

	OXY PERMIAN DRILLING 9 POINT DRILLING PLAN SHEEP MOUNTAIN 1-3-M	SDP No: 1
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1. GEOLOGICAL MARKERS & FORMATION TOP

The SMU 1-3-M will be a new drill from Pad Site #1 near Sheep Mountain in Huerfano County, CO. The objective of the 1-3-M is to target the Dakota and Entrada repeat sections of each block by drilling through faulted zones. A 13 3/8" surface casing string will be set above the Pierre formation at 976 ft, with 9 5/8" intermediate casing through into the Niobrara formation, covering the Pierre shale at 2255 ft MD (2151 ft TVD). Then an 8 1/2" hole will be drilled to a TD point of 10,226 ft MD (8942 ft TVD) with 7" casing run to bottom.

The names and depths of estimated formation tops are given below in the chart. The chart provides the formation tops for reservoir zones, including the repeat sections.

Formation Top	MD (ft)	TVD (ft)
Pierre	631	631
Niobrara	2129	2051
Codell	2879	2573
Carlile	2960	2625
Greenhorn	3246	2809
Graneros	2900	3388
Dakota	2972	3497
Morrison	3199	3822
Entrada	3466	4173
Sangre de Cristo	3693	4454
Block A (repeat of Dakota/Entrada)	4875	4056
Block B	5920	5008
Block C	7110	6095
Block D	8730	7575
TD	10226	8942

Table 1: Formation Tops for SMU 1-3-M

2. ESTIMATED TOPS OF ANTICIPATED WATER, OIL, GAS OR MINERALS

The cells highlighted in green in Table 1 represent the formation tops of the possible zones containing CO₂. Repeat sections of the Dakota and Entrada are expected to be encountered below the Sangre de Cristo where faulted zones are estimated.

No other hydrocarbons or usable quality water zones are present in these formations. Casing and cementing will be designed to protect the CO₂ zones, lost circulation, and usable quality water zones.

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3. THE OPERATORS MINIMUM SPECIFICATIONS FOR PRESSURE CONTROL

A schematic of the BOP is provided in Appendix A. The BOP setup complies with the regulations presented in the BLM Onshore Order #2 for a 10M system. The rated working pressure of the BOP stack is 10,000 psi. Rams are rated to 10,000 psi while the annular is rated to 5,000 psi. The BOP stack will be nipped up after surface casing has been cemented and the "A&B" sections of the wellhead installed. As indicated in Onshore Order #2, the ram type preventers will be tested to its stack working pressure of 10,000 psi for 10 minutes along with its associated equipment. The annular preventer will be tested to 3400 psi, which meets the requirements of Onshore Order #2 as it exceeds the 50% rated working pressure for the annular. This test will also be conducted for 10 minutes. A low pressure test of 250 psi for 10 minutes will occur for all BOP equipment. All BOP tests are going to occur every 21 days as per Oxy's standard, and use clear water for the test.

A diagram of the choke manifold is presented in Appendix A.

4. PROPOSED CASING SETTING DEPTHS AND CEMENTING PROGRAM

The casing program for the SMU 1-3-M is outlined in the table below. The table contains specific details including weight, grades, and design ratings.

SMU 1-3-M Casing Program

String	Depth (ft) MD	OD (in)	ID (in)	Coupling OD (in)	Drift (in)	Weight (#/ft)	Grade	CXN	Burst (psi)	Collapse (psi)	Tension (k-lbs)
Surface	0 - 976'	13.375	12.615	14.375	12.459	54.5	J-55	BTC	2,740	1,130	909
Intermediate	0 - 2255'	9.625	8.835	10.625	8.679	40	L-80	BTC	5,750	3,090	947
Production	0' - 10,226'	7	6.276	7.656	6.151	26	L-80	BTC	7,250	5,410	641

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Cement Program

Cement Design 13 3/8" Surface Casing								
Stage	Weight (ppg)	TOC (ft)	BOC (ft)	Hole Size (In)	% Open Hole Excess	Cement Volume (sacks)	Slurry Volume (bbbls)	Remarks
Tail	12.8	Surface	976	17.5	100%	623	242	Adjust if hole conditions change.
TAIL SLURRY								
Cement Type:			VARICEM (last 60 bbl w/ super CBL)					
Mix Water			12.11 Gal/sk					
Slurry Density:			12.8 ppg					
Yield:			2.18 ft ³ /sack					

Detailed Pumping Schedule – 13 3/8" Surface Casing				
Fluid #	Fluid Type	Fluid Name	Surface Density lbm/gal	Volume bbl
1	Spacer	Water Based Spacer	10.5	50
2	Cement	Tail Cement	12.8	242
DROP PLUG				
3	Spacer	Displacement Fluid	9.5	140

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Cement Design 9 5/8" Intermediate Casing								
Stage	Weight (ppg)	TOC (ft)	BOC (ft)	Hole Size (in)	% Open Hole Excess	Cement Volume (sacks)	Slurry Volume (bbls)	Remarks
Lead 1	12.6	0	900	12.615 CH/ 12.25 OH	25%	156.16	58.13	
Lead 2	12.6	900	2005	12.25	25%	205.91	76.65	Adjust if hole conditions change.
Tail	13.5	2005	2255	12.25	25%	78.24	24.25	Adjust if hole conditions change.
LEAD SLURRY								
Cement Type:		ECONOCEM (LEAD 1 W/O SUPER CBL, LEAD 2 W/ SUPER CBL)						
Mix Water		11.41 gal/sack						
Slurry Density:		12.6 ppg						
Yield:		2.09 ft ³ /sack						
TAIL SLURRY								
Cement Type:		FRACCEN SYSTEM						
Mix Water		8.82 Gal/sk						
Slurry Density:		13.5 ppg						
Yield:		1.74 ft ³ /sack						

Detailed Pumping Schedule – 9 5/8" Intermediate Casing				
Fluid #	Fluid Type	Fluid Name	Surface Density lbm/gal	Volume bbl
1	Spacer	Enhanced Spacer	9	50
2	Cement	Lead Cement	12.6	134.78
3	Cement	Tail Cement	13.5	24.25
DROP PLUG				
4	Spacer	Displacement Fluid	9.2	164.15

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Cement Design 7" Production Casing								
Stage	Weight (ppg)	TOC (ft)	BOC (ft)	Hole Size (in)	% Open Hole Excess	Cement Volume (sacks)	Slurry Volume (bbls)	Remarks
Tail	10	1755	10226	8.5	25%	648.7	277.56	Adjust if hole conditions change.
TAIL SLURRY								
Cement Type:		TUNED LIGHT SYSTEM						
Mix Water		9.57 gal/sack						
Slurry Density:		10 ppg						
Yield:		2.402 ft ³ /sack						

Detailed Pumping Schedule – 7" Production Casing				
Fluid #	Fluid Type	Fluid Name	Surface Density lbm/gal	Volume bbl
1	Spacer	Enhanced Spacer	9	30
2	Cement	Tail Cement	10	277.56
DROP PLUG				
3	Spacer	Displacement Fluid	8.3	387.8

5. MUD PROGRAM

Mud specifications are provided in the table below. The properties will be followed, but may change depending on hole conditions. Materials to control a lost circulation event or well control will be on site, too. These products are contained in sacks and delivered to the rigs on a pallet wrapped in plastic. The drilling operation will have a closed looped system with all returns going through a shale shaker and back into the rig's mud pit system. All cuttings will be removed via the cuttings disposal procedure and hauled off to a designated disposal site.

Hole Size (in)	Depth Interval (ft)	Fluid Type	Mud Weight (ppg)	Funnel Visc (s/qt)	PV	YP	Drill Solids (%)
17 ½"	0 - 976	FW spud mud	8.4 – 9.2	28-34	10-15	12-15	<8

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12 ¼"	976 – 2255	OBM*	9.0-9.2	35 – 40	8 – 12	6 – 10	< 5
8 ½"	2255 – 10226	OBM*	8.5-8.8	35 – 40	8 – 12	6 – 10	< 5

**The OBM will contain an oil/water ratio of 80/20 – to 85/15.*

6. LOGGING PROGRAM

When drilling the 12 ¼" intermediate hole section, a gamma tool will be run in conjunction with the drilling assembly. Once the 9 5/8" casing is set and cemented, a CBL will be run to identify the top of cement. For the 8 ½" interval, the logging program will consist of a quad combo log, which includes Gamma Ray, Formation Density, Neutron, and Sonic. A CBL is planned to be run in the 7" casing once the drilling rig has moved off the site.

A mud logger will be onsite through the duration of the well collecting mud samples and keeping track of all formation intervals.

7. ANTICIPATED PRESSURES AND TEMPERATURES

The Dakota and Entrada formations are considered as depleted. The repeat sections of both the Dakota and Entrada are predicted to have higher reservoir pressures than the first Dakota/Entrada zones, but still may be prone to lost circulation. The Dakota pressure gradient has been estimated at 0.38 psi/ft and the Entrada at 0.35 psi/ft.

The Morrison shale can lead to wellbore instability and may be seen while drilling through the faulted zones.

Maximum bottom hole temperature will be less than 180°F. The maximum bottom hole pressure is anticipated to be 3,000 psi.

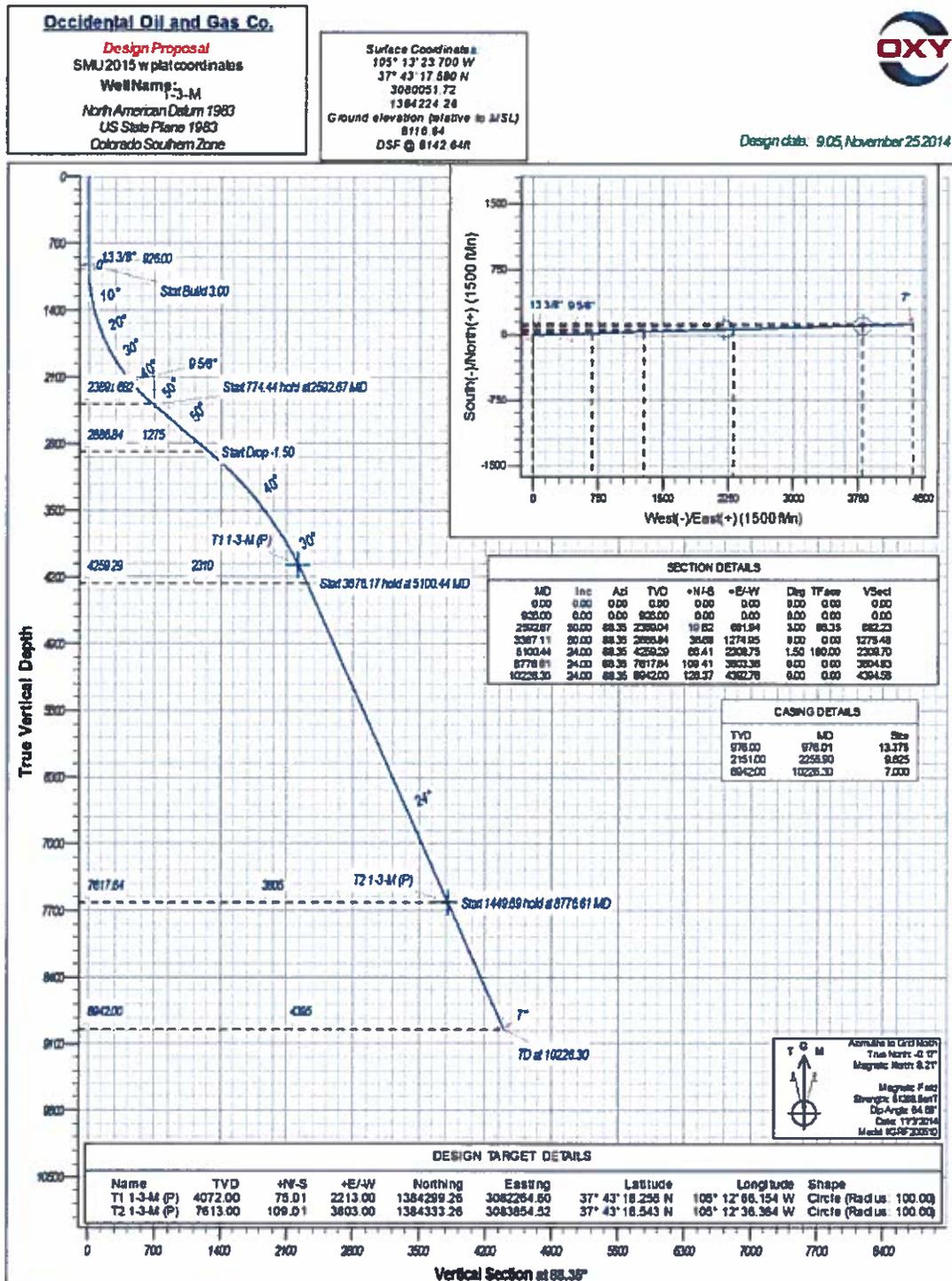


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8. DIRECTIONAL PROGRAM

The directional plan for the side track consists of a 2-D S-shaped well and is shown below. A copy of the directional plan will be sent to the BLM.



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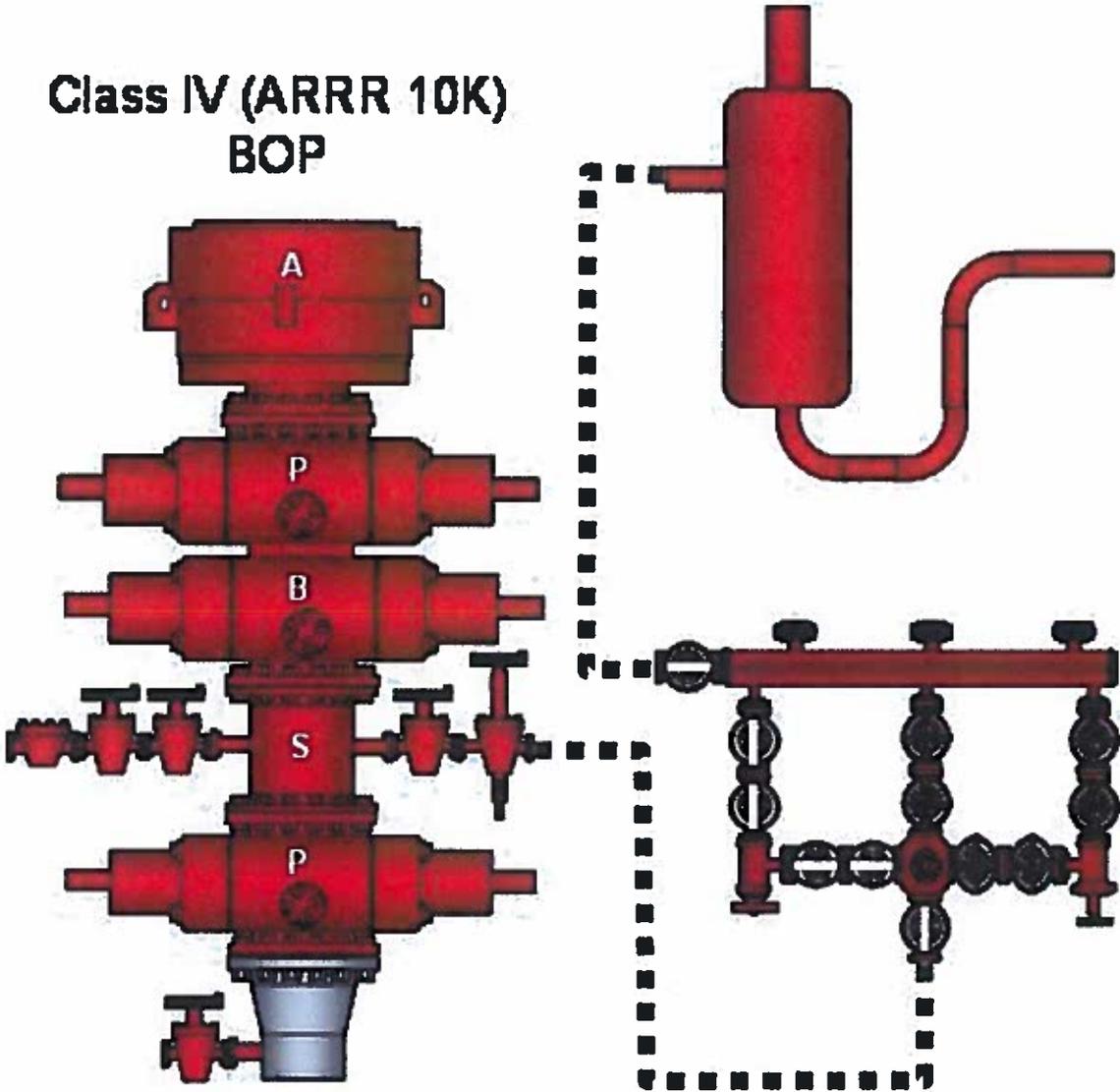
9. WELLHEAD SCHEMATIC

The wellhead will be a multi-bowl system consisting of a 13-3/8" x 9-5/8" x 7" 10M design. A drawing of the wellhead can be found in Appendix A.

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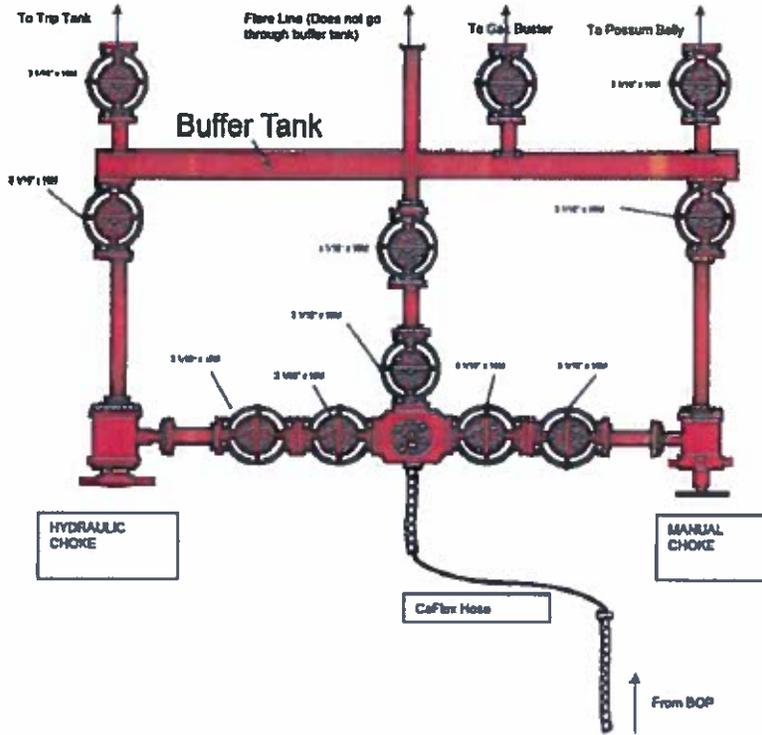
APPENDIX A
a) BOP Diagram

**Class IV (ARRR 10K)
BOP**

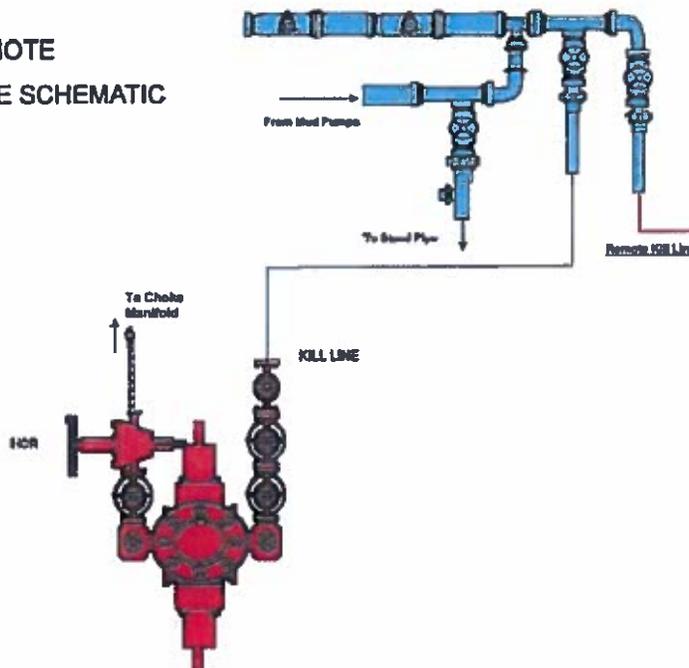


b) Choke Manifold

FLEX3 STD CHOKE MANIFOLD (COMPREHENSIVE)



10M REMOTE
KILL LINE SCHEMATIC





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c) Wellhead

