RECEIVED

MAR 1 0 2011

Bureau of Land Management
Durango Colorado

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL, DEEPEN, OR PLUG BACK

1a. Type of Work
DRILL

5. Lease Number
I-22-IND-2772
Unit Reporting Number

1b. Type of Well
GAS

6. If Indian, All. or Tribe
Ute Mountain Ute Tribe

2. Operator
BURLINGTON RESOURCES Oil & Gas Company, LP

7. Unit Agreement Name

RCVD JUL 6'11
OIL CONS. DIV.
DIST. 3

3. Address & Phone No. of Operator
PO Box 4289, Farmington, NM 87499

(505) 326-9700

8. Farm or Lease Name
Ute Mountain Ute

9. Well Number
106

4. Location of Well
Surface: Unit M(SWSW), 609' FSL & 998' FWL
BH: Unit N(SESW), 710' FSL & 1500' FWL

Surface: Latitude: 36.967876° N (NAD83)
Longitude: 108.283990° W
BH: Latitude: 36.968155° N (NAD83)
Longitude: 108.282271° W

10. Field, Pool, Wildcat
Ute Dome Paradox

11. Sec., Twn, Rge, Mer. (NMPM)
Sec. 23, T32N, R14W

API # 30-045- 35306

14. Distance in Miles from Nearest Town
26.9 Miles from Farmington, NM

12. County
San Juan

13. State
NM

15. Distance from Proposed Location to Nearest Property or Lease Line
609'

16. Acres in Lease

Venting / Flaring approved for 30 days per NTL-4A

17. Acres Assigned to Well
640 Acres

Hold C104 for Directional Survey and "As Drilled" plat

18. Distance from Proposed Location to Nearest Well, Drlg, Compl, or Applied for on this Lease
3264.3' from Ute Mountain Ute 73 (Basin Dakota)

19. Proposed Depth
8955'

Approval of this agreement does not warrant or certify that the operator thereof and other holders of operating rights hold legal or equitable title to those rights in the subject lease which are committed hereto...

20. Rotary or Cable Tools
Rotary

21. Elevations (DF, FT, GR, Etc.)
6145' GL

~~22. Approx. Date Work will Start~~

SEE ATTACHED
CONDITIONS OF APPROVAL

23. Proposed Casing and Cementing Program
See Operations Plan attached

24. Authorized by: Brandie Blakley 3-7-11
Brandie Blakley (Staff Regulatory Technician) Date

APPROVED FOR A PERIOD
NOT TO EXCEED 2 YEARS

PERMIT NO. /S/ BRAD DODD APPROVAL DATE

APPROVED BY ACTING TITLE CENTER MANAGER DATE JUN 30 2011

Archaeological Report attached
Threatened and Endangered Species Report attached
A gas recovery unit may or may not be used on this location.

NOTE: This format is issued in lieu of U.S. BLM Form 3160-3

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

Bond Numbers NMB-000015 and NMB-000089

NOTIFY AZTEC OCD 24 HRS. PRIOR TO CASING & CEMENT

Hold C104 for Directional Survey and "As Drilled" plat

JUL 25 2011

District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W Grand Avenue, Artesia, NM 88210
District III
1000 Rio Brazos Rd., Aztec, NM 87410
District IV
1220 S St. Francis Dr., Santa Fe, NM 87505

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

Form C-102
Revised July 16, 2010
Submit one copy to appropriate
District Office

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

1 API Number	2 Pool Code	3 Pool Name
30-045-35306	86760	UTE DOME PARADOX

4 Property Code	5 Property Name	6 Well Number
18725	UTE MOUNTAIN UTE	106

7 OGRID No.	8 Operator Name	9 Elevation
14538	BURLINGTON RESOURCES OIL & GAS COMPANY LP	6145

10 SURFACE LOCATION

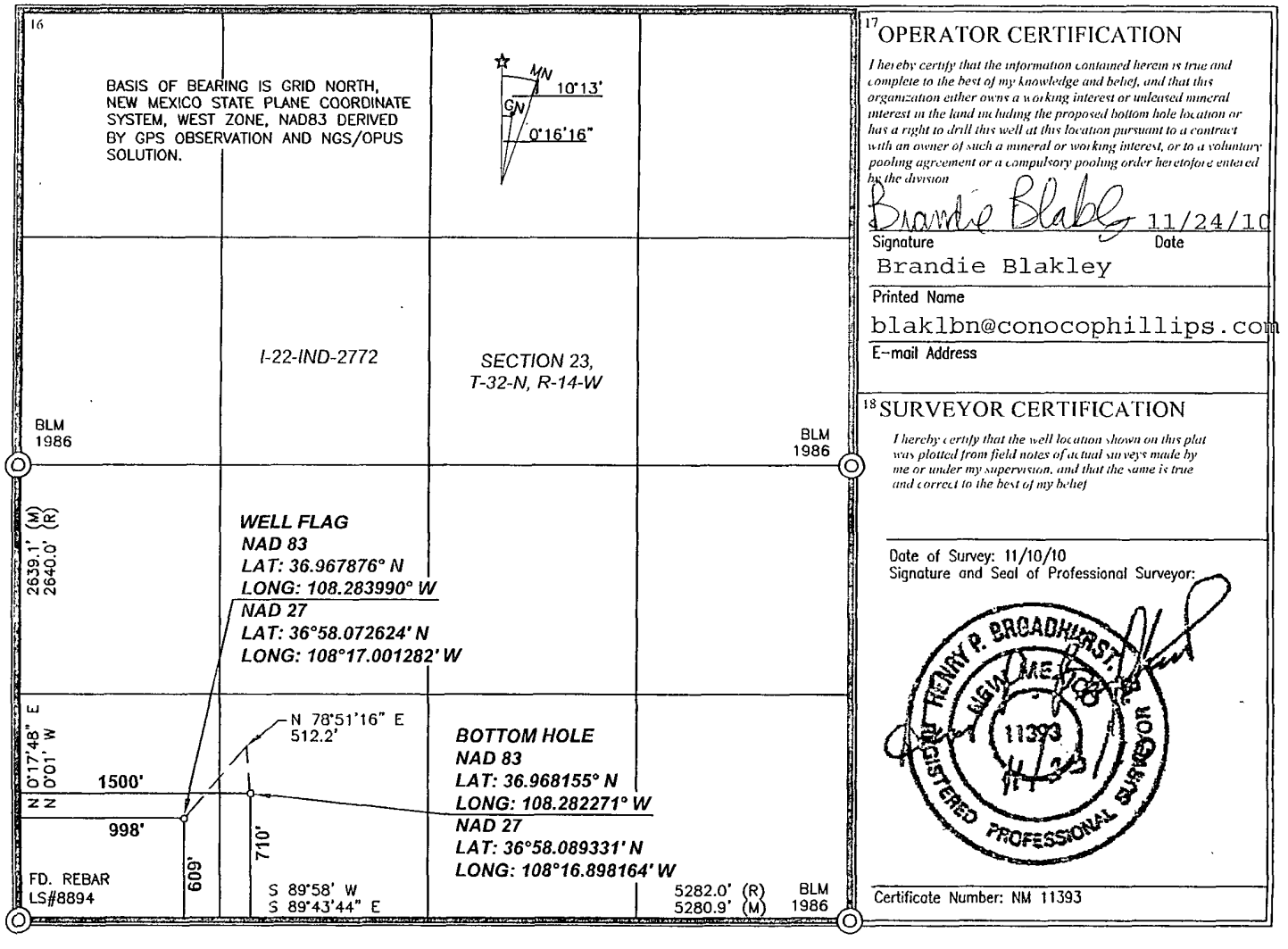
UL or lot no	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
M	23	32-N	14-W		609	SOUTH	998	WEST	SAN JUAN

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
N	23	32-N	14-W		710	SOUTH	1500	WEST	SAN JUAN

12 Dedicated Acres	13 Joint or Infill	14 Consolidation Code	15 Order No.
640.0			R-12444 (B) (C)

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



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

Brandie Blakley 11/24/10
Signature Date

Brandie Blakley
Printed Name

blaklbn@conocophillips.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

Date of Survey: 11/10/10
Signature and Seal of Professional Surveyor:

Certificate Number: NM 11393

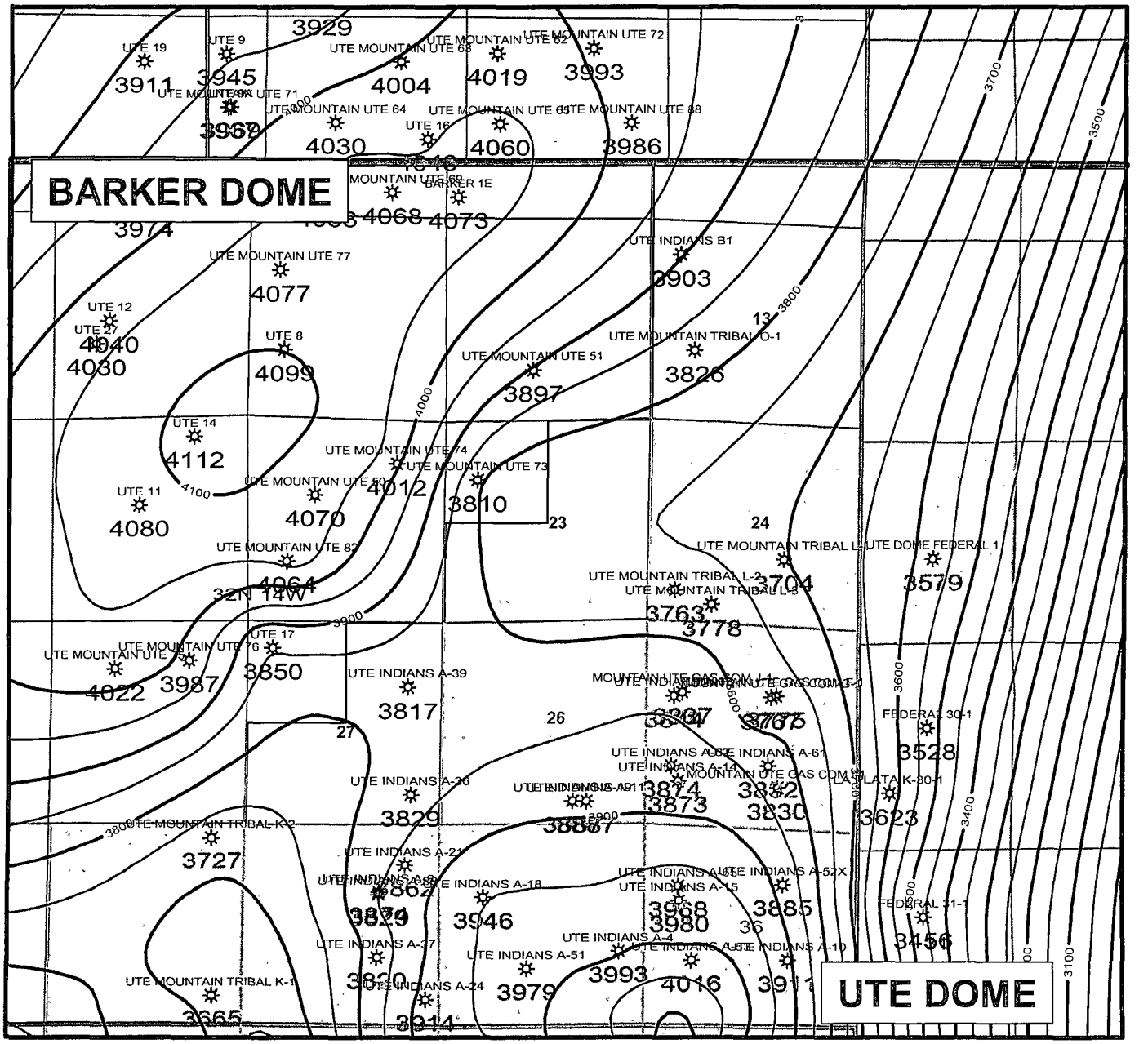
Based on the evidence below and structure maps attached, ConocoPhillips respectfully requests that BLM Order UMU-1 be amended to remove all of Section 23 from within the outline of Barker Dome and place it within Ute Dome.

Exhibit #1: Structure of top Greenhorn

This contour map shows the sub-surface structure of the top of the Greenhorn Limestone. This surface was selected for mapping because it is penetrated by most of the wells drilled in this area and therefore provides the maximum number of control points for mapping. Note how structurally low the Greenhorn is in the UMU 73 well located SWNW of Sec. 23. Note also that this well is down structure from the Ute 17 well located in NWNW of Section 27.

Exhibit #2: Structure of top of Barker Creek

This contour map shows the sub-surface structure of the top of the Barker Creek member of the Paradox Formation, which is the main producing reservoir of both the Barker Dome and Ute Dome Fields. This map was constructed by first creating a thickness map of the Greenhorn to Barker Creek interval and then subtracting that interval from the top Greenhorn structure. By this method it is possible to use the shallow control points (like UMU 73) to help guide the deep structure. On this map the structural high to the NW is Barker come and the structural high to the SE of Ute Dome. At this depth the SE flank of the Barker Dome is marked by a major normal fault. Note that the Ute 17 well missed the Barker Dome entirely and cut the top Barker Creek in a very low structural position on the SE (low) side of the fault. Given that the UMU 73 well is structurally low to Ute 17 at the top Greenhorn then it follows that it will also be low at the Barker Creek depth. This clearly demonstrates that Section 23 is not on the geologic structure that hosts the Barker Dome Field and is properly on the NW flake of the Ute Dome.

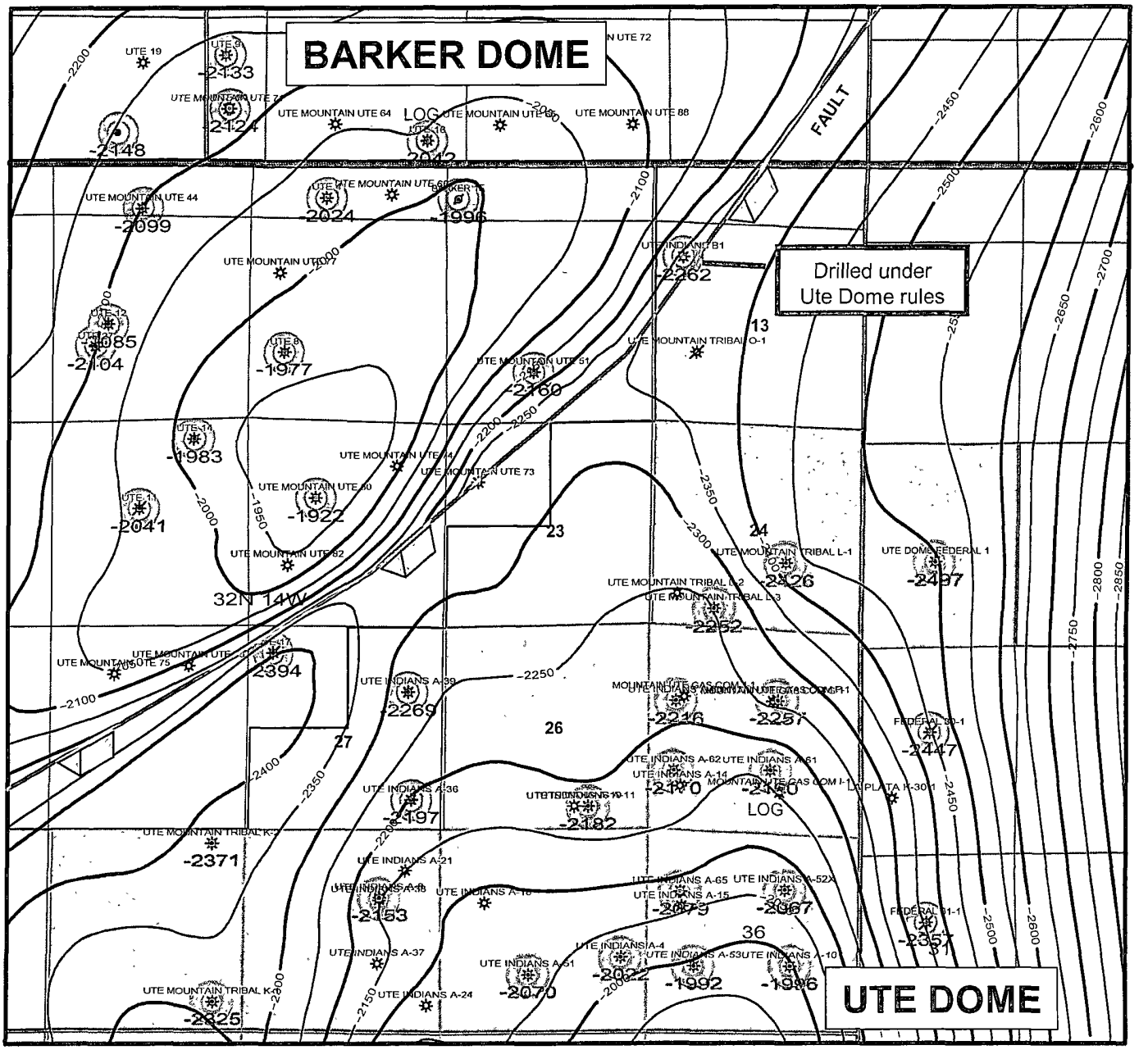


ConocoPhillips

STRUCTURE MAP
TOP OF GREENHORN
CI = 50 FEET

SCALE	DRAWN: Koerschner 9-09	DATE: 16-SEP-2009
DRAWING		

Exhibit # 1



◎ **Completed in Penn**

Exhibit # 2

ConocoPhillips

STRUCTURE MAP
TOP OF BARKER CREEK
CI = 50 FEET

SCALE	DRAWN	DATE
	Koerschner 10-09	22-OCT-2009
DRAWING		

Ute Mountain Ute #106

Technical Plan

1. **Geologic Tops** –

Surface bedrock formation is Menefee

Formation	Top		Fluid
	MD (FT)	TVD (FT)	
MANCOS	650.00	650.00	No Fluids
GREENHORN	2,367.00	2,367.00	No Fluids
GRANEROS	2,422.00	2,422.00	No Fluids
MORRISON	2,710.00	2,710.00	Water
BLUFF	3,215.00	3,215.00	Water
ENTRADA	3,645.00	3,645.00	Water
CHINLE	4,145.00	4,145.00	No Fluids
SHINARUMP	4,790.00	4,790.00	Water
MOENKOPI	4,930.20	4,930.00	No Fluids
DE CHELLY	5,025.70	5,025.00	Water
CUTLER	5,146.60	5,145.00	Water
RICO	6,693.70	6,680.00	Water
HONAKER TRAIL	6,975.90	6,960.00	Water/Gas
ISMAY	7,857.80	7,835.00	Gas
DESERT CREEK	8,033.20	8,009.00	Gas
AKAH	8,195.40	8,170.00	Sour Gas
BARKER CREEK	8,477.60	8,450.00	Sour Gas
ALKALI GULCH	8,825.30	8,795.00	Sour Gas

2. **Pressure control equipment** – See attached diagram

- Total Depth = 8,955 ft TVD.
- Bottom Hole Pressure = 3,791 psi (estimated).
- Minimum BOP Working Pressure = 3,791 psi – (3,791 ft * 0 .223 psi/ft) = 2,946 psi
- Well will be drilled with 5,000 psi BOPE stack.

3. **Complete information on the drilling equipment, casing and cementing program –**

Proposed Casing And Cementing Program				
Size of Hole	Size of Casing	Weight/Foot	Setting Depth (MD)	Quantity of Cement

Ute Mountain Ute #106

(Surface) 16"	13 3/8"	48#, H-40, ST&C, New	0' - 800'	Cement to surface with 699 cu.ft, volume includes 100% excess in open hole, to consist of **Lead slurry** 605 cu.ft (473 sks) Type III cement + 1% bwoc Calcium Chloride + 0.25 lbs/sack Cello Flake + 0.2% bwoc FL-52 + 58.9% Fresh Water mixed at 14.60 ppg and **Tail Slurry** 94 cu.ft (74 sks) Type III cement + 3% bwoc Calcium Chloride + 0.25% bwoc Cello Flake + 51.2% Fresh Water mixed at 15.2 ppg, compressive strength 500 psi after 8 hours.
(Intermediate) 10-5/8"	8 5/8"	32#, J-55, LT&C, New	0' - 5126' Stage Tool +/- 2050'	Cement to surface in two stages, in the **first stage**, pump 983 cu.ft volume includes 50% excess in open hole, to consist of a **Scavenger**: 56 cu.ft (19 sks) Premium Lite FM + 3% bwoc Calcium Chloride + 0.25 lbs/sack Cello Flake + 5 lbs/sack LCM-1 + 0.4% bwoc FL-52 + 8% bwoc Bentonite + 0.4% bwoc Sodium Metasilicate + 177.9% Fresh Water mixed at 11.00 ppg. **Lead slurry**: 697 cu.ft (327 sks) of Premium Lite FM + 3% bwoc Calcium Chloride + 0.25 lbs/sack Cello Flake + 5 lbs/sack LCM-1 + 0.4% bwoc FL-52 + 8% bwoc Bentonite + 0.4% bwoc Sodium Metasilicate + 112.3% Fresh Water mixed at 12.50 ppg. **Tail slurry**: 230 cu.ft (166 sks) of Type III cement + 1% bwoc Calcium Chloride + 0.25 lbs/sack Cello Flake + 0.2% bwoc FL-52 + 58.9% Fresh Water mixed at 14.60 ppg. Slurries are extended to achieve stated densities and may include various additives to control seepage. TOC for tail: near 4,100' MD to ensure good cement above both casing exits. **Second stage**, pump 775 cu.ft (364 sks) of Lead slurry (volume includes 50% excess in open hole) Premium Lite FM + 3% bwoc Calcium Chloride + 0.25 lbs/sack Cello Flake + 5 lbs/sack LCM-1 + 0.4% bwoc FL-52 + 8% bwoc Bentonite + 0.4% bwoc Sodium Metasilicate + 97% Fresh Water mixed at 12.50 ppg

(Production) 7-7/8"	5-1/2'	17#, L-80, LTC/BTC, New	0'-8987' Stage Tool +/- 6740'	Cement to surface in two stages, in the **first stage**, pump 551 cu.ft volume includes 40% excess in open hole, to consist of a **Scavenger**: 28 cu.ft (9 sks) Premium Lite High Strength FM + 0.25 lbs/sack Cello Flake + 0.3% bwco CD-32 + 6.25 lbs/sack LCM-1 + 1.0% bwoc FL-52 + 180.6% Fresh Water mixed at 11.00 ppg. **Lead slurry**: 206 cu.ft (97 sks) Premium Lite High Strength FM + 0.25 lbs/sack Cello Flake + 0.3% bwco CD-32 + 6.25 lbs/sack LCM-1 + 1.0% bwoc FL-52 + 97.5% Fresh Water mixed at 12.50 ppg. **Tail slurry**: 317 cu.ft (230 sks) of Type III cement + 1% bwoc Calcium Chloride + 0.25 lbs/sack Cello Flake + 0.2% bwoc FL-52 + 58.9% Fresh Water mixed at 14.60 ppg. Slurries are extended to achieve stated densities and may include various additives to control seepage. TOC for tail: near 7,190' MD to ensure good cement around production zone. **Second stage**, pump 1300 cu.ft (610 sks) of Lead slurry (volume includes 50% excess in open hole) Premium Lite High Strength FM + 0.25 lbs/sack Cello Flake + 0.3% bwoc CD-32 + 6.25 lbs/sack LCM-1 + 1.0% bwoc FL-52 + 97.5% Fresh Water mixed at 12.50 ppg

4. **Information on Mud System -**

Mud Program				
Interval	**Mud Type**	**Weight (ppg)**	**Water/Fluid Loss**	**Additives**
Surface	Gel/Water	Air or 8.3 – 9.2	No Control	Gel
Intermediate	LSND or Gel system	8.4 – 9.2	Some control	Polymer and gel as required
Production	LSND	8.4-10	Some control	Polymer and LCM as required.

5. **Testing, Logging, Coring -**

- Logs at intermediate section: Triple Combo logs in open hole will be run to cover disposal zones - log from intermediate TD to surface casing.
- Logs at production section: Platform Express (triple combo) from TD to intermediate casing.
- MWD (directional only) from under surface shoe to TD.
- Muddling: from 100' above Greenhorn (2267 ft MD) to final TD at 8,987 ft MD (8,955 ft TVD).
- Coring: No coring is planned

6. **Expected BHP, abnormal temperatures and pressures, and hazards –**

- No over-pressured intervals expected
- Require H2S contingent drilling plan. (Attached H2S Contingency Plan)
- No expecting lost circulation. The offset wells (Ute Mountain Ute #50 and Ute Mountain Ute #51) do not have lost circulation trouble reported. Attached are the operation summaries for these wells.

UTE MOUNTAIN UTE #50

Surface Location: 1800 FNL; 1850 FWL. Drilled on March, 1998

Ground Elevation: 6,231 ft RT Elevation: 6,231 ft Rig Elevation: 14 ft

Mud Drill Surface Shoe: 385 ft Production Shoe: 8690 ft

Big A 54 drilled 12 ¼" surface hole to 389 ft. Ran 8 5/8" 24#/ft, K-55 casing to 385 ft. Cemented w/ 57.3 bbls of class B Lead cement, returns 8 bbls of cement to surface. No problem reported. Drilled production hole w/ 7 7/8" insert bit from 389' to 3475'. POOH to change bit and found lost cone in hole. It fished cone with magnet and junk sub. Continued drilling (Mud logger comments only Barker Dome well that has been this gassy in cutler, no new formation tops in last 24 hrs). POOH to change bit. Drilled to 7815 ft. POOH for new bit. Continued drilling to TD at 8692 ft. Attempt to run open hole log. Hit tight spot at 2524 ft and 2533, had to work tools free. POOH and R/D loggers. TIH w/clean assy, worked through bridges, raised vis to 80. finished TIH to cond mud. Ran open hole. TIH to clean hole. Ran 5 ½" 17#/ft, L-80, LTC casing and set shoe at 8690 ft. No losses reported. Cemented In two stages, circulated 20 bbls in first stage and 195 bbls in second stage.

Note: There were two trips to clean hole due to logs tools hit tight spot at 2479' in first trip, 2524' second trip and stuck it at 2533' for reactive shale from 2400 ft to 2600 ft. No lost circulation trouble reported.

UTE MOUNTAIN UTE #51

Surface Location: 1,500 FSL; 2,270 FWL. Drilled on May, 1998

Ground Elevation: 6,884 ft RT Elevation: 6,898 ft Rig Elevation: 14 ft

Mud Drill Surface Shoe: 8 5/8" at 1,436 ft Production Shoe: 5 ½" at 9,601 ft

Big A 54 drilled 12 ¼" surface hole to 1447 ft. Ran 8 5/8" 24#/ft, K-55 casing to 1436 ft.

Ute Mountain Ute #106

Cemented w/ 229 bbls of class G lead cement, returns 100 bbls of cement to surface. No problem reported. Drilled production hole w/ 7 7/8" insert bit from 1436' to 2301'. POOH for plugged bit. Continued drilling 4115'. POOH to change bit. Drilled to 6038 ft. POOH for new bit. Continued drilling to 7904 ft. POOH twice more for new bit and continued drilling to TD at 9602 ft. Attempt to run open hole log and stuck at 9447'. Recover all logging tool. TIH w/clean assy. Ran 5 ½" 17#/ft, L-80, LTC casing and set shoe at 9601 ft. No losses reported. Cemented in two stages. Circulated 60 bbls in first stage and 93 bbls in second stage.

7. **Other information** –

This well will be drill vertical to 4,900 ft (KOP), and then directional drilling to intermediate shoe point at 5,125 ft. with 2 degree of build rate. Run open hole logs from intermediate TD to surface shoe. Run 8 5/8" intermediate casing and cement in two stages. The production section will be directional drill holding 7.16 degrees of inclination to TD at 8,986 ft. Open hole logs will be run from TD to intermediate casing shoe. Run 5 ½" production casing and cement in two stages.

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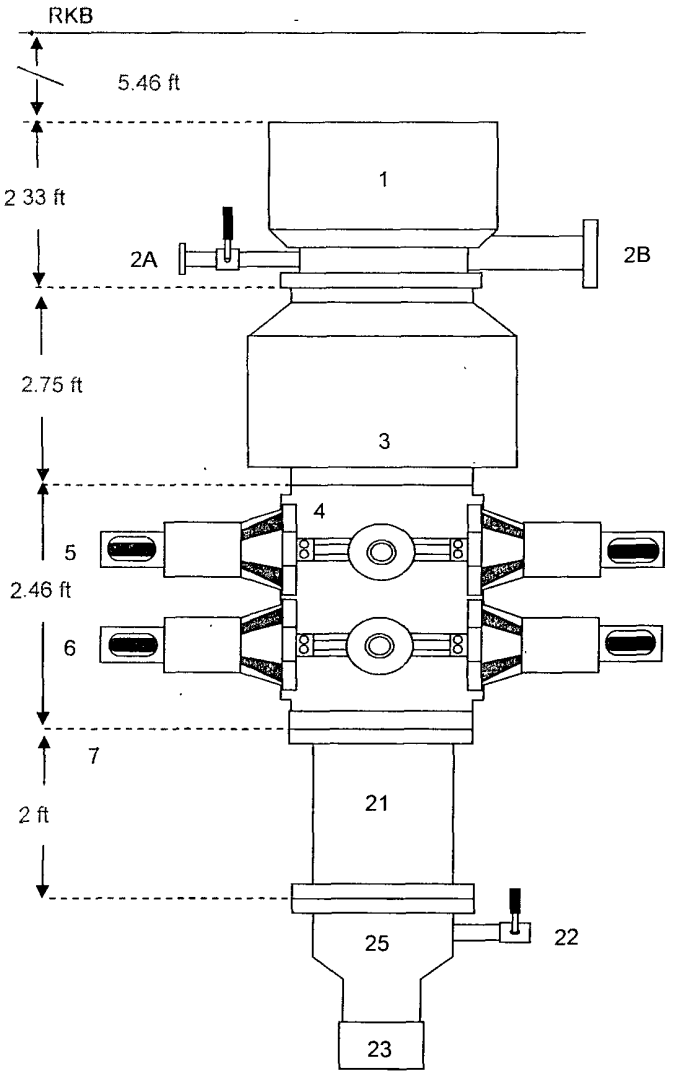
WELL CONTROL EQUIPMENT - AZTEC WELL SERVICES RIGS

5000 psi x 11"



Stack Height Including Spacer Spool= 9 54ft

Pressure Test

Annular 250 / 3500 psi 3/10 min (70% working pressure)

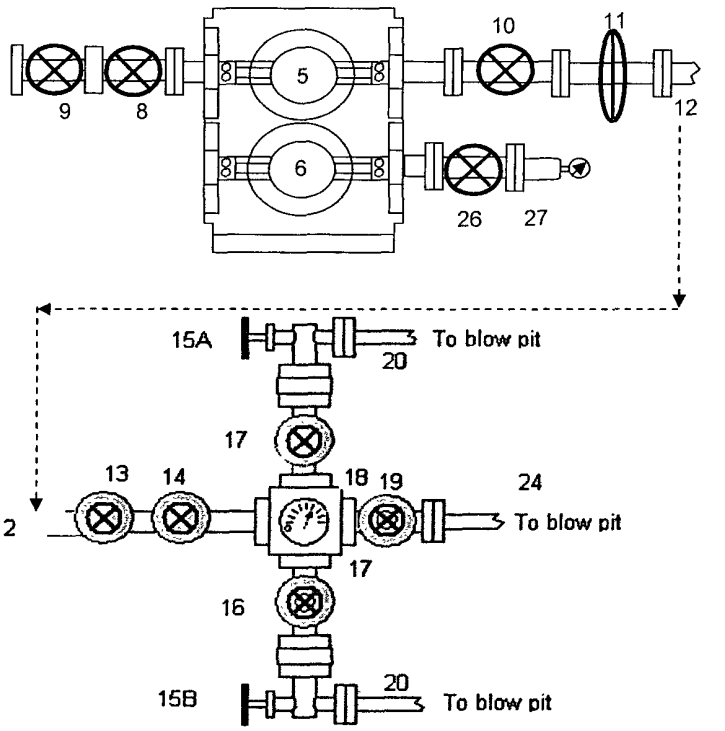
Rams 250 / 5000 psi 3/10 min

Choke Manifold 250 / 5000 psi 3/10 min

Surface casing 600 psi 30 min.

Intermediate 1500 psi 30 min

Side View of BOP



1 Williams Rotating Head
2A. Fill-up Line & valve
2B. Flowline
3. Annular Preventor (11", 5000 psi) Rucker Schaffer
4. Double Ram BOP Townsend Type 82/ 4"
5 Blind Rams (11", 5000 psi)
6. Pipe Rams (11", 5000 psi)
7. Kill Line Connection
8. Kill Line Valve (2-1/16") 5000 psi
9 Kill Line Gate Valve (2-1/16") 5000 psi
10 Inner Choke Line Valve (3-1/8") 5000 psi
11 Hydraulic HCR Choke Line Valve (3-1/8") 5000 psi
12. Choke Line (3", 8 ft between valves)
13. Choke Line Valve (3-1/8") 5000 psi
14 Choke Line Valve (3-1/8") 5000 psi
15A Variable Choke Line Valve (2-1/16") 5000 psi
16. Choke Line Valve (2-1/16") 5000 psi
17. Choke Line Valve (2-1/16") 5000 psi
18. Choke Manifold Pressure Gauge
19. Choke Line Valve (3-1/8") 5000 psi
20. Choke Line (2") 5000 psi
21. Spacer Spool 5000 psi
22. Casing Head Valve
23. 9 5/8" Casing Collar
24 Panic Line (3")
25. 11" Casing Head
26 Gate Valve - 2-1/16" 5000 psi
27. 2" XXX Bull Plug w/ 1/2" port and 5000 psi Gauge

Frazer Little - 14 June 2010
Edited by: Cedeno 21 FEB 2011

ConocoPhillips

PROJECT PROPOSAL - New Drill / Sidetrack

San Juan Business Unit

UTE MOUNTAIN UTE 106 **DEVELOPMENT**

Lease:	AFE #: WAN.CDR.8412			AFE $: 888,950.00
Field Name: SAN JUAN	Rig: Aztec Rig 920	State: NM	County: SAN JUAN	API #:
Geologist:	Phone:	Geophysicist:		Phone:
Geoscientist:	Phone:	Prod. Engineer:		Phone:
Res. Engineer:	Phone:	Proj. Field Lead:		Phone:

Primary Objective (Zones):

Zone	Zone Name
RCO509	UTE DOME::PARADOX (RCO509)

Location: Surface	Datum Code: NAD 27				Directional
Latitude: 36.967877	Longitude: -108.283355	X:	Y:	Section: 23	Range: 014W
Footage X: 998 FWL	Footage Y: 609 FSL	Elevation: 6145 (FT)	Township: 032N		
Tolerance:					
Location: Bottom Hole	Datum Code: NAD 27				Directional
Latitude: 36.968155	Longitude: -108.281635	X:	Y:	Section: 23	Range: 014W
Footage X: 1500 FWL	Footage Y: 710 FSL	Elevation: (FT)	Township: 032N		
Tolerance:					

Location Type: Year Round Start Date (Est.): 1/1/2011 Completion Date: Date In Operation:

Formation Data: Assume KB = 6160 Units = FT

Formation Call & Casing Points	Depth (TVD in Ft)	SS (Ft)	MD (Ft)	Depletion (Yes/No)	BHP (PSIG)	BHT	Remarks
MANCOS	650	5510		☐			Washouts in lower mancos
Surface Casing	800	5360		☐			Surface formation is Mesaverde - casing set about 150' into Mancos
GREENHORN	2367	3793		☐			Assume KOP below intermediate casing
GRANEROS	2422	3738		☐			
MORRISON	2710	3450		☐			
BLUFF	3215	2945		☐			Disposal zone - interval also contains Junction Creek ss & Summerville sh & Todilto ls
ENTRADA	3645	2515		☐			Disposal zone
CHINLE	4145	2015		☐			Washouts in offsets - shale
SHINARUMP	4790	1370		☐			Washouts - conglomerate
MOENKOPI	4930	1230		☐			Washouts - shale
DE CHELLY	5025	1135		☐			Sandstone
Intermediate Casing	5125	1035		☐			Intermediate set 100' into DeChelly SS to cover reactive shales above
CUTLER	5145	1015		☐			Mostly shale
RICO	6680	-520		☐			Mostly Limestone
HONAKER TRAIL	6960	-800		☐			Limestone with sh/silt/ss
ISMAY	7835	-1675		☐			Limestone - interval also contains Gothic sh
DESERT CREEK	8009	-1849		☐			Interval also contains Chimney Rock sh
AKAH	8170	-2010		☐			Contains anhydrate beds which can cause increase in mud vis
BARKER CREEK	8450	-2290		☐	880		Limestone & Dolomite - upper to lower ~115' - could be secondary target - could have lost circ if higher porosity develops

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ConocoPhillips

PROJECT PROPOSAL - New Drill / Sidetrack

San Juan Business Unit

UTE MOUNTAIN UTE 106 **DEVELOPMENT**

ALKALI GULCH	8795	-2635	☐	2200	Limestone & Dolomite - primary & likely only target 345' below Barker Creek top with pay at 8840' TVD & -2635' SS TVD
Total Depth	8955	-2795	☐		TD about 160' below top of Alkali Gulch pay

Reference Wells:

Reference Type	Well Name	Comments
Production	Ute Indians A 39	
Production	Ute Mountain Ute 50 & 51	
Production	Ute Mountain Tribal L 3	

Logging Program:

Intermediate Logs: ☐ Log only if show ☐ GR/ILD ☑ Triple Combo ☑ Other

Logs at intermediate to cover disposal zones - log from intermediate TD to surface casing. Mudlog from 100' above Greenhorn to final TD

TD Logs: ☑ Triple Combo ☐ Dipmeter ☐ RFT ☐ Sonic ☐ VSP ☐ TDT ☑ Other

Log platform Express from TD to intermediate casing.

Additional Information:

Log Type	Stage	From (Ft)	To (Ft)	Tool Type/Name	Remarks

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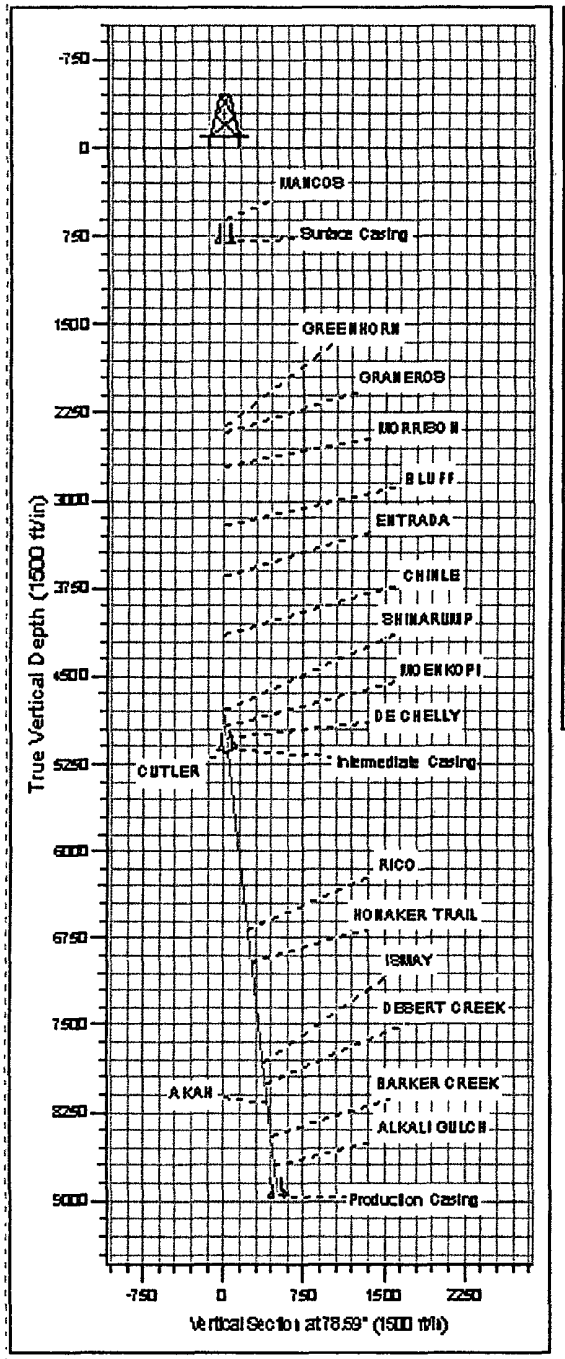
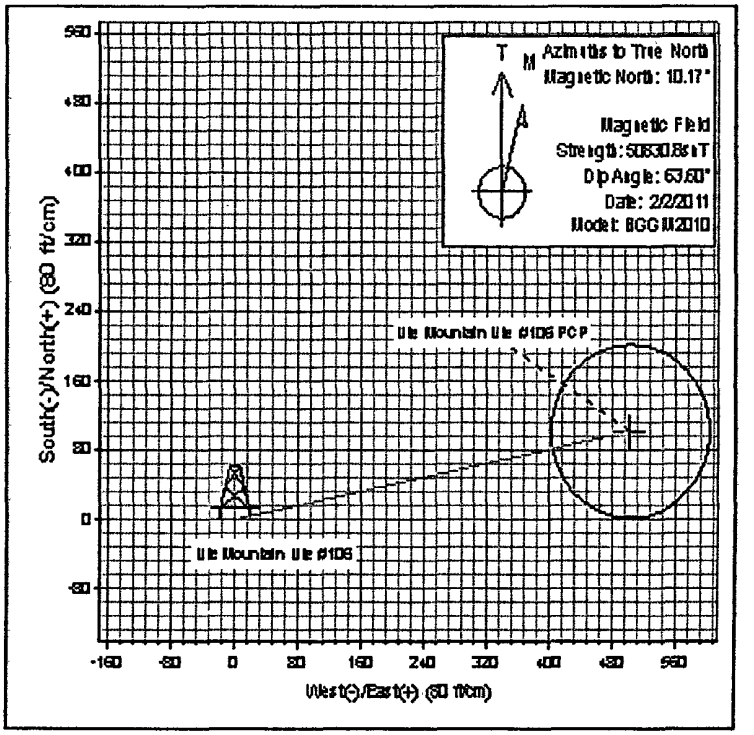
REFERENCE INFORMATION	Project: San Juan Basin - New Mexico West Wells
RKB @ 6160.0ft (AWS RIG5) Ground Elevation: 6145.0 Reference Lat: 36° 58' 4.367 N Reference Long: 108° 17' 0.077 W	Site: Other Named Wells Well: Ute Mountain Ute #106 Wellbore: Original Hole Design: Plan #1

ConocoPhillips

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	4700.0	0.00	0.00	4700.0	0.0	0.0	0.00	0.00	0.0	
3	5058.2	7.16	78.59	5057.2	4.4	21.9	2.00	78.59	22.4	
4	8986.6	7.16	78.59	8955.0	101.3	502.1	0.00	0.00	512.2	Ute Mountain Ute #106 PCP





Proposed Casing Program			
Size of Hole	Size of Casing	Weight/Foot	Setting Depth (MD)
(Surface) 16"	13 3/8"	48#, H-40, ST&C, New	0' - 800'
(Intermediate) 10-5/8"	8 5/8"	32#, J-55, LT&C, New	0' - 5126'
(Production) 7-7/8"	5-1/2'	17#, L-80, LTC/BTC, New	0'-8987'

Database:	EDM Central Planning	**Local Co-ordinate Reference:**	Well Ute Mountain Ute #106
Company:	ConocoPhillips SJBU	**TVD Reference:**	RKB @ 6160 0ft (AWS RIGS)
Project:	San Juan Basin - New Mexico West Wells	**MD Reference:**	RKB @ 6160 0ft (AWS RIGS)
Site:	Other Named Wells	**North Reference:**	True
Well:	Ute Mountain Ute #106	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Original Hole		
Design:	Plan #1		

Project San Juan Basin - New Mexico West Wells, New Mexico, Directional "S"

Map System:	US State Plane 1927 (Exact solution)	**System Datum:**	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico West 3003		Using geodetic scale factor

Site Other Named Wells

Site Position:		**Northing:**	2,108,178 26 ft	**Latitude:**	36° 47' 33 793 N
From:	Lat/Long	**Easting:**	643,887 63 ft	**Longitude:**	107° 20' 30 932 W
Position Uncertainty:	15 0 ft	**Slot Radius:**	6-1/8"	**Grid Convergence:**	0 29 °

Well Ute Mountain Ute #106, Baker Dome Paradox Pool

Well Position	**+N/-S**	0 0 ft	**Northing:**	2,171,885 44 ft	**Latitude:**	36° 58' 4 357 N
	+E/-W	0 0 ft	**Easting:**	368,531 26 ft	**Longitude:**	108° 17' 0 077 W
Position Uncertainty		3 5 ft	**Wellhead Elevation:**	ft	**Ground Level:**	6,145 0 ft

Wellbore Original Hole

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2010	2/2/2011	10 17	63 60	50,831

Design Plan #1

Audit Notes:

Version:	1	**Phase:**	PROTOTYPE	**Tie On Depth:**	0 0

Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0 0	0 0	0 0	78 59

Plan Sections

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0 0	0 00	0 00	0.0	0 0	0 0	0 00	0 00	0 00	0 00	
4,700 0	0 00	0 00	4,700.0	0 0	0 0	0 00	0 00	0.00	0 00	
5,058 2	7 16	78 59	5,057.2	4 4	21 9	2 00	2 00	0 00	78 59	
8,986 6	7 16	78 59	8,955 0	101 4	502 1	0.00	0 00	0 00	0 00	Ute Mountain Ute #10

Database:	EDM Central Planning	Local Co-ordinate Reference:	Well Ute Mountain Ute #106
Company:	ConocoPhillips SJBU	TVD Reference:	RKB @ 6160 0ft (AWS RIGS)
Project:	San Juan Basin - New Mexico West Wells	MD Reference:	RKB @ 6160 0ft (AWS RIGS)
Site:	Other Named Wells	North Reference:	True
Well:	Ute Mountain Ute #106	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	Plan #1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
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
650 0	0 00	0 00	650 0	0 0	0 0	0 0	0 00	0 00	0 00
MANCOS									
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
Surface Casing									
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
2,367 0	0 00	0.00	2,367.0	0 0	0 0	0 0	0 00	0 00	0 00
GREENHORN									
2,400 0	0 00	0 00	2,400 0	0 0	0 0	0.0	0 00	0 00	0 00
2,422 0	0 00	0 00	2,422 0	0 0	0 0	0 0	0.00	0.00	0 00
GRANEROS									
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
2,710 0	0 00	0 00	2,710.0	0 0	0 0	0 0	0 00	0.00	0 00
MORRISON									
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
3,215 0	0 00	0 00	3,215 0	0 0	0 0	0 0	0 00	0 00	0 00
BLUFF									
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
3,645 0	0 00	0 00	3,645.0	0.0	0 0	0 0	0 00	0.00	0 00
ENTRADA									
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

Database:	EDM Central Planning	Local Co-ordinate Reference:	Well Ute Mountain Ute #106
Company:	ConocoPhillips SJBU	TVD Reference:	RKB @ 6160.0ft (AWS RIGS)
Project:	San Juan Basin - New Mexico West Wells	MD Reference:	RKB @ 6160.0ft (AWS RIGS)
Site:	Other Named Wells	North Reference:	True
Well:	Ute Mountain Ute #106	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	Plan #1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
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
4,145 0	0 00	0 00	4,145 0	0 0	0 0	0 0	0 00	0 00	0 00
CHINLE									
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
4,790 0	1 80	78 59	4,790 0	0 3	1 4	1 4	2 00	2 00	0.00
SHINARUMP									
4,800 0	2 00	78 59	4,800 0	0 3	1 7	1.7	2 00	2 00	0 00
4,900 0	4 00	78 59	4,899 8	1 4	6.8	7 0	2 00	2 00	0.00
4,930 2	4 60	78 59	4,930.0	1 8	9 1	9 2	2 00	2 00	0 00
MOENKOPI									
5,000.0	6 00	78.59	4,999.5	3 1	15.4	15 7	2 00	2.00	0 00
5,025.7	6 51	78 59	5,025.0	3 7	18 1	18 5	2.00	2 00	0 00
DE CHELLY									
5,058 2	7 16	78 59	5,057 2	4 4	21 9	22.4	2 00	2 00	0 00
5,100 0	7 16	78.59	5,098 7	5 5	27 0	27 6	0 00	0 00	0 00
5,126.5	7 16	78 59	5,125 0	6 1	30 3	30 9	0 00	0 00	0.00
Intermediate Casing									
5,146.6	7 16	78 59	5,145 0	6 6	32 7	33.4	0 00	0.00	0 00
CUTLER									
5,200 0	7 16	78 59	5,198 0	7 9	39 3	40 0	0 00	0 00	0 00
5,300 0	7 16	78 59	5,297 2	10 4	51 5	52 5	0 00	0.00	0 00
5,400 0	7 16	78 59	5,396 4	12 9	63.7	65 0	0 00	0 00	0 00
5,500.0	7 16	78 59	5,495.6	15 3	75.9	77.5	0 00	0 00	0 00
5,600 0	7 16	78.59	5,594 8	17.8	88 1	89 9	0 00	0 00	0 00
5,700 0	7 16	78 59	5,694 1	20 3	100.4	102.4	0 00	0.00	0.00
5,800.0	7 16	78 59	5,793.3	22.7	112 6	114 9	0 00	0 00	0 00
5,900 0	7 16	78 59	5,892 5	25 2	124 8	127 3	0.00	0 00	0 00
6,000 0	7 16	78 59	5,991 7	27 7	137.0	139 8	0.00	0 00	0 00
6,100.0	7 16	78 59	6,090 9	30 1	149.3	152 3	0 00	0 00	0 00
6,200.0	7 16	78 59	6,190.2	32.6	161 5	164 7	0 00	0 00	0 00
6,300 0	7.16	78 59	6,289 4	35 1	173 7	177 2	0 00	0 00	0.00
6,400.0	7 16	78 59	6,388 6	37 5	185 9	189.7	0.00	0 00	0 00
6,500 0	7 16	78 59	6,487 8	40 0	198.2	202 2	0 00	0 00	0 00
6,600 0	7 16	78 59	6,587 0	42 5	210 4	214 6	0 00	0 00	0 00
6,693.7	7 16	78 59	6,680 0	44.8	221 8	226.3	0 00	0.00	0 00
RICO									
6,700 0	7 16	78 59	6,686 3	44 9	222 6	227 1	0.00	0.00	0.00
6,800 0	7 16	78 59	6,785.5	47.4	234.8	239 6	0 00	0 00	0 00
6,900.0	7 16	78.59	6,884 7	49 9	247.1	252 0	0 00	0 00	0 00
6,975 9	7 16	78 59	6,960 0	51.8	256.3	261.5	0 00	0 00	0.00
HONAKER TRAIL									
7,000 0	7 16	78 59	6,983 9	52 3	259.3	264 5	0 00	0 00	0 00
7,100 0	7 16	78 59	7,083 1	54 8	271.5	277 0	0 00	0.00	0.00
7,200 0	7 16	78 59	7,182 3	57 3	283 7	289.5	0 00	0 00	0 00
7,300 0	7 16	78.59	7,281.6	59.7	295 9	301 9	0.00	0.00	0 00
7,400 0	7 16	78 59	7,380 8	62.2	308 2	314 4	0 00	0 00	0 00

Database:	EDM Central Planning	Local Co-ordinate Reference:	Well Ute Mountain Ute #106
Company:	ConocoPhillips SJBU	TVD Reference:	RKB @ 6160.0ft (AWS RIGS)
Project:	San Juan Basin - New Mexico West Wells	MD Reference:	RKB @ 6160.0ft (AWS RIGS)
Site:	Other Named Wells	North Reference:	True
Well:	Ute Mountain Ute #106	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	Plan #1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
7,500 0	7 16	78 59	7,480 0	64 7	320 4	326 9	0.00	0 00	0 00
7,600 0	7 16	78 59	7,579 2	67 2	332 6	339 3	0.00	0 00	0 00
7,700 0	7 16	78 59	7,678 4	69 6	344 8	351 8	0 00	0 00	0 00
7,800 0	7 16	78 59	7,777 7	72.1	357 1	364 3	0 00	0 00	0.00
7,857 8	7.16	78 59	7,835 0	73 5	364 1	371 5	0.00	0 00	0.00
ISMAY									
7,900 0	7 16	78 59	7,876 9	74 6	369 3	376 7	0 00	0 00	0 00
8,000.0	7.16	78 59	7,976 1	77 0	381.5	389 2	0 00	0 00	0 00
8,033.2	7 16	78 59	8,009.0	77 8	385.6	393 3	0 00	0 00	0 00
DESERT CREEK									
8,100 0	7 16	78 59	8,075 3	79 5	393 7	401 7	0.00	0 00	0.00
8,195 4	7 16	78 59	8,170.0	81 8	405.4	413.6	0 00	0 00	0 00
AKAH									
8,200 0	7 16	78 59	8,174.5	82 0	406 0	414 2	0 00	0.00	0 00
8,300 0	7 16	78.59	8,273 8	84 4	418.2	426 6	0 00	0 00	0 00
8,400 0	7 16	78 59	8,373 0	86 9	430.4	439 1	0 00	0 00	0 00
8,477 6	7 16	78 59	8,450 0	88 8	439 9	448.8	0 00	0 00	0 00
BARKER CREEK									
8,500 0	7.16	78 59	8,472 2	89 4	442 6	451 6	0 00	0 00	0 00
8,600 0	7 16	78 59	8,571 4	91 8	454 9	464.0	0 00	0 00	0.00
8,700 0	7 16	78.59	8,670.6	94 3	467 1	476 5	0 00	0 00	0 00
8,800.0	7 16	78.59	8,769 9	96.8	479 3	489.0	0 00	0 00	0 00
8,825.3	7.16	78 59	8,795 0	97 4	482.4	492 1	0 00	0 00	0 00
ALKALI GULCH									
8,900 0	7 16	78 59	8,869.1	99 2	491 5	501.4	0 00	0 00	0 00
8,986 6	7 16	78 59	8,955 0	101 4	502.1	512 2	0 00	0 00	0 00
Production Casing - Ute Mountain Ute #106 PCP									

Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
Ute Mountain Ute #106 I - plan hits target center - Circle (radius 100 0)	0 00	0 00	8,955 0	101 4	502 1	2,171,984.43	369,033 81	36° 58' 5 359 N	108° 16' 53 890 W

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
800 0	800 0	Surface Casing	9-5/8	12-1/4
5,126 5	5,125 0	Intermediate Casing	7	8-3/4
8,986 6	8,955 0	Production Casing	4-1/2	6-1/4

Database:	EDM Central Planning	Local Co-ordinate Reference:	Well Ute Mountain Ute #106
Company:	ConocoPhillips SJBU	TVD Reference:	RKB @ 6160 0ft (AWS RIGS)
Project:	San Juan Basin - New Mexico West Wells	MD Reference:	RKB @ 6160 0ft (AWS RIGS)
Site:	Other Named Wells	North Reference:	True
Well:	Ute Mountain Ute #106	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	Plan #1		

Formations

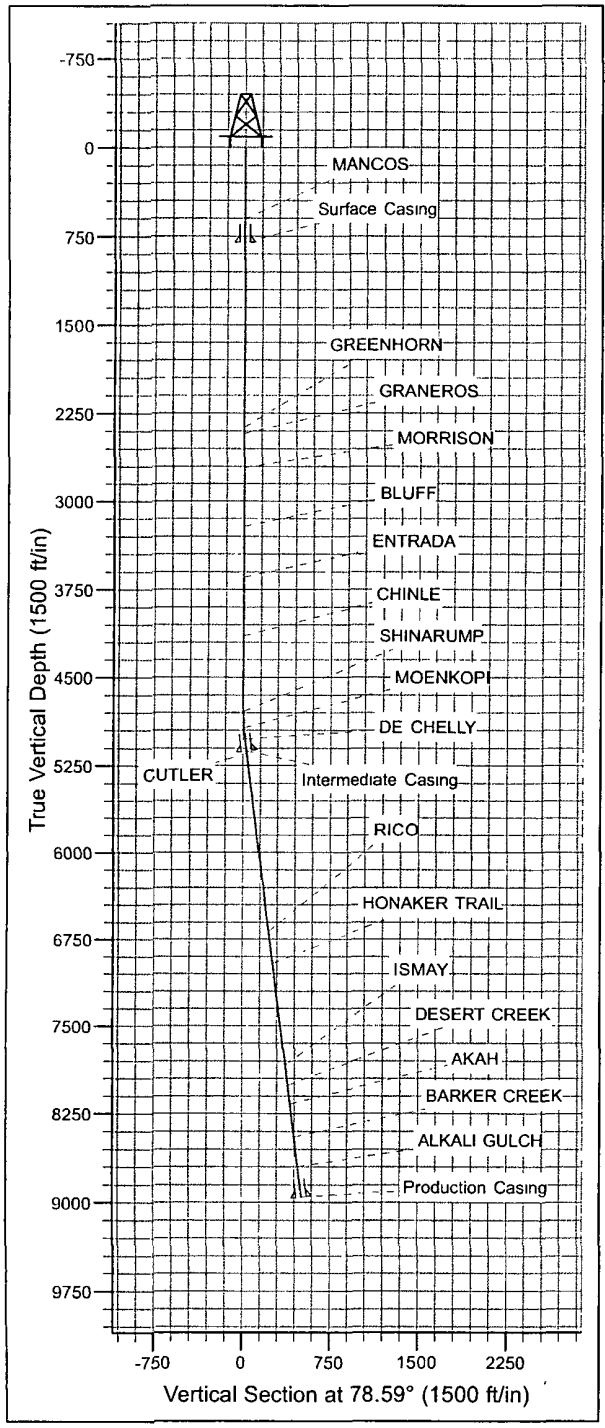
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
6,975 9	6,960.0	HONAKER TRAIL	LIMESTONE, SILTY	0 00	
2,422 0	2,422.0	GRANEROS		0.00	
8,033 2	8,009 0	DESERT CREEK	???	0 00	
3,215.0	3,215 0	BLUFF		0 00	
2,367 0	2,367 0	GREENHORN		0 00	
2,710 0	2,710.0	MORRISON		0 00	
650 0	650.0	MANCOS		0 00	
8,477 6	8,450 0	BARKER CREEK	LIMESTONE, DOLOMITIC	0 00	
4,145.0	4,145 0	CHINLE	SHALE	0 00	
8,195 4	8,170.0	AKAH		0.00	
3,645 0	3,645.0	ENTRADA		0.00	
8,825 3	8,795 0	ALKALI GULCH	LIMESTONE, DOLOMITIC	0 00	
6,693.7	6,680.0	RICO	LIMESTONE	0.00	
7,857 8	7,835 0	ISMAY	LIME AND SHALE	0 00	
4,930 2	4,930 0	MOENKOPI	SHALE	0 00	
5,146 6	5,145 0	CUTLER	SHALE	0 00	
5,025.7	5,025 0	DE CHELLY	SANDSTONE	0 00	
4,790 0	4,790 0	SHINARUMP	CONGLOMERATE	0 00	

REFERENCE INFORMATION	Project: San Juan Basin - New Mexico West V
RKB @ 6160.0ft (AWS RIGS) Ground Elevation 6145.0 Reference Lat: 36° 58' 4.357 N Reference Long: 108° 17' 0.077 W	Site: Other Named Wells Well: Ute Mountain Ute #106 Wellbore: Original Hole Design: Plan #1

ConocoPhillips

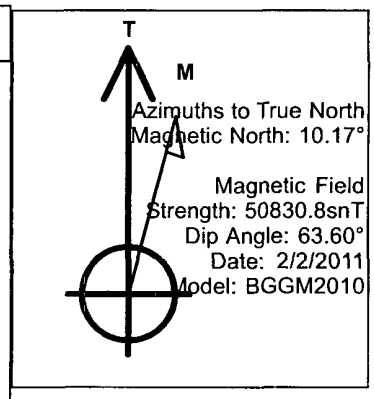
SECTION DETAILS

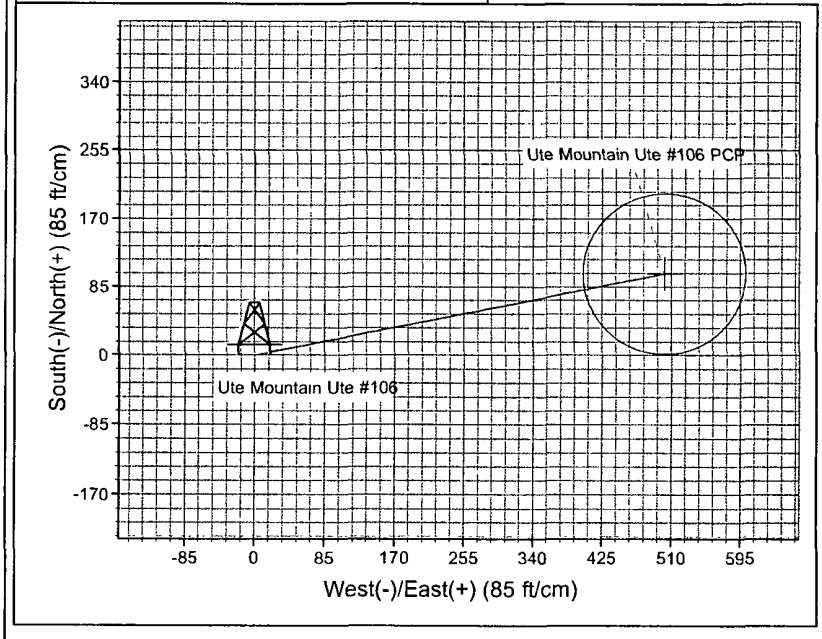
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	4700.0	0.00	0.00	4700.0	0.0	0.0	0.00	0.00	0.0	
3	5058.2	7.16	78.59	5057.2	4.4	21.9	2.00	78.59	22.4	
4	8986.6	7.16	78.59	8955.0	101.3	502.1	0.00	0.00	512.2	Ute Mountain Ute #106 PCP



FORMATION TOP DETAILS

TVDPath	MDPath	Formation
605.0	605.0	MANCOS
2367.0	2367.0	GREENHORN
2422.0	2422.0	GRANEROS
2710.0	2710.0	MORRISON
3215.0	3215.0	BLUFF
3645.0	3645.0	ENTRADA
4145.0	4145.0	CHINLE
4790.0	4790.0	SHINARUMP
4930.0	4930.2	MOENKOPI
5025.0	5025.7	DE CHELLY
5145.0	5146.6	CUTLER
6680.0	6693.7	RICO
6960.0	6975.9	HONAKER TRAIL
7835.0	7857.8	ISMAY
8009.0	8033.2	DESERT CREEK
8170.0	8195.4	AKAH
8450.0	8477.6	BARKER CREEK
8700.0	8729.6	ALKALI GULCH





BURLINGTON RESOURCES OIL & GAS COMPANY LP

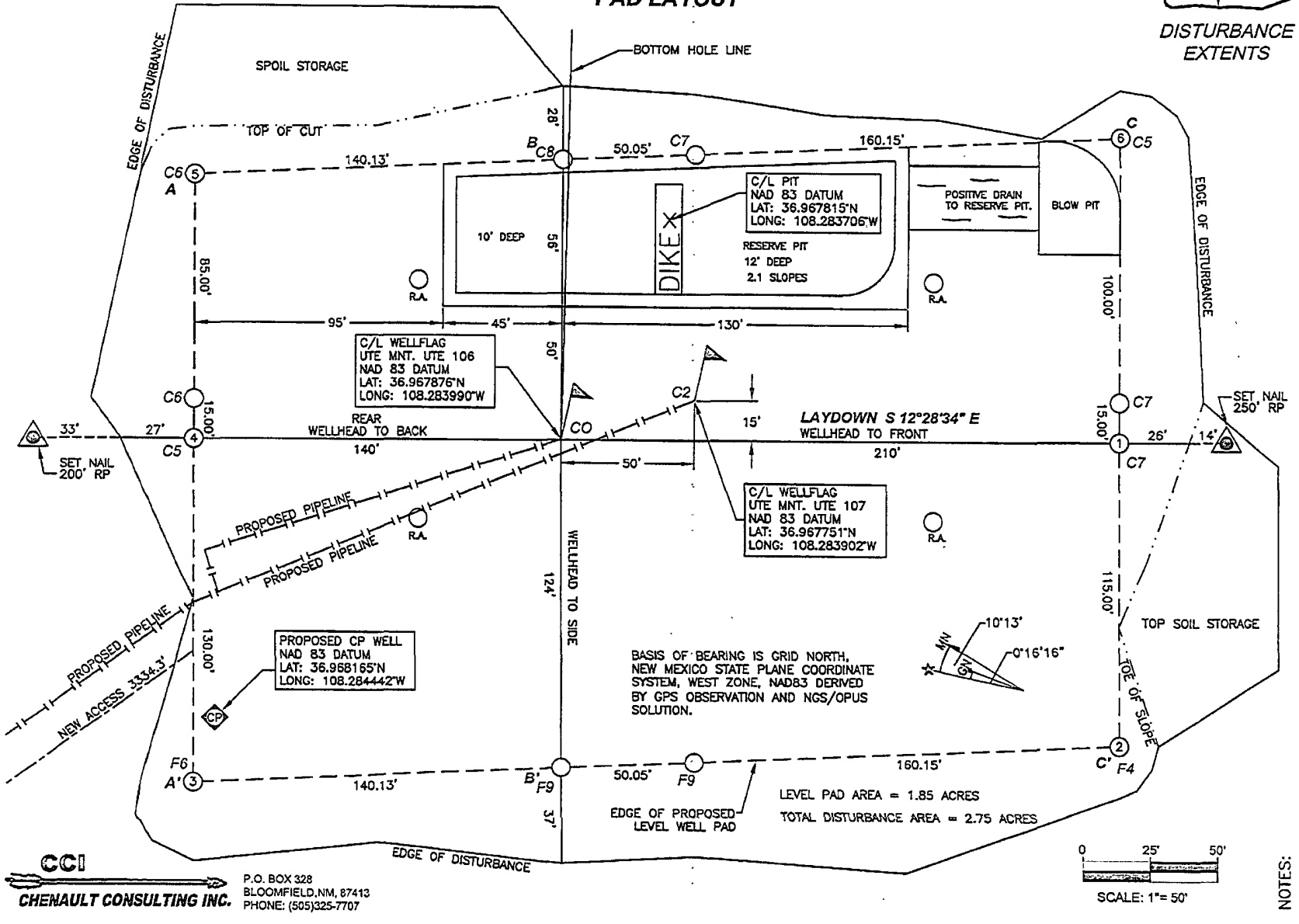
UTE MOUNTAIN UTE 106 - 609' FSL, 998' FWL

SECTION 23, T-32-N, R-14-W, N.M.P.M., SAN JUAN COUNTY, NEW MEXICO

ELEV.: 6145 NAVD88 DATE: NOVEMBER 10, 2010

NEW ACCESS 3334.3'

PAD LAYOUT



CCI
CHENAULT CONSULTING INC.
P.O. BOX 328
BLOOMFIELD,NM, 87413
PHONE: (505)325-7707

NOTES:

1. 8' ABOVE DEEP SIDE (OVERFLOW-3' WIDE AND 1' ABOVE SHALLOW SIDE). RESERVE PIT DIKE: TO BE
2. C.C.I. SURVEYS IS NOT LIABLE FOR UNDERGROUND UTILITIES OR PIPELINES. CONTRACTOR SHOULD CALL ONE-CALL FOR LOCATION OF ANY MARKED OR UNMARKED BURIED PIPELINES OR CABLES ON WELL PAD AND OR ACCESS ROAD AT LEAST TWO (2) WORKING DAYS PRIOR TO CONSTRUCTION.

BURLINGTON RESOURCES OIL & GAS COMPANY LP

UTE MOUNTAIN UTE 106
609' FSL, 998' FWL
SECTION 23, T-32-N, R-14-W, N.M.P.M.,
SAN JUAN COUNTY, NEW MEXICO
NAD 83 LAT: 36.967876°N Long: 108.283990°W
ELEV.: 6145 NAVD88
NEW ACCESS 3334.3'

DRIVING DIRECTIONS TO: UTE MNT. UTE 106 & 107
THIS WELL IS IN BARKER DOME AREA.

Driving directions from the intersection of West Main & La Plata Highway 170.

- Go: 15.0 Miles north on Hwy 170 to the intersection of Hwy 173 (Old La Plata School).
- Continue 2.3 Miles north on Hwy 170. Turn right at intersection to La Plata Mine.
- Go: 0.2 Miles east. Turn left onto old mine haul road, "U Turn" and head west towards over pass.
- Go: 3.0 Miles west on haul road. Turn Right (haul road barricaded).
- Go: 5.6 Miles northwest. Turn Right, and head north towards Barker Dome.
- Go: 0.8 Miles north east. Begin 3334.3 ft. new access on right (east) side of road.

ConocoPhillips

H_2S CONTINGENCY PLAN

PLAN APPLIES TO H2S CONCENTRATIONS BETWEEN 10 TO 100 PPM

Ute Mountain Ute #106
Surface: 609' FSL & 998' FWL, Section 23, T-32-N, R-14-W
San Juan County, New Mexico
Latitude 36°, 58.07256 Minutes N, Longitude 108°, 17.0394 Minutes W (Nad 83)

Bottom Location: 710' FSL & 1500' FWL, Section 23, T-32-N, R-14-W
San Juan County, New Mexico
Latitude 36°, 58.0893 Minutes N, Longitude 108°, 16.93626 Minutes W (Nad 83)

Mike Neuschafer - Drilling Engineering Supervisor

Terry Carpenter - Drilling Superintendent

Jerome Eggemeyer - Drilling Manager

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INTRODUCTION

ConocoPhillips is drilling and completing the Ute Mountain Ute #106 well for the purpose of evaluating and exploiting hydrocarbon reservoirs.

Drilling reports from offset wells indicate that hydrogen sulfide (H_2S) may be present from the deep formations (below 7500 ft). Hydrogen sulfide (H_2S) is a flammable and highly toxic gas, which in relatively small concentrations, can have adverse effects on people and equipment (refer to the section - Effects of H_2S).

These measures are to be in effect prior to drilling into the Honaker Trail formation and can be released after the production cement job.

Precautionary measures concerning H_2S in this plan have been formulated based on the following assumptions:

1. ConocoPhillips is expecting negligible levels of H_2S from this location, but offset wells, such as the UTE A5, UTE A4, UMT H1, UTE A7, UMT D1, UTE K1, and UTE A39, showed H_2S at levels at or below 5 ppm. Please note that ConocoPhillips does not expect H_2S levels to be greater than 10 ppm during drilling operations. This contingency plan will be in affect while drilling the production section based on the drilling summary of the nearby well.

2. Radius of Exposure (ROE) calculations, as detailed in the Department of Interior, Bureau of Land Management, Part II, 43 CFR Part 3160, Onshore Order No. 6, Hydrogen Sulfide Operations, do not apply at concentrations below 100 ppm. H_2S levels are not expected to equal or exceed 100 ppm, and as such, there is no radius of exposure at 100 or 500 ppm.

3. No residences, schools, business, parks or other areas where the public could reasonably be expected to frequent fall within a 500 ft radius of the location. As such, exposure to the general public is considered neglible.

This plan has been designated as a guide for well requirements and special considerations to provide for safe and efficient drilling (or servicing) operations in the anticipated presence of hydrogen sulfide.

H_2S equipment required on location for the Ute Mountain Ute #106:

Less than 100ppm & greater than 10ppm	• 5 Escape Packs • Fixed Monitor & at least 3 H_2S sensors • Personal Monitors for All Crew on Location • Well Condition Sign • 3 Windsocks • No Smoking Signs • Fire Extinguisher • Flare System • Emergency Response Numbers

GENERAL EMERGENCY ACTION

In the event an emergency situation occurs, the following action shall be initiated:

1. If the H_2S alarm sounds, stop the rotation of the drill pipe, secure rig, and close well in as time and conditions permit.

2. Evacuate quickly to the "Safe Briefing Area".

3. Account for all personnel and take appropriate action as necessary for personnel safety.

4. Raise appropriate color warning flag to describe the type of emergency.

The ConocoPhillips Onsite Supervisor will assess the situation and assign duties to various persons to bring the situation under control. Those who must enter the hazard area must wear self-contained breathing apparatus and use other appropriate safety equipment. (Use the "buddy system" at all times.) If self-contained breathing apparatus will ne required, ConocoPhillips Onsite Supervisor will be responsible to order such equipment out to location.

The Onsite Supervisor will advise the ConocoPhillips Drilling Manager as soon as the emergency will permit. In the event of a well kick, procedures outlined in the Operations Plan for Drilling will be followed.

Notification of local law enforcement agencies, residents and emergency vehicles as per the following Communications Directory, will be assigned by the ConocoPhillips Onsite Supervisor.

Any press inquiries are to be referred to the Implementation Manager of ConocoPhillips (Pat Bent).

ConocoPhillips

(505) 326-9700
ALL AREA CODES ARE (505) UNLESS OTHERWISE INDICATED

Drilling Department

Name	Office	Home	Pager/Cellular
Drilling Managers:			
Jerome Eggemeyer	326-9570	325-1949	Cell: 215-9745
Drilling Superintendent:			
Terry Carpenter	324-6166	326-4876	Cell: 320-9319
Tom Lee	326-9785	947-3335	Cell: 793-7460
Drilling Engineering Supervisor:			
Mike Neuschafer	324-5109		Cell: 215-1242

Health, Safety & Environmental Department

HSE Representatives:	Office	Home	Pager/Cellular
Smith, Robert (WSER Supervisor)	599-4052	334-8618	Cell: 947-8282
Mangum, Zach (Drilling WSER)	326-9879		Cell: 947-0673
Bettale, Mark (Drilling WSER)	324-6103	327-7512	Cell: 320-0617
Carpenter, Mike (Completions WSER)	326-9815	327-3795	Cell: 320-5650
Serrano, Leroy (1st Delivery WSER)		632-2648	Cell: 320-1364
Emerson, Warren (BU HSE Manager)	326-9754		Cell: 608-0426
Lowe, Brett (Emergency Response)	599-4089		Cell: 320-9074
Johnson, Monica (Environmental)	326-9829	320-9056	Cell: 326-2010

Contract Safety

(Farmington, New Mexico)	Office	Home	Pager/Cellular
DXP Safety Alliance:			
Martinez, Steve	325-7233		320-0544
Advance Safety LLC:			
Smith, Bill	324-0575		793-0904

Well Control Companies

Wild Well	**Control Co.**	24 HR.	(281) 784-4700

ConocoPhillips
Emergency Contact Agencies (Cont.)

State Police/Sheriff/City Police:

San Juan County, NM	
State Police	325-7547
Sheriff's Department	911 or 334-6622
Police Department	911 or 334-6622
Ambulance	911 or 334-6622
Fire Dept.	911 or 334-6622
Air Care 1	911 or (505) 599-6046 or 1-800-452-9990

Hospitals

Mercy Medical Center, Durango, CO	(970) 247-4311

LIST OF RESIDENTS / BUSINESSES / SCHOOLS

No residences, schools, business, parks or other areas where the public could reasonably be expected to frequent were found to be exposed to levels that can be expected to exceed 100 ppm. No Federal, State, County, or municipal road or highway owned and principally maintained for public use is located within any area that could be reasonably expected to reach or exceed 500 ppm. Included are topographic maps indicating a 500 ft radius, which far exceeds any potential exposure areas. All land within the radius is Ute Mountain Ute Tribal Lands.

RESPONSIBILITIES

All Personnel

1. All Personnel who spend over one day on the ConocoPhillips location shall be familiarized with the procedures outlined in this directive.

2. All personnel will attend to their personal safety first.

3. If it can be done safely, help anyone who may be injured or overcome from toxic gases by administering first aid.

4. Report to the "Safe Briefing Area" and follow the instructions of the supervisor.

ConocoPhillips Onsite Supervisor (Contract or Direct Employee)

1. It is the responsibility of the ConocoPhillips Onsite Supervisor to see that all personnel on the ConocoPhillips location observe these safety and emergency procedures.

2. The Onsite Supervisor will advise the Drilling Manager whenever the procedures as specified herein are complied with or cannot be followed. A checklist (attached) will be utilized. One (1) completed copy of the checklist will be forwarded to the Drilling Manager and one copy to ConocoPhillips HSE Department.

3. The ConocoPhillips Onsite Supervisor shall keep the number of personnel on location to a minimum during hazardous operations.

4. The Intermediate section of the well should be kept full with mud to surface at all times, including while tripping & circulating. A lost circulation event can reduce the fluid level & hydrostatic column, permitting higher concentrations & volume of gas inflow. Well flow observation & control processes should be applied at all times.

5. The Onsite Supervisor shall be trained in the use of all safety equipment and completely briefed on safety and emergency procedures. This shall include full knowledge of the requirements in this contingency plan.

6. It is the responsibility of the ConocoPhillips Onsite Supervisor to see that the Contractor has adequately trained the drilling crews in handling emergency situations. He should satisfy himself that this is the case. He should notify the ConocoPhillips Drilling Manager if the Contractor fails to fill this responsibility.

7. If an unexpected emergency occurs, or the H_2S alarm sounds, the Supervisor (either ConocoPhillips or Contractor) will assess the situation and will advise all personnel what conditions exist. Action to be taken under each of three possible conditions is as follows:

CONDITION I - POTENTIAL DANGER TO LIFE (such as hazardous amount of toxic gasses detected at surface)

a. Order nonessential personnel out of the potential danger area.

b. Display the YELLOW CONDITION I warning sign and flag.

c. Order all essential personnel to check their safety equipment to see that it is working properly and in the proper location (see supervisor's checklist). Persons without respiratory protection cannot work in the hazard area.

d. Notify Drilling Manager of condition and action taken.

e. Increase gas monitoring activities and continue operations as appropriate.

CONDITION II - MODERATE DANGER TO LIFE (such as circulating out a potentially toxic gas kick). In addition to Condition I requirements:

a. Display only the ORANGE CONDITION II warning sign and flag.

b. Direct corrective action to control flow of gas.

c. Set up roadblocks and restrict personnel movements to minimum.

d. Notify other appropriate personnel listed on emergency telephone list.

CONDITION III - EXTREME DANGER TO LIFE (when it appears that well control will be lost). In addition to Conditions I and II requirements:

a. Contact and request local police to evacuate people and to control traffic within the danger zone. Should the condition be immediately dangerous to the public, take necessary life saving action until local police arrive. Display only the RED CONDITION III warning sign and flag.

b. Ignite the well if necessary. (See the following section - Igniting the Well.)

NOTE: **The Drilling Manager will dispatch additional ConocoPhillips personnel and/or additional professional safety personnel to the well site as needed to assist the Onsite Supervisor.**

Contractor Onsite Supervisor (Toolpusher)

1. In the absence or incapacitation of the Contractor Onsite Supervisor, the ConocoPhillips Onsite Supervisor will assume all responsibilities designated herein to the Contractor Onsite Supervisor.

2. Assist the ConocoPhillips Supervisor and Safety Representative in training crews for handling emergency situations.

3. Will be trained for all well control or emergency situations as contained herein and how to properly use all safety equipment.

Driller

1. In the absence or incapacitation of both Onsite Supervisors (ConocoPhillips and Contractor), the Driller will assume their responsibilities as designated herein.

2. In the event of any emergency, the Driller if trained, will don respiratory equipment and secure the rig if time permits.

3. Assist Contractor supervisor in crew preparation.

HSE Department

1. Shall provide safety and environmental information and guidance when required.

2. Shall review and approve any changes in safety or environmental procedures.

3. Shall assist as appropriate with operating and maintenance procedures for the safety equipment called for in this plan.

4. Shall assist with arranging initial training on safety procedures and equipment. Shall provide assistance as needed for follow up training.

Rig Contractor

1. Shall have personnel properly trained in First Aid/CPR and H_2S Awareness

2. Shall keep personnel trained in use of safety equipment and safety procedures.

Visitors, Service Personnel (Vendors) and Others

1. Only personnel authorized by ConocoPhillips Onsite Supervisor shall be permitted to enter area when an emergency condition exists.

2. Third parties shall be permitted to enter area under an emergency condition only if needed, and then, only after being properly instructed in use of safety equipment and have necessary equipment issued or available.

3. Vendors must have all of their personnel trained in H2S procedures who will be on location from 1,000' above the expected H2S zone through rig release.

Igniting the Well

1. Responsibility

The decision to ignite the well is the responsibility of the ConocoPhillips Drilling Manager. However, the decision should be made only as a last resort and in a situation where it is clear that:

a. Human life or property is endangered.

b. There is no hope of controlling the blowout under the prevailing conditions at the well.

In all cases, an attempt should be made to notify the Drilling Manager of the plans to ignite the well, if time permits. However, the Drilling Manager and Onsite Supervisor must not delay a decision if human life is threatened.

REMEMBER, if the well is ignited, the burning H_2S will be converted to sulfur dioxide (SO2), which is also highly toxic. Do not assume that the area is safe after the well is ignited. Follow through with all plans to evacuate endangered persons.

2. Means of Ignition

a. In preparation for igniting the well, keep unnecessary persons in the "Safe Briefing Area". A two person team is required for the actual ignition. Both team members will wear self-contained breathing units and will have 200 feet retrieval ropes attached to safety harnesses. One team member is responsible for checking the atmosphere for explosive gasses with the explosimeter. The other member is responsible for igniting the well. Persons remaining in the "Safe Briefing Area" will closely watch the ignition team; and should either man be overcome, they will immediately pull him to safety by the retrieval ropes and apply revival measures.

b. The primary method for igniting the well will be with a 25 mm meteortype flare gun to be kept on location (preferably in the company man's trailer). Flare guns can be obtained from DXP Safety Alliance. These guns have a range of approximately 500 feet. If this method fails or well conditions are such that a safer or better method is apparent, then an alternate method should be used.

c. Always ignite the well from upwind and do not approach the well any closer than warranted.

d. Select a location to fire the flare gun that provides maximum protection to the ignition team (behind equipment) while keeping in visible site by personnel in the "Safe Briefing Area".

e. Choose a location that has good accessibility and from which retreat can easily be made.

f. **REMEMBER**, before firing the flare gun or igniting flammable material, check the atmosphere at your location for combustible gasses with explosimeter.

PRECAUTIONARY MEASURES

These measures are to be in effect prior to drilling out surface casing.

General

1. **Two areas** shall be designated as safe briefing areas, each located, as a minimum: 150 feet from the wellhead and vent discharge area; spaced 160 degrees apart on an arc, with the wellhead as the center point; and as best suited for topographical considerations and prevailing winds.

2. Emergency equipment shall be on location as described in the H_2S Contingency Equipment Checklist.

3. A copy of all emergency telephone numbers shall be posted on the doghouse bulletin board, at the "Safe Briefing Areas", in the ConocoPhillips Onsite Supervisor's office, and in the Contractor Supervisor's office.

4. Wind direction indicators shall be located where at least one can be viewed from any position on the location.

5. An automatic hydrogen sulfide (H_2S) 4-channel monitor shall be provided, with detectors placed at the flow line, mud pit, rig floor & substructure (near rotating head). Either of these detectors shall be capable of sensing a minimum of 5 ppm H2S in air and shall be able to independently activate visual and audio alarms. Both the visual alarm and the audible alarm will be activated at 10 ppm. The audible alarm must be capable of alerting people at any point on the location.

6. All personnel on location shall wear a Single Gas Personal Monitor with alarm set at 10ppm.

7. A sign that reads, "Caution - Poisonous Gas May be Present", will be posted at the last intersection leading to location.

8. The well-site shall be equipped with commercial communications. The equipment should be located for safe access and should not be an ignition source.

9. The ConocoPhillips Onsite Supervisor's vehicle should always be parked a safe distance (at least 100 feet) from the rig, and in an upwind direction when feasible.

10. For all well kicks, the Operations Plan will be followed. All drilling contractor personnel shall be trained, and drills shall be conducted to insure proper well control procedures.

11. The checklist of all emergency equipment (see Onsite Supervisor's checklist) shall be completed prior to drilling our surface casing, as identified in the introduction. The Onsite Supervisor shall inspect the equipment with assistance, as needed, from ConocoPhillips HSE personnel as to working condition, proper placement, etc. The inspection will be noted on the checklist. ***A copy of the checklist will be placed in the Onsite Supervisor's files and one copy each will be provided to the Drilling Manager and HSE Department.***

12. To ensure proper hole filling during tripping operations, a stroke counter and pit level sensor will be utilized at all times.

13. ConocoPhillips Contractor Onsite Supervisor will be on-site security monitoring head count, enforcing that all personnel on location will have no facial hair, keeping only essential personnel on location, and all personnel on location are trained on H_2S Emergency Response.

SPECIAL SAFETY TRAINING

The minimum training for personnel working in affected areas shall include the following elements:

1. Hazards, characteristics and symptoms of hydrogen sulfide (H_2S), sulfur dioxide (SO_2), carbon monoxide (CO), methane gas, and other hazardous substances as may be appropriate. Effects of these substances are discussed in a section that follows.

2. Effect on metal components of the system.

3. Safety precautions to include possible sources at the site.

4. Operation of safety equipment and life support means and systems.

5. Corrective action and shutdown procedures.

6. Detection and measurements of H_2S, CO and combustible gas.

THE CONOCOPHILLIPS SUPERVISOR ON LOCATION SHALL BE RESPONSIBLE FOR THE OVERALL ON-SITE OPERATION, INCLUDING THE SAFETY AND TRAINING PROGRAM.

All personnel, contracted or employed on an unscheduled basis, shall be trained as a minimum in the severity of H_2S and other toxic gasses, safety precautions, evacuation procedures, and as appropriate, the use of respiratory protection equipment. This training shall be completed prior to entering the H_2S location. Visitors shall also be instructed regarding these matters.

To promote efficient safety procedures, an on-site toxic gas safety program, which includes **a drill** and training session, shall be established for all crews. Records of attendance shall be maintained on the drilling facility.

EQUIPMENT AND MATERIAL SPECIFICATIONS

1. Wellhead and blowout equipment is to conform as per Operations Plan.

2. BOP equipment will be tested to pressure rating prior to drilling out from the surface casing, with all testing witnessed and recorded by the ConocoPhillips Onsite Supervisor.

3. The BOP will be operationally tested on every trip. ***BOP drills will be held each tour prior to drilling all potential H_2S bearing formations and recorded on the tour sheets.***

4. The casing planned for this well is listed in the Operations' Plan. If H2S levels warrant as such, this casing has been designed in accordance with ConocoPhillips' requirements for sour service.

Mud Requirements

1. The pH of the mud system will be maintained above 9.0 to neutralize (disassociate) any H_2S encountered. The pH will be maintained with Lime, no caustic soda and/or soda ash will be kept on location.

2. While drilling from all potential H_2S bearing formations to total depth, the Mud Engineer is to test daily for filtrate sulfide using a "Hach H_2S Test Kit" and following the procedures of API Standard RP13B (copy in a following section). The results of this test are to be reported on the daily report.

3. Small concentrations of sulfide are expected and can be tolerated. However, concentrations which result in "Hach Tests" of greater than **50 ppm** are potentially more serious and should be treated with H_2S scavenger to reduce the concentration of acceptable levels.

4. The Hach Test will be routinely "doubled-checked" by means of the Garrett Gas Train.

5. Prior to dumping any significant quantities of drilling fluid (changing over, cleaning pits, cementing, etc.), it may be necessary to treat out sulfides with H_2S scavenger in order to preclude formation of H_2S gas in the reserve pit.

ConocoPhillips
H_2S CONTINGENCY EQUIPMENT CHECKLIST

Well: Ute Mountain Ute #106 Rig N/N: _____

Date: _____ Supervisor: _____

_____(All) **Personnel must be H_2S trained** & provide record of training (cards, certificates, etc.)
_____(2) **Muster Points** for use as "Safe Briefing Areas", 150' from wellhead, and 160° apart.
_____(1) **Warning sign** with current well condition indicator (yellow, orange, red flags), located at last intersection to location so vehicles may have turn-around area.
_____(3) **Wind direction indicators,** located to provide visibility from any place on location.
_____(3) **No Smoking signs** on drive posts.
_____(3) **Safe Briefing Area signs** on drive posts.
_____(1)) **H_2S monitor & Alarm system** (continuous) located on rig floor with detectors (sensitivity of 5 ppm in air) located at the flow line, mud pits discharge, and on the rig floor capable of individual activation by any detector with maximum settings as follows: visual and audible alarms at 10 ppm (audible must be capable of alerting personnel at any point on location).
_____(5) **Escape Packs** for individual use of each rig floor hand, located at dog house.
_____(1) **Flare system** with continuous pilot and remote ignitor.
_____(1) **Fire extinguisher** (rated 60:BC).
_____(4) **Emergency telephone number lists,** as shown in "COP Emergency Response Plan" folder, located in doghouse, company man's trailer, and both safe briefing areas.
_____(*) **Single Gas Personal Monitor** for all personal on location.

EFFECTS OF HYDROGEN SULFIDE AND OTHER GASSES ON DRILLING OPERATIONS

Toxic Effect

1. Hydrogen Sulfide - H_2S

Hydrogen sulfide is a colorless, flammable, extremely poisonous gas. It is 1.2 times as heavy as air and will accumulate in low areas. It forms an explosive mixture with air between 4.3 and 46.0 percent by volume. It can be detected by smell at a concentration in air of only 0.02 ppm. Exposure to 10 ppm can be tolerated up to 8 hours without respiratory equipment. Respiratory equipment is required to protect workers should conditions exceed the foregoing allowable exposure limit. Concentrations in excess of 20 ppm have an effect on the olfactory nerve which deadens the sense of smell. Unconsciousness can occur without warning within seconds of inhalation at concentrations above 500 ppm.

Physical Effects of Hydrogen Sulfide

Concentration Percent (%)	ppm	Physical Effects
0.001	10	Obvious and unpleasant odor.
0.001	10	Current ACGIH TLV allowed for 8 hour exposure.
0.01	100	Kills smell in 3 to 15 minutes, may sting eyes & throat.
0.02	200	Kills smell shortly, stings eyes & throat.
0.05	500	Dizziness, breathing ceases in a few minutes. Needs prompt artificial respiration.
0.07	700	Unconscious quickly; death will result if not rescued promptly.
0.10	1000	Unconscious at once; followed by death within minutes.

2. Sulfur Dioxide - SO_2

Sulfur dioxide is a colorless, nonflammable, intensely irritating gas and 2.2 times heavier than air. It is a by-product of combustion of hydrogen sulfide and is highly toxic. Exposure to 2 ppm can be tolerated for a maximum of 8 hrs. Respiratory equipment will be available and should be used by personnel measuring SO_2 concentration downwind from a flare.

3. Methane - CH_4

Methane is the major component of natural gas and is colorless, odorless and extremely flammable. The chief danger from methane is explosion. Mixture of CO_2, H_2S and CH_4 will burn if the total H_2S and CH_4 content, in any ratio, is above 25 percent. Also the presence of methane causes an oxygen deficient environment and requires adequate ventilation for breathing.

5. Carbon Monoxide - CO

Carbon monoxide is a colorless, odorless toxic gas. Its toxicity results from preferential reaction with the hemoglobin in the blood; however, it has no unique toxic action on any of the bodily tissues. CO displaces oxygen from hemoglobin and reduces the oxygen carrying capability of the blood.

The primary danger from CO is that it binds with hemoglobin within the blood, thereby preventing oxygen / blood transfer. Respiratory equipment should be considered for atmospheres containing greater than 25 ppm. Exposure to 25 ppm is allowed up to 8 hours; however, at higher levels it will tend to cause headaches, dizziness and nausea. Concentrations above 1200 ppm are considered immediately dangerous to life and health.

In addition to the toxic effects of CO, carbon monoxide burns readily in air. The flammability limits of CO in air change with pressure. At atmospheric pressure, however, the lower limit is ±12.5% and upper limit is ±74%.

6. Properties of Various Gasses

Common Name & Chemical Formula	Specific Gravity Air=1	Time Weighted Average*	IDLH**	Lethal Concentration***	Flammability
Hydrogen Sulfide (H_2S)	1.18	10 ppm	100 ppm	600 ppm	4.3% to 46% by volume in air
Sulfur Dioxide (SO_2)	2.21	2 ppm	---	1000 ppm	
Methane (CH_4)	0.55	Simple Asphyxiate	---	--------	5.3% to 14.0% by volume in air
Carbon Monoxide (CO)	0.97	25 ppm	1200 ppm	--------	12.5% to 74% by volume in air

* Time Weighted Average (TWA) - Employee's average exposure in any eight-hour work, of a 40-hour work week that shall not be exceeded.

** Hazardous - Concentration that may cause death.

*** Lethal - Concentration that will cause death with short term exposure.

CORROSION EFFECTS OF H2S ON STEEL

1. Hydrogen Sulfide (H_2S)

The three forms of hydrogen sulfide corrosion of steel are as follows:
(a) general or weight loss,
(b) localized or pitting, and
(c) sulfide stress cracking.

In both general and localized corrosion, hydrogen sulfide reacts with the steel to produce iron sulfide. General corrosion is characterized by the formation of an iron sulfide film on the surface of the steel. After long periods of exposure, weight loss can lead to a significant reduction in strength. Localized corrosion is much more serious and predominantly occurs in the pH range below six. Chloride or similar ions must be present for pitting to occur. Iron chloride accumulates at the metal to iron sulfide film interface and promotes a localized attack. Pitting corrosion has not presented a significant problem in drilling operations.

Of foremost concern is sulfide stress cracking or hydrogen embrittlement where failure may take place without warning or significant metal loss. This problem is related to strength of the steel, hydrogen sulfide concentration, pH, exposure time, and temperature and stress level of the steel. Hydrogen sulfide absorbed on the metal surface promotes the entry of atomic hydrogen into the metal. The atomic hydrogen that enters the steel matrix diffuses to positions of high stress where it can induce hydrogen embrittlement. Thus, brittle failure can occur at stress levels significantly less than normal yield stress. A high total dissolved sulfide concentration can be tolerated if the pH is high enough (9.5 or greater).

EFFECTS OF H_2S ON DRILLING FLUID

1. Hydrogen Sulfide - H_2S

When H_2S is entrained in a drilling fluid, it will disassociate to some degree depending on the pH of the system.

Undisassociated hydrogen sulfide is the molecule that attacks steel surfaces and causes corrosion and embrittlement. At a low pH, nearly all of the H_2S in a system is in this molecular state. With increasing pH, H_2S disassociation increases so that above pH 10, effectively all of the H_2S is disassociated into bisulfide and sulfide ions. These ions are relatively harmless in the mud as long as the high pH is maintained. If pH is lowered, the reaction will be reversed and hydrogen sulfide gas will be evolved.

In addition to sulfide ions, disassociation of H_2S in drilling mud produces hydrogen ions, which will react with hydroxyl ions in a high pH mud to form water. With sufficient H_2S contamination, excess lime, if any, can be depleted and pH will begin to drop. A sufficient decrease in pH will, as previously stated, evolve H_2S gas.

It is therefore desirable to know whether H_2S has been encountered at the least possible time. This can be accomplished by testing the mud for sulfide ions daily, as described in the sulfide testing procedures that follow (API RP 13B).

SULFIDE TESTING PROCEDURE
HACH TEST

PROCEDURE FOR ESTIMATING FILTRATE SULFIDE

Equipment: The following materials are required to estimate the sulfide concentration in the mud filtrate:

a. Special test vial with vented cap
b. Lead acetate test paper to fit cap
c. Color comparison chart

(NOTE: THE HACH HYDROGEN SULFIDE TEST KIT (MODEL HS-7) CONSISTS OF ITEMS a, b, and c ABOVE.)

d. Distilled water
e. Hypodermic syringe
f. Defoamer (such as octyl alcohol or sulfated castor oil)
g. 0.1N acid, sulfuric or hydrochloric

Procedure: Place one disk of dry lead acetate test paper inside the dry cap of the test vial.

Measure 2.5 cm3 of freshly collected mud filtrate into the test vial. Dilute to the 25 cm3 with distilled water.

Add 2 cm3 of 0.1N acid, immediately add a fresh seltzer tablet, and quickly place the cap with the test paper on the vial. Allow the seltzer tablet to dissolve and then wait one minute.

Remove lead acetate paper and observe for brown coloration. If no coloration can be detected, then report the soluble sulfide as zero. If brown coloration is present, compare the test paper with color comparison chart. Read the appropriate ppm value (0.1, 0.3, 0.5, 1, 2, or 5) from the color chart and multiply by 10 to obtain the test result (1, 3, 5, 10, 20, or 50).

If the test paper matches the darkest color (5 ppm) on the color chart, the test result must be interpreted as greater than 50 ppm.

To extend the test range to higher concentration, dilute the filtrate as follows:

a. For a test range of 10 to 500 ppm, dilute 1.0 cm3 of filtrate with 9.0 cm3 of distilled water. Use 2.5 cm3 of the diluted filtrate for the sulfide determination. Multiply the color chart value by 100 to obtain the test result.

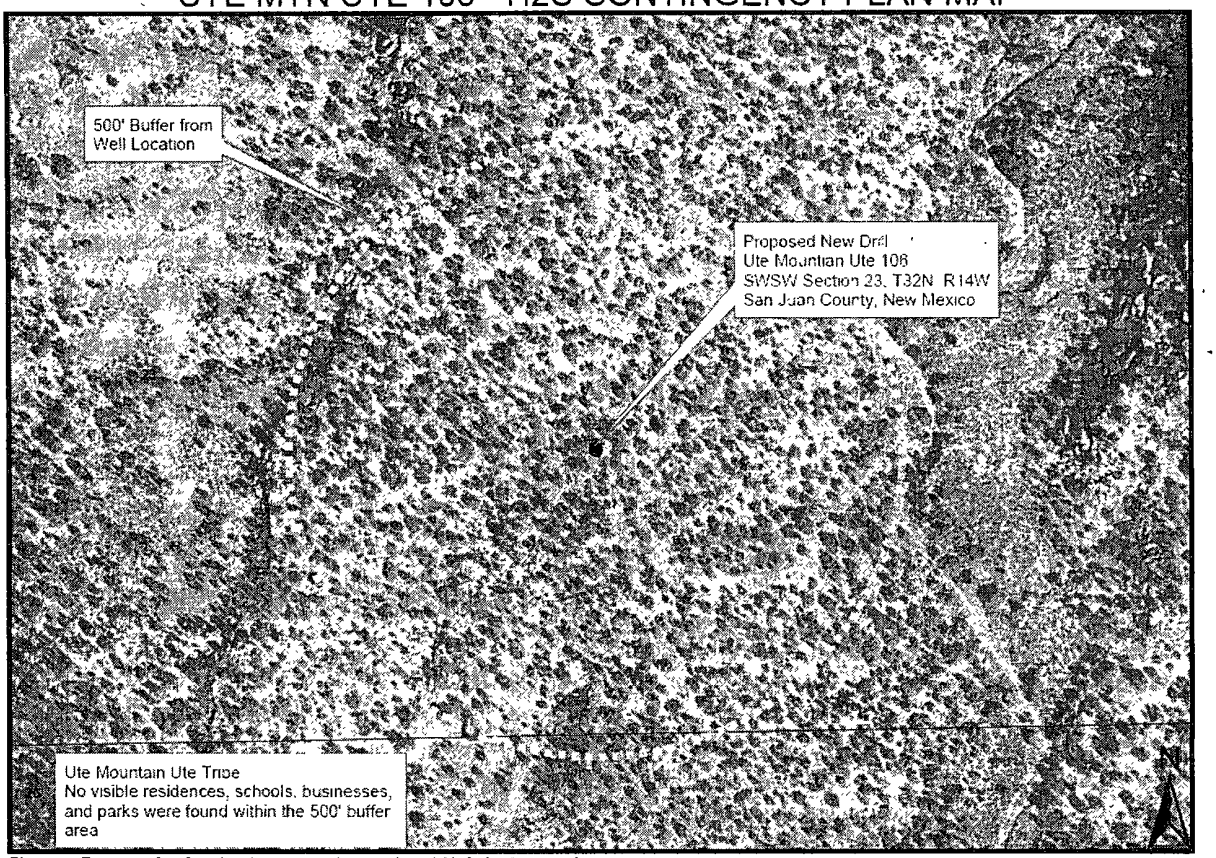
Report the test result as filtrate sulfide in ppm.

NOTE 1: **IT IS IMPORTANT TO NOTE THAT THIS TEST IS NOT HIGHLY ACCURATE. THE RESULTS SHOULD BE INTERPRETED AS ROUGH ESTIMATES.**

NOTE 2: **THE METHOD MAY BE USED FOR WATER USING 25 CM3 SAMPLES OR THE SAME DILUTION PROCEDURE USED FOR MULLED FILTRATE. THIS METHOD MAY ALSO BE USED FOR MUD BUT THE PROBABLE MEANING OF THE RESULTS IS VERY UNCERTAIN. THERE COULD ALSO BE CONSIDERABLE DIFFICULTY IN OBTAINING A REPRESENTATIVE SAMPLE OF DILUTED MUD.**

ATTACHMENTS

UTE MTN UTE 106 - H2S CONTINGENCY PLAN MAP



Disclaimer: This map is for informational purposes and may not be suitable for legal, engineering, or surveying purposes

Features were identified based on COP Aerial Photography. If an onsite is necessary, please contact PTRRC
S:\gsotrrc\New Mexico - ADM 095\H-2S Contingency Plan\Ute Mtn Ute 156-Ute Mtn Ute 106- H2S Contingency Plan Map
Elmo Seabolt 320-3602 or Maclovia Blakley 326-9705

1 inch equals 200 feet

0 100 200 400 Feet

LIST OF REFERENCES

1. "API Recommended Practices for Safe Drilling of Wells Containing Hydrogen Sulfide", (API RP 49) American Petroleum Institute, Dallas, Texas, 1974.

2. "API Recommended Practice: Standard Procedure for Testing Drilling Fluids", (API RP 13B) American Petroleum Institute, Dallas, Texas, 1976.

3. Clark, R. K., "Hydrogen Sulfide in Water-Base Drilling Fluids - I: Chemistry, Corrosion and Treatment", Technical Progress Report BRC 35-77, Shell Development, Houston, Texas, 1977.

4. "Contingency Plan for Drilling, Completion and Workover, Sour Gas Wells, Safety Regulations and Emergency Procedures", Shell Oil Company, Michigan Operations, Traverse City, Michigan, 1974.

5. "Contingency Plan for the Drilling of Taylor DT 653, Ventura Avenue Field, Ventura County, California; Safety Procedures and Precautionary measures", Shell Oil Company, West Coast Division, Los Angeles, California, 1973.

6. "Drilling Contingency Plan for McElmo Dome Area", Shell Oil Company, Midland Operations, Midland, Texas, 1976.

7. "Drilling Fluid Engineering Manual", Magcobar Operations, Dresser Industries Inc., Houston, Texas, 1972.

8. "Rule 36: Oil, Gas or Geothermal Resource Operation in Hydrogen Sulfide Areas", Railroad Commission of Texas, Oil and Gas Division, Austin, Texas, 1976, as amended effective September 15, 1985.

9. "Safe Practices for Drilling and Well Servicing Operations", Volumes I and II, Shell Oil company Exploration and Production.

10. "Sulfide Stress Cracking Resistant Metallic Material for Oil Field Equipment", NACE Standard MR-01-75, National Association of Corrosion Engineers, Katy, Texas, 1978.

11. "Onshore Order No. 6, Hydrogen Sulfide Operations", Department of the Interior, Bureau of Land Management, 43 CFR Part 3160.