

Submit 3 Copies To Appropriate District
Office
District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Ave., 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 and Natural Resources

Form C-103
May 27, 2004

OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

WELL API NO. 30-015- 35543 35512
5. Indicate Type of Lease STATE ☐ FEE ☒
6. State Oil & Gas Lease No.
7. Lease Name or Unit Agreement Name South Culebra Bluff 23
8. Well Number 019
9. OGRID Number 227588
10. Pool name or Wildcat Loving, Brushy Canyon East

SUNDRY NOTICES AND REPORTS ON WELLS
(DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT" (FORM C-101) FOR SUCH PROPOSALS.)

1. Type of Well: Oil Well ☐ Gas Well ☐ Other Water Injection

2. Name of Operator
Range Operating New Mexico, Inc.

3. Address of Operator
100 Throckmorton St., Ste. 1200, Fort Worth, TX 76102

4. Well Location
Unit Letter F : 1950 feet from the North OCD-AR line and 2470 feet from the West line
Section 23 Township 23S Range 28E NMPM Eddy County

11. Elevation (Show whether DR, RKB, RT, GR, etc.)
3020' GR

Pit or Below-grade Tank Application ☐ or Closure ☐

Pit type _____ Depth to Groundwater _____ Distance from nearest fresh water well _____ Distance from nearest surface water _____

Pit Liner Thickness: _____ mil Below-Grade Tank: Volume _____ bbls; Construction Material _____

12. Check Appropriate Box to Indicate Nature of Notice, Report or Other Data

NOTICE OF INTENTION TO:

PERFORM REMEDIAL WORK ☐ PLUG AND ABANDON ☐
TEMPORARILY ABANDON ☐ CHANGE PLANS ☐
PULL OR ALTER CASING ☐ MULTIPLE COMPL ☐

OTHER: ☐

SUBSEQUENT REPORT OF:

REMEDIAL WORK ☐ ALTERING CASING ☐
COMMENCE DRILLING OPNS. ☒ P AND A ☐
CASING/CEMENT JOB ☐

OTHER: ☐

13. Describe proposed or completed operations. (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work). SEE RULE 1103. For Multiple Completions: Attach wellbore diagram of proposed completion or recompletion.

- 4-21-07 - Spud well @ 1500 PM 4-21-07 and drill to 340'. Hole 12.25", Ran 8 jts, 342', 24#, K-55, New LTC, 8.625" csg. Cmt'd same w/250 sx Class 'C' + 2% CaCl₂. Circulated cement to surface - amount not recorded. Ran 135% excess.
- 4-23-07 - Test csg to 1000 psi for 30 minutes, OK. WOC 38 hrs. Drlg. 7-7/8" hole.
- 5-05-07 - Reached original hole TD 5-05-07 @ 0530 am. Ran logs. TIH. Rig broke down. Pipe stuck at 6305'.
- 5-11-07 - After rig repair and extensive fishing operations, backed off drill pipe at 4845'.
- 5-17-07 - After extensive fishing operations, including screwing back into fish, and backing off at 4850', decision was made to sidetrack well. Set whipstock at 4840'.
- 5-18-07 - Began milling on whipstock.
- 5-22-07 - Unsuccessful retrieving whipstock. Cemented fish in hole at 4853' with 150 sx Class 'H' + 1.2% CD-3 + 0.1% R-3, Yield 0.9 CF/sk & 18.0 PPG. WOC 72 hrs. Repairing rig.
- 5-26-07 - Resume drilling 4600'-4797' (cement).
- 5-30-07 - Set cement plug in hole - 200 sx Class 'H' + 1.2% CD-3 + 0.1% R-3, Yield 0.9 CF/sk & 18.0 PPG. WOC 12 hrs. Tag cement at 4470'. Resume drilling.
- 6-07-07 - Reached TD 6-07-07 @ 1500 pm.
- 6-08-07 - Ran 149 jts, 6396', 15.5#, J-55, new LTC, 5.5" csg. Set csg @ 6396'. Cmt'd w/905 sx. Class 'C' + 5% Salt + 6/10% FL-25 + 0.6% FL-52A + 0.5% BA-10 + 4# LCM-1 (100% Excess). Cemented 2nd Stage through DV Collar @ 3522' w/1143 sx Class 'C' + 5% Salt + 3/10% FL-52A + 4# LCM-1 (LEAD) & 100 sx. Class 'C' Neat (TAIL). Circulated 56 sx back to surface.
- 6-10-07 - Tested casing to 3000 psig for 30 minutes, OK. Waited on cement 24 hrs.
- 7-31-07 - MJRU. Test BOP Blind Rams to 1000 psig for 5 mins, OK. TIH. Test BOP Pipe Rams to 1000 psig. Tagged DV Tool and drilled out.
- 8-01-07 - Tagged at 6282' and drilled out to 6307'. Circulate hole clean. Test casing to 1000 psi for 30 mins, OK. POOH. Ran CBL-GR Log.
- 8-02-07 - Perforate 6224'-6236', 6183'-6202', and 6160'-6177' (Lower Brushy Canyon) w/4 JSPF, 90 DEG phasing, 0.35" EHD, 192 holes. Acidized perfs with 2,400 Gallons 15% NEFE acid. POOH.
- 8-03-07 - RIH w/5-1/2" x 2-3/8" Nickel Coated Arrowset I-X pkr, 1.43" ID 'F' profile nipple w/on-off tool, Fiber Line Adaptor and 198 jts 2-3/8", 4 7#, J-55, 8R, EUE Fiber Lined tubing to 6108.17'. Set packer. Test casing to 500 psig, OK. Open by-pass & circulate packer fluid. Re-set packer. ND BOP; NU WH. Tested casing to 500 psig for 30 mins, OK. RDMO.

I hereby certify that the information above is true and complete to the best of my knowledge and belief. I further certify that any pit or below-grade tank has been/will be constructed or closed according to NMOCD guidelines ☐, a general permit ☐ or an (attached) alternative OCD-approved plan ☐.

SIGNATURE Bill Stiles for LCS TITLE Sr. Engineering Tech DATE 8/29/07

Type or print name Linda C. Stiles E-mail address: lstiles@rangeresources.com Telephone No. (817) 869-4208

FOR RECORDS ONLY

AUG 30 2007

For State Use Only

AUG 3 0 2007

FOR RECORDS ONLY

APPROVED BY: _____ TITLE _____ DATE _____

Conditions of Approval (if any):

Well Name: SCB 23-19

Field: Loving

County: Eddy

State: New Mexico

30-015-35512

07/31/07

SCB 23-19

AFE # 06-04-13-0437

Eddy NM

Day 1

Purpose of Wk: Completion. MIRU I&J WS UNIT #4 / NU BOP / TALLIED TUB / RU GRACO REV RIG / TST BOP BLIND RAMS 1000# / 5 MIN / OK / PU 4 3/4 BIT BS 6 3 1/4 DC'S / XO SUB / TIH W/ 1 JT TBG / TST BOP PIPE RAMS 1000# 5 MIN / OK / FINISHED TIH PICKING UP TBG / TAGGED DV TOOL @ 3525 / RU POWER SWEVIAL & DRLG OUT DV TOOL, CIRC HOLE CLEAN / RD POWER SWEVIAL / CWI SWIFN.

Daily Cost \$11,041

Cum Cmpl Cost \$0

Cum Well Cost \$11,041

08/01/07

SCB 23-19

AFE # 06-04-13-0437

Eddy NM

Day 2

Purpose of Wk: Completion. OPENED WELL / 0 PSI FINISHED TIH W/ TBG, TAGGED UP @ 6282 / RU POWER SWEVIAL / CLEAN OUT TO 6307 / DRLG FC @ 6286 & 21FT CMT / CIRC HOLE CLEAN / CWI / PSI TST CSG TO 1000# FOR 30 MIN / OK / RELEASED PSI / TOH STANDING UP TBG / LD DC'S & BIT / RD MO REV RIG / MI RU ENTERTEC WL TRK W/ PACK OFF / RU & RIH / TAGGED UP @ 6343 / LOGGED BACK TO 5950 W 0 PSI ON CSG / RU KILL TRK / RIH TAGGED PBTD / LOGED BACK TO 3000FT W/ 500# CSG PSI / CBL LOG LOOKED GOOD / RD WL TRK / CWI SWIFN / E-MAILED LOG TO ENG.

Daily Cost \$13,105

Cum Cmpl Cost \$0

Cum Well Cost \$26,889

08/02/07

SCB 23-19

AFE # 06-04-13-0437

Eddy NM

Day 3

Purpose of Wk: Completion. OPENED WELL / 0 PSI WO THUNDER STORM TO PASS / RU ENTERTECH WL TRK / PU & TIH W 3 3/8's EXPT. GUN LOADED 4 JSPF 90dg PHASED 35 gr CHARGES & CORL. W/ ENERTECH CBL LOG DATED 8/1/07 & PERF 6224 TO 6236 48 HOLES / TOH / ALL SHOTS FIRED / PU 2nd GUN / SLECT FIRE 3 3/8's EXP GUN LOADED W/ 4 JSPF 90dg PH 35gr CHARGES / TIH & RE CORL W/ CBL LOG & PERF 6183 TO 6202 76 SHOTS / MOVED UP HOLE / CORL W/ CBL LOG & PERF 6160 TO 6177 TOTAL 68 SHOTS / TOH ALL SHOTS FIRED / RD MO ENERTECK LOGGING TRK / PU 5 1/2 MOD "G" RBP & 5 1/2 PK / TIH TAGGED UP @ 6346 PU & SET RBP @ 6250 / PK @ 6238 / MI RU PETRO PLEX ACID CO / TST LINES TO 4000# / OK / ON TBG TST RBP PK & TBG TO 4000# / OK / UN SET PK MOVED UP HOLE TO 6209 / BROKE CIRC & SPOTTED 600gal 15% NEFE TO PK CLOSED BY-PASS & PSI TBG TO 1300# TAKING FLUID @ 2BPM / INCREASED RATE TO 7 BPM @ 2600# & ACIDIZED FORM W/ 600 gal 15% NEFE HCL / STARTED FLUSH @ 2600# 8 BPM / W/ 35 BBL FLUSH PMP BACK SIDE COMMUNICATED / SD / TBG ON VAC / UN SET PK & MOVED UP HOLE TO 6105 STARTED ACID @ 2 BPM / PMP 4 BBL'S HOLE LOADED / INCRESIED RATE TO 8 BPM @ 2800# / PMP 1800 GAL 15% NEFE HCL & FLUSHED W 38 BBL PROD H2O / FINAL PMP PSI 2450# @ 8BPM / ISIP VAC. TOTAL 2400 gal 15% NEFE HCL / 78 BBL PROD H2O / UN SET PK TIH RET RBP / STARTED OUT OF HOLE LD TBG / LD TO 5000# / SWIFN.

Daily Cost \$23,827

Cum Cmpl Cost \$0

Cum Well Cost \$50,716

Well Name: SCB 23-19

Field: Loving

County: Eddy

State: New Mexico

08/03/07

SCB 23-19

AFE # 06-04-13-0437

Eddy NM

Day 4

Purpose of Wk: Completion. OPENED WELL / TBG ON VAC / FINISHED LD 2 7/8'S WS / UN LOADED & TALLIED 204 JTS OF 2 3/8 J-55 8RD EUE FIBER LINED INJ TBG / PU ARROW SET 1-X 2 3/8'S X 5 1/2 15.5# NICKLE PLATED & PLASTIC LINED PK W/ 1.43 PRO FILE NIPPLE & ON & OFF TOOL ON TOP W/ WL ENTRY GUIDE ON BTM / RIH ON 197 JTS OF TBG / SET PK @ 6108.17 / MI RU KILL TRK / LOAD CSG & TST PK & TBG TO 500# FOR 30 MIN / OK / UN SET PK / & CIRC 140 BBL PKR FLUID DN ANL / RESET PK / ND BOP / NU WH / RE PSI CSG TO 500# FOR 30 MIN / OK RELEASED PSI RD MO KILL TRK / CWI / RD MO WO UNIT.

TBG DETAIL:

KB	17.4
2 3/8'S X 2 7/8'S XO	.35
197 JTS OF 2 3/8'S J-55 4.7# FIBER LINED TBG	6082.20
ON & OFF TOOL W/ 1.47 PROFILE NIPPLE	.61
2 3/8 X 5 1/2 ARROW SET 1 X PKR	7.21
WL ENTRY GUIDE	.40
END OF TBG	6108.17
PKR ELEMET	6104.16

Daily Cost \$14,503

Cum Cmpl Cost \$0

Cum Well Cost \$65,219

FINAL REPORT

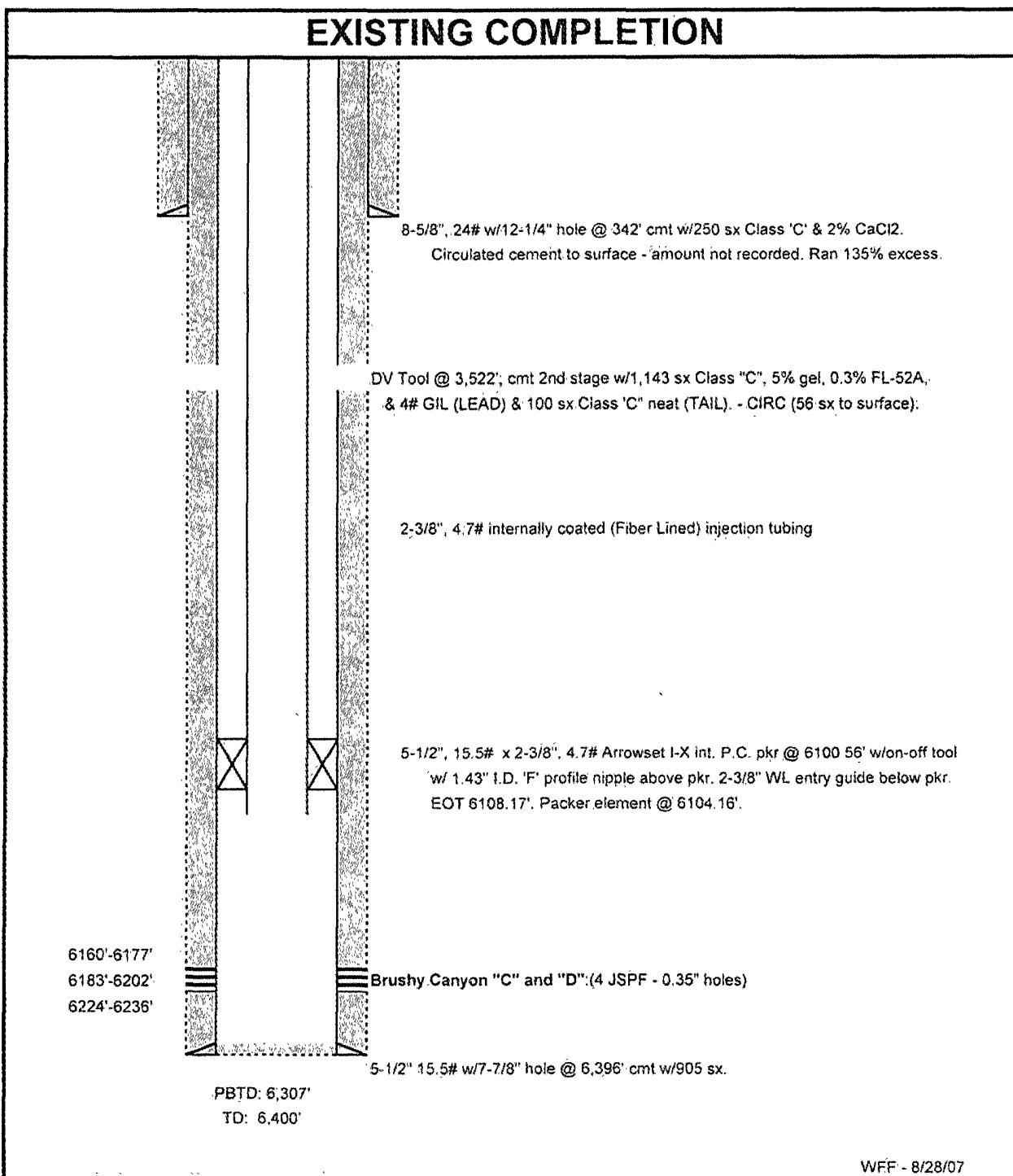


RANGE RESOURCES

LEASE: SCB
FIELD: Loving East
LOCATION: Sec 23, T23S, R28E

WELL #: 23-19
COUNTY: Eddy
LEGAL: 1950' FNL & 2470' FWL (surf)
API#: 30-015-35512
STATE: New Mexico
KB: 3037.4' (KB 17.4')

EXISTING COMPLETION



Tubing Detail

SCB 23-19 Tbg Detail :

	Length (ft)	Depth (ft)
KB	17.40	
2-3/8" SS x 2-7/8" SS XO	0.35	17.40
197 Jts. Fiber Lined Tbg, 2-3/8", 4.7#, J-55, 8R, EUE tbg, 1.73 I.D.	6082.20	17.75
On-Off Tool w/1.43" ID 'F' Profile Nipple	0.61	6099.95
2-3/8" x 5-1/2" Arrow set 1-X Pkr, Nickle plated w/ Internal Plastic Coating	7.21	6100.56
2 3/8 WL Entry Guide	0.40	6107.77
END OF TUBING		6108.17
Packer Element		6104.16

DIRECTIONAL SURVEY REPORT

RANGE RESOURCES

SCB 23 #19 ST

EDDY COUNTY, NEW MEXICO

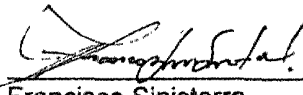
PREPARED BY: FRANCISCO SINISTERRA

DIRECTIONAL SURVEY COMPANY REPORT:

1. NAME OF SURVEYING COMPANY: PATHFINDER ENERGY SERVICES
2. NAME OF PERSON(S) PERFORMING SURVEY:
A) FRANK MIJARES
3. POSITION OF SAID PERSON(S): (A-F) SURVEYORS (FIELD ENGINEERS)
4. DATE(S) ON WHICH SURVEY WAS PERFORMED: 05/04/07 TO 5/17/07
5. STATE IN WHICH SURVEY WAS PERFORMED: New Mexico
6. LOCATION OF WELL: Eddy County, NM
7. TYPE OF SURVEY(S) PERFORMED: MWD
8. COMPLETE IDENTIFICATION OF WELL:

RANGE RESOURCES
SCB 23 #19 ST
EDDY COUNTY, NM
RIG: PATTERSON 141
9. SURVEY CERTIFIED FROM: 4515 TO 5717 FEET MEASURED DEPTH.

THIS IS TO VERIFY THAT ATTACHED DOCUMENTS SHOWING THE WELL TO BE DISPLACED AT 314.12 FEET ON A BEARING OF 20.16 DEGREES FROM THE CENTER OF THE ROTARY TABLE AT A PROJECTED BIT DEPTH OF 5819 FEET, ARE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE.



Francisco Sinisterra
M/LWD SERVICE COORDINATOR

PathFinder Energy Services, Inc.

BHL Report

Page 01/01
Tie-in Date: 06/01/2007
Date Completed: 06/03/2007

RANGE RESOURCES

SCB 23-#19 ST

Eddy COUNTY, New Mexico

Rig:Patterson #141

PathFinder Office Supervisor: Francisco Sinisterra

PathFinder Field Engineers:Frank Mijares

Survey Horiz. Reference:WELLHEAD

Ref Coordinates: LAT:32.17.33.9720 N LON:104.3.29.4696 W

GRID Reference:NAD27 new mexico east Transverse Mercator

Ref GRID Coord: X: 585022.2246 Y: 470335.8412

North Aligned To:TRUE NORTH

Total Magnetic Correction: 8.14° EAST TO TRUE

Vertical Section Plane: 14.97

Survey Vert. Reference: 0.00° Kelly Bushing To MSL

Measured Depth	5819.00	(feet)
Inclination	13.00	(deg)
Azimuth	7.00	(deg)
True Vertical Depth	5800.43	(feet)
Vertical Section	312.84	(feet)
Survey X cord	585130.47	(feet)
Survey Y cord	470630.88	(feet)
Survey Lat	32.29358027 N	(deg)
Survey Lon	104.05783325 W	(deg)
Rectangular Corr. N/S	294.88 N	(feet)
Rectangular Corr. E/W	108.27 E	(feet)
Closure Distance	314.12	(feet)
Direction of Closure	20.16	(deg)
Dogleg Severity	1.29	(deg/100ft)

PathFinder Energy Services, Inc.

Survey Report

RANGE RESOURCES

SCB 23-#19 ST

Eddy COUNTY, New Mexico

Rig: Patterson #141

PathFinder Office Supervisor: Francisco Sinisterra

PathFinder Field Engineers: Frank Mijares

Survey Horiz. Reference: WELLHEAD

Ref Coordinates: LAT: 32.17.33.9720 N LON: 104.3.29.4696 W

Reference: NAD27 new mexico east Transverse Mercator

Ref GRID Coord: X: 585022.2246 Y: 470335.8412

North Aligned To: TRUE NORTH

Total Magnetic Correction: 8.14° EAST TO TRUE

Vertical Section Plane: 14.97

Survey Vert. Reference: 0.00' Kelly Bushing To MSL

Survey Calculations by RX5 V5.11D using Minimum Curvature

Measured Depth (ft)	Incl (deg)	Drift Dir. (deg)	TVD (ft)	Course Length (ft)	Vertical Section (ft)	TOTAL Retangular Offsets (ft) (ft)		Closure Dist Dir (ft) (deg)	DLS (dg/100ft)	
TIE-IN DATA TO PATHFINDER MWD SURVEY FROM PREVIOUS WELL.										
4438.00	9.06	5.33	4430.81	0.00	148.54	125.11 N	107.16 E	164.73@ 40.58	0.00	
THE FOLLOWING ARE PATHFINDER SURVEYS.										
4515.00	5.89	1.02	4507.15	77.00	158.36	135.10 N	107.79 E	172.83@ 38.59	4.18	
4579.00	5.80	0.49	4570.81	64.00	164.68	141.62 N	107.88 E	178.03@ 37.30	0.16	
4642.00	5.89	358.38	4633.49	63.00	170.86	148.03 N	107.82 E	183.13@ 36.07	0.37	
4705.00	5.80	357.77	4696.16	63.00	177.00	154.44 N	107.60 E	188.23@ 34.86	0.17	
4817.00	5.72	354.08	4807.59	112.00	187.62	165.65 N	106.80 E	197.10@ 32.81	0.34	
4831.00	5.54	352.49	4821.53	14.00	188.89	167.01 N	106.64 E	198.16@ 32.56	1.70	
4895.00	6.16	351.79	4885.19	64.00	194.90	173.47 N	105.75 E	203.17@ 31.37	0.97	
4958.00	6.42	353.02	4947.81	63.00	201.28	180.32 N	104.84 E	208.58@ 30.17	0.46	
5022.00	5.80	350.91	5011.45	64.00	207.55	187.06 N	103.89 E	213.98@ 29.05	1.03	
5084.00	6.68	358.21	5073.08	62.00	213.86	193.76 N	103.29 E	219.57@ 28.06	1.91	
5148.00	6.42	358.21	5136.66	64.00	220.85	201.06 N	103.06 E	225.93@ 27.14	0.41	
5212.00	6.16	357.59	5200.28	64.00	227.56	208.06 N	102.80 E	232.07@ 26.29	0.42	
5275.00	5.89	356.27	5262.93	63.00	233.84	214.67 N	102.45 E	237.86@ 25.51	0.48	
5339.00	6.42	357.68	5326.56	64.00	240.37	221.52 N	102.09 E	243.91@ 24.74	0.86	
5402.00	6.42	357.68	5389.17	63.00	247.10	228.56 N	101.81 E	250.20@ 24.01	0.00	
5465.00	6.33	357.86	5451.78	63.00	253.78	235.55 N	101.53 E	256.50@ 23.32	0.15	
5528.00	7.03	1.72	5514.35	63.00	260.85	242.87 N	101.52 E	263.23@ 22.68	1.32	
5591.00	8.53	8.32	5576.77	63.00	269.25	251.35 N	102.31 E	271.37@ 22.15	2.77	
5654.00	10.11	8.14	5638.94	63.00	279.38	261.45 N	103.77 E	281.29@ 21.65	2.51	
5717.00	11.70	7.96	5700.80	63.00	291.21	273.25 N	105.44 E	292.88@ 21.10	2.53	
STRAIGHT LINE PROJECTION TO BIT @ 5819 FT MD.										
5819.00	13.00	7.00	5800.43	102.00	312.84	294.88 N	108.27 E	314.12@ 20.16	1.29	
5975.00	10.00	7.00	5954.06	156.00	340.55	321.76N	111.57 E	321.76@ 19.12		
6400.00	4.00	7.00	6378.04	425.00	369.46	351.06N	115.17 E	351.06@ 18.16		

PATHFINDER

ENERGY SERVICES

TIE-IN SURVEY INFORMATION SHEET

CLIENT INFORMATION

CLIENT:	RANGE RESOURCES		
LEASE / WELL No.:	SCB 23	19 ST	
WELL LOCATION:	LOVING, NEW MEXICO		
COUNTY / STATE / COUNTRY:	EDDY COUNTY	NM	USA
RIG:	PATTERSON 141		
API WELL No:			
JOB No:	101006436		
P.O. / AFE No.			
DIRECTIONAL COMPANY:	PATHFINDER ENERGY		

WELL SITE INFORMATION

MAGNETIC DECLINATION:			
On Wall Plat:	8.14	LWD Calculated:	8.14
		Agreed Upon:	8.14
X =	585022.200000	Feet	Y = 470336.000000
			Feet
SITE LATITUDE:	32.292770 N	SITE LONGITUDE:	104.058186 W
GRID SYSTEM:	TRUE ☐ UTM ☒ LAMBERT ☐	ZONE:	NEW MEXICO EASTERN ZONE
PROPOSED DRIFT DIRECTION:	14.97		
KELLY BUSHING ELEVATION:	15		
ALTITUDE:	Feet	WATER DEPTH:	Feet

TIE-IN SURVEY

MEASURED DEPTH:	4438		
DRIFT ANGLE:	9.06		
DRIFT DIRECTION:	4.54		
TRUE VERTICAL DEPTH:	4430.81		
VERTICAL SECTION:	148.54		
RECTANGULAR COORDINATE (N / S):	125.11		
RECTANGULAR COORDINATE (E / W):	107.16		
CLOSURE DISTANCE / DIRECTION:	164.73	40.58	
SURVEY CALCULATION METHOD:	AA ☐	MC ☒	RC ☐ BT ☐
SOURCE OF TIE-IN DATA (COMPANY):	PATHFINDER ENERGY		
COPY OF TIE-IN SURVEY REPORT	☒ YES ☐ NO		

WELL PLAN

KICKOFF DEPTH:	4818	TOTAL DEPTH:	
KICKOFF ANGLE:	12.05	MAX ANGLE:	18

PES Engineers:

Frank Nijares

**Signature of both field engineers required if applicable

Directional Driller:

[Signature]

DATE: *6/7/02*

PathFinder Energy Services, Inc.

Magnetic & Grid Calculations

RANGE RESOURCES COMPANY
SCB 23 # 19 ST
EDDY Co., NM
Rig:PATTERSON 141

Thu May 17 09:14:41 2007

Coordinates

Latitude: 32.292770 N (32 deg. 17 min. 33.9736 sec.)
Longitude: 104.058186 W (-104 deg. 3 min. 29.4699 sec.)
Elevation: 3020.00 feet.
Calculation Date: May/17/2007

Magnetic Calculations

Model: IGRF2005
Dip Angle: 60.2720 degrees
Total Magnetic Field: 0.49033 gauss
Magnetic Declination: 8.285964 degrees
Horizontal Intensity: 0.243148 gauss

To Convert a Magnetic Dir. to a TRUE North Dir. Add 8.285964 Degr

Transverse Mercator Grid Calculations NAD27

Grid System: Transverse Mercator: new mexico east
Ellipsoid: Clarke 1866
X: 585022.2000 feet
Y: 470336.0000 feet
True to Grid: (convergence) -0.146997 degrees
Magnetic to Grid: 8.138967 degrees

To Convert a Magnetic Dir. to a GRID dir. Add 8.138967 Degr.

PATHFINDER ENERGY SERVICES

MAGNETIC DECLINATION / TOOLFACE OFFSET WORKSHEET

Client: <u>RANGE RESOURCES</u>	LWD Run No: <u>1</u>
Well: <u>SCB 23-#19 ST</u>	DTA No: <u>5/27/2007</u>
Location: <u>EDDY COUNTY, NEW MEXICO</u>	HDAS No: <u>2046</u>
Rig: <u>PATTERSON #141</u>	TrkrElec No: <u>5538</u>
Job No: <u>010100-6436</u>	

Magnetic Declination:

GRID SYSTEM USED: TRUE ☐ UTM ☐ LAMBERT ☐ ZONE: NEW MEXICO EASTERN

X = 585022.2 Y = 470336

SITE LATITUDE: 32.292770 N SITE LONGITUDE: 104.058186 W

Magnetic Declination:

On Wall Plat: 8.14

LWD Calculated: 8.14

Agreed Upon: 8.14

Directional Driller Approval: *[Signature]*

LWD Engineers Approval: *[Signature]*

Supervisor Approval: *[Signature]*

ToolFace Offset Calculation:

- 1: Ensure all connections between M/LWD are torqued correctly.
- 2: Estimate toolface offset.
- 3: Measure the distance from the M/LWD scribe line to the motor scribe line in a clockwise direction looking down hole.
- 4: Measure the circumference of the tool.
- 5: Calculate Tool Face Offset using.

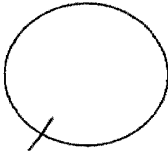
$$\text{TOOL FACE OFFSET} = \frac{\text{Distance from M/LWD to Motor}}{\text{Circumference}} \times 360^\circ$$

ToolFace Offset Using Protractor:

- 1: Hook protractor onto the M/LWD tool.
- 2: Read Tool Face Offset from top of protractor where the motor scribe line intersects protractor.
- 3: If motor scribe line does not intersect protractor flip protractor over and repeat steps 1 and 2.

Distance from M/LWD to Motor: _____

Circumference: _____


V- Door

OTF Estimate: _____ OTF Calculated: _____ OTF Protractor: _____

Offset Tool Face Used = 0

M/LWD Engineer #1: *[Signature]*

M/LWD Engineer #2: _____

Directional Driller: *[Signature]*

PATHFINDER ENERGY SERVICES

MAGNETIC DECLINATION / TOOLFACE OFFSET WORKSHEET

Client: <u>RANGE RESOURCES</u>	LWD Run No: <u>2</u>
Well: <u>SCB 23-#19 ST</u>	DTA No: <u>5/28/2007</u>
Location: <u>EDDY COUNTY, NEW MEXICO</u>	HDAS No: <u>5910</u>
Rig: <u>PATTERSON #141</u>	TrkrElec No: <u>5042</u>
Job No: <u>010100-6436</u>	

Magnetic Declination:

GRID SYSTEM USED: ☒ TRUE ☐ UTM ☐ LAMBERT ☐ ZONE: NEW MEXICO EASTERN

X = 585022.2 Y = 470336

SITE LATITUDE: 32.292770 N SITE LONGITUDE: 104.058186 W

Magnetic Declination:

On Wall Plat: 8.14

LWD Calculated: 8.14

Agreed Upon: 8.14

Directional Driller Approval: [Signature]

LWD Engineers Approval: [Signature]

Supervisor Approval: [Signature]

ToolFace Offset Calculation:

- 1: Ensure all connections between M/LWD are torqued correctly.
- 2: Estimate toolface offset.
- 3: Measure the distance from the M/LWD scribe line to the motor scribe line in a clockwise direction looking down hole.
- 4: Measure the circumference of the tool.
- 5: Calculate Tool Face Offset using.

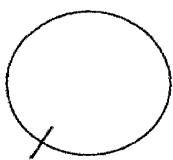
$$\text{TOOL FACE OFFSET} = \frac{\text{Distance from M/LWD to Motor}}{\text{Circumference}} \times 360^\circ$$

ToolFace Offset Using Protractor:

- 1: Hook protractor onto the M/LWD tool.
- 2: Read Tool Face Offset from top of protractor where the motor scribe line intersects protractor.
- 3: If motor scribe line does not intersect protractor flip protractor over and repeat steps 1 and 2.

Distance from M/LWD to Motor: _____

Circumference: _____



V- Door

OTF Estimate: _____ OTF Calculated: _____ OTF Protractor: _____

Offset Tool Face Used = 0

M/LWD Engineer #1: Frank Nijares

M/LWD Engineer #2: _____

Directional Driller: [Signature]

PATHFINDER ENERGY SERVICES

MAGNETIC DECLINATION / TOOLFACE OFFSET WORKSHEET

Client: <u>RANGE RESOURCES</u>	LWD Run No: <u>3</u>
Well: <u>SCB 23-#19 ST</u>	DTA No: <u>5/31/2007</u>
Location: <u>EDDY COUNTY, NEW MEXICO</u>	HDAS No: <u>5910</u>
Rig: <u>PATTERSON #141</u>	TrkrElec No: <u>5042</u>
Job No: <u>010100-6436</u>	

Magnetic Declination:

GRID SYSTEM USED: ☒ TRUE ☐ UTM ☐ LAMBERT ☐ ZONE: NEW MEXICO EASTERN

X = 585022.2 Y = 470336

SITE LATITUDE: 32.292770 N SITE LONGITUDE: 104.058186 W

Magnetic Declination:

On Wall Plat: 8.14

LWD Calculated: 8.14

Agreed Upon: 8.14

Directional Driller Approval: *[Signature]*

LWD Engineers Approval: *[Signature]*

Supervisor Approval: *[Signature]*

ToolFace Offset Calculation:

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- 3: Measure the distance from the M/LWD scribe line to the motor scribe line in a clockwise direction looking down hole.
- 4: Measure the circumference of the tool.
- 5: Calculate Tool Face Offset using.

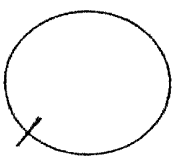
$$\text{TOOL FACE OFFSET} = \frac{\text{Distance from M/LWD to Motor}}{\text{Circumference}} \times 360^\circ$$

ToolFace Offset Using Protractor:

- 1: Hook protractor onto the M/LWD tool.
- 2: Read Tool Face Offset from top of protractor where the motor scribe line intersects protractor.
- 3: If motor scribe line does not intersect protractor flip protractor over and repeat steps 1 and 2.

Distance from M/LWD to Motor: _____

Circumference: _____


V- Door

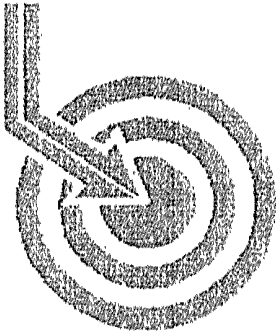
OTF Estimate: _____ OTF Calculated: _____ OTF Protractor: _____

Offset Tool Face Used = 0

M/LWD Engineer #1: *[Signature]*

M/LWD Engineer #2: _____

Directional Driller: *[Signature]*



Scientific Drilling

RANGE RESOURCES

Field: Loving
Site: Eddy County, NM
Well: South Culebra Bluff 23 #19
Wellpath: VH - Job #32K0407350
Survey: 04/28/07

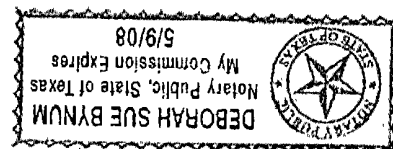
AUG 30 2007
OCD-ARIESIA

This survey is correct to the best of my knowledge
and is supported by actual field data.

.....*R. Wharton*..... Company Representative

Notorized this date 14th of May, 2007.

Deborah Sue Bynum
Notary Signature
County of Midland
State of Texas





Scientific Drilling International Survey Report

Company: RANGE RESOURCES
 Field: Loving
 Site: Eddy County, NM
 Well: South Culebra Bluff 23 #19
 Wellpath: VH - Job #32K0407350
 Date: 05/08/2007
 Co-ordinate(N/E) Reference: Site: Eddy County, NM, Grid North
 Vertical (TVD) Reference: SITE 0.0
 Section (VS) Reference: Site (0.00N,0.00E,14.97Azi)
 Survey Calculation Method: Minimum Curvature
 Db: Sybase
 Survey: 04/28/07
 Start Date: 04/28/2007
 Company: Scientific Drilling International
 Tool: Keeper/Keeper Gyro
 Engineer: Pena w/Geogym
 Tied-to: From Surface

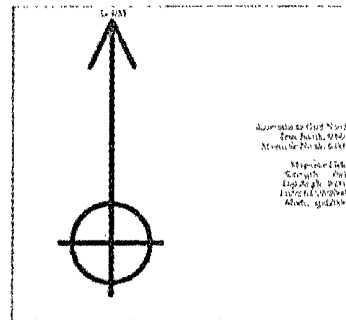
Survey

MD ft	Incl deg	Azim deg	TVD ft	VS ft	N/S ft	E/W ft	DLS deg/100ft	CRD ft	CSA deg
0.00	0.00	359.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.65	332.28	100.00	0.42	0.50	-0.26	0.65	0.57	332.28
200.00	0.76	343.99	199.99	1.40	1.64	-0.71	0.18	1.79	336.60
300.00	0.96	327.60	299.98	2.54	2.99	-1.34	0.32	3.27	335.80
400.00	0.88	331.60	399.97	3.66	4.37	-2.16	0.10	4.87	333.73
500.00	1.11	344.01	499.95	5.05	5.98	-2.79	0.31	6.59	334.98
600.00	1.50	355.11	599.93	7.11	8.21	-3.17	0.46	8.80	338.91
700.00	1.97	5.75	699.88	10.04	11.23	-3.11	0.57	11.65	344.53
800.00	2.57	6.65	799.80	13.96	15.16	-2.67	0.60	15.40	350.00
900.00	2.66	8.50	899.70	18.48	19.68	-2.07	0.12	19.79	353.99
1000.00	2.78	8.56	999.58	23.20	24.38	-1.37	0.12	24.42	356.79
1100.00	2.61	7.51	1099.47	27.86	29.03	-0.71	0.18	29.04	358.60
1200.00	2.58	10.23	1199.37	32.36	33.51	-0.01	0.13	33.51	359.98
1300.00	2.67	7.63	1299.27	36.92	38.03	0.70	0.15	38.03	1.05
1400.00	2.30	3.76	1399.17	41.20	42.34	1.14	0.41	42.35	1.54
1500.00	2.64	1.71	1499.08	45.41	46.64	1.34	0.35	46.66	1.64
1600.00	2.24	9.99	1598.99	49.59	50.87	1.75	0.53	50.90	1.97
1700.00	1.85	17.01	1698.92	53.15	54.34	2.56	0.46	54.40	2.69
1800.00	1.82	31.05	1798.87	56.29	57.24	3.85	0.45	57.37	3.85
1900.00	3.00	54.54	1898.79	59.84	60.12	6.80	1.52	60.50	6.45
2000.00	4.33	67.96	1998.58	64.13	63.06	12.43	1.57	64.27	11.15
2100.00	4.42	71.40	2098.29	68.53	65.70	19.58	0.28	68.56	16.60
2200.00	4.51	74.33	2197.99	72.66	67.99	27.02	0.25	73.16	21.67
2300.00	4.78	81.03	2297.66	76.36	69.70	34.92	0.61	77.96	26.61
2400.00	5.30	83.09	2397.27	79.77	70.91	43.62	0.55	83.25	31.60
2500.00	4.50	89.24	2496.91	82.56	71.52	52.13	0.96	88.50	36.09
2600.00	3.59	96.31	2596.66	84.09	71.23	59.16	1.04	92.59	39.71
2700.00	2.77	102.16	2696.50	84.68	70.37	64.64	0.88	95.55	42.57
2800.00	2.71	101.25	2796.39	84.95	69.40	69.32	0.07	98.09	44.97
2900.00	2.62	93.78	2896.28	85.55	68.79	73.92	0.36	100.97	47.06
3000.00	2.43	93.39	2996.18	86.42	68.51	78.31	0.19	104.05	48.82
3100.00	2.52	99.85	3096.09	87.04	68.01	82.60	0.29	106.99	50.53
3200.00	2.24	98.65	3196.00	87.45	67.34	86.69	0.28	109.78	52.16
3300.00	2.14	95.78	3295.93	87.96	66.86	90.48	0.15	112.51	53.54
3400.00	2.04	90.23	3395.86	88.72	66.67	94.12	0.23	115.34	54.69
3500.00	1.70	94.04	3495.81	89.45	66.55	97.38	0.36	117.95	55.65
3600.00	1.36	93.47	3595.77	89.97	66.38	100.04	0.34	120.06	56.44
3620.00	1.75	100.82	3615.77	90.04	66.31	100.58	2.19	120.47	56.61

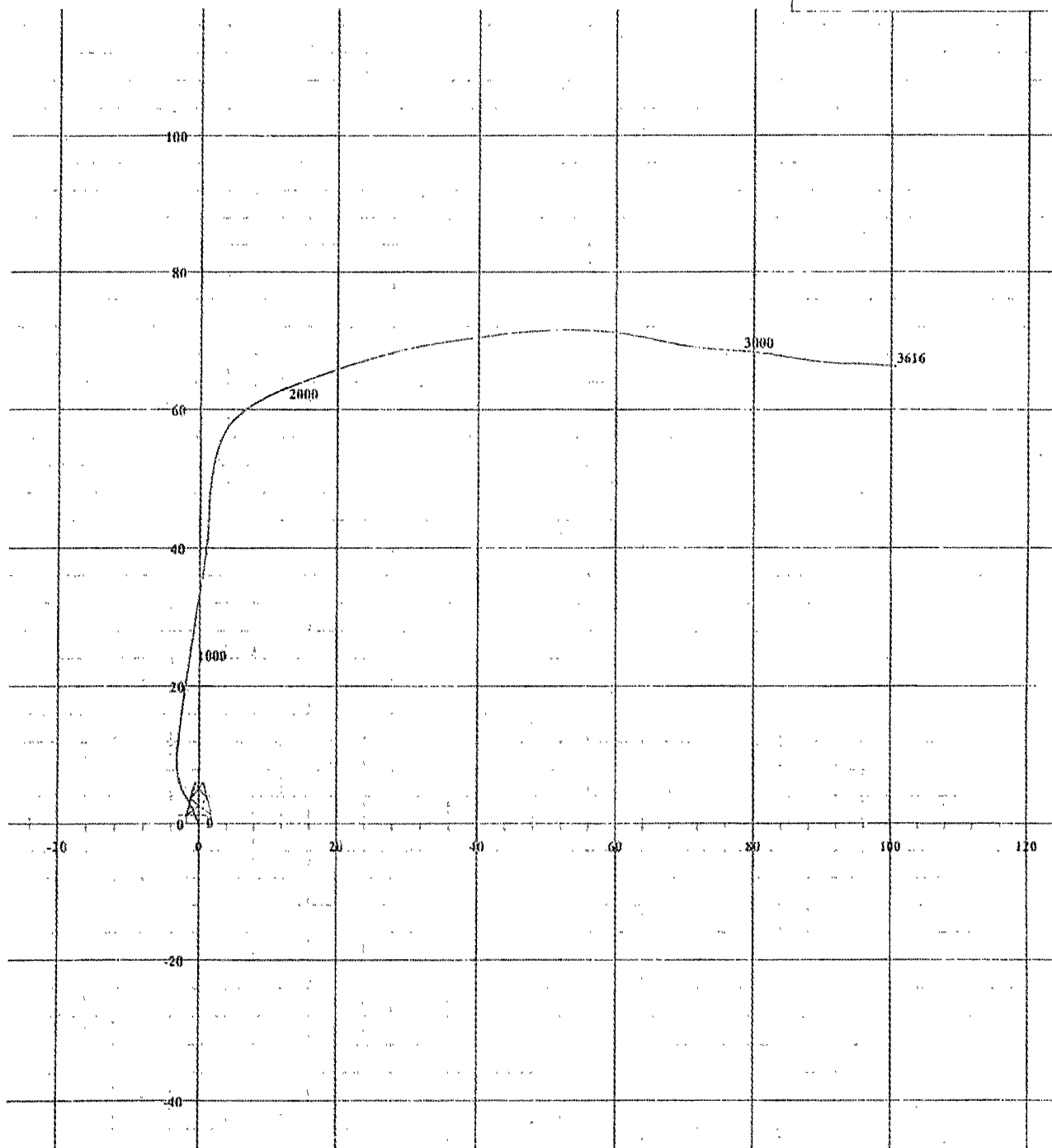


**Scientific
Drilling**

Field: **Loving**
Site: **Eddy County, NM**
Well: **South Culebra Bluff 23 #19**
Wellpath: **VH - Job #32K0407350**
Survey: **04/28/07**



South(-)/North(+) [20ft/in]

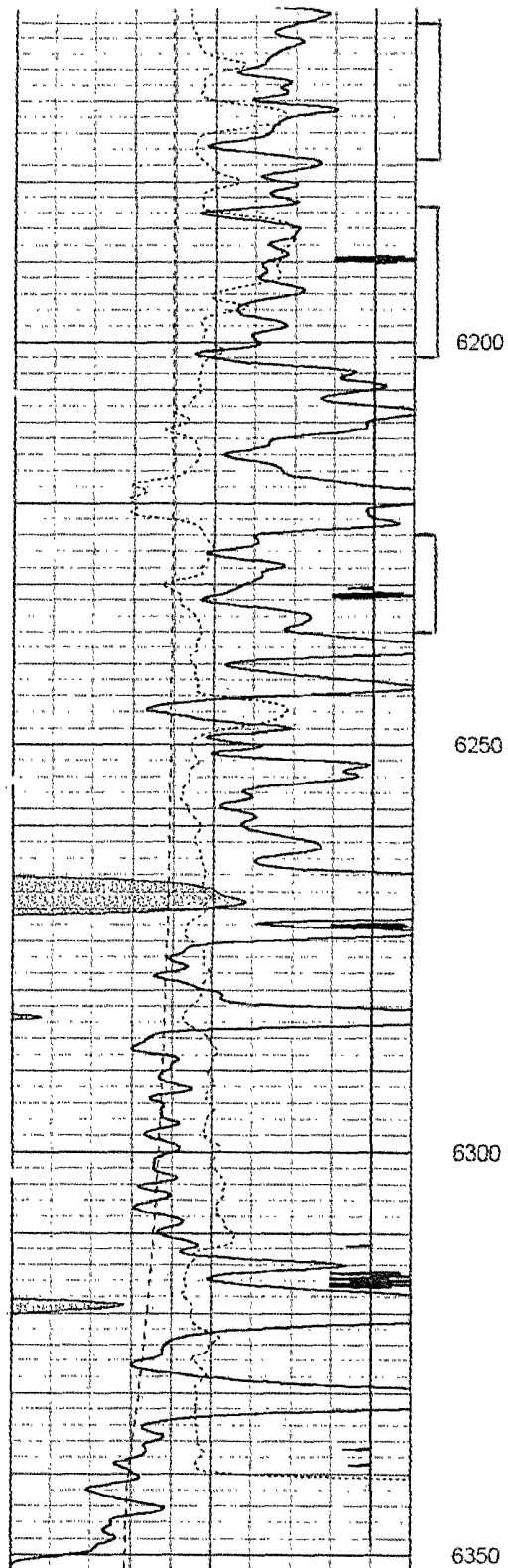


West(-)/East(+) [20ft/in]

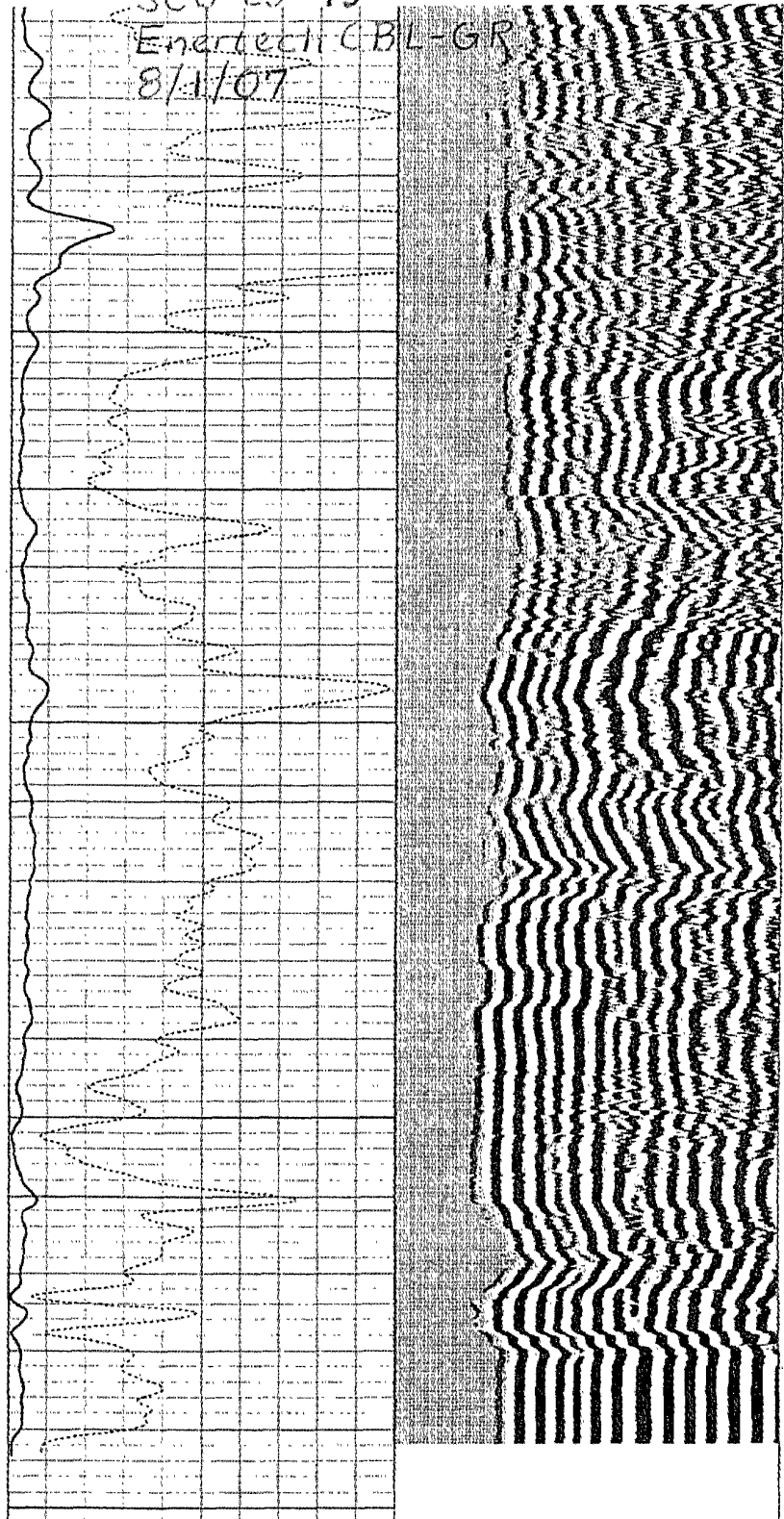
SCB 23-19

Enertech CBL-GR

8/1/07



400	Travel Time (usec)	200
9	Collar Locator	-1
0	GR (GAPI)	100
0	Line Tension (lbs) (lb)	3000



0	Amplitude (mV)	100	200	Variable Density	1200
0	Amplified Amplitude (mV)	10			

CASING DETAIL AND CEMENTING REPORT

Well:	SCB 23 - 19	Field	Loving	County	Eddy	State:	NM		
Total depth:	340	Bit Size:	12.25	Avg Hole size:	12.25	Mud wt:	8.4		
String detail (list each item in order run)									
Length	Cum Length	No Jts	OD	Description	Mfg	Wt	Grade	Threads	Cond
	0	1	8.580	Insert Float	Weatherford				
43.62	43.62	1	8.580	casing	Range	24	K55	8RD	New
	43.62	1	8.580	centralizer	Weatherford				
43.17	86.79	1	8.580	casing	Range	24	K55	8RD	New
	86.79	1	8.580	centralizer	Weatherford				
43.03	129.82	1	8.580	casing	Range	24	K55	8RD	New
	129.82	1	8.580	centralizer	Weatherford				
212.15	341.97	5	8.580	casing	Range	24	K55	8RD	New
	341.97								
	341.97	Total length							
MINUS		Cut-off							
PLUS		RIG KB							
	341.97	Setting depth							
Wt of csg string in mud:									
Wt of csg set on slips:									
Cement used		Cementing company:		GJ					Design
Stage	No. sacks	Cement type and additives			PPG	YIELD	BBLs	BPM	TOC
SPACER									
Lead	250	Class c + 2% Cacl2.1000 bbl. H2O.			14.8	1.32	59	6.32	
							0		
Displacement		fresh water					22		
STAGE 2	IF APPLICABLE						0		
							0		
Displacement									
Full circ (Y/N):		yes		Pipe reciprocated?				yes	
Cement to Surface		yes		Pipe rotated?				no	
Bbls to Surface				Float held (Y/N):				yes	
				Plug bumped (Y/N):				yes	
Centralizer and scratcher placement (type, depth and amount):									
Centralizers @ 130, 86, 43									
Casing on location NOT RUN									
Length	No Jts	OD	Description - Mfg			Wt	Grade	Threads	Cond
Remarks:									
Reported by:					Date:				

CASING DETAIL AND CEMENTING REPORT

Well:	SCB 23-19	Field	East Loving	County	Eddy	State:	NM
Total depth:	6400	Bit Size:	7.875	Avg Hole size:		Mud wt:	10.1

String detail (list each item in order run)									
Length	Cum Length	No Jts	OD	Description	Mfg	Wt	Grade	Threads	Cond
1.3	1.3		5.500	Shoe	Gemoco	15.5	J55	LT&C	new
85.55	86.85	2	5.500	Casing		15.5	J55	LT&C	new
1.1	87.95		5.500	Float Shoe	Gemoco	15.5	J55	LT&C	new
2783.02	2870.97	65	5.500	Casing		5.5	J55	LT&C	new
2.4	2873.37		5.500	DV collar	Gemoco	5.5	J55	LT&C	new
3524.93	6398.3	82							
	6398.3								
	6398.3								
	6398.3								
	6398.3								
MINUS	20	Total length							
PLUS	17.44	Cut-off							
	6395.74	RIG KB							
		Setting depth							
Wt of csg string in mud		95000							
Wt of csg set on slips:									

Cement used		Cementing company:		BJ Services					Design
Stage	No. sacks	Cement type and additives			PPG	YIELD	BBLS	BPM	TOC
SPACER		H2O					20		
Lead	905	Class C+5%Salt+.6%FL-25+.6%FL-52A+.5%BA-10+4#LC(100% excess)			13.2	1.64	264	7	
Displacement									
STAGE 2	IF APPLICABLE								
Lead	1143	Class C+5% Salt+.3%FL-52A+4#LCM-1			12.4	2.1	427	7	
Tail	100	CLASS C Neat			14.8	1.32	24	5	
Displacement									

Full circ (Y/N):	Y	Pipe reciprocated?	Y
Cement to Surface	Y	Pipe rotated?	N
Bbls to Surface	10	Float held (Y/N):	Y
		Plug bumped (Y/N)	Y

Centralizer and scratcher placement (type, depth and amount):

Centralizers at: 6355', 6313', 6228', 6100', 5973', 5844', 5716', 5586', 5460', 5331', 5202', 5073', 4944', 4815', 4686', 4557', 4427', 4299', 4169', 4040', 3911', 3784', 3655' = 23 Centralizers

Casing on location NOT RUN									
Length	No Jts	OD	Description - Mfg			Wt	Grade	Threads	Cond
257.43	6	5.5				15.5	J55	LT&C	New

Remarks:

Reported by: Kevin Carter Date: 6/8/2007