

14-14

HOBBS OCD

Form 3160-3
(August 2007)

JAN 13 2014

RECEIVED

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

OCD Hobbs

Split Estate

FORM APPROVED
OMB No. 1004-0137
Expires July 31, 2010

5. Lease Serial No.
Face BLM 119277, St VB15060000

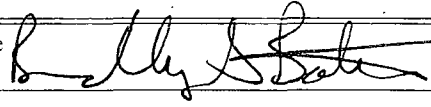
APPLICATION FOR PERMIT TO DRILL OR REENTER

1a. Type of work: ☒ DRILL ☐ REENTER		7. If Unit or CA Agreement, Name and No.
1b. Type of Well: ☒ Oil Well ☐ Gas Well ☐ Other ☒ Single Zone ☐ Multiple Zone		8. Lease Name and Well No. Battle Axe Federal Com #2H
2. Name of Operator ENDEAVOR ENERGY RESOURCES, L.P. <190595>		9. API Well No. 30-025-41370
3a. Address 110 N. Marienfeld, Suite 200 Midland, Texas 79701	3b. Phone No. (include area code) 432-685-1575	10. Field and Pool, or Exploratory WILDCAT G-09 S253335K; B5
4. Location of Well (Report location clearly and in accordance with any State requirements.)* At surface 2260' FNL & 380' FWL, SEC 2, 26S, 33E, UNIT E At proposed prod. zone 330' FNL & 380' FWL, SEC 35, 25S, 33E, UNIT D N/2Fee		11. Sec., T. R. M. or Blk. and Survey or Area Surface Location: Sec 36 T25S-R33E Bottom Hole: Sec 35 T25S-R33E
14. Distance in miles and direction from nearest town or post office* 26 Miles Southwest of Jal New Mexico		12. County or Parish Lea
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) 330' OL, 330' PP		13. State NM
16. No. of acres in lease 430 BLM 320, Fee 320, St 320		17. Spacing Unit dedicated to this well BLM 120, Fee 40, St 80
18. Distance from proposed location* to nearest well, drilling, completed, 1st Well applied for, on this lease, ft.		20. BLM/BIA Bond No. on file NMB 000846
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 3322' GL		22. Approximate date work will start* 09/20/2013
		23. Estimated duration 40 Days

24. Attachments

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

- | | |
|--|---|
| 1. Well plat certified by a registered surveyor. | 4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above). |
| 2. A Drilling Plan. | 5. Operator certification |
| 3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO must be filed with the appropriate Forest Service Office). | 6. Such other site specific information and/or plans as may be required by the BLM. |

25. Signature 	Name (Printed/Typed) Bradley S. Bates	Date 10/01/2013
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Title Petroleum Engineer

Approved by (Signature) /s/ STEPHEN J. CAFFEY	Name (Printed/Typed)	Date JAN - 9 2014
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Title FIELD MANAGER	Office CARLSBAD FIELD OFFICE
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Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.
Conditions of approval, if any, are attached.

APPROVAL FOR TWO YEARS

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Continued on page 2)

*(Instructions on page 2)

Carlsbad Controlled Water Basin

KZ
01/14/14

SEE ATTACHED FOR
CONDITIONS OF APPROVAL

Approval Subject to General Requirements
& Special Stipulations Attached

JAN 15 2014

bn

ENDEAVOR ENERGY RESOURCES, L.P.**Battle Axe Federal Com #2H**

API# 30-025-41370

Drilling Plan

Driving Directions: Beginning in Jal at the intersection of State Hwy 18 and State Hwy 128, go west on State Hwy 128 for 14.1 miles, turn left on County Road 2 (AKA Battle Axe Road) and head southwest for 13.5 miles, then turn left on Dinwiddie Road west for 200 yards, then north go 1/8 mile to Battle Axe #2H well on the left.

Surface Location: 2260 ft from N line & 380 ft from W line (UL "E") of Sec. 2, T-26S, R-33E, Lea Co., New Mexico

Elevation: 3322 ft GL, 3345 ft KB elevation (23 ft RKB).

FORMATION TOPS AND ANTICIPATED FRESH WATER, OIL OR GAS:

No other Formations are expected to give up oil, gas or fresh water in measurable quantities. Surface fresh water sands will be protected by setting 13-3/8" casing at ± 950 and circulating cement back to surface.

Formation	Top	Base	Comments
Upper Permian Sands	0	400	Fresh Water
Rustler anhydrite	920		
Surface casing point	± 950		
Salt	~ 1120		
Lamar Lime	~ 4800		
9-5/8" casing point	± 4900		
Bell Canyon	5016		
Cherry Canyon	6250		Oil
Brushy Canyon	7875		Oil
Bone Spring lime	9336		
1 st Bone Spring sand	10,100		Oil
2 nd Bone Spring sand	10,660		Oil
H_z Target	10,850		Oil
3 rd Bone Spring sand	11,745		Oil
Wolfcamp	12,200		Oil & gas
Pilot Hole TD	12,250		

ENDEAVOR ENERGY RESOURCES, L.P.

Battle Axe Federal Com #2H

API# 30-025-41370

CASING PROGRAM: All casing will be NEW.

See
CORA

Hole	Depth	Casing	Wt	Grade	Conn.	Collapse Force	SF Collapse ≥1.125	SF Burst ≥1.0	SF Tension ≥1.6 dry ≥1.8 buoy
26+	40' + GL	20							
17-1/2"	0 - 950' (b50)	13-3/8"	48	H40	ST&C	445 psi (9.0 MW)	740 (1.67)	3.50 (10.0 MW)	7.1 dry 8.2 buoy

Prior to drill-out: 1210 psi CIT (70% of burst). Drill out w/ 10# brine (no FIT necessary).

12-1/4"	0 - 4300' 4300' - 4990' Sec	9-5/8" 9-5/8"	40 40	J55 HCK-55	ST&C ST&C	2236 psi 2548 psi (10.0 MW)	2570 (1.15) 4230 (1.66)	1.67 (9.3 MW)	2.31 dry 2.72 buoy (10#)
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HCK-55 below 4300' to maintain >1.125 min SF collapse. (4230 psi collapse rating)

8-3/4"	0 - 10,135'	5 1/2"	17	P110	UltraDQX			1.25 (8500 psi max on frac job)	2.96 dry 3.43 buoy (9.0 MW) (UltraDQX = 545.9k yield)
8-1/2"	10,135 - 17,739' (10,850' TVD)	5 1/2"	17	P110	UltraFJ	5360 psi (9.5 MW 10,850' TVD)	7480 (1.40)		*See spec sheet

UltraDQX above KOP (10,135') and UltraFJ below KOP to PBHL.

CEMENTING PROGRAM:

20" Conductor:

- Cement to surface with Redi-Mix cement

13-3/8" Surface Casing: (annular volume = 0.6947 cu ft/ft)

- Lead cement: 430 sx 15/85/4 Poz/C/gel + 2% CaCl₂ + 4 pps kolite/gilsonite/phenoseal (13.5 ppg, 1.69 cu ft/sk, 727 cu ft of slurry)
 - Circulate cement to surface with 50% excess
- Tail cement: 200 sx C + 2% CaCl₂ (14.8 ppg, 1.34 cu ft/sk, 268 cu ft of slurry)
 - Interval: 950' shoe to 693 ft (calculated with 50% excess)
 - WOC time prior to drill-out: 500 psi compressive strength in 6.5 hr.

9-5/8" Intermediate Casing: (annular volume = 0.3132 cu ft/ft)

- Lead cement: 940 sx 35/65/6 Poz/C/gel + 5% BWOW salt (12.6 ppg, 2.08 cu ft/sk, 1955 cu ft of slurry)
 - Interval: 4333' to surface (calc. with 50% excess in open hole)
- Tail cement: 200 sx C + (0-1% CaCl₂) (14.8 ppg, 1.32 cu ft/sk, 264 cu ft of slurry)
 - Interval: 4900' shoe to 4338 ft (calc. with 50% excess)
 - Est BHST = 114°F
 - WOC time prior to drill-out: 500 psi compressive strength in 6 hr

Pilot Hole Plugback: Hole volume: 8-3/4" = 0.4176 cu ft/ft

- 1150 sx H + 0.02 gps D206 AF + 0.06 gps D080 dispersant + 0.085 gps D197 Retarder (may adjust for TT). (17.5 ppg, 0.98 cu ft/sk)
 - Interval: 12,250' (Pilot Hole TD) - 10,000' (calculated with 20% excess). Will adjust volume to log caliper + 10% excess. Cement will be dressed to 100' short of KOP, then sidetrack operations will begin.
 - Cementers may spot this plug in multiple stages to prevent differential sticking of the DP.
 - Est BHST = 178°F BHST at 12,250'

ENDEAVOR ENERGY RESOURCES, L.P.

Battle Axe Federal Com #2H

API# 30-025-41370

CEMENTING PROGRAM (cont.):

5-1/2" Production Casing: annular volume: 8-1/2" = 0.2291 cu ft/ft

8-3/4" = 0.2526 cu ft/ft

- Lead cement: 890 sx 50/50/10 Poz/H/gel + 5% BWOW salt + 4 pps kolite/gilsonite/phenoseal (11.8 ppg, 2.54 cu ft/sk, 739 cu ft of slurry, 14.904 gal/sk). *See COA*
 - Interval: 11,260 ft MD (EOC) to ~~4400'~~ (calc. with 30% excess) *→ TOC*
- Tail cement: 1525 sx 50/50/2 Poz/H/gel + 5% BWOW salt (14.4 ppg, 1.33 cu ft/sk, 5.989 gal/sk).
 - Interval: 17,739 ft MD (shoe) to 11,260 ft MD (EOC), calc. with 30% excess)
 - Est BHST = 167°F
 - ~~WOC time prior to drill-out. N/A~~

BOP'S & TESTING:

Annular preventer will be functioned at least weekly. Rams will be functioned on each trip (not more than once per day). BOP drills will be performed weekly with each crew.

13-5/8" 5M double ram hydraulic BOP. Dress BOP with pipe rams and blind rams. Test rams as follows:

Prior to drilling out below 13-3/8" casing

BOP test: Rams 2,000 / 250 psi w/test plug
Annular 1,000 / 250 psi

CIT: 1,210 psi (70% of burst)

Drill out w/10# brine (no FIT)

Prior to drilling out 9-5/8" casing

BOP test: Rams 5,000/250 psi w/test plug
Annular 2,500/250 psi

CIT: 1,500 psi

Drill out w/fresh water 20' below shoe and perform FIT to 9.5 ppg equiv (± 280 psi)

ENDEAVOR ENERGY RESOURCES, L.P.

Battle Axe Federal Com #2H

API# 30-025-41370

MUD PROGRAM:

No reserve pit will be utilized during drilling of this well. All drill cuttings will be hauled off for disposal. Sufficient mud materials will be kept on location at all times to control lost circulation or unexpected kicks. Mud levels will be monitored both visually and by mechanical floats with electronic alarms.

*See
COA*

Depth	Hole	MW	Vis.	WL	Synopsis
Surf - 950 <i>1050</i>	17-1/2"	8.4-9.0	28-34	N/C	Fresh water, add vis w/ fresh gel.
950 - 4900' <i>5000</i>	12-1/4"	10	28-32	N/C	Brine water. Add vis with salt gel.
4900 - 12,250' Pilot Hole TD	8-3/4"	8.4 - 9.3	28	N/C	Drill out with fresh water. Raise weight with brine.
10,135 (KOP) - 17,739 MD (PBHL)	8-3/4" 8-1/2"	9.0 - 9.5	28-40	N/C	Cut brine. Add XC polymer for hole cleaning (as req'd).

DIRECTIONAL PLAN: Preliminary planning depths

Critical Point	Hole Size	MD	Incl.	Az.	TVD	VS	Build Rate	Comments
KOP	8-3/4"	10,134			10,134			
End of Curve	8-3/4"	11,259	90		10,850	716	8	Build curve w/ motor.
PBHL	8-1/2"	17,739	90		10,850	7196		330 ft from N line

LOGGING / TESTING:

17-1/2" surface hole (0-950'): None

12-1/4" hole (950-4900'): None

8-3/4" hole (4900-12,250'): Triple combo 12,250' - 4900', gamma ray & neutron to surface

DST's: None.

*See
COA*

ABNORMAL CONDITIONS, PRESSURES, TEMPERATURES AND POTENTIAL HAZARDS:

The estimated bottom-hole temperature (BHT) at TD is 178 degrees F with an estimated maximum bottom-hole pressure (BHP) at TD of 5925 psig. No hydrogen sulfide or other hazardous gases or fluids have been encountered, reported or are known to exist at this depth in this area. No major loss circulation zones have been reported in offsetting wells.

ANTICIPATED STARTING DATE AND DURATION OF OPERATIONS:

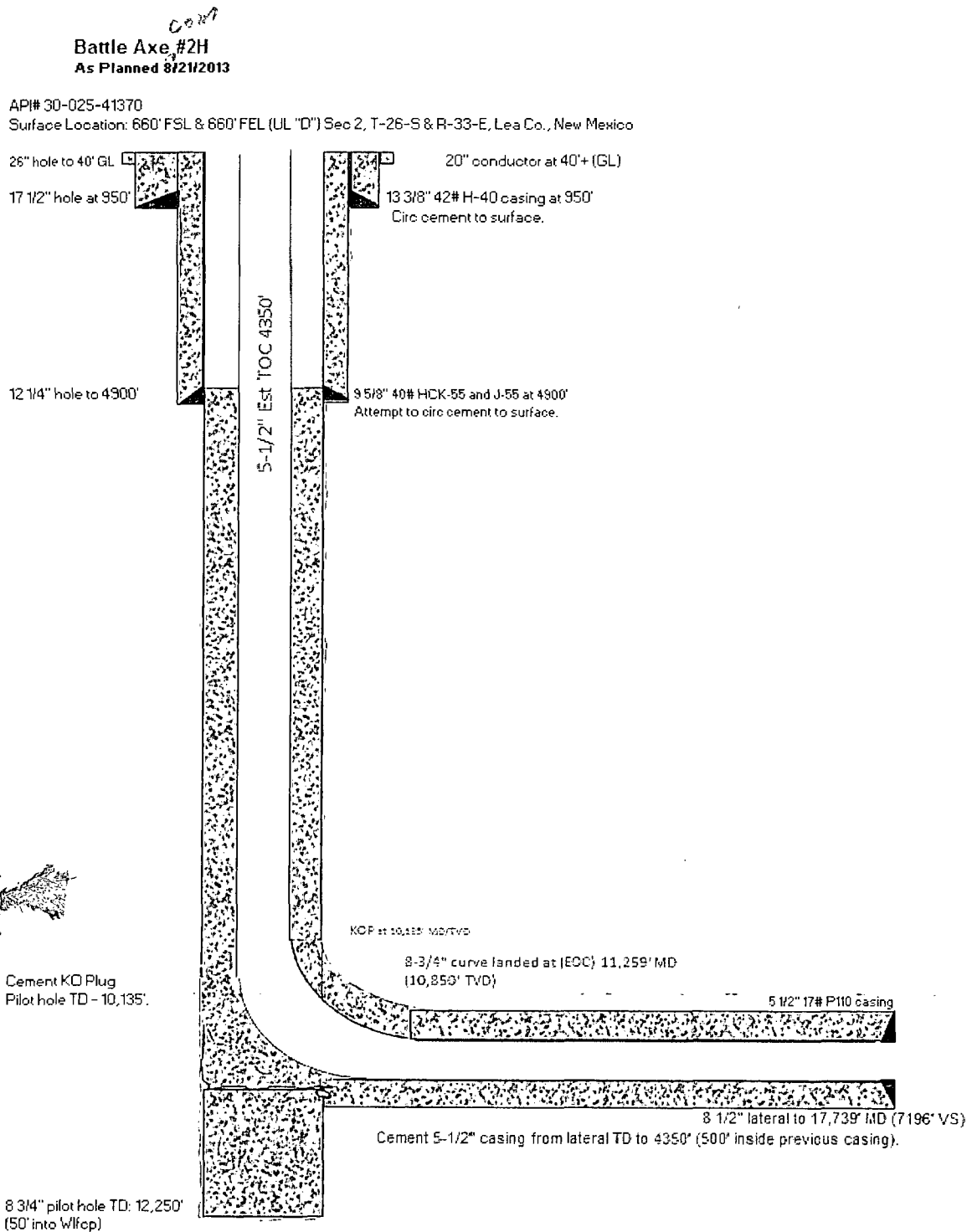
The drilling operation should be finished in approximately 40 days. If the well is productive, an additional 60-90 days will be required for completion and testing before a decision is made to install permanent facilities.

ENDEAVOR ENERGY RESOURCES, L.P.

Battle Axe Federal Com #2H

API# 30-025-41370

PROPOSED WELLBORE:



WELL:	Battle Axe Fed Com 2H	FIELD:	Lea County, NM (NAD 83)	STRUCTURE:	Big Dog 20
Mapsheet Parameters:		Surface Location:		Mapsheet:	
Model: BIGDOG 2012	Dip: 59.945°	Lat: N 32 4 24.708	NAD83 New Mexico State Plane, Eastern Zone, US Feet	Stat: Battle Axe Fed Com 2H	TVD Ref: WKB13145 (above MSL)
Mag Dec: 7.391°	Date: September 25, 2013	Long: W 103 35 1.534	Northing: 391367.40 NUS	Plan: ST01 Rev0 mcs 25Sep13	Srvy Name: September 25, 2013
			Grid Conv: 0.416°		
			Scale Feet: 9.9997544		

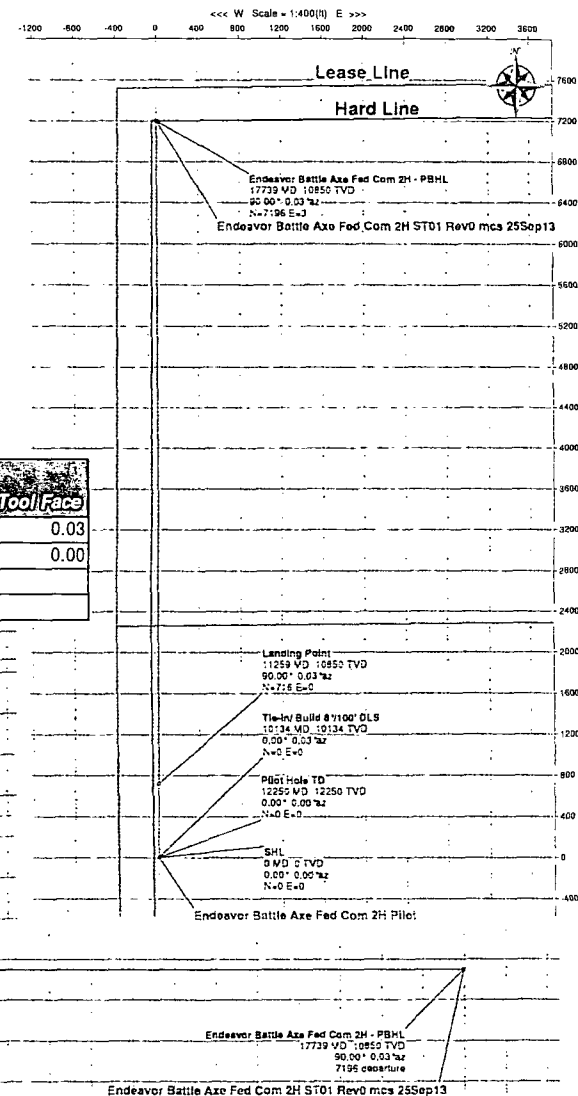
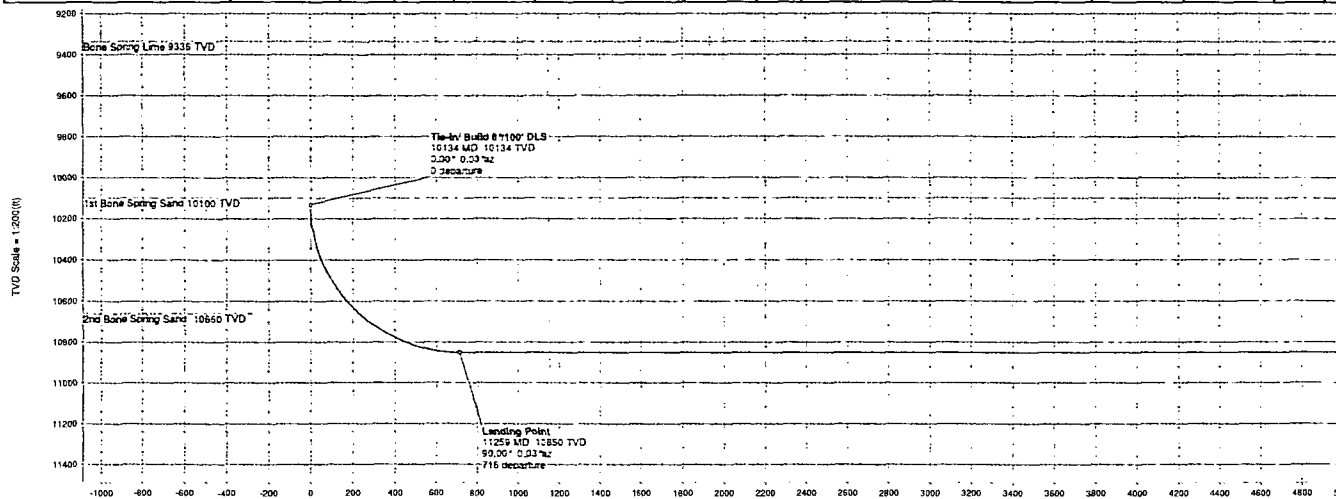
Legend

Endeavor Battle Axe Fed Com 2H - 2nd Bone Spring Sand 10850 TVD
Endeavor Battle Axe Fed Com 2H - 1st Bone Spring Sand 10134 TVD
Endeavor Battle Axe Fed Com 2H - 1st Bone Spring Sand 10134 TVD
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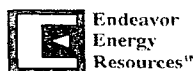
Grid North
Tot Corr (M->G 6.9756°)
Mag Dec (7.391°)
Grid Conv (0.416°)

Critical Points

Comments	Survey MD	Inc	Azim	TVD	SSTVD	VS	NS	EW	Longitude	Latitude	Easting	Northing	DLS	Tool/Face
SHL	0.00	0.00	0.00	0.00	-3345.00	0.00	0.00	0.00	N 32 4 24.708 W 103 33 1.534	783838.80	391367.40		0.03	
Tie-In/ Build 8"100' DLS	10133.80	0.00	0.03	10133.80	6788.80	0.00	0.00	0.00	N 32 4 24.708 W 103 33 1.534	783838.80	391367.40	0.00	0.00	
Landing Point	11258.80	90.00	0.03	10850.00	7505.00	716.20	716.20	0.34	N 32 4 31.795 W 103 33 1.470	783839.14	392083.58	8.00		
PBHL	17738.79	90.00	0.03	10850.00	7505.00	7196.18	7196.18	3.40	N 32 5 35.915 W 103 33 0.888	783842.20	398563.40	0.00		



Drawn By: MShaffer
Date Created: September 25, 2013 12:45:00 PM
Checked By:
Checked Date:
Approved By:
Approved Date:



Endeavor Battle Axe Fed Com 2H ST01 Rev0 mcs 25Sep13 Proposal Geodetic Report



Report Date:	September 25, 2013 - 12:18 PM	Survey / DLS Computation:	Minimum Curvature / Lubinski
Client:	Endeavor	Vertical Section Azimuth:	0.000 ° (Grid North)
Field:	NM Lea County (NAD 83)	Vertical Section Origin:	0.000 ft, 0.000 ft
Structure / Slot:	Endeavor Battle Axe Fed Com 2H / Endeavor Battle Axe Fed Com 2H	TVD Reference Datum:	RKB
Well:	Endeavor Battle Axe Fed Com 2H	TVD Reference Elevation:	3345.000 ft above MSL
Borehole:	ST01	Seabed / Ground Elevation:	3322.000 ft above MSL
UWI / API#:	Big Dog 20 / Unknown	Magnetic Declination:	7.391 °
Survey Name:	Endeavor Battle Axe Fed Com 2H ST01 Rev0 mcs 25Sep13	Total Gravity Field Strength:	998.4819mgn (9.80665 Based)
Survey Date:	September 25, 2013	Total Magnetic Field Strength:	48263.382 nT
Tort / AHD / DDI / ERD Ratio:	90.000 ° / 7196.185 ft / 6.025 / 0.663	Magnetic Dip Angle:	59.945 °
Coordinate Reference System:	NAD83 New Mexico State Plane, Eastern Zone, US Feet	Declination Date:	September 25, 2013
Location Lat / Long:	N 32° 4' 24.70837", W 103° 33' 1.53437"	Magnetic Declination Model:	BGGM 2012
Location Grid N/E Y/X:	N 391367.400 ftUS, E 783838.800 ftUS	North Reference:	Grid North
CRS Grid Convergence Angle:	0.4157 °	Grid Convergence Used:	0.4157 °
Grid Scale Factor:	0.99997644	Total Corr Mag North->Grid North:	6.9756 °
		Local Coord Referenced To:	Structure Reference Point

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
Upper Permian Sand Base	400.00	0.00	0.03	400.00	-2945.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
Rustler Anhydrite	920.00	0.00	0.03	920.00	-2425.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
Surface Csq	950.00	0.00	0.03	950.00	-2395.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
Salt	1120.00	0.00	0.03	1120.00	-2225.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
Lamar Lime	4800.00	0.00	0.03	4800.00	1455.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
9 5/8" Csq	4900.00	0.00	0.03	4900.00	1555.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
Bell Canyon	5016.00	0.00	0.03	5016.00	1671.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
Cherry Canyon	6250.00	0.00	0.03	6250.00	2905.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
Brushy Canyon	7875.00	0.00	0.03	7875.00	4530.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
Bone Spring Lime	9336.00	0.00	0.03	9336.00	5991.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
1st Bone Spring Sand	10100.00	0.00	0.03	10100.00	6755.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
Tie-In/ Build 8"/100' DLS	10133.80	0.00	0.03	10133.80	6788.80	0.00	0.00	0.00	N/A	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
2nd Bone Spring Sand	10724.84	47.28	0.03	10660.00	7315.00	230.35	230.35	0.11	8.00	391597.74	783838.91	N 32 4 26.99	W 103 33 1.51
Landing Point	11258.80	90.00	0.03	10850.00	7505.00	716.20	716.20	0.34	8.00	392083.58	783839.14	N 32 4 31.80	W 103 33 1.47
Endeavor Battle Axe Fed Com 2H - PBHL	17738.79	90.00	0.03	10850.00	7505.00	7196.18	7196.18	3.40	0.00	398563.40	783842.20	N 32 5 35.92	W 103 33 0.89

Survey Type: Def Plan

Survey Error Model: ISCWSA Rev 0 *** 3-D 95.000% Confidence 2.7955 sigma
Survey Program:

Description	MD From (ft)	MD To (ft)	EOU Freq (ft)	Hole Size (in)	Casing Diameter (in)	Survey Tool Type	Borehole / Survey
	0.000	23.000	1/100.000	30.000	30.000	SLB_MWD-STD-Depth Only	Pilot / Endeavor Battle Axe Fed Com 2H Pilot Rev0 mcs 25Sep13
	23.000	10133.800	1/100.000	30.000	30.000	SLB_MWD-STD	Pilot / Endeavor Battle Axe Fed Com 2H Pilot Rev0 mcs 25Sep13
	10133.800	17738.787	1/100.000	30.000	30.000	SLB_MWD-STD	ST01 / Endeavor Battle Axe Fed Com 2H ST01 Rev0 mcs



Endeavor Battle Axe Fed Com 2H ST01 Rev0 mcs 25Sep13 Proposal Geodetic Report (Def Plan)



Report Date:	September 25, 2013 - 12:21 PM	Survey / DLS Computation:	Minimum Curvature / Lubinski
Client:	Endeavor	Vertical Section Azimuth:	0.000 ° (Grid North)
Field:	NM Lea County (NAD 83)	Vertical Section Origin:	0.000 ft, 0.000 ft
Structure / Slot:	Endeavor Battle Axe Fed Com 2H / Endeavor Battle Axe Fed Com 2H	TVD Reference Datum:	RKB
Well:	Endeavor Battle Axe Fed Com 2H	TVD Reference Elevation:	3345.000 ft above MSL
Borehole:	ST01	Seabed / Ground Elevation:	3322.000 ft above MSL
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Survey Name:	Endeavor Battle Axe Fed Com 2H ST01 Rev0 mcs 25Sep13	Total Gravity Field Strength:	998.4819mgm (9.80665 Based)
Survey Date:	September 25, 2013	Total Magnetic Field Strength:	48263.382 nT
Tort / AHD / DDI / ERD Ratio:	90.000 ° / 7196.185 ft / 6.025 / 0.663	Magnetic Dip Angle:	59.945 °
Coordinate Reference System:	NAD83 New Mexico State Plane, Eastern Zone, US Feet	Declination Date:	September 25, 2013
Location Lat / Long:	N 32° 4' 24.70837", W 103° 33' 1.53437"	Magnetic Declination Model:	BGGM 2012
Location Grid N/E Y/X:	N 391367.400 ftUS, E 783838.800 ftUS	North Reference:	Grid North
CRS Grid Convergence Angle:	0.4157 °	Grid Convergence Used:	0.4157 °
Grid Scale Factor:	0.99997644	Total Corr Mag North->Grid North:	6.9756 °
		Local Coord Referenced To:	Structure Reference Point

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS ("/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
SHL	0.00	0.00	0.00	0.00	-3345.00	0.00	0.00	0.00	N/A	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	100.00	0.00	0.03	100.00	-3245.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	200.00	0.00	0.03	200.00	-3145.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	300.00	0.00	0.03	300.00	-3045.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
Upper Permian Sand Base	400.00	0.00	0.03	400.00	-2945.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	500.00	0.00	0.03	500.00	-2845.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	600.00	0.00	0.03	600.00	-2745.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	700.00	0.00	0.03	700.00	-2645.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	800.00	0.00	0.03	800.00	-2545.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	900.00	0.00	0.03	900.00	-2445.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
Rustler Anhydrite	920.00	0.00	0.03	920.00	-2425.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
Surface Csq	950.00	0.00	0.03	950.00	-2395.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	1000.00	0.00	0.03	1000.00	-2345.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	1100.00	0.00	0.03	1100.00	-2245.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
Salt	1120.00	0.00	0.03	1120.00	-2225.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	1200.00	0.00	0.03	1200.00	-2145.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	1300.00	0.00	0.03	1300.00	-2045.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	1400.00	0.00	0.03	1400.00	-1945.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	1500.00	0.00	0.03	1500.00	-1845.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	1600.00	0.00	0.03	1600.00	-1745.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	1700.00	0.00	0.03	1700.00	-1645.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	1800.00	0.00	0.03	1800.00	-1545.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	1900.00	0.00	0.03	1900.00	-1445.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	2000.00	0.00	0.03	2000.00	-1345.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	2100.00	0.00	0.03	2100.00	-1245.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	2200.00	0.00	0.03	2200.00	-1145.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	2300.00	0.00	0.03	2300.00	-1045.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	2400.00	0.00	0.03	2400.00	-945.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	2500.00	0.00	0.03	2500.00	-845.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	2600.00	0.00	0.03	2600.00	-745.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	2700.00	0.00	0.03	2700.00	-645.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	2800.00	0.00	0.03	2800.00	-545.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
	2900.00	0.00	0.03	2900.00	-445.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	3000.00	0.00	0.03	3000.00	-345.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	3100.00	0.00	0.03	3100.00	-245.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	3200.00	0.00	0.03	3200.00	-145.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	3300.00	0.00	0.03	3300.00	-45.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	3400.00	0.00	0.03	3400.00	55.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	3500.00	0.00	0.03	3500.00	155.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	3600.00	0.00	0.03	3600.00	255.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	3700.00	0.00	0.03	3700.00	355.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	3800.00	0.00	0.03	3800.00	455.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	3900.00	0.00	0.03	3900.00	555.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	4000.00	0.00	0.03	4000.00	655.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	4100.00	0.00	0.03	4100.00	755.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	4200.00	0.00	0.03	4200.00	855.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	4300.00	0.00	0.03	4300.00	955.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	4400.00	0.00	0.03	4400.00	1055.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	4500.00	0.00	0.03	4500.00	1155.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	4600.00	0.00	0.03	4600.00	1255.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	4700.00	0.00	0.03	4700.00	1355.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
Lamar Lime	4800.00	0.00	0.03	4800.00	1455.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
9 5/8" Csg	4900.00	0.00	0.03	4900.00	1555.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	5000.00	0.00	0.03	5000.00	1655.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
Bell Canyon	5016.00	0.00	0.03	5016.00	1671.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	5100.00	0.00	0.03	5100.00	1755.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	5200.00	0.00	0.03	5200.00	1855.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	5300.00	0.00	0.03	5300.00	1955.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	5400.00	0.00	0.03	5400.00	2055.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	5500.00	0.00	0.03	5500.00	2155.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	5600.00	0.00	0.03	5600.00	2255.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	5700.00	0.00	0.03	5700.00	2355.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	5800.00	0.00	0.03	5800.00	2455.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	5900.00	0.00	0.03	5900.00	2555.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	6000.00	0.00	0.03	6000.00	2655.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	6100.00	0.00	0.03	6100.00	2755.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
Cherry Canyon	6200.00	0.00	0.03	6200.00	2855.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	6250.00	0.00	0.03	6250.00	2905.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	6300.00	0.00	0.03	6300.00	2955.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	6400.00	0.00	0.03	6400.00	3055.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	6500.00	0.00	0.03	6500.00	3155.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	6600.00	0.00	0.03	6600.00	3255.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	6700.00	0.00	0.03	6700.00	3355.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	6800.00	0.00	0.03	6800.00	3455.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	6900.00	0.00	0.03	6900.00	3555.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	7000.00	0.00	0.03	7000.00	3655.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	7100.00	0.00	0.03	7100.00	3755.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	7200.00	0.00	0.03	7200.00	3855.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	7300.00	0.00	0.03	7300.00	3955.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	7400.00	0.00	0.03	7400.00	4055.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	7500.00	0.00	0.03	7500.00	4155.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	7600.00	0.00	0.03	7600.00	4255.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	7700.00	0.00	0.03	7700.00	4355.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
Brushy Canyon	7800.00	0.00	0.03	7800.00	4455.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	7875.00	0.00	0.03	7875.00	4530.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	7900.00	0.00	0.03	7900.00	4555.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	8000.00	0.00	0.03	8000.00	4655.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	8100.00	0.00	0.03	8100.00	4755.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	8200.00	0.00	0.03	8200.00	4855.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
	8300.00	0.00	0.03	8300.00	4955.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	8400.00	0.00	0.03	8400.00	5055.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	8500.00	0.00	0.03	8500.00	5155.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	8600.00	0.00	0.03	8600.00	5255.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	8700.00	0.00	0.03	8700.00	5355.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	8800.00	0.00	0.03	8800.00	5455.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	8900.00	0.00	0.03	8900.00	5555.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	9000.00	0.00	0.03	9000.00	5655.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	9100.00	0.00	0.03	9100.00	5755.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	9200.00	0.00	0.03	9200.00	5855.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	9300.00	0.00	0.03	9300.00	5955.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
Bone Spring Lime	9336.00	0.00	0.03	9336.00	5991.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	9400.00	0.00	0.03	9400.00	6055.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	9500.00	0.00	0.03	9500.00	6155.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	9600.00	0.00	0.03	9600.00	6255.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	9700.00	0.00	0.03	9700.00	6355.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	9800.00	0.00	0.03	9800.00	6455.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	9900.00	0.00	0.03	9900.00	6555.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
1st Bone Spring Sand	10000.00	0.00	0.03	10000.00	6655.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
Tie-Inf Build 8°/100' DLS	10100.00	0.00	0.03	10100.00	6755.00	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	10133.80	0.00	0.03	10133.80	6788.80	0.00	0.00	0.00	0.00	391367.40	783838.80	N 32 4 24.71	W 103 33 1.53
	10200.00	5.30	0.03	10199.91	6854.91	3.06	3.06	0.00	8.00	391370.46	783838.80	N 32 4 24.74	W 103 33 1.53
	10300.00	13.30	0.03	10298.51	6953.51	19.20	19.20	0.01	8.00	391386.60	783838.81	N 32 4 24.90	W 103 33 1.53
	10400.00	21.30	0.03	10393.91	7048.91	48.90	48.90	0.02	8.00	391416.30	783838.82	N 32 4 25.19	W 103 33 1.53
	10500.00	29.30	0.03	10484.25	7139.25	91.60	91.60	0.04	8.00	391459.00	783838.84	N 32 4 25.61	W 103 33 1.53
	10600.00	37.30	0.03	10567.77	7222.77	146.45	146.45	0.07	8.00	391513.85	783838.87	N 32 4 26.16	W 103 33 1.52
	10700.00	45.30	0.03	10642.84	7297.84	212.39	212.39	0.10	8.00	391579.79	783838.90	N 32 4 26.81	W 103 33 1.52
2nd Bone Spring Sand	10724.84	47.28	0.03	10660.00	7315.00	230.35	230.35	0.11	8.00	391597.74	783838.91	N 32 4 26.99	W 103 33 1.51
	10800.00	53.30	0.03	10708.00	7363.00	288.14	288.14	0.14	8.00	391655.53	783838.94	N 32 4 27.56	W 103 33 1.51
	10900.00	61.30	0.03	10761.99	7416.99	372.22	372.22	0.18	8.00	391739.61	783838.98	N 32 4 28.39	W 103 33 1.50
	11000.00	69.30	0.03	10803.74	7458.74	462.99	462.99	0.22	8.00	391830.38	783839.02	N 32 4 29.29	W 103 33 1.49
	11100.00	77.30	0.03	10832.46	7487.46	558.70	558.70	0.26	8.00	391926.08	783839.06	N 32 4 30.24	W 103 33 1.48
Landing Point	11200.00	85.30	0.03	10847.58	7502.58	657.46	657.46	0.31	8.00	392024.85	783839.11	N 32 4 31.21	W 103 33 1.48
	11258.80	90.00	0.03	10850.00	7505.00	716.20	716.20	0.34	8.00	392083.58	783839.14	N 32 4 31.80	W 103 33 1.47
	11300.00	90.00	0.03	10850.00	7505.00	757.40	757.40	0.36	0.00	392124.78	783839.16	N 32 4 32.20	W 103 33 1.47
	11400.00	90.00	0.03	10850.00	7505.00	857.40	857.40	0.41	0.00	392224.78	783839.21	N 32 4 33.19	W 103 33 1.46
	11500.00	90.00	0.03	10850.00	7505.00	957.40	957.40	0.45	0.00	392324.77	783839.25	N 32 4 34.18	W 103 33 1.45
	11600.00	90.00	0.03	10850.00	7505.00	1057.40	1057.40	0.50	0.00	392424.77	783839.30	N 32 4 35.17	W 103 33 1.44
	11700.00	90.00	0.03	10850.00	7505.00	1157.40	1157.40	0.55	0.00	392524.77	783839.35	N 32 4 36.16	W 103 33 1.43
	11800.00	90.00	0.03	10850.00	7505.00	1257.40	1257.40	0.59	0.00	392624.76	783839.39	N 32 4 37.15	W 103 33 1.42
	11900.00	90.00	0.03	10850.00	7505.00	1357.40	1357.40	0.64	0.00	392724.76	783839.44	N 32 4 38.14	W 103 33 1.41
	12000.00	90.00	0.03	10850.00	7505.00	1457.40	1457.40	0.69	0.00	392824.76	783839.49	N 32 4 39.13	W 103 33 1.40
	12100.00	90.00	0.03	10850.00	7505.00	1557.40	1557.40	0.74	0.00	392924.76	783839.54	N 32 4 40.12	W 103 33 1.39
	12200.00	90.00	0.03	10850.00	7505.00	1657.40	1657.40	0.78	0.00	393024.75	783839.58	N 32 4 41.11	W 103 33 1.39
	12300.00	90.00	0.03	10850.00	7505.00	1757.40	1757.40	0.83	0.00	393124.75	783839.63	N 32 4 42.10	W 103 33 1.38
	12400.00	90.00	0.03	10850.00	7505.00	1857.40	1857.40	0.88	0.00	393224.75	783839.68	N 32 4 43.09	W 103 33 1.37
	12500.00	90.00	0.03	10850.00	7505.00	1957.40	1957.40	0.92	0.00	393324.75	783839.72	N 32 4 44.08	W 103 33 1.36
	12600.00	90.00	0.03	10850.00	7505.00	2057.40	2057.40	0.97	0.00	393424.74	783839.77	N 32 4 45.07	W 103 33 1.35
	12700.00	90.00	0.03	10850.00	7505.00	2157.40	2157.40	1.02	0.00	393524.74	783839.82	N 32 4 46.06	W 103 33 1.34
	12800.00	90.00	0.03	10850.00	7505.00	2257.40	2257.40	1.07	0.00	393624.74	783839.87	N 32 4 47.05	W 103 33 1.33
	12900.00	90.00	0.03	10850.00	7505.00	2357.40	2357.40	1.11	0.00	393724.74	783839.91	N 32 4 48.04	W 103 33 1.32
	13000.00	90.00	0.03	10850.00	7505.00	2457.40	2457.40	1.16	0.00	393824.73	783839.96	N 32 4 49.02	W 103 33 1.31
	13100.00	90.00	0.03	10850.00	7505.00	2557.40	2557.40	1.21	0.00	393924.73	783840.01	N 32 4 50.01	W 103 33 1.30
	13200.00	90.00	0.03	10850.00	7505.00	2657.40	2657.40	1.26	0.00	394024.73	783840.06	N 32 4 51.00	W 103 33 1.30
	13300.00	90.00	0.03	10850.00	7505.00	2757.40	2757.40	1.30	0.00	394124.73	783840.10	N 32 4 51.99	W 103 33 1.29
	13400.00	90.00	0.03	10850.00	7505.00	2857.40	2857.40	1.35	0.00	394224.72	783840.15	N 32 4 52.98	W 103 33 1.28

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
	13500.00	90.00	0.03	10850.00	7505.00	2957.40	2957.40	1.40	0.00	394324.72	783840.20	N 32 4 53.97	W 103 33 1.27
	13600.00	90.00	0.03	10850.00	7505.00	3057.40	3057.40	1.44	0.00	394424.72	783840.24	N 32 4 54.96	W 103 33 1.26
	13700.00	90.00	0.03	10850.00	7505.00	3157.40	3157.40	1.49	0.00	394524.72	783840.29	N 32 4 55.95	W 103 33 1.25
	13800.00	90.00	0.03	10850.00	7505.00	3257.40	3257.40	1.54	0.00	394624.71	783840.34	N 32 4 56.94	W 103 33 1.24
	13900.00	90.00	0.03	10850.00	7505.00	3357.40	3357.40	1.59	0.00	394724.71	783840.39	N 32 4 57.93	W 103 33 1.23
	14000.00	90.00	0.03	10850.00	7505.00	3457.40	3457.40	1.63	0.00	394824.71	783840.43	N 32 4 58.92	W 103 33 1.22
	14100.00	90.00	0.03	10850.00	7505.00	3557.40	3557.40	1.68	0.00	394924.71	783840.48	N 32 4 59.91	W 103 33 1.21
	14200.00	90.00	0.03	10850.00	7505.00	3657.40	3657.40	1.73	0.00	395024.70	783840.53	N 32 5 0.90	W 103 33 1.21
	14300.00	90.00	0.03	10850.00	7505.00	3757.40	3757.40	1.78	0.00	395124.70	783840.58	N 32 5 1.89	W 103 33 1.20
	14400.00	90.00	0.03	10850.00	7505.00	3857.40	3857.40	1.82	0.00	395224.70	783840.62	N 32 5 2.88	W 103 33 1.19
	14500.00	90.00	0.03	10850.00	7505.00	3957.40	3957.40	1.87	0.00	395324.70	783840.67	N 32 5 3.87	W 103 33 1.18
	14600.00	90.00	0.03	10850.00	7505.00	4057.40	4057.40	1.92	0.00	395424.69	783840.72	N 32 5 4.86	W 103 33 1.17
	14700.00	90.00	0.03	10850.00	7505.00	4157.40	4157.40	1.96	0.00	395524.69	783840.76	N 32 5 5.85	W 103 33 1.16
	14800.00	90.00	0.03	10850.00	7505.00	4257.40	4257.40	2.01	0.00	395624.69	783840.81	N 32 5 6.84	W 103 33 1.15
	14900.00	90.00	0.03	10850.00	7505.00	4357.40	4357.40	2.06	0.00	395724.69	783840.86	N 32 5 7.83	W 103 33 1.14
	15000.00	90.00	0.03	10850.00	7505.00	4457.40	4457.40	2.11	0.00	395824.68	783840.91	N 32 5 8.81	W 103 33 1.13
	15100.00	90.00	0.03	10850.00	7505.00	4557.40	4557.40	2.15	0.00	395924.68	783840.95	N 32 5 9.80	W 103 33 1.12
	15200.00	90.00	0.03	10850.00	7505.00	4657.40	4657.40	2.20	0.00	396024.68	783841.00	N 32 5 10.79	W 103 33 1.12
	15300.00	90.00	0.03	10850.00	7505.00	4757.40	4757.40	2.25	0.00	396124.68	783841.05	N 32 5 11.78	W 103 33 1.11
	15400.00	90.00	0.03	10850.00	7505.00	4857.40	4857.40	2.30	0.00	396224.67	783841.09	N 32 5 12.77	W 103 33 1.10
	15500.00	90.00	0.03	10850.00	7505.00	4957.40	4957.40	2.34	0.00	396324.67	783841.14	N 32 5 13.76	W 103 33 1.09
	15600.00	90.00	0.03	10850.00	7505.00	5057.40	5057.40	2.39	0.00	396424.67	783841.19	N 32 5 14.75	W 103 33 1.08
	15700.00	90.00	0.03	10850.00	7505.00	5157.40	5157.40	2.44	0.00	396524.66	783841.24	N 32 5 15.74	W 103 33 1.07
	15800.00	90.00	0.03	10850.00	7505.00	5257.40	5257.40	2.48	0.00	396624.66	783841.28	N 32 5 16.73	W 103 33 1.06
	15900.00	90.00	0.03	10850.00	7505.00	5357.40	5357.40	2.53	0.00	396724.66	783841.33	N 32 5 17.72	W 103 33 1.05
	16000.00	90.00	0.03	10850.00	7505.00	5457.40	5457.40	2.58	0.00	396824.66	783841.38	N 32 5 18.71	W 103 33 1.04
	16100.00	90.00	0.03	10850.00	7505.00	5557.40	5557.40	2.63	0.00	396924.65	783841.43	N 32 5 19.70	W 103 33 1.04
	16200.00	90.00	0.03	10850.00	7505.00	5657.40	5657.40	2.67	0.00	397024.65	783841.47	N 32 5 20.69	W 103 33 1.03
	16300.00	90.00	0.03	10850.00	7505.00	5757.40	5757.40	2.72	0.00	397124.65	783841.52	N 32 5 21.68	W 103 33 1.02
	16400.00	90.00	0.03	10850.00	7505.00	5857.40	5857.40	2.77	0.00	397224.65	783841.57	N 32 5 22.67	W 103 33 1.01
	16500.00	90.00	0.03	10850.00	7505.00	5957.40	5957.40	2.81	0.00	397324.64	783841.61	N 32 5 23.66	W 103 33 1.00
	16600.00	90.00	0.03	10850.00	7505.00	6057.40	6057.40	2.86	0.00	397424.64	783841.66	N 32 5 24.65	W 103 33 0.99
	16700.00	90.00	0.03	10850.00	7505.00	6157.40	6157.40	2.91	0.00	397524.64	783841.71	N 32 5 25.64	W 103 33 0.98
	16800.00	90.00	0.03	10850.00	7505.00	6257.40	6257.40	2.96	0.00	397624.64	783841.76	N 32 5 26.63	W 103 33 0.97
	16900.00	90.00	0.03	10850.00	7505.00	6357.40	6357.40	3.00	0.00	397724.63	783841.80	N 32 5 27.62	W 103 33 0.96
	17000.00	90.00	0.03	10850.00	7505.00	6457.40	6457.40	3.05	0.00	397824.63	783841.85	N 32 5 28.60	W 103 33 0.95
	17100.00	90.00	0.03	10850.00	7505.00	6557.40	6557.40	3.10	0.00	397924.63	783841.90	N 32 5 29.59	W 103 33 0.95
	17200.00	90.00	0.03	10850.00	7505.00	6657.40	6657.40	3.15	0.00	398024.63	783841.95	N 32 5 30.58	W 103 33 0.94
	17300.00	90.00	0.03	10850.00	7505.00	6757.40	6757.40	3.19	0.00	398124.62	783841.99	N 32 5 31.57	W 103 33 0.93
	17400.00	90.00	0.03	10850.00	7505.00	6857.40	6857.40	3.24	0.00	398224.62	783842.04	N 32 5 32.56	W 103 33 0.92
	17500.00	90.00	0.03	10850.00	7505.00	6957.40	6957.40	3.29	0.00	398324.62	783842.09	N 32 5 33.55	W 103 33 0.91
	17600.00	90.00	0.03	10850.00	7505.00	7057.40	7057.40	3.33	0.00	398424.62	783842.13	N 32 5 34.54	W 103 33 0.90
	17700.00	90.00	0.03	10850.00	7505.00	7157.40	7157.40	3.38	0.00	398524.61	783842.18	N 32 5 35.53	W 103 33 0.89
Endeavor Battle Axe Fed Com 2H - PBHL	17738.79	90.00	0.03	10850.00	7505.00	7196.18	7196.18	3.40	0.00	398563.40	783842.20	N 32 5 35.92	W 103 33 0.89

Survey Type: Def Plan

Survey Error Model: ISCWSA Rev 0 *** 3-D 95.000% Confidence 2.7955 sigma
Survey Program:

Description	MD From (ft)	MD To (ft)	EOU Freq (ft)	Hole Size (in)	Casing Diameter (in)	Survey Tool Type	Borehole / Survey
	0.000	23.000	1/100.000	30.000	30.000	SLB_MWD-STD-Depth Only	Pilot / Endeavor Battle Axe Fed Com 2H Pilot Rev0 mcs: 25Sep13
	23.000	10133.800	1/100.000	30.000	30.000	SLB_MWD-STD	Pilot / Endeavor Battle Axe Fed Com 2H Pilot Rev0 mcs: 25Sep13

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
	10133.800		17738.787		1/100.000	30.000	30.000	SLB_MWD-STD		ST01 / Endeavor Battle Axe Fed Com 2H ST01 Rev0 mcs			

ULTRA-DQX Product Summary: Pipe and Connection Data

PIPE BODY							CONNECTION					J-55		
Nominal OD in	Nominal Weight lb/ft	PE Weight lb/ft	Wall Thickness in	Nominal ID in	Drift Dia in	Nominal PBA in²	Coupling Critical Section Area in²	% Tensile Efficiency	% Compression Efficiency	Makeup Less in	Coupling OD in	Coupling Length in	Yield Load lbs	Parting Load lbs
4 1/2	10.50	10.23	0.224	4.052	3.927	3.009	4.602	100	100	3.772	5.000	7.544	165,500	213,400
4 1/2	11.60	11.35	0.250	4.000	3.875	3.338	4.602	100	100	3.772	5.000	7.544	183,600	236,700
4 1/2	12.60	12.24	0.271	3.958	3.833	3.600	4.602	100	100	3.772	5.000	7.544	198,000	255,300
4 1/2	13.50	13.04	0.290	3.920	3.795	3.836	4.602	100	100	3.772	5.000	7.544	211,000	272,000
4 1/2	15.10	14.98	0.337	3.826	3.701	4.407	4.602	100	100	3.772	5.000	7.544	242,400	312,600
5	15.00	14.87	0.296	4.408	4.283	4.374	5.841	100	100	4.097	5.563	8.194	240,600	307,900
5	18.00	17.93	0.362	4.276	4.151	5.275	5.841	100	100	4.097	5.563	8.194	290,100	371,300
5	21.40	21.30	0.437	4.126	4.001	6.264	5.841	93	100	4.097	5.563	8.194	321,200	407,800
5	23.20	23.08	0.478	4.044	3.919	6.791	5.841	86	100	4.097	5.563	8.194	321,200	407,800
5	24.10	24.03	0.500	4.000	3.875	7.069	5.915	84	100	4.222	5.563	8.444	325,300	412,900
5 1/2	15.50	15.35	0.275	4.950	4.825	4.514	6.297	100	100	4.122	6.050	8.244	248,300	315,400
5 1/2	17.00	16.87	0.304	4.892	4.767	4.962	6.297	100	100	4.122	6.050	8.244	272,900	346,800
5 1/2	20.00	19.81	0.361	4.778	4.653	5.828	6.297	100	100	4.122	6.050	8.244	320,600	407,300
5 1/2	23.00	22.54	0.415	4.670	4.545	6.630	6.297	95	100	4.122	6.050	8.244	346,300	436,400
6 5/8	20.00	19.49	0.288	6.049	5.924	5.734	10.110	100	100	4.261	7.390	8.522	315,300	394,000
6 5/8	23.20	22.19	0.330	5.965	5.840	6.526	10.110	100	100	4.261	7.390	8.522	358,900	448,400
6 5/8	24.00	23.58	0.352	5.921	5.796	6.937	10.110	100	100	4.261	7.390	8.522	381,500	476,700
6 5/8	24.60	24.21	0.362	5.901	5.776	7.123	10.110	100	100	4.261	7.390	8.522	391,700	489,400
6 5/8	28.00	27.65	0.417	5.791	5.666	8.133	10.110	100	100	4.261	7.390	8.522	447,300	558,800
6 5/8	29.00	28.57	0.432	5.761	5.636	8.405	10.110	100	100	4.261	7.390	8.522	462,300	577,500
6 5/8	32.00	31.20	0.475	5.675	5.550	9.177	10.110	100	100	4.261	7.390	8.522	504,800	630,600
7	23.00	22.63	0.317	6.366	6.241	6.655	9.501	100	100	4.461	7.656	8.922	366,100	454,700
7	26.00	25.66	0.362	6.276	6.151	7.549	9.501	100	100	4.461	7.656	8.922	415,200	515,800
7	29.00	28.72	0.408	6.184	6.059	8.449	9.501	100	100	4.461	7.656	8.922	464,700	577,300
7	32.00	31.67	0.453	6.094	5.969	9.317	9.501	100	100	4.461	7.656	8.922	512,500	636,600
7	35.00	34.58	0.498	6.004	5.879	10.172	9.501	93	100	4.461	7.656	8.922	522,500	642,700
7	38.00	37.26	0.540	5.920	5.795	10.959	9.501	87	100	4.461	7.656	8.922	522,500	642,700
7 5/8	26.40	25.56	0.328	6.969	6.844	7.519	13.385	100	100	4.742	8.500	9.485	413,600	508,900
7 5/8	29.70	29.04	0.375	6.875	6.750	8.541	13.385	100	100	4.742	8.500	9.485	469,800	578,000
7 5/8	33.70	33.04	0.430	6.765	6.640	9.720	13.385	100	100	4.742	8.500	9.485	534,600	657,800
7 5/8	35.80	35.56	0.465	6.695	6.570	10.460	13.385	100	100	4.742	8.500	9.485	575,300	707,900
7 5/8	39.00	38.05	0.500	6.625	6.500	11.192	13.385	100	100	4.742	8.500	9.485	615,600	757,400
7 5/8	42.80	42.39	0.562	6.501	6.376	12.470	13.385	100	100	4.742	8.500	9.485	685,900	844,000
7 5/8	45.30	44.67	0.595	6.435	6.310	13.141	13.385	100	100	4.742	8.500	9.485	722,700	889,300
7 5/8	47.10	46.73	0.625	6.375	6.250	13.744	13.385	97	100	4.742	8.500	9.485	736,200	893,700
8 5/8	32.00	31.10	0.352	7.921	7.796	9.149	16.943	100	100	4.742	9.625	9.485	503,200	609,600
8 5/8	36.00	35.14	0.400	7.825	7.700	10.336	16.943	100	100	4.742	9.625	9.485	568,500	688,800
8 5/8	40.00	39.29	0.450	7.725	7.600	11.557	16.943	100	100	4.742	9.625	9.485	635,600	770,200
8 5/8	44.00	43.39	0.500	7.625	7.500	12.763	16.943	100	100	4.742	9.625	9.485	701,900	850,500
8 5/8	49.00	47.99	0.557	7.511	7.386	14.118	16.943	100	100	4.742	9.625	9.485	776,500	940,800
9 5/8	36.00	34.89	0.352	8.921	8.765	10.254	18.820	100	100	4.742	10.625	9.485	564,000	672,700
9 5/8	40.00	38.94	0.395	8.835	8.679	11.454	18.820	100	100	4.742	10.625	9.485	630,000	751,400
9 5/8	43.50	42.69	0.435	8.755	8.599	12.559	18.820	100	100	4.742	10.625	9.485	690,700	823,900
9 5/8	47.00	46.14	0.472	8.681	8.525	13.572	18.820	100	100	4.742	10.625	9.485	746,500	890,400
9 5/8	53.50	52.85	0.545	8.535	8.379	15.546	18.820	100	100	4.742	10.625	9.485	855,100	1,019,900
9 5/8	58.40	57.38	0.595	8.435	8.279	16.879	18.820	100	100	4.742	10.625	9.485	928,400	1,107,300
10 3/4	40.50	38.88	0.350	10.050	9.894	11.435	20.994	100	100	4.792	11.750	9.585	628,900	736,800
10 3/4	45.50	44.22	0.400	9.950	9.794	13.006	20.994	100	100	4.792	11.750	9.585	715,300	838,000
10 3/4	51.00	49.50	0.450	9.850	9.694	14.561	20.994	100	100	4.792	11.750	9.585	800,900	938,200
10 3/4	55.50	54.21	0.495	9.760	9.604	15.947	20.994	100	100	4.792	11.750	9.585	877,100	1,027,500
10 3/4	60.70	59.40	0.545	9.660	9.504	17.473	20.994	100	100	4.792	11.750	9.585	961,000	1,125,800
10 3/4	65.70	64.53	0.595	9.560	9.404	18.982	20.994	100	100	4.792	11.750	9.585	1,044,000	1,223,100
11 3/4	47.00	45.60	0.375	11.000	10.844	13.401	22.739	100	100	4.692	12.750	9.385	737,000	849,500
11 3/4	54.00	52.62	0.435	10.880	10.724	15.463	22.739	100	100	4.692	12.750	9.385	850,500	980,300
11 3/4	60.00	58.81	0.489	10.772	10.616	17.300	22.739	100	100	4.692	12.750	9.385	951,500	1,096,700
13 3/8	54.50	52.74	0.380	12.615	12.459	15.513	25.858	100	100	4.742	14.375	9.485	853,200	957,300
13 3/8	61.00	59.50	0.430	12.515	12.359	17.487	25.858	100	100	4.742	14.375	9.485	961,800	1,079,100
13 3/8	68.00	66.10	0.480	12.415	12.259	19.445	25.858	100	100	4.742	14.375	9.485	1,069,500	1,199,900
13 3/8	72.00	70.60	0.514	12.347	12.191	20.768	25.858	100	100	4.742	14.375	9.485	1,142,200	1,281,500

The performance properties given in these tables are calculated per API 5C3. Yield Load is based upon minimum material values and nominal pipe body dimensions. Parting Load is based upon minimum ultimate strength of the material and the API Buttress formula. Neither Minimum Yield or Parting Load include any Design or Safety Factors.

If you have a special application that requires a unique premium threaded connection, we can design a fit-for-purpose connection that meets your needs.

Contact TMK IPSCO Technical Support for specific details.

The ULTRA thread concept was originally invented by Erich F. Klementich PE, FASME, SPE.

The ULTRA-DQX Threaded & Coupled Drilling with Casing Connection for High RPM Rotating & Drilling

J-55		L-80				P-110				Q-125			
Optimal Torque ft-lbs	Yield Torque ft-lbs	Yield Load lbs	Parting Load lbs	Optimal Torque ft-lbs	Yield Torque ft-lbs	Yield Load lbs	Parting Load lbs	Optimal Torque ft-lbs	Yield Torque ft-lbs	Yield Load lbs	Parting Load lbs	Optimal Torque ft-lbs	Yield Torque ft-lbs
2,900	4,600	240,700	275,800	3,600	5,800	331,000	365,500	4,500	7,200	376,100	398,100	4,900	7,900
3,300	5,300	267,000	306,000	4,300	6,800	367,200	405,400	5,400	8,600	417,200	441,600	6,000	9,500
3,700	5,900	288,000	330,000	4,800	7,700	396,000	437,300	6,100	9,800	450,100	476,300	6,800	10,800
4,000	6,400	306,800	351,600	5,200	8,400	421,900	465,900	6,700	10,800	479,400	507,400	7,500	12,000
4,800	7,600	352,600	404,000	6,400	10,200	484,800	535,400	8,300	13,200	550,900	583,100	9,200	14,800
5,000	8,000	349,900	399,000	6,500	10,400	481,200	529,100	8,300	13,200	546,800	576,800	9,100	14,700
6,400	10,200	422,000	481,100	8,400	13,500	580,200	638,000	10,900	17,500	659,300	695,600	12,200	19,500
7,800	12,500	467,300	529,800	10,500	16,900	642,500	703,200	13,800	22,100	730,100	767,500	15,500	24,800
8,600	13,700	467,300	529,800	11,600	18,600	642,500	703,200	15,300	24,600	730,100	767,500	17,200	27,500
9,000	14,300	473,200	536,500	12,200	19,600	650,600	712,200	16,100	25,800	739,400	777,200	18,100	29,000
5,200	8,300	361,100	409,700	6,700	10,800	496,500	543,800	8,600	13,800	564,300	593,400	9,500	15,200
5,900	9,500	397,000	450,400	7,800	12,500	545,900	597,800	10,100	16,100	620,300	652,300	11,200	17,900
7,400	11,800	466,300	529,000	9,900	15,800	641,100	702,100	12,900	20,600	728,500	766,100	14,400	23,100
8,600	13,900	503,800	568,400	11,800	18,800	692,700	755,100	15,500	24,800	787,100	824,800	17,400	27,800
7,800	12,600	458,700	514,600	10,200	16,400	630,700	684,200	13,100	21,000	716,700	748,300	14,500	23,200
9,400	15,100	522,100	585,700	12,500	20,000	717,900	778,800	16,200	26,000	815,800	851,700	18,100	29,000
10,200	16,400	555,000	622,600	13,700	21,900	763,100	827,800	17,800	28,600	867,100	905,300	19,900	31,900
10,600	16,900	569,800	639,300	14,200	22,800	783,500	850,000	18,600	29,700	890,300	929,600	20,800	33,200
12,600	20,100	650,600	729,900	17,100	27,400	894,600	970,500	22,500	36,100	1,016,600	1,061,400	25,300	40,400
13,100	21,000	672,400	754,300	17,900	28,600	924,500	1,003,000	23,600	37,800	1,050,600	1,096,900	26,500	42,300
14,600	23,400	734,200	823,700	20,000	32,100	1,009,500	1,095,200	26,600	42,500	1,147,200	1,197,800	29,900	47,800
9,300	15,000	532,400	595,100	12,400	19,900	732,100	791,700	16,100	25,800	831,900	866,500	18,000	28,700
11,200	17,900	603,900	675,000	15,100	24,200	830,400	898,000	19,800	31,700	943,600	982,900	22,200	35,500
13,100	20,900	676,000	755,500	17,800	28,600	929,400	1,005,100	23,600	37,700	1,056,200	1,100,100	26,400	42,300
14,900	23,800	745,400	833,100	20,400	32,700	1,024,900	1,108,400	27,100	43,400	1,164,700	1,213,100	30,500	48,800
16,600	26,600	760,000	843,800	23,000	36,800	1,045,100	1,123,900	30,600	49,000	1,187,600	1,231,700	34,400	55,100
18,200	29,100	760,000	843,800	25,300	40,500	1,045,100	1,123,900	33,800	54,100	1,187,600	1,231,700	38,100	60,900
11,000	17,600	601,500	668,000	14,400	23,000	827,100	889,700	18,400	29,500	939,900	975,000	20,400	32,700
13,300	21,400	683,300	758,800	17,800	28,400	939,500	1,010,700	23,100	36,900	1,067,700	1,107,500	25,700	41,200
16,000	25,700	777,600	863,500	21,700	34,700	1,069,200	1,150,200	28,400	45,500	1,215,000	1,260,400	31,800	50,900
17,700	28,300	836,800	929,300	24,100	38,600	1,150,600	1,237,700	31,800	50,900	1,307,500	1,356,300	35,600	57,000
19,300	31,000	895,400	994,400	26,500	42,400	1,231,100	1,324,400	35,100	56,100	1,399,000	1,451,300	39,400	63,000
22,200	35,500	997,600	1,107,900	30,600	49,000	1,371,700	1,475,700	40,800	65,300	1,558,800	1,617,100	45,800	73,400
23,700	37,900	1,051,300	1,167,500	32,800	52,500	1,445,500	1,555,000	43,700	70,000	1,642,600	1,704,000	49,200	78,800
25,000	40,000	1,070,800	1,178,600	34,700	55,600	1,472,300	1,572,100	46,400	74,300	1,673,100	1,725,800	52,300	83,600
15,200	24,300	731,900	804,500	20,200	32,400	1,006,300	1,073,400	26,300	42,100	1,143,600	1,178,600	29,300	46,900
18,300	29,200	826,900	908,900	24,700	39,500	1,136,900	1,212,700	32,400	51,900	1,292,000	1,331,600	36,300	58,100
21,400	34,200	924,600	1,016,300	29,300	46,800	1,271,300	1,356,000	38,700	61,900	1,444,600	1,488,900	43,400	69,500
24,500	39,200	1,021,000	1,122,300	33,700	54,000	1,403,900	1,497,400	44,800	71,800	1,595,300	1,644,300	50,400	80,700
27,900	44,700	1,129,400	1,241,500	38,700	62,000	1,553,000	1,656,500	51,700	82,800	1,764,700	1,818,900	58,200	93,200
18,100	28,900	820,400	892,500	24,400	39,100	1,128,000	1,192,800	32,000	51,200	1,281,800	1,312,500	35,800	57,300
21,500	34,500	916,300	996,900	29,400	47,100	1,259,900	1,332,300	38,900	62,300	1,431,700	1,466,000	43,700	69,900
24,700	39,600	1,004,700	1,093,100	34,100	54,500	1,381,500	1,460,900	45,300	72,500	1,569,900	1,607,500	50,900	81,400
27,600	44,200	1,085,800	1,181,300	38,300	61,300	1,493,000	1,578,800	51,100	81,700	1,696,500	1,737,200	57,500	92,000
33,200	53,200	1,243,700	1,353,100	46,500	74,400	1,710,100	1,808,400	62,300	99,700	1,943,300	1,989,900	70,300	112,400
37,000	59,200	1,350,300	1,469,100	51,900	83,100	1,856,700	1,963,500	69,900	111,800	2,109,900	2,160,500	78,800	126,100
21,400	34,200	914,800	983,600	29,100	46,600	1,257,900	1,317,300	38,400	61,500	1,429,400	1,452,900	43,100	69,000
26,500	42,400	1,040,500	1,118,700	36,500	58,400	1,430,700	1,498,200	48,600	77,800	1,625,800	1,652,400	54,600	87,400
31,500	50,400	1,164,900	1,252,500	43,800	70,100	1,601,700	1,677,400	58,600	93,800	1,820,200	1,850,000	66,000	105,600
35,900	57,400	1,275,800	1,371,700	50,200	80,400	1,754,200	1,837,100	67,500	107,900	1,993,400	2,026,100	76,100	121,700
40,800	65,200	1,397,800	1,502,900	57,300	91,700	1,922,000	2,012,800	77,200	123,500	2,184,100	2,219,900	87,100	139,400
45,500	72,900	1,518,600	1,632,800	64,300	102,800	2,088,000	2,186,700	86,700	138,800	2,372,800	2,411,700	98,000	156,800
28,200	45,100	1,072,100	1,140,500	39,100	62,600	1,474,100	1,530,200	52,200	83,600	1,675,100	1,691,300	58,800	94,100
35,500	56,800	1,237,000	1,316,000	49,700	79,500	1,700,900	1,765,700	66,800	106,800	1,932,900	1,951,600	75,300	120,500
41,900	67,100	1,384,000	1,472,300	59,100	94,500	1,903,000	1,975,400	79,700	127,500	2,162,400	2,183,400	89,900	143,900
36,200	57,900	1,241,100	1,297,500	50,600	81,000	1,706,500	1,746,200	67,900	108,700	1,939,200	1,936,800	76,600	122,600
44,100	70,600	1,399,000	1,462,600	62,100	99,400	1,923,600	1,968,300	83,800	134,100	2,185,900	2,183,200	94,600	151,400
51,900	83,100	1,555,600	1,626,300	73,500	117,700	2,139,000	2,188,700	99,500	159,200	2,430,700	2,427,700	112,500	179,900
57,200	91,500	1,661,400	1,736,900	81,200	130,000	2,284,400	2,337,600	110,000	176,100	2,596,000	2,592,800	124,400	199,100

ULTRA-DQX™

Threaded & Coupled Drilling with Casing Connection 4 1/2" - 13 3/8"

For High RPM Rotating and Drilling

- Designed for high RPM and high dogleg fatigue resistance in horizontal wells where rotating and reciprocating are the only ways to reach bottom
- Superior high pressure gas leak resistance
- Pressure ratings exceed API minimum internal yield and collapse

FullContact™ Threads

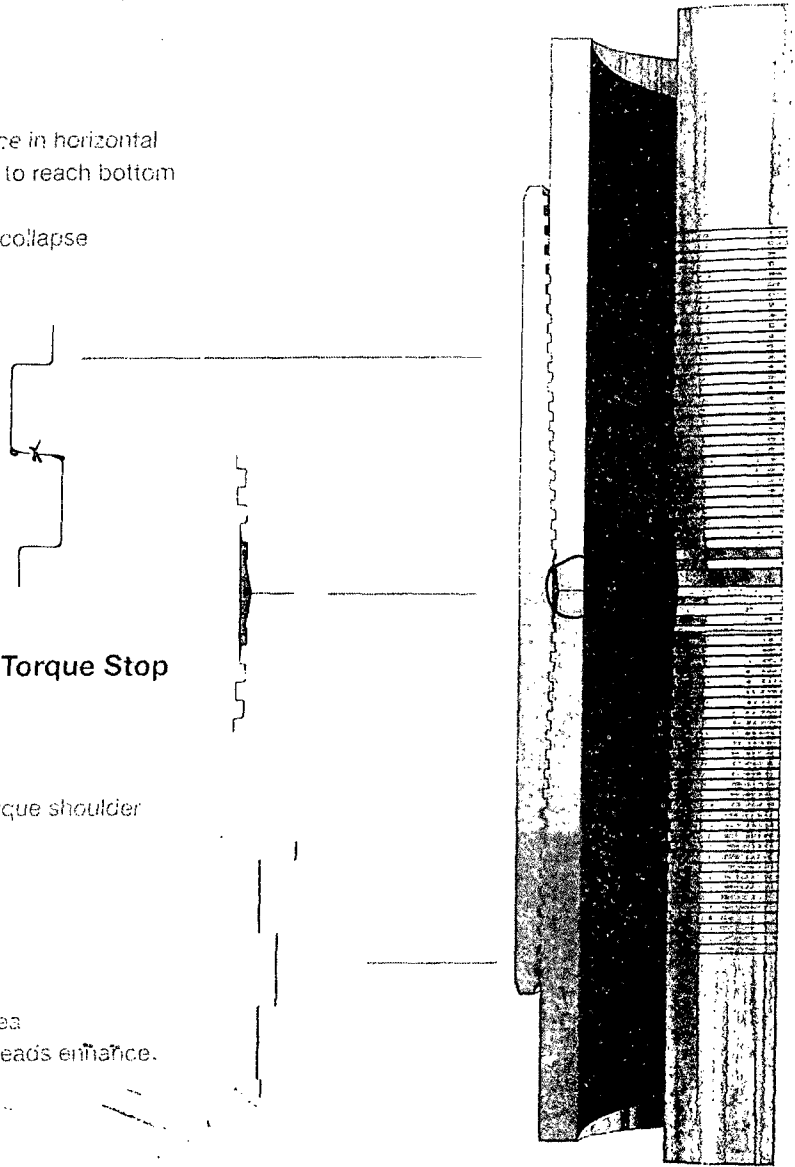
- Tension and compression efficiency
- High bending capacity and evenly distributed stress
- Deep, easy stabbing and quick, easy make-up
- Leak-tight thread sealing

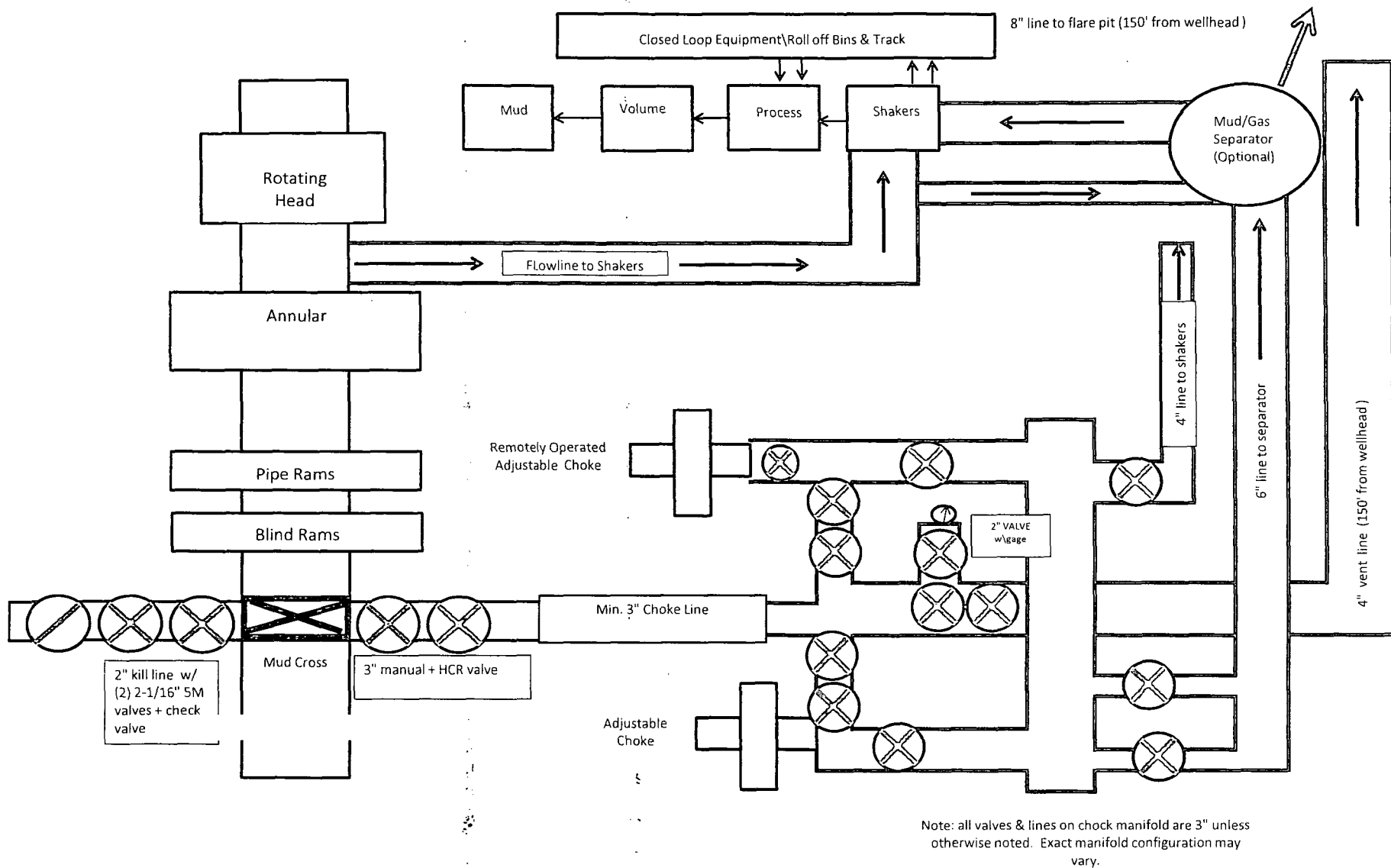
Pin Nose to Pin Nose Positive Torque Stop

- Excellent torque resistance
- Torque energized metal seal
- Reduced coupling fatigue
- Verifiable make-up with positive torque shoulder
- Superior over-torque drift-ability
- Minimized flow turbulence

Run-Out Threads

- Maximum critical section area
- Low interference run-out threads enhance fatigue life





**13-5/8" 5M BOPE (2 Rams and Rotating Head) &
Closed Loop System Equipment Schematic
Exhibit 1**

ENDEAVOR ENERGY RESOURCES, L.P.

Battle Axe Federal Com #2H

API# 30-025-41370

CLOSED LOOP SYSTEM CLOSURE PLAN:

1. Methods of handling waste materials:
 - a. Drill cuttings shall be disposed of in steel cutting bins (catch tanks) on the drilling pad (behind the steel mud tanks). The bin and cuttings shall be hauled to a division approved facility by an approved transporter. At the facility, the cuttings shall be removed from the bin and the bin shall be returned to the drilling site for reuse, moved to the next drilling site or returned to the provider.
 - b. Remaining drilling fluids shall be hauled off by approved transports to a division approved disposal facility. Water produced during completion shall be put in storage tanks and disposed of at a division approved facility. Oil and condensate produced shall be put in a storage tank and sold or put in a sales pipeline.
2. Reclamation:
 - a. Within 120 days after the drilling and completion of the well, the location area shall be reduced as determined by operator to the minimum area necessary to safely and effectively operate the well. The reclaimed location area shall be restored to the condition that existed prior to oil and gas operations.

CLOSED LOOP SYSTEM OPERATIONAL REQUIREMENTS [19.15.17.12]:

- A. General Specification. An operator shall maintain and operate a pit, closed-loop system, below-grade tank or sump in accordance with the following requirements.
 1. The operator shall operate and maintain a pit, closed-loop system, below grade tank or sump to contain liquids and solids and maintain the integrity of the liner, liner systems or secondary containment system, prevent contamination of fresh water and protect public health and the environment.
 - i. Operator shall operate and maintain a closed loop system.
 2. The operator shall recycle, reuse or reclaim all drilling fluids in a manner that prevents the contamination of fresh water and protects public health and the environment.
 - i. Operator shall recycle, reuse or reclaim all drilling fluids used. Excess or unused fluid shall be disposed of at division approved facilities.
 3. The operator shall not discharge into or store any hazardous waste in a pit, closed-loop system, below-grade tank or sump.
 - i. Operator shall not knowingly discharge hazardous waste into the closed loop system.
 4. If the integrity of the pit liner is compromised, or if any penetration of the liner occurs above the liquid's surface, then the operator shall notify the appropriate division district office within 48 hours of the discovery and repair the damage or replace the liner.
 - i. No pit liner, closed loop system.

ENDEAVOR ENERGY RESOURCES, L.P.

Battle Axe Federal Com #2H

API# 30-025-41370

CLOSED LOOP SYSTEM OPERATIONAL REQUIREMENTS [19.15.17.12] (cont):

5. If a lined pit develops a leak, or if any penetration of the liner occurs below the liquid's surface, then the operator shall remove all liquid above the damage or leak line from the pit within 48 hours and repair the damage or replace the liner.
 - i. No pit liner, closed loop system. If a leak develops in any of the closed loop tanks, all liquid shall be removed from the effected tank within 48 hours and any damage shall be repaired prior to putting the tank back in service.
6. The operator shall install a level measuring device in a lined pit containing fluids to monitor the level of the fluid surface , so that the operator may recognize unanticipated change in volume of fluids.
 - i. No pit, closed loop system. Excess fluid shall be removed appropriately from the catch tanks.
7. The injection or withdrawal of liquids from a lined pit shall be accomplished through a header, diverter or other hardware that prevents damage to the liner by erosion, fluid jets or impact from installation and removal of hoses or pipes.
 - i. No pit, closed loop system. Excess fluid shall be removed appropriately from the catch tanks using a re-circulating pump or vacuum trucks.
8. The operator shall operate and install a pit, below-grade tank or sump to prevent the collection of surface water run-on.
 - i. Operator shall berm or collect surface water run-on and dispose of at a division approved facility.
9. The operator shall install, or maintain on site, an oil absorbent boom or other device to contain and remove oil from a pit's surface.
 - i. Operator shall install a skimmer system on catch tanks, circulating tanks and over-flow tanks as needed to collect oil.

ENDEAVOR ENERGY RESOURCES, L.P.

Battle Axe Federal Com #2H

API# 30-025-41370

RIG LAYOUT DIAGRAM

Contractor: Big Dog Drilling (Rig #20)

