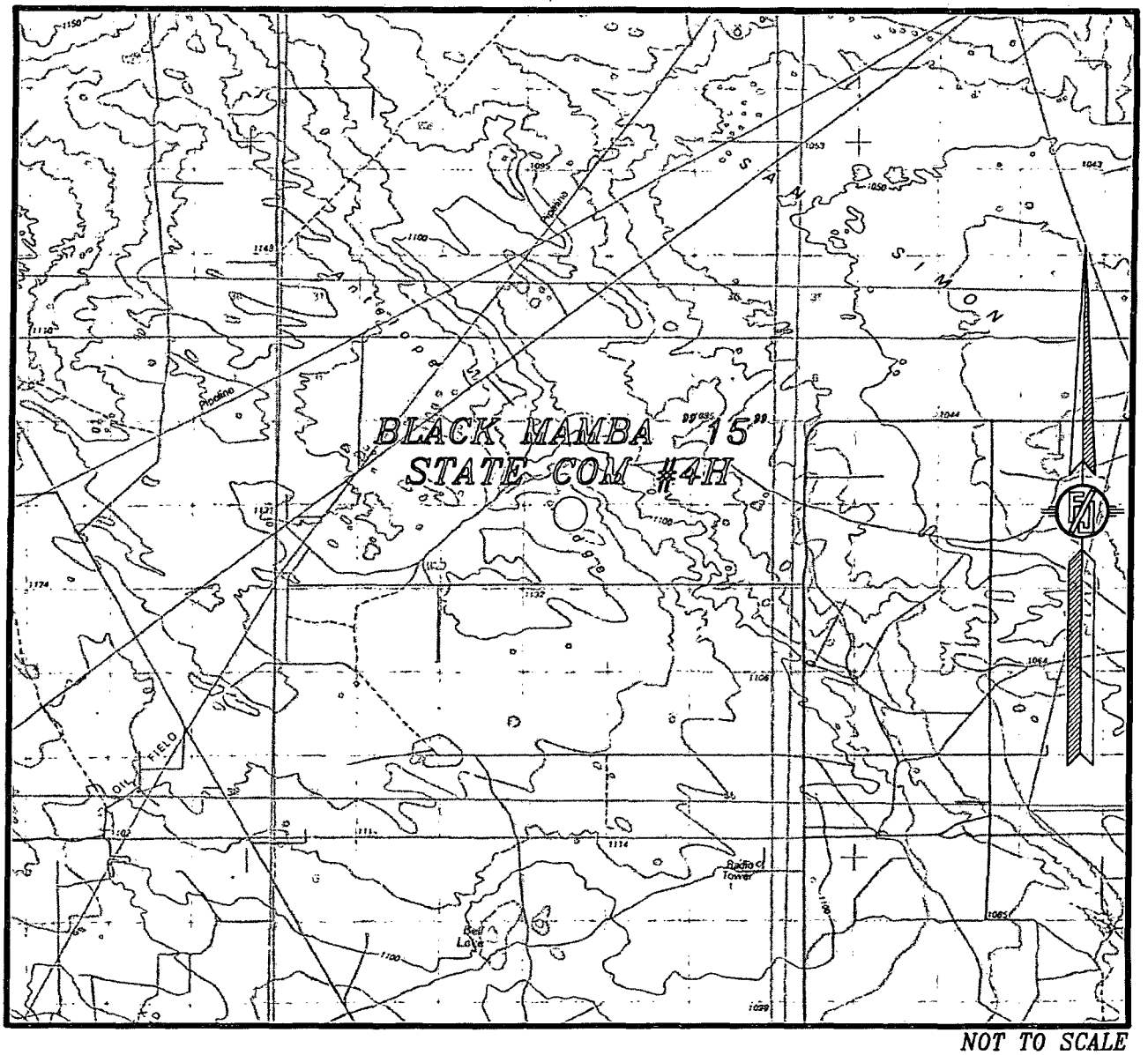
APRIL 3, 2013

SURVEY NO. 1727

MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

SECTION 15, TOWNSHIP 23 SOUTH, RANGE 33 EAST, N.M.P.M.
LEA COUNTY, STATE OF NEW MEXICO

VICINITY MAP



NOT TO SCALE

DEVON ENERGY PRODUCTION COMPANY, L.P.

BLACK MAMBA "15" STATE COM #4H

LOCATED 450 FT. FROM THE NORTH LINE
AND 2370 FT. FROM THE EAST LINE OF
SECTION 15, TOWNSHIP 23 SOUTH,
RANGE 33 EAST, N.M.P.M.
LEA COUNTY, STATE OF NEW MEXICO

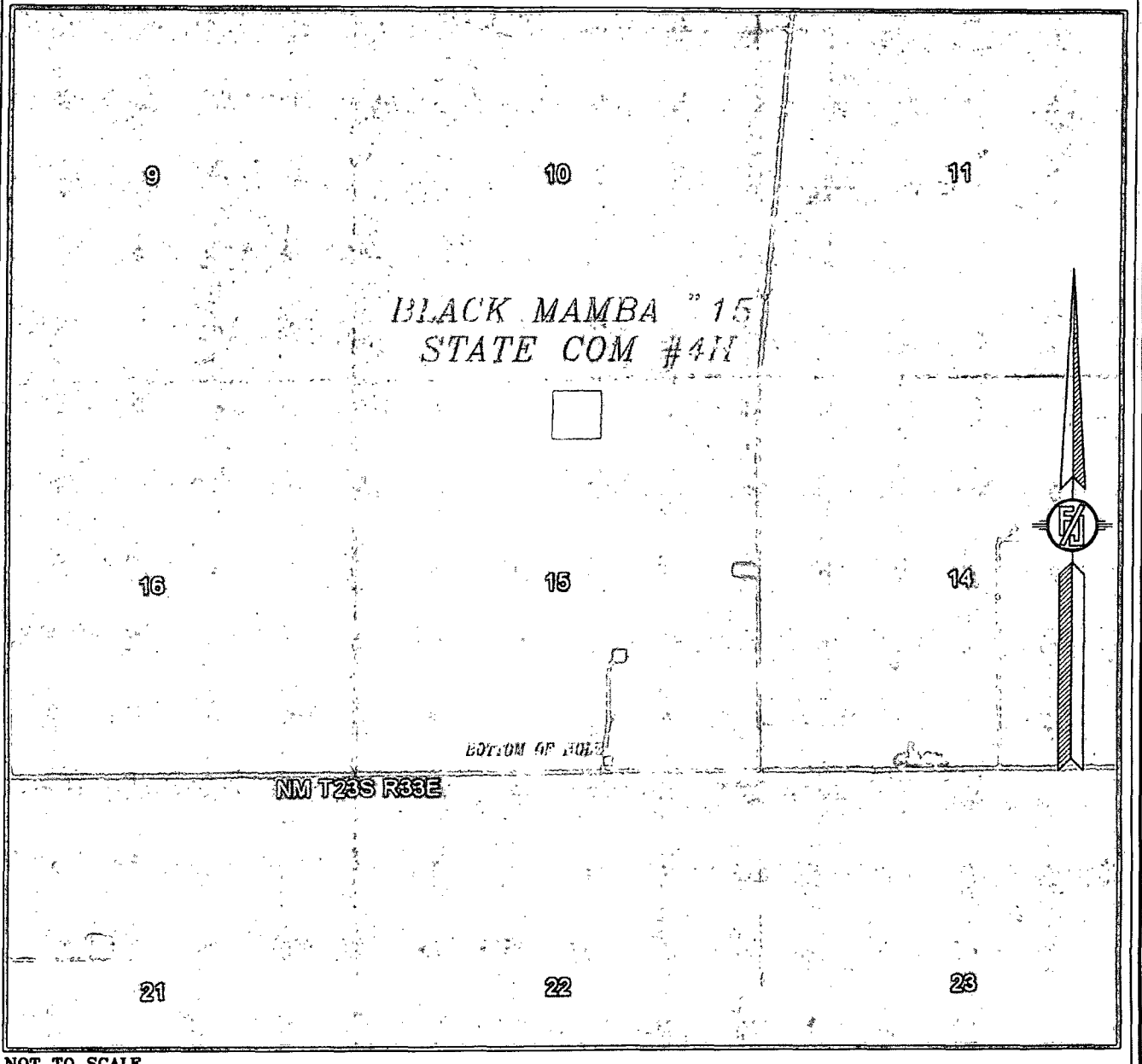
APRIL 3, 2013

SURVEY NO. 1727

MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

SECTION 15, TOWNSHIP 23 SOUTH, RANGE 33 EAST, N.M.P.M.
LEA COUNTY, STATE OF NEW MEXICO

AERIAL PHOTO



NOT TO SCALE
AERIAL PHOTO:
GOOGLE EARTH
MARCH 2012

DEVON ENERGY PRODUCTION COMPANY, L.P.
BLACK MAMBA "15" STATE COM #4H
LOCATED 450 FT. FROM THE NORTH LINE
AND 2370 FT. FROM THE EAST LINE OF
SECTION 15, TOWNSHIP 23 SOUTH,
RANGE 33 EAST, N.M.P.M.
LEA COUNTY, STATE OF NEW MEXICO

APRIL 3, 2013

SURVEY NO. 1727

MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

Devon Energy, Black Mamba 15 State Com 4H

1. Geologic Formations

TVD of target	11216	Pilot hole depth	11450
MD at TD:	15887	Deepest expected fresh water:	

Basin

Formation	Depth (TVD) from KB	Water/Mineral Bearing/ Target Zone?	Hazards*
RUSTLER	1,290	Water	
TOP SALT	1,770	Salt	
BASE SALT	5,090	Salt	
DELAWARE	5,190	Barren	
Cherry Canyon	6,060	Oil/Gas	
Brushy Canyon	7,640	Oil/Gas	
Bone Spring Lime	9,070	Oil/Gas	
1st Bone Spring Sand	10,065	Oil/Gas	
2nd Bone Spring Sand	10,770	Target Zone	
Target 2nd Bone Spring Sand (0' vert. sec)	11,220	Target Zone	
2nd Bone Spring Sand Target (Heel)	11,216	Target Zone	
2nd Bone Spring Sand Target (Toe)	11,190	Target Zone	

*H2S, water flows, loss of circulation, abnormal pressures, etc.

2. Casing Program

Hole Size	Casing Interval From	Casing Interval To	Csg. Size	Weight (lbs)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
17.5"	0	1350	13.375"	48	H40	STC	1.25	2.80	8.35
12.25"	0	4300	9.625"	40	J55	LTC	1.15	1.40	2.30
12.25"	4300	5150	9.625"	40	HCK55	BTC	1.90	2.83	4.37
Option #1									
8.75"	0	15887	5.5"	17	P110	BTC	1.39	1.98	2.10
Option # 2									
8.75"	0	10678	7"	29	P110	BTC	1.80	2.20	2.66
8.75	10678	15887	5.5"	17	P110	BTC	1.39	1.98	4.09
				BLM Minimum Safety Factor			1.125	1	1.6 Dry 1.8 Wet

All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h

Must have table for contingency casing

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

2. Cementing Program

Casing	# Sks	Wt. lb/ gal	Yld ft3/ sack	H_20 gal/sk	500# Comp. Strength (hours)	Slurry Description
Surf.	690	13.5	1.72	9.07	12	Lead: Class C Cement + 0.125 lbs/sack Pol-E-Flake + 4% bwoc Bentonite
	550	14.8	1.34	6.34	6	Tail: Class C Cement + 0.125 lbs/sack Poly-E-Flake + 1% BWOC Calcium Chloride
Surf.	370	13.5	1.72	9.07	12	Lead: Class C Cement + 0.125 lbs/sack Pol-E-Flake + 4% bwoc Bentonite
	550	14.8	1.34	6.34	6	1st stage Tail: Class C Cement + 0.125 lbs/sack Poly-E-Flake + 1% BWOC Calcium Chloride
	DV/ECP Tool 400'					
	420	14.8	1.34	6.34	6	2nd stage Tail: Class C Cement + 0.125 lbs/sack Poly-E-Flake + 1% BWOC Calcium Chloride
Inter.	1080	12.9	9.81	1.85	17	Lead: (65:35) Class C Cement: Poz (Fly Ash): 6% BWOC Bentonite + 5% BWOW Sodium Chloride + 0.125 lbs/sack Poly-E-Flake
	430	14.8	1.33	6.32	7	Tail: Class C Cement + 0.125 lbs/sack Poly-E-Flake
Inter.	960	12.9	9.81	1.85	17	1st stage Lead: (65:35) Class C Cement: Poz (Fly Ash): 6% BWOC Bentonite + 5% BWOW Sodium Chloride + 0.125 lbs/sack Poly-E-Flake
	220	14.8	1.33	6.32	7	1st stage Tail: : Class C Cement + 0.125 lbs/sack Poly-E-Flake
	DV/ECP Tool 1450'					
	180	12.9	9.81	1.85	17	2nd stage Lead: (65:35) Class C Cement: Poz (Fly Ash): 6% BWOC Bentonite + 5% BWOW Sodium Chloride + 0.125 lbs/sack Poly-E-Flake
	150	14.8	1.33	6.32	6	2nd stage Tail: : Class C Cement + 0.125 lbs/sack Poly-E-Flake + 1% BWOC Calcium Chloride

Casing	# Sks	Wt. lb/ gal	Yld ft3/ sack	H_20 gal/sk	500# Comp. Strength (hours)	Slurry Description
Prod. (5.5")	610	11.9	2.3	13.29	n/a	1st Lead : (50:50) Class H Cement: Poz (Fly Ash) + 10% BWOC Bentonite + 1 lb/sk of Kol-Seal + 0.3% BWOC HR-601 + 0.5lb/sk D-Air 5000
	330	12.5	1.96	10.86	30	2nd Lead: (65:35) Class H Cement: Poz (Fly Ash) + 6% BWOC Bentonite + 0.25% BWOC HR-601 + 0.125 lbs/sack Poly-E-Flake
	1360	14.5	1.2	5.31	25	Tail: (50:50) Class H Cement: Poz (Fly Ash) + 0.5% bwoc HALAD-344 + 0.4% bwoc CFR-3 + 0.2% BWOC HR-601 + 2% bwoc Bentonite
Prod. (7" x 5.5")	390	10.4	3.17	16.8	30	Lead: Tuned Light® Cement + 0.125 lb/sk Pol-E-Flake
	1360	14.5	1.2	5.31	25	Tail: (50:50) Class H Cement: Poz (Fly Ash) + 0.5% bwoc HALAD-344 + 0.4% bwoc CFR-3 + 0.2% BWOC HR-601 + 2% bwoc Bentonite

DV tool depth(s) will be adjusted based on hole conditions and cement volumes will be adjusted proportionally. DV tool will be set a minimum of 50 feet below previous casing and a minimum of 200 feet above current shoe. Lab reports with the 500 psi compressive strength time for the cement will be onsite for review.

Casing String	TOC	% Excess
Surface - Single Stage	0'	100%
Surface - Two Stage	1st Stage = 400' / 2nd Stage = 0'	100%
Intermediate – Single Stage	0'	75%
Intermediate – Two Stage	1st Stage = 1450' / 2nd Stage = 0'	75%
Production (5.5")	4650'	25%
Production (7 x 5.5")	4650'	25%

Include Pilot Hole Cementing specs:
Pilot hole depth 11450
KOP 10728

Plug top	Plug Bottom	% Excess	No. Sacks	Wt. lb/gal	Yld ft3/sack	Water gal/sk	Slurry Description and Cement Type
10528	11450	10	360	15.6	1.19	5.42	Class H + 0.5% BWOC HR-601 + 0.2% BWOC Halad-9

4. Pressure Control Equipment

N	A variance is requested for the use of a diverter on the surface casing. See attached for schematic.

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

*Specify if additional ram is utilized.

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

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

Y	Formation integrity test will be performed per Onshore Order #2. On Exploratory wells or on that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.i.

Y	A variance is requested for the use of a flexible choke line from the BOP to Choke Manifold. See attached for specs and hydrostatic test chart.	
	Y	Are anchors required by manufacturer?
Y	A multibowl wellhead is being used. The BOP will be tested per Onshore Order #2 after installation on the surface casing which will cover testing requirements for a maximum of 30 days. If any seal subject to test pressure is broken the system must be tested. • Wellhead will be installed by FMC's representatives. • If the welding is performed by a third party, the FMC's representative will monitor the temperature to verify that it does not exceed the maximum temperature of the seal. • FMC representative will install the test plug for the initial BOP test. • FMC will install a solid steel body pack-off to completely isolate the lower head after cementing intermediate casing. After installation of the pack-off, the pack-off and the lower flange will be tested to 5M, as shown on the attached schematic. Everything above the pack-off will not have been altered whatsoever from the initial nipple up. Therefore the BOP components will not be retested at that time. • If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head will be cut and top out operations will be conducted. • Devon will pressure test all seals above and below the mandrel (but still above the casing) to full working pressure rating. • Devon will test the casing to 70% of burst or 1500 psi, whichever is greater, as per Onshore Order #2. After running the 13-3/8" surface casing, a 13-5/8" BOP/BOPE system with a minimum rating of 3M will be installed on the FMC Uni-head wellhead system and will undergo a 250 psi low pressure test followed by a 3,000 psi high pressure test. The 3,000 psi high and 250 psi low test will cover testing requirements a maximum of 30 days, as per Onshore Order #2. If the well is not complete within 30 days of this BOP test, another full BOP test will be conducted, as per Onshore Order #2. After running the 9-5/8' intermediate casing with a mandrel hanger, the 13-5/8" BOP/BOPE system with a minimum rating of 3M will already be installed on the FMC Uni-head. The pipe rams will be operated and checked each 24 hour period and each time the drill pipe is out of the hole. These tests will be logged in the daily driller's log. A 2" kill line and 3" choke line will be incorporated into the drilling spool below the ram BOP. In addition to the rams and annular preventer, additional BOP accessories include a kelly cock, floor safety valve, choke lines, and choke manifold rated at 3,000 psi WP.	

5. Mud Program

Depth		Type	Weight (ppg)	Viscosity	Water Loss
From	To				
0	1,350	FW Gel	8.6-8.8	28-34	N/C
1,350	5,150	Saturated Brine	10.0-10.2	28-34	N/C
5,150	15,887	Cut Brine	8.5-9.3	28-34	N/C

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

What will be used to monitor the loss or gain of fluid?	PVT/Pason/Visual Monitoring

6. Logging and Testing Procedures

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

Additional logs planned		Interval
X	Resistivity	Int. shoe to PHTD
X	Density	Int. shoe to PHTD
X	CBL	Production casing
X	Mud log	Intermediate shoe to TD
	PEX	

7. Drilling Conditions

Condition	Specify what type and where?
BH Pressure at deepest TVD	4900 psi
Abnormal Temperature	No

Mitigation measure for abnormal conditions. Describe. Lost circulation material/sweeps/mud scavengers.

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

8. Other facets of operation

Is this a walking operation? NO
Will be pre-setting casing? NO

Attachments
_X_ Directional Plan
___ Other, describe

DEVON ENERGY

Project: Lea County, NM (NAD-83)
Site: Black Mamba 15 State Com
Well: 4H
Wellbore: 4H OH
Design: Plan #1

Azimuths to Grid North
True North: -0.41°
Magnetic North: 6.94°

Magnetic Field
Strength: 48305.9snT
Dip Angle: 60.18°
Date: 9/9/2014
Model: BGGM2014

PROJECT DETAILS: Lea County, NM (NAD-83)
Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: New Mexico Eastern Zone

devon

DESIGN TARGET DETAILS

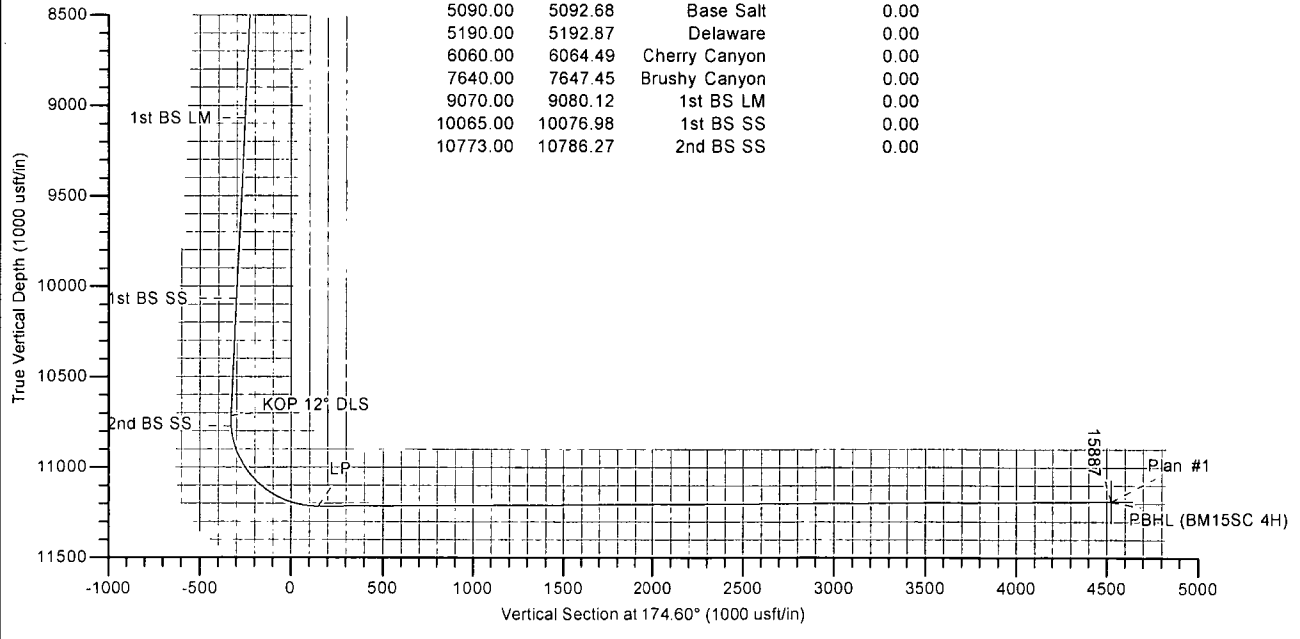
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
SHL (BM15SC 4H)	0.00	0.00	0.00	477647.75	780452.29	32° 18' 38.712 N	103° 33' 33.674 W
PBHL (BM15SC 4H)	11190.00	-4503.20	425.32	473144.55	780877.61	32° 17' 54.122 N	103° 33' 29.098 W

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	3500.00	0.00	0.00	3500.00	0.00	0.00	0.00	0.00	0.00	Start Nudge
3	3733.33	3.50	35.00	3733.19	5.84	4.09	1.50	35.00	-5.43	Hold
4	10728.75	3.50	35.00	10715.56	355.66	249.04	0.00	0.00	-330.67	KOP 12° DLS
5	11504.92	90.34	178.14	11216.00	-123.21	283.07	12.00	143.08	149.28	LP
6	15887.29	90.34	178.14	11190.00	-4503.20	425.32	0.00	0.00	4523.24	TD

FORMATION TOP DETAILS

TVDPath	MDPath	Formation	DipAngle	DipDir
1290.00	1290.00	Rustler	0.00	
1770.00	1770.00	Top Salt	0.00	
5090.00	5092.68	Base Salt	0.00	
5190.00	5192.87	Delaware	0.00	
6060.00	6064.49	Cherry Canyon	0.00	
7640.00	7647.45	Brushy Canyon	0.00	
9070.00	9080.12	1st BS LM	0.00	
10065.00	10076.98	1st BS SS	0.00	
10773.00	10786.27	2nd BS SS	0.00	



LEAM Drilling Systems, Inc.

LEAM DRILLING SYSTEMS LLC
2010 East Davis, Conroe, Texas 77301
Phone: 936/756-7577, Fax 936/756-7595

Plan: Plan #1 (4H/4H OH)
Black Mamba 15 State Com
Created By: Brady Deaver Date: 13:47, September 09 2014
Date: _____
Approved: _____ Date: _____

DEVON ENERGY

Lea County, NM (NAD-83)
Black Mamba 15 State Com
4H

4H OH

Plan: Plan #1

Standard Planning Report

09 September, 2014

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well 4H
Company:	DEVON ENERGY	**TVD Reference:**	H&P 394: 3704.9' GL + 25' RKB @ 3729.90usft
Project:	Lea County, NM (NAD-83)	**MD Reference:**	H&P 394: 3704.9' GL + 25' RKB @ 3729.90usft
Site:	Black Mamba 15 State Com	**North Reference:**	Grid
Well:	4H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	4H OH		
Design:	Plan #1		

Project	Lea County, NM (NAD-83)		
Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	Black Mamba 15 State Com				
Site Position:		**Northing:**	477,647.32 usft	**Latitude:**	32° 18' 38.711 N
From:	Map	**Easting:**	780,402.30 usft	**Longitude:**	103° 33' 34.257 W
Position Uncertainty:	0.00 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	0.41 °

Well	4H, 2nd BS SS					
Well Position	**+N/-S**	0.43 usft	**Northing:**	477,647.75 usft	**Latitude:**	32° 18' 38.712 N
	+E/-W	49.99 usft	**Easting:**	780,452.29 usft	**Longitude:**	103° 33' 33.674 W
Position Uncertainty		0.00 usft	**Wellhead Elevation:**	3,729.90 usft	**Ground Level:**	3,704.90 usft

Wellbore	4H OH				
Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	BGGM2014	9/9/2014	7.35	60.18	48,306

Design	Plan #1				
Audit Notes:					
Version:		**Phase:**	PLAN	**Tie On Depth:**	0.00
Vertical Section:	**Depth From (TVD) (usft)**	**+N/-S (usft)**	**+E/-W (usft)**	**Direction (°)**	
	0.00	0.00	0.00	174.60	

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
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,500.00	0.00	0.00	3,500.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,733.33	3.50	35.00	3,733.19	5.84	4.09	1.50	1.50	0.00	35.00	
10,728.75	3.50	35.00	10,715.56	355.66	249.04	0.00	0.00	0.00	0.00	
11,504.92	90.34	178.14	11,216.00	-123.21	283.07	12.00	11.19	18.44	143.08	
15,887.29	90.34	178.14	11,190.00	-4,503.20	425.32	0.00	0.00	0.00	0.00	PBHL (BM15SC 4H)

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well 4H
Company:	DEVON ENERGY	**TVD Reference:**	H&P 394: 3704.9' GL + 25' RKB @ 3729.90usft
Project:	Lea County, NM (NAD-83)	**MD Reference:**	H&P 394: 3704.9' GL + 25' RKB @ 3729.90usft
Site:	Black Mamba 15 State Com	**North Reference:**	Grid
Well:	4H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	4H OH		
Design:	Plan #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)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SHL (BM15SC 4H)									
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,290.00	0.00	0.00	1,290.00	0.00	0.00	0.00	0.00	0.00	0.00
Rustler									
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,770.00	0.00	0.00	1,770.00	0.00	0.00	0.00	0.00	0.00	0.00
Top Salt									
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00
2,600.00	0.00	0.00	2,600.00	0.00	0.00	0.00	0.00	0.00	0.00
2,700.00	0.00	0.00	2,700.00	0.00	0.00	0.00	0.00	0.00	0.00
2,800.00	0.00	0.00	2,800.00	0.00	0.00	0.00	0.00	0.00	0.00
2,900.00	0.00	0.00	2,900.00	0.00	0.00	0.00	0.00	0.00	0.00
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	0.00	0.00
3,100.00	0.00	0.00	3,100.00	0.00	0.00	0.00	0.00	0.00	0.00
3,200.00	0.00	0.00	3,200.00	0.00	0.00	0.00	0.00	0.00	0.00
3,300.00	0.00	0.00	3,300.00	0.00	0.00	0.00	0.00	0.00	0.00
3,400.00	0.00	0.00	3,400.00	0.00	0.00	0.00	0.00	0.00	0.00
3,500.00	0.00	0.00	3,500.00	0.00	0.00	0.00	0.00	0.00	0.00
Start Nudge									
3,600.00	1.50	35.00	3,599.99	1.07	0.75	-1.00	1.50	1.50	0.00
3,700.00	3.00	35.00	3,699.91	4.29	3.00	-3.99	1.50	1.50	0.00
3,733.33	3.50	35.00	3,733.19	5.84	4.09	-5.43	1.50	1.50	0.00
Hold									
3,800.00	3.50	35.00	3,799.73	9.17	6.42	-8.53	0.00	0.00	0.00
3,900.00	3.50	35.00	3,899.54	14.17	9.92	-13.17	0.00	0.00	0.00
4,000.00	3.50	35.00	3,999.36	19.17	13.42	-17.82	0.00	0.00	0.00
4,100.00	3.50	35.00	4,099.17	24.17	16.93	-22.47	0.00	0.00	0.00
4,200.00	3.50	35.00	4,198.98	29.17	20.43	-27.12	0.00	0.00	0.00

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well 4H
Company:	DEVON ENERGY	**TVD Reference:**	H&P 394: 3704.9' GL + 25' RKB @ 3729.90usft
Project:	Lea County, NM (NAD-83)	**MD Reference:**	H&P 394: 3704.9' GL + 25' RKB @ 3729.90usft
Site:	Black Mamba 15 State Com	**North Reference:**	Grid
Well:	4H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	4H OH		
Design:	Plan #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)
4,300.00	3.50	35.00	4,298.80	34.17	23.93	-31.77	0.00	0.00	0.00
4,400.00	3.50	35.00	4,398.61	39.17	27.43	-36.42	0.00	0.00	0.00
4,500.00	3.50	35.00	4,498.43	44.18	30.93	-41.07	0.00	0.00	0.00
4,600.00	3.50	35.00	4,598.24	49.18	34.43	-45.72	0.00	0.00	0.00
4,700.00	3.50	35.00	4,698.05	54.18	37.94	-50.37	0.00	0.00	0.00
4,800.00	3.50	35.00	4,797.87	59.18	41.44	-55.02	0.00	0.00	0.00
4,900.00	3.50	35.00	4,897.68	64.18	44.94	-59.67	0.00	0.00	0.00
5,000.00	3.50	35.00	4,997.49	69.18	48.44	-64.32	0.00	0.00	0.00
5,092.68	3.50	35.00	5,090.00	73.81	51.69	-68.63	0.00	0.00	0.00
Base Salt									
5,100.00	3.50	35.00	5,097.31	74.18	51.94	-68.97	0.00	0.00	0.00
5,192.87	3.50	35.00	5,190.00	78.82	55.19	-73.29	0.00	0.00	0.00
Delaware									
5,200.00	3.50	35.00	5,197.12	79.18	55.44	-73.62	0.00	0.00	0.00
5,300.00	3.50	35.00	5,296.93	84.18	58.94	-78.27	0.00	0.00	0.00
5,400.00	3.50	35.00	5,396.75	89.18	62.45	-82.92	0.00	0.00	0.00
5,500.00	3.50	35.00	5,496.56	94.18	65.95	-87.57	0.00	0.00	0.00
5,600.00	3.50	35.00	5,596.37	99.18	69.45	-92.21	0.00	0.00	0.00
5,700.00	3.50	35.00	5,696.19	104.19	72.95	-96.86	0.00	0.00	0.00
5,800.00	3.50	35.00	5,796.00	109.19	76.45	-101.51	0.00	0.00	0.00
5,900.00	3.50	35.00	5,895.81	114.19	79.95	-106.16	0.00	0.00	0.00
6,000.00	3.50	35.00	5,995.63	119.19	83.46	-110.81	0.00	0.00	0.00
6,064.49	3.50	35.00	6,060.00	122.41	85.71	-113.81	0.00	0.00	0.00
Cherry Canyon									
6,100.00	3.50	35.00	6,095.44	124.19	86.96	-115.46	0.00	0.00	0.00
6,200.00	3.50	35.00	6,195.25	129.19	90.46	-120.11	0.00	0.00	0.00
6,300.00	3.50	35.00	6,295.07	134.19	93.96	-124.76	0.00	0.00	0.00
6,400.00	3.50	35.00	6,394.88	139.19	97.46	-129.41	0.00	0.00	0.00
6,500.00	3.50	35.00	6,494.69	144.19	100.96	-134.06	0.00	0.00	0.00
6,600.00	3.50	35.00	6,594.51	149.19	104.47	-138.71	0.00	0.00	0.00
6,700.00	3.50	35.00	6,694.32	154.19	107.97	-143.36	0.00	0.00	0.00
6,800.00	3.50	35.00	6,794.14	159.19	111.47	-148.01	0.00	0.00	0.00
6,900.00	3.50	35.00	6,893.95	164.19	114.97	-152.66	0.00	0.00	0.00
7,000.00	3.50	35.00	6,993.76	169.20	118.47	-157.31	0.00	0.00	0.00
7,100.00	3.50	35.00	7,093.58	174.20	121.97	-161.96	0.00	0.00	0.00
7,200.00	3.50	35.00	7,193.39	179.20	125.48	-166.60	0.00	0.00	0.00
7,300.00	3.50	35.00	7,293.20	184.20	128.98	-171.25	0.00	0.00	0.00
7,400.00	3.50	35.00	7,393.02	189.20	132.48	-175.90	0.00	0.00	0.00
7,500.00	3.50	35.00	7,492.83	194.20	135.98	-180.55	0.00	0.00	0.00
7,600.00	3.50	35.00	7,592.64	199.20	139.48	-185.20	0.00	0.00	0.00
7,647.45	3.50	35.00	7,640.00	201.57	141.14	-187.41	0.00	0.00	0.00
Brushy Canyon									
7,700.00	3.50	35.00	7,692.46	204.20	142.98	-189.85	0.00	0.00	0.00
7,800.00	3.50	35.00	7,792.27	209.20	146.48	-194.50	0.00	0.00	0.00
7,900.00	3.50	35.00	7,892.08	214.20	149.99	-199.15	0.00	0.00	0.00
8,000.00	3.50	35.00	7,991.90	219.20	153.49	-203.80	0.00	0.00	0.00
8,100.00	3.50	35.00	8,091.71	224.20	156.99	-208.45	0.00	0.00	0.00
8,200.00	3.50	35.00	8,191.52	229.21	160.49	-213.10	0.00	0.00	0.00
8,300.00	3.50	35.00	8,291.34	234.21	163.99	-217.75	0.00	0.00	0.00
8,400.00	3.50	35.00	8,391.15	239.21	167.49	-222.40	0.00	0.00	0.00
8,500.00	3.50	35.00	8,490.96	244.21	171.00	-227.05	0.00	0.00	0.00
8,600.00	3.50	35.00	8,590.78	249.21	174.50	-231.70	0.00	0.00	0.00

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well 4H
Company:	DEVON ENERGY	**TVD Reference:**	H&P 394: 3704.9' GL + 25' RKB @ 3729.90usft
Project:	Lea County, NM (NAD-83)	**MD Reference:**	H&P 394: 3704.9' GL + 25' RKB @ 3729.90usft
Site:	Black Mamba 15 State Com	**North Reference:**	Grid
Well:	4H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	4H OH		
Design:	Plan #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)
8,700.00	3.50	35.00	8,690.59	254.21	178.00	-236.35	0.00	0.00	0.00
8,800.00	3.50	35.00	8,790.40	259.21	181.50	-241.00	0.00	0.00	0.00
8,900.00	3.50	35.00	8,890.22	264.21	185.00	-245.64	0.00	0.00	0.00
9,000.00	3.50	35.00	8,990.03	269.21	188.50	-250.29	0.00	0.00	0.00
9,080.12	3.50	35.00	9,070.00	273.22	191.31	-254.02	0.00	0.00	0.00
1st BS LM									
9,100.00	3.50	35.00	9,089.85	274.21	192.01	-254.94	0.00	0.00	0.00
9,200.00	3.50	35.00	9,189.66	279.21	195.51	-259.59	0.00	0.00	0.00
9,300.00	3.50	35.00	9,289.47	284.21	199.01	-264.24	0.00	0.00	0.00
9,400.00	3.50	35.00	9,389.29	289.21	202.51	-268.89	0.00	0.00	0.00
9,500.00	3.50	35.00	9,489.10	294.22	206.01	-273.54	0.00	0.00	0.00
9,600.00	3.50	35.00	9,588.91	299.22	209.51	-278.19	0.00	0.00	0.00
9,700.00	3.50	35.00	9,688.73	304.22	213.02	-282.84	0.00	0.00	0.00
9,800.00	3.50	35.00	9,788.54	309.22	216.52	-287.49	0.00	0.00	0.00
9,900.00	3.50	35.00	9,888.35	314.22	220.02	-292.14	0.00	0.00	0.00
10,000.00	3.50	35.00	9,988.17	319.22	223.52	-296.79	0.00	0.00	0.00
10,076.98	3.50	35.00	10,065.00	323.07	226.22	-300.37	0.00	0.00	0.00
1st BS SS									
10,100.00	3.50	35.00	10,087.98	324.22	227.02	-301.44	0.00	0.00	0.00
10,200.00	3.50	35.00	10,187.79	329.22	230.52	-306.09	0.00	0.00	0.00
10,300.00	3.50	35.00	10,287.61	334.22	234.02	-310.74	0.00	0.00	0.00
10,400.00	3.50	35.00	10,387.42	339.22	237.53	-315.39	0.00	0.00	0.00
10,500.00	3.50	35.00	10,487.23	344.22	241.03	-320.03	0.00	0.00	0.00
10,600.00	3.50	35.00	10,587.05	349.22	244.53	-324.68	0.00	0.00	0.00
10,700.00	3.50	35.00	10,686.86	354.23	248.03	-329.33	0.00	0.00	0.00
10,728.75	3.50	35.00	10,715.56	355.66	249.04	-330.67	0.00	0.00	0.00
KOP 12° DLS									
10,750.00	2.12	81.35	10,736.78	356.25	249.80	-331.19	12.00	-6.51	218.16
10,775.00	3.46	140.77	10,761.76	355.74	250.73	-330.59	12.00	5.38	237.66
10,786.27	4.61	151.05	10,773.00	355.08	251.17	-329.89	12.00	10.19	91.21
2nd BS SS									
10,800.00	6.12	158.12	10,786.67	353.92	251.71	-328.68	12.00	11.01	51.49
10,825.00	9.00	164.73	10,811.45	350.79	252.72	-325.48	12.00	11.50	26.44
10,850.00	11.93	168.13	10,836.03	346.38	253.77	-320.98	12.00	11.75	13.61
10,875.00	14.90	170.20	10,860.35	340.68	254.84	-315.21	12.00	11.85	8.28
10,900.00	17.87	171.59	10,884.33	333.72	255.95	-308.17	12.00	11.90	5.58
10,925.00	20.85	172.60	10,907.91	325.51	257.09	-299.89	12.00	11.93	4.03
10,950.00	23.84	173.36	10,931.03	316.08	258.24	-290.39	12.00	11.94	3.06
10,975.00	26.83	173.97	10,953.63	305.45	259.42	-279.70	12.00	11.96	2.41
11,000.00	29.82	174.46	10,975.63	293.65	260.62	-267.84	12.00	11.96	1.96
11,025.00	32.81	174.86	10,996.99	280.71	261.82	-254.85	12.00	11.97	1.63
11,050.00	35.80	175.21	11,017.64	266.67	263.04	-240.76	12.00	11.97	1.39
11,075.00	38.80	175.51	11,037.52	251.58	264.26	-225.61	12.00	11.98	1.20
11,100.00	41.79	175.77	11,056.59	235.46	265.49	-209.45	12.00	11.98	1.05
11,125.00	44.79	176.01	11,074.78	218.36	266.72	-192.31	12.00	11.98	0.94
11,150.00	47.79	176.22	11,092.06	200.33	267.94	-174.25	12.00	11.98	0.84
11,175.00	50.78	176.41	11,108.36	181.43	269.16	-155.31	12.00	11.99	0.77
11,200.00	53.78	176.59	11,123.65	161.69	270.37	-135.55	12.00	11.99	0.70
11,225.00	56.78	176.75	11,137.89	141.18	271.56	-115.02	12.00	11.99	0.65
11,250.00	59.77	176.90	11,151.04	119.95	272.74	-93.77	12.00	11.99	0.61
11,275.00	62.77	177.05	11,163.05	98.06	273.89	-71.87	12.00	11.99	0.57

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well 4H
Company:	DEVON ENERGY	**TVD Reference:**	H&P 394: 3704.9' GL + 25' RKB @ 3729.90usft
Project:	Lea County, NM (NAD-83)	**MD Reference:**	H&P 394: 3704.9' GL + 25' RKB @ 3729.90usft
Site:	Black Mamba 15 State Com	**North Reference:**	Grid
Well:	4H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	4H OH		
Design:	Plan #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
11,300.00	65.77	177.18	11,173.91	75.57	275.03	-49.37	12.00	11.99	0.54
11,325.00	68.77	177.31	11,183.57	52.54	276.13	-26.34	12.00	11.99	0.52
11,350.00	71.76	177.43	11,192.01	29.04	277.21	-2.84	12.00	11.99	0.50
11,375.00	74.76	177.55	11,199.21	5.12	278.26	21.07	12.00	11.99	0.48
11,400.00	77.76	177.67	11,205.14	-19.14	279.27	45.31	12.00	11.99	0.47
11,425.00	80.76	177.79	11,209.80	-43.68	280.24	69.84	12.00	11.99	0.46
11,450.00	83.75	177.90	11,213.17	-68.43	281.18	94.57	12.00	11.99	0.45
11,475.00	86.75	178.01	11,215.24	-93.33	282.07	119.44	12.00	11.99	0.44
11,500.00	89.75	178.12	11,216.00	-118.30	282.91	144.38	12.00	11.99	0.44
11,504.92	90.34	178.14	11,216.00	-123.21	283.07	149.28	12.00	11.99	0.44
LP									
11,600.00	90.34	178.14	11,215.43	-218.24	286.16	244.18	0.00	0.00	0.00
11,700.00	90.34	178.14	11,214.84	-318.19	289.40	343.99	0.00	0.00	0.00
11,800.00	90.34	178.14	11,214.25	-418.13	292.65	443.80	0.00	0.00	0.00
11,900.00	90.34	178.14	11,213.65	-518.08	295.89	543.61	0.00	0.00	0.00
12,000.00	90.34	178.14	11,213.06	-618.03	299.14	643.42	0.00	0.00	0.00
12,100.00	90.34	178.14	11,212.47	-717.97	302.39	743.22	0.00	0.00	0.00
12,200.00	90.34	178.14	11,211.87	-817.92	305.63	843.03	0.00	0.00	0.00
12,300.00	90.34	178.14	11,211.28	-917.86	308.88	942.84	0.00	0.00	0.00
12,400.00	90.34	178.14	11,210.69	-1,017.81	312.12	1,042.65	0.00	0.00	0.00
12,500.00	90.34	178.14	11,210.09	-1,117.75	315.37	1,142.45	0.00	0.00	0.00
12,600.00	90.34	178.14	11,209.50	-1,217.70	318.62	1,242.26	0.00	0.00	0.00
12,700.00	90.34	178.14	11,208.91	-1,317.64	321.86	1,342.07	0.00	0.00	0.00
12,800.00	90.34	178.14	11,208.32	-1,417.59	325.11	1,441.88	0.00	0.00	0.00
12,900.00	90.34	178.14	11,207.72	-1,517.54	328.35	1,541.69	0.00	0.00	0.00
13,000.00	90.34	178.14	11,207.13	-1,617.48	331.60	1,641.49	0.00	0.00	0.00
13,100.00	90.34	178.14	11,206.54	-1,717.43	334.85	1,741.30	0.00	0.00	0.00
13,200.00	90.34	178.14	11,205.94	-1,817.37	338.09	1,841.11	0.00	0.00	0.00
13,300.00	90.34	178.14	11,205.35	-1,917.32	341.34	1,940.92	0.00	0.00	0.00
13,400.00	90.34	178.14	11,204.76	-2,017.26	344.58	2,040.73	0.00	0.00	0.00
13,500.00	90.34	178.14	11,204.16	-2,117.21	347.83	2,140.53	0.00	0.00	0.00
13,600.00	90.34	178.14	11,203.57	-2,217.15	351.08	2,240.34	0.00	0.00	0.00
13,700.00	90.34	178.14	11,202.98	-2,317.10	354.32	2,340.15	0.00	0.00	0.00
13,800.00	90.34	178.14	11,202.38	-2,417.05	357.57	2,439.96	0.00	0.00	0.00
13,900.00	90.34	178.14	11,201.79	-2,516.99	360.81	2,539.77	0.00	0.00	0.00
14,000.00	90.34	178.14	11,201.20	-2,616.94	364.06	2,639.57	0.00	0.00	0.00
14,100.00	90.34	178.14	11,200.60	-2,716.88	367.31	2,739.38	0.00	0.00	0.00
14,200.00	90.34	178.14	11,200.01	-2,816.83	370.55	2,839.19	0.00	0.00	0.00
14,300.00	90.34	178.14	11,199.42	-2,916.77	373.80	2,939.00	0.00	0.00	0.00
14,400.00	90.34	178.14	11,198.82	-3,016.72	377.04	3,038.81	0.00	0.00	0.00
14,500.00	90.34	178.14	11,198.23	-3,116.66	380.29	3,138.61	0.00	0.00	0.00
14,600.00	90.34	178.14	11,197.64	-3,216.61	383.54	3,238.42	0.00	0.00	0.00
14,700.00	90.34	178.14	11,197.04	-3,316.56	386.78	3,338.23	0.00	0.00	0.00
14,800.00	90.34	178.14	11,196.45	-3,416.50	390.03	3,438.04	0.00	0.00	0.00
14,900.00	90.34	178.14	11,195.86	-3,516.45	393.27	3,537.85	0.00	0.00	0.00
15,000.00	90.34	178.14	11,195.26	-3,616.39	396.52	3,637.65	0.00	0.00	0.00
15,100.00	90.34	178.14	11,194.67	-3,716.34	399.77	3,737.46	0.00	0.00	0.00
15,200.00	90.34	178.14	11,194.08	-3,816.28	403.01	3,837.27	0.00	0.00	0.00
15,300.00	90.34	178.14	11,193.48	-3,916.23	406.26	3,937.08	0.00	0.00	0.00
15,400.00	90.34	178.14	11,192.89	-4,016.17	409.50	4,036.89	0.00	0.00	0.00
15,500.00	90.34	178.14	11,192.30	-4,116.12	412.75	4,136.69	0.00	0.00	0.00
15,600.00	90.34	178.14	11,191.70	-4,216.06	415.99	4,236.50	0.00	0.00	0.00

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well 4H
Company:	DEVON ENERGY	**TVD Reference:**	H&P 394: 3704.9' GL + 25' RKB @ 3729.90usft
Project:	Lea County, NM (NAD-83)	**MD Reference:**	H&P 394: 3704.9' GL + 25' RKB @ 3729.90usft
Site:	Black Mamba 15 State Com	**North Reference:**	Grid
Well:	4H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	4H OH		
Design:	Plan #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)
15,700.00	90.34	178.14	11,191.11	-4,316.01	419.24	4,336.31	0.00	0.00	0.00
15,800.00	90.34	178.14	11,190.52	-4,415.96	422.49	4,436.12	0.00	0.00	0.00
15,887.29	90.34	178.14	11,190.00	-4,503.20	425.32	4,523.24	0.00	0.00	0.00
TD - PBHL (BM15SC 4H)									

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
SHL (BM15SC 4H) - plan hits target center - Point	0.00	0.00	0.00	0.00	0.00	477,647.75	780,452.29	32° 18' 38.712 N	103° 33' 33.674 W
PBHL (BM15SC 4H) - plan hits target center - Point	0.00	0.00	11,190.00	-4,503.20	425.32	473,144.55	780,877.61	32° 17' 54.122 N	103° 33' 29.098 W

Formations

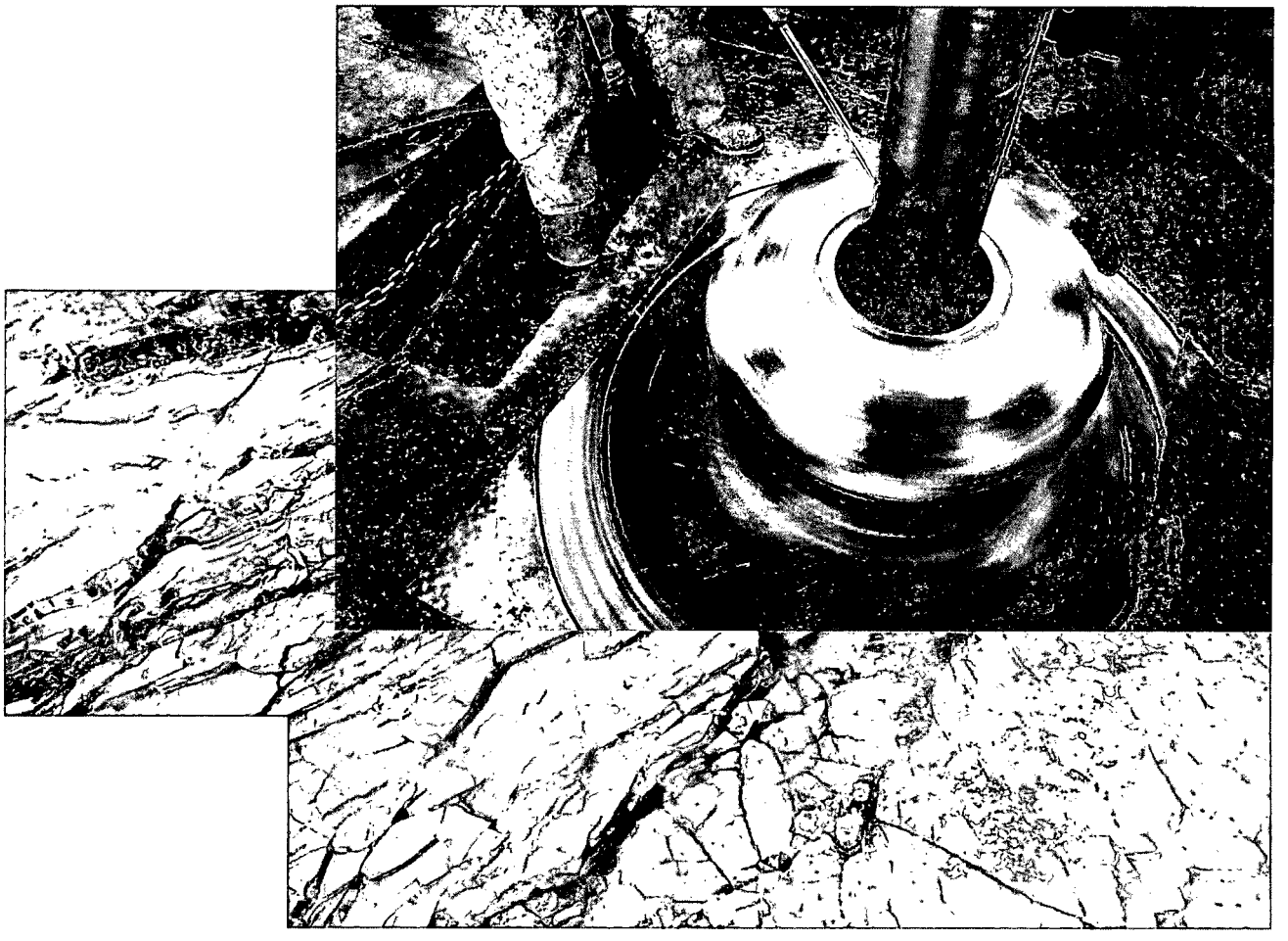
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,290.00	1,290.00	Rustler		0.00	
1,770.00	1,770.00	Top Salt		0.00	
5,092.68	5,090.00	Base Salt		0.00	
5,192.87	5,190.00	Delaware		0.00	
6,064.49	6,060.00	Cherry Canyon		0.00	
7,647.45	7,640.00	Brushy Canyon		0.00	
9,080.12	9,070.00	1st BS LM		0.00	
10,076.98	10,065.00	1st BS SS		0.00	
10,786.27	10,773.00	2nd BS SS		0.00	

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
3,500.00	3,500.00	0.00	0.00	Start Nudge
3,733.33	3,733.19	5.84	4.09	Hold
10,728.75	10,715.56	355.66	249.04	KOP 12° DLS
11,504.92	11,216.00	-123.21	283.07	LP
15,887.29	11,190.00	-4,503.20	425.32	TD

devon

Commitment Runs Deep



Design Plan
Operation and Maintenance Plan
Closure Plan

SENM - Closed Loop Systems
September 2014

I. Design Plan

Devon uses MI SWACO closed loop system (CLS). The MI SWACO CLS is designed to maintain drill solids at or below 5%. The equipment is arranged to progressively remove solids from the largest to the smallest size. Drilling fluids can thus be reused and savings is realized on mud and disposal costs. Dewatering may be required with the centrifuges to insure removal of ultra fine solids.

The drilling location is constructed to allow storm water to flow to a central sump normally the cellar. This insures no contamination leaves the drilling pad in the event of a spill. Storm water is reused in the mud system or stored in a reserve fluid tank farm until it can be reused. All lubricants, oils, or chemicals are removed immediately from the ground to prevent the contamination of storm water. An oil trap is normally installed on the sump if an oil spill occurs during a storm.

A tank farm is utilized to store drilling fluids including fresh water and brine fluids. The tank farm is constructed on a 20 ml plastic lined, bermed pad to prevent the contamination of the drilling site during a spill. Fluids from other sites may be stored in these tanks for processing by the solids control equipment and reused in the mud system. At the end of the well the fluids are transported from the tank farm to an adjoining well or to the next well for the rig.

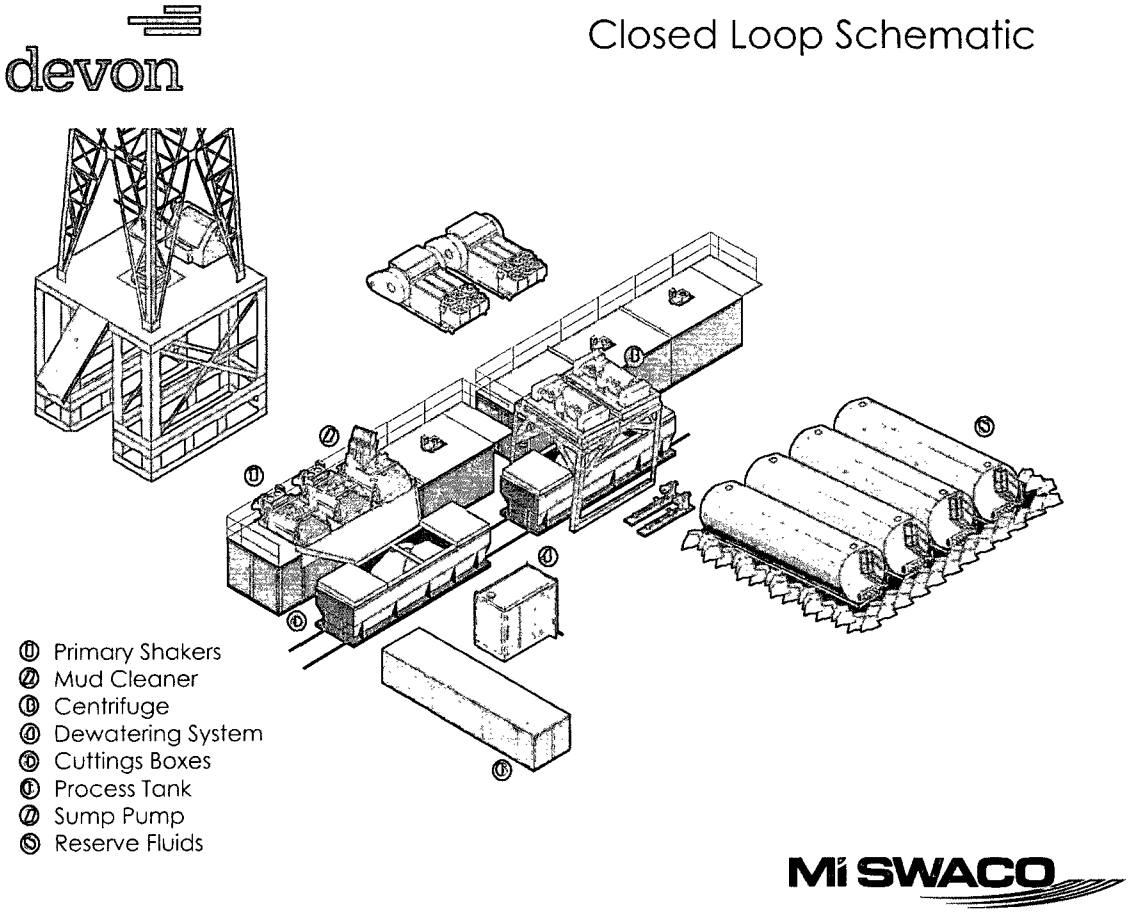
Prior to installing a closed-loop system on site, the topsoil, if present, will be stripped and stockpiled for use as the final cover or fill at the time of closure.

Signs will be posted on the fence surrounding the closed-loop system unless the closed-loop system is located on a site where there is an existing well, that is operated by Devon.

II. Operations and Maintenance Plan

Primary Shakers: The primary shakers make the first removal of drill solids from the drilling mud as it leaves the well bore. The shakers are sized to handle maximum drilling rate at optimal screen size. The shakers normally remove solids down to 74 microns.

Mud Cleaner: The Mud Cleaner cleans the fluid after it leaves the shakers. A set of hydrocyclones are sized to handle 1.25 to 1.5 times the maximum circulating rate. This ensures all the fluid is being processed to an average cut point of 25 microns. The wet discharged is dewatered on a shaker equipped with ultra fine mesh screens and generally cut at 40 microns.



Centrifuges: The centrifuges can be one or two in number depending on the well geometry or depth of well. The centrifuges are sized to maintain low gravity solids at 5% or below. They may or may not need a dewatering system to enhance the removal rates. The centrifuges can make a cut point of 8-10 microns depending on bowl speed, feed rate, solids loading and other factors.

The centrifuge system is designed to work on the active system and be flexible to process incoming fluids from other locations. This set-up is also dependant on well factors.

Dewatering System: The dewatering system is a chemical mixing and dosing system designed to enhance the solids removal of the centrifuge. Not commonly used in shallow wells. It may contain pH adjustment, coagulant mixing and dosing, and polymer mixing and dosing. Chemical flocculation binds ultra fine solids into a mass that is within the centrifuge operating design. The

dewatering system improves the centrifuge cut point to infinity or allows for the return of clear water or brine fluid. This ability allows for the ultimate control of low gravity solids.

Cuttings Boxes: Cuttings boxes are utilized to capture drill solids that are discarded from the solids control equipment. These boxes are set upon a rail system that allows for the removal and replacement of a full box of cuttings with an empty one. They are equipped with a cover that insures no product is spilled into the environment during the transportation phase.

Process Tank: (Optional) The process tank allows for the holding and process of fluids that are being transferred into the mud system. Additionally, during times of lost circulation the process tank may hold active fluids that are removed for additional treatment. It can further be used as a mixing tank during well control conditions.

Sump and Sump Pump: The sump is used to collect storm water and the pump is used to transfer this fluid to the active system or to the tank for to hold in reserve. It can also be used to collect fluids that may escape during spills. The location contains drainage ditches that allow the location fluids to drain to the sump.

Reserve Fluids (Tank Farm): A series of frac tanks are used to replace the reserve pit. These are steel tanks that are equipped with a manifold system and a transfer pump. These tanks can contain any number of fluids used during the drilling process. These can include fresh water, cut brine, and saturated salt fluid. The fluid can be from the active well or reclaimed fluid from other locations. A 20 ml liner and berm system is employed to ensure the fluids do not migrate to the environment during a spill.

If a leak develops, the appropriate division district office will be notified within 48 hours of the discovery and the leak will be addressed. Spill prevention is accomplished by maintaining pump packing, hoses, and pipe fittings to insure no leaks are occurring. During an upset condition the source of the spill is isolated and repaired as soon as it is discovered. Free liquid is removed by a diaphragm pump and returned to the mud system. Loose topsoil may be used to stabilize the spill and the contaminated soil is excavated and placed in the cuttings boxes. After the well is finished and the rig has moved, the entire location is scrapped and testing will be performed to determine if a release has occurred.

All trash is kept in a wire mesh enclosure and removed to an approved landfill when full. All spent motor oils are kept in separate containers and they are removed and sent to an approved recycling center. Any spilled lubricants, pipe

dope, or regulated chemicals are removed from soil and sent to landfills approved for these products.

These operations are monitored by Mi Swaco service technicians. Daily logs are maintained to ensure optimal equipment operation and maintenance. Screen and chemical use is logged to maintain inventory control. Fluid properties are monitored and recorded and drilling mud volumes are accounted for in the mud storage farm. This data is kept for end of well review to insure performance goals are met. Lessons learned are logged and used to help with continuous improvement.

A MI SWACO field supervisor manages from 3-5 wells. They are responsible for training personnel, supervising installations, and inspecting sites for compliance of MI SWACO safety and operational policy.

III. Closure Plan

A maximum 340' X 340' caliche pad is built per well. All of the trucks and steel tanks fit on this pad. All fluid cuttings go to the steel tanks to be hauled by various trucking companies to an agency approved disposal.