

A GYRO TECHNOLOGIES INC. COMPANY

PO Box 261021
Corpus Christi, Texas 78426
(361) 767-0602 • (800) 606-GYRO • Fax (361) 767-0612

30-015-39725

February 24, 2012

Devon Energy Production Company
20 North Broadway
Oklahoma City, OK 73102

Attn: Mark Cooper

Re: **Rigel 20 Fed Com 3H**

Please find enclosed a copy of the survey from 0' to 8,255' ran on the above referenced well.

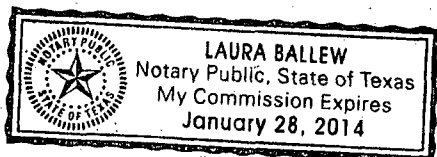
If I can be of any further service, please do not hesitate to call me at 800-606-4976.

Sincerely,

Keith Havelka
Operations

STATE OF TEXAS §
 §
COUNTY OF NUECES §

This instrument was acknowledged before me on the 29th day of February A.D., 2012, by Keith Havelka.



Laura Ballew
Laura Ballew
Notary Public, State of Texas



Company: Devon Energy Production Co., LP
Lease/Well: Rigel 20 Fed Com/3H
Location: S20 T19S R31E
Rig Name: H&P 300
State/County: New Mexico/Eddy
Latitude: 32.64
GRID North is 0.23 Degrees East of True North
VS-Azi: 0.00 Degrees



RKB : 26.2 Feet

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: gyrorun_int.ut

Minimum Curvature Method

Report Date/Time: 2/27/2012 / 09:11

Vaughn Energy Services

Gardendale, Texas

432-563-5444

Surveyor: Ray Seago

Rigel 20 Fed Com 3H / API 30-015-39725

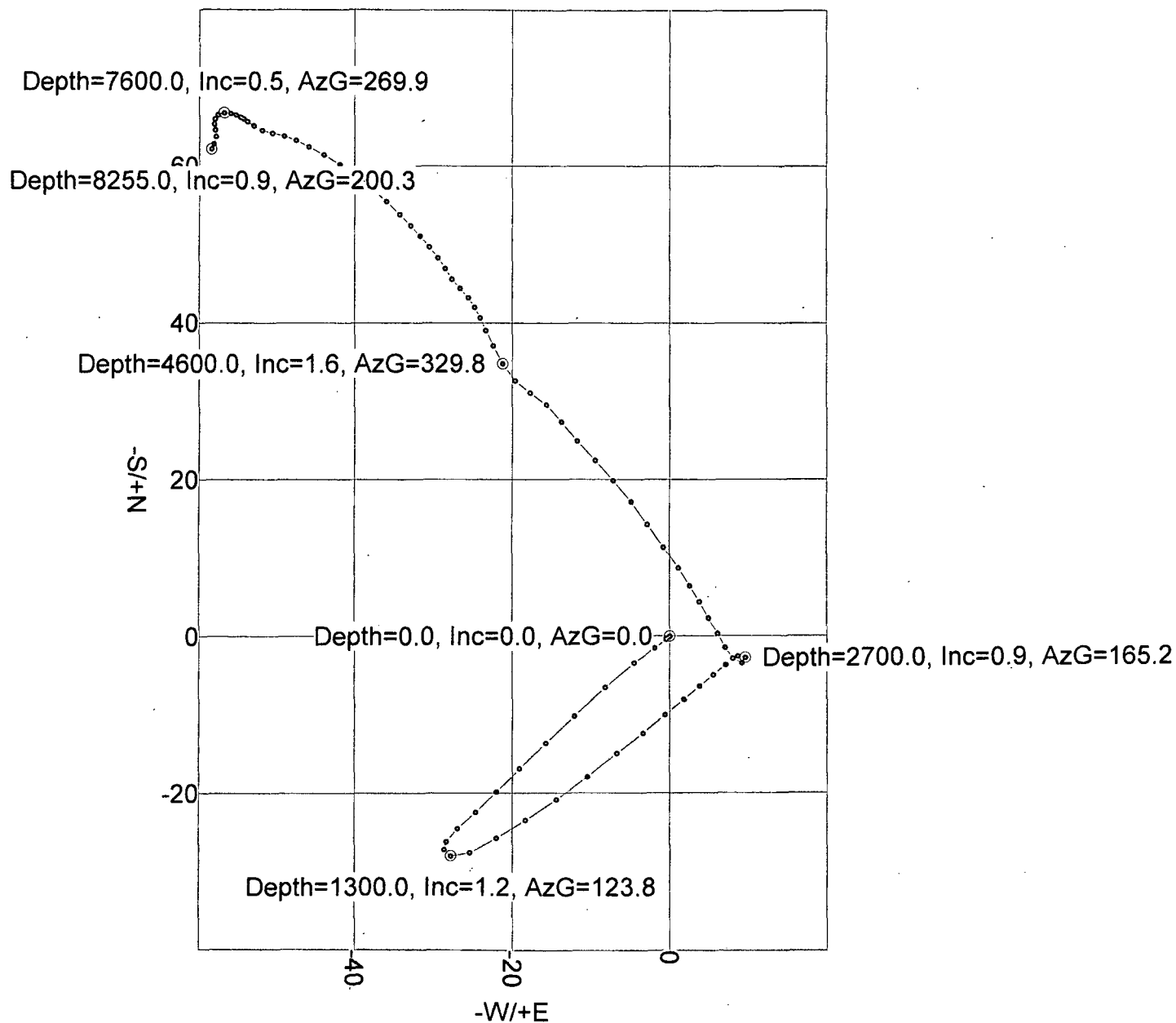
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
100.00	0.70	227.96	100.00	-0.41	-0.46	-0.41	0.61	227.96	0.70
200.00	1.41	235.93	199.98	-1.51	-1.93	-1.51	2.45	231.95	0.72
300.00	2.30	231.84	299.93	-3.44	-4.52	-3.44	5.68	232.77	0.90
400.00	3.20	227.76	399.81	-6.55	-8.17	-6.55	10.47	231.26	0.92
500.00	2.99	226.94	499.67	-10.20	-12.13	-10.20	15.85	229.94	0.21
600.00	2.78	226.12	599.54	-13.66	-15.78	-13.66	20.87	229.12	0.21
700.00	2.53	225.24	699.43	-16.89	-19.09	-16.89	25.49	228.50	0.25
800.00	2.28	224.36	799.34	-19.86	-22.05	-19.86	29.67	227.98	0.25
900.00	1.95	226.45	899.28	-22.45	-24.66	-22.45	33.35	227.69	0.34
1000.00	1.62	228.54	999.23	-24.56	-26.95	-24.56	36.46	227.66	0.34
1100.00	0.94	204.46	1099.20	-26.24	-28.35	-26.24	38.63	227.21	0.85
1200.00	0.27	180.39	1199.20	-27.23	-28.69	-27.23	39.55	226.50	0.70
1300.00	1.19	123.82	1299.19	-28.04	-27.83	-28.04	39.51	224.79	1.06
1400.00	2.10	57.26	1399.15	-27.63	-25.43	-27.63	37.55	222.63	1.96
1500.00	2.37	64.79	1499.08	-25.76	-22.03	-25.76	33.89	220.54	0.40
1600.00	2.63	52.32	1598.98	-23.47	-18.34	-23.47	29.79	218.00	0.61
1700.00	2.77	59.90	1698.87	-20.85	-14.43	-20.85	25.36	214.68	0.38
1800.00	2.91	47.47	1798.75	-17.92	-10.46	-17.92	20.75	210.27	0.63

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
1900.00	2.58	56.88	1898.64	-14.98	-6.71	-14.98	16.41	204.12	0.56
2000.00	2.24	46.29	1998.55	-12.40	-3.41	-12.40	12.85	195.37	0.56
2100.00	1.94	53.16	2098.48	-10.03	-0.64	-10.03	10.05	183.65	0.40
2200.00	1.63	50.03	2198.43	-8.10	1.80	-8.10	8.30	167.45	0.32
2300.00	1.41	50.23	2298.40	-6.40	3.84	-6.40	7.46	149.01	0.22
2400.00	1.20	50.43	2398.37	-4.94	5.60	-4.94	7.47	131.46	0.22
2500.00	1.12	52.55	2498.35	-3.68	7.18	-3.68	8.07	117.15	0.08
2600.00	1.05	54.66	2598.33	-2.56	8.71	-2.56	9.07	106.36	0.08
2700.00	0.88	165.20	2698.32	-2.77	9.65	-2.77	10.04	105.99	1.59
2800.00	0.71	275.73	2798.32	-3.45	9.23	-3.45	9.86	110.46	1.31
2900.00	0.90	311.35	2898.31	-2.86	8.03	-2.86	8.52	109.62	0.53
3000.00	1.10	336.97	2998.29	-1.46	7.06	-1.46	7.21	101.65	0.49
3100.00	1.24	326.49	3098.27	0.33	6.09	0.33	6.09	86.87	0.25
3200.00	1.38	336.01	3198.25	2.34	5.00	2.34	5.52	64.95	0.26
3300.00	1.38	324.30	3298.22	4.41	3.81	4.41	5.83	40.80	0.28
3400.00	1.37	332.58	3398.19	6.45	2.56	6.45	6.94	21.62	0.20
3500.00	1.70	323.79	3498.15	8.71	1.13	8.71	8.78	7.39	0.40
3600.00	2.02	325.00	3598.10	11.35	-0.76	11.35	11.37	356.18	0.33
3700.00	2.04	324.39	3698.04	14.24	-2.81	14.24	14.51	348.85	0.03
3800.00	2.06	323.79	3797.98	17.14	-4.90	17.14	17.83	344.03	0.03
3900.00	2.02	316.96	3897.91	19.88	-7.17	19.88	21.13	340.17	0.25
4000.00	1.98	320.14	3997.85	22.49	-9.48	22.49	24.40	337.15	0.12
4100.00	1.88	313.78	4097.79	24.95	-11.77	24.95	27.58	334.75	0.24
4200.00	1.78	327.42	4197.74	27.39	-13.79	27.39	30.67	333.28	0.45
4300.00	1.57	309.87	4297.70	29.58	-15.68	29.58	33.48	332.07	0.55
4400.00	1.36	302.32	4397.67	31.09	-17.74	31.09	35.80	330.30	0.28
4500.00	1.49	316.07	4497.64	32.67	-19.64	32.67	38.12	328.98	0.36
4600.00	1.61	329.82	4597.60	34.82	-21.25	34.82	40.79	328.60	0.39
4700.00	1.36	333.91	4697.57	37.10	-22.48	37.10	43.38	328.79	0.28
4800.00	1.10	338.01	4797.55	39.05	-23.36	39.05	45.50	329.11	0.27
4900.00	0.95	334.14	4897.53	40.68	-24.07	40.68	47.27	329.38	0.16
5000.00	0.80	330.27	4997.52	42.02	-24.78	42.02	48.79	329.47	0.16
5100.00	0.86	322.51	5097.51	43.23	-25.58	43.23	50.23	329.38	0.13
5200.00	0.93	314.76	5197.50	44.39	-26.62	44.39	51.76	329.06	0.14
5300.00	0.91	322.84	5297.48	45.60	-27.67	45.60	53.34	328.75	0.13
5400.00	0.90	330.92	5397.47	46.92	-28.53	46.92	54.91	328.69	0.13
5500.00	0.98	324.80	5497.46	48.30	-29.41	48.30	56.55	328.67	0.13
5600.00	1.06	318.69	5597.44	49.69	-30.51	49.69	58.31	328.45	0.13
5700.00	1.04	320.95	5697.42	51.09	-31.69	51.09	60.11	328.19	0.05

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
5800.00	1.02	313.21	5797.41	52.40	-32.90	52.40	61.87	327.87	0.14
5900.00	1.26	317.51	5897.39	53.81	-34.29	53.81	63.81	327.49	0.25
6000.00	1.50	311.82	5997.36	55.49	-36.00	55.49	66.15	327.02	0.28
6100.00	1.46	309.05	6097.33	57.16	-37.96	57.16	68.62	326.41	0.08
6200.00	1.42	306.27	6197.29	58.69	-39.95	58.69	71.00	325.76	0.08
6300.00	1.40	309.31	6297.26	60.20	-41.89	60.20	73.34	325.17	0.08
6400.00	1.38	292.35	6397.24	61.43	-43.94	61.43	75.52	324.42	0.41
6500.00	1.17	302.00	6497.21	62.42	-45.91	62.42	77.49	323.66	0.30
6600.00	0.97	291.64	6597.19	63.27	-47.56	63.27	79.16	323.07	0.28
6700.00	0.90	286.14	6697.18	63.81	-49.11	63.81	80.51	322.42	0.11
6800.00	0.84	280.64	6797.17	64.16	-50.59	64.16	81.71	321.75	0.10
6900.00	0.74	292.44	6897.16	64.54	-51.91	64.54	82.83	321.19	0.19
7000.00	0.65	304.25	6997.15	65.11	-52.98	65.11	83.94	320.86	0.17
7100.00	0.44	303.61	7097.15	65.64	-53.77	65.64	84.85	320.68	0.20
7200.00	0.24	302.98	7197.15	65.97	-54.27	65.97	85.42	320.56	0.20
7300.00	0.31	298.67	7297.14	66.21	-54.68	66.21	85.87	320.45	0.07
7400.00	0.37	294.37	7397.14	66.47	-55.21	66.47	86.41	320.29	0.07
7500.00	0.45	282.13	7497.14	66.69	-55.89	66.69	87.01	320.04	0.12
7600.00	0.54	269.89	7597.14	66.77	-56.74	66.77	87.63	319.64	0.13
7700.00	0.45	233.23	7697.13	66.54	-57.53	66.54	87.96	319.15	0.32
7800.00	0.37	196.57	7797.13	65.99	-57.94	65.99	87.81	318.72	0.27
7900.00	0.41	178.90	7897.13	65.31	-58.03	65.31	87.37	318.38	0.13
8000.00	0.45	161.23	7997.13	64.58	-57.89	64.58	86.73	318.12	0.14
8100.00	0.52	183.90	8097.12	63.75	-57.79	63.75	86.05	317.80	0.20
8200.00	0.59	206.57	8197.12	62.83	-58.06	62.83	85.55	317.26	0.23
8255.00	0.91	200.29	8252.11	62.17	-58.34	62.17	85.25	316.82	0.60



Vaughn Energy Services
Gardendale, Texas
432-563-5444
Surveyor: Ray Seago
Rigel 20 Fed Com 3H / API 30-015-39725



VES Survey Date: 01/19/2012

Pathfinder:

6213 WCR 112
Midland, Texas 79706
Tel (432)687-1647
Fax (432)687-1544



April 5, 2012

Devon Energy
20 N. Broadway
Oklahoma City, OK

RE: Devon Energy
Rigel 20 Fed Com #3H
API: 30-015-39725
Eddy County, NM
RIG: H&P 300
FIELD: Hackberry; Bone Spring
PES FILE NO.: 700005256-WT-WT

To whom it may concern:

We hereby certify that the enclosed Original Field Survey Data contained in this report represents to the best of our knowledge, a true and accurate survey of the well at the time the survey was run.

DIRECTIONAL SURVEY DATA
1 – Original survey report
2 – Survey report copies

We appreciate the opportunity to work with you and we look forward to your business support. If you have any questions, I can be reached at (432) 687-1647

Sincerely,

A handwritten signature in black ink, appearing to read "S. Bibb".

STEVE BIBB
M/LWD Service Coordinator
PathFinder Energy Services

ML:sh



A Schlumberger Company

DIRECTIONAL SURVEY REPORT

DEVON ENERGY

RIGEL 20 FED COM #3H

EDDY COUNTY, NEW MEXICO

PREPARED BY: STEVE BIBB

Pathfinder

6213 WCR. 112
Midland, Texas. 79706
Tel. (432)687-1647
Fax (432)687-1544

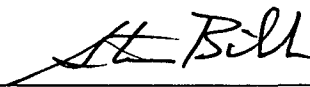


DIRECTIONAL SURVEY COMPANY REPORT:

1. NAME OF SURVEYING COMPANY: PATHFINDER ENERGY SERVICES
2. NAME OF PERSON(S) PERFORMING SURVEY:
A) PRITHWISH DAS
3. POSITION OF SAID PERSON(S): (A-F) SURVEYORS (FIELD ENGINEERS)
4. DATE(S) ON WHICH SURVEY WAS PERFORMED: 02-21-12 TO 03-01-12
5. STATE IN WHICH SURVEY WAS PERFORMED: NEW MEXICO
6. LOCATION OF WELL: EDDY COUNTY
7. TYPE OF SURVEY(S) PERFORMED: MWD
8. COMPLETE IDENTIFICATION OF WELL:

DEVON ENERGY
RIGEL 20 FEDERAL COM #3H
EDDY COUNTY, NM
RIG: H&P 300
9. SURVEY CERTIFIED FROM: 8324 TO 13235 FEET MEASURED DEPTH.

THIS IS TO VERIFY THAT ATTACHED DOCUMENTS SHOWING THE WELL TO BE
DISPLACED AT 4617.33 FEET ON A BEARING OF 91.27 DEGREES FROM THE
CENTER OF THE ROTARY TABLE AT A PROJECTED BIT DEPTH OF 13305 FEET,
ARE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE.



STEVE BIBB
M/LWD SERVICE COORDINATOR

PathFinder Energy Services, Inc.

BHL Report

Page 01/01
Tie-in Date: 02/20/2012
Date Completed: 03/01/2012

DEVON ENERGY
RIGEL 20 FEDERAL COM #3H - API#: 30-015-39725
EDDY COUNTY, NEW MEXICO
Rig:H&P 300
PathFinder Office Supervisor: STEVE BIBB
PathFinder Field Engineers:P.DAS
M.ALIYEV

Survey Horiz. Reference:WELLHEAD
Ref Coordinates: LAT:32.38.36.8810 N LON:103.53.56.0990 W
GRID Reference:NAD83 new mexico east Transverse Mercator
Ref GRID Coord: X: 675052.9900 Y: 598138.0500
North Aligned To:GRID NORTH
Total Magnetic Correction: 7.45° EAST TO GRID
Vertical Section Plane: 90.89
Survey Vert. Reference: 26.20' Rotary Table To Ground
Altitude:3406.50' Ground To MSL

Measured Depth	13305.00	(feet)
Inclination	93.12	(deg)
Azimuth	89.89	(deg)
True Vertical Depth	8889.17	(feet)
Vertical Section	4617.22	(feet)
Survey X cord	679669.18	(feet)
Survey Y cord	598035.63	(feet)
Survey Lat	32.64324375 N	(deg)
Survey Lon	103.88392105 W	(deg)
Rectangular Corr. N/S	102.42 S	(feet)
Rectangular Corr. E/W	4616.19 E	(feet)
Closure Distance	4617.33	(feet)
Direction of Closure	91.27	(deg)
Dogleg Severity	0.00	(deg/100ft)

PathFinder Energy Services, Inc.

Survey Report

Page 01/03
Tie-in Date: 02/20/2012
Date Completed: 03/01/2012

DEVON ENERGY
RIGEL 20 FEDERAL COM #3H - API#: 30-015-39725
EDDY COUNTY, NEW MEXICO
Rig:H&P 300
PathFinder Office Supervisor: STEVE BIBB
PathFinder Field Engineers: P.DAS
M.ALIYEV

Survey Horiz. Reference:WELLHEAD
Ref Coordinates: LAT:32.38.36.8810 N LON:103.53.56.0990 W
GRID Reference:NAD83 new mexico east Transverse Mercator
Ref GRID Coord: X: 675052.9900 Y: 598138.0500
North Aligned To:GRID NORTH
Total Magnetic Correction: 7.45° EAST TO GRID
Vertical Section Plane: 90.89
Survey Vert. Reference: 26.20' Rotary Table To Ground
Altitude:3406.50' Ground To MSL

Survey Calculations by RX5 V6.04 using Minimum Curvature

Measured Depth (ft)	Incl (deg)	Drift Dir. (deg)	TVD (ft)	Course Length (ft)	Vertical Section (ft)	TOTAL Rectangular Offsets (ft) (ft)		Closure Dist Dir (ft) (deg)		DLS (dg/100ft)
TIED INTO VAUGHN ENERGY SERVICE GYRO SURVEY @ 8255' MD.										
8255.00	0.91	200.29	8252.11	0.00	-59.30	62.17 N	58.34 W	85.26@	316.82	0.00
THE FOLLOWING ARE PATHFINDER MWD SURVEYS.										
8324.00	11.43	80.75	8320.67	69.00	-52.73	62.76 N	51.76 W	81.35@	320.49	17.25
8356.00	15.48	89.45	8351.79	32.00	-45.33	63.31 N	44.35 W	77.30@	324.98	14.12
8387.00	16.44	95.60	8381.59	31.00	-36.82	62.92 N	35.85 W	72.42@	330.33	6.27
8419.00	16.27	95.43	8412.30	32.00	-27.84	62.05 N	26.88 W	67.63@	336.58	0.55
8450.00	16.36	92.97	8442.05	31.00	-19.15	61.42 N	18.20 W	64.06@	343.49	2.25
8482.00	18.38	89.63	8472.59	32.00	-9.60	61.22 N	8.65 W	61.82@	351.95	7.04
8513.00	21.63	90.24	8501.72	31.00	1.00	61.22 N	1.95 E	61.25@	1.83	10.50
8545.00	24.62	92.32	8531.14	32.00	13.56	60.93 N	14.51 E	62.63@	13.40	9.69
8576.00	27.70	92.66	8558.96	31.00	27.22	60.33 N	28.16 E	66.58@	25.02	9.95
8608.00	28.84	92.85	8587.15	32.00	42.37	59.60 N	43.30 E	73.67@	36.00	3.57
8639.00	31.22	93.85	8613.98	31.00	57.87	58.69 N	58.79 E	83.07@	45.05	7.84
8671.00	33.94	94.50	8640.95	32.00	75.07	57.43 N	75.97 E	95.24@	52.91	8.57
8702.00	35.70	94.86	8666.39	31.00	92.73	55.99 N	93.61 E	109.08@	59.12	5.72
8734.00	38.08	94.58	8691.99	32.00	111.90	54.41 N	112.76 E	125.20@	64.24	7.46
8765.00	40.71	93.83	8715.94	31.00	131.54	52.97 N	132.38 E	142.58@	68.19	8.62
8797.00	43.70	93.68	8739.64	32.00	153.00	51.56 N	153.82 E	162.24@	71.47	9.35
8828.00	46.60	94.70	8761.50	31.00	174.94	49.95 N	175.74 E	182.70@	74.13	9.64
8860.00	49.86	95.24	8782.82	32.00	198.75	47.88 N	199.51 E	205.18@	76.50	10.27
8892.00	54.26	95.81	8802.49	32.00	223.89	45.45 N	224.63 E	229.18@	78.56	13.82
8923.00	58.39	96.31	8819.67	31.00	249.58	42.72 N	250.27 E	253.89@	80.31	13.39
8954.00	62.52	96.71	8834.95	31.00	276.41	39.67 N	277.06 E	279.89@	81.85	13.37
8986.00	67.09	97.47	8848.57	32.00	305.19	36.09 N	305.79 E	307.91@	83.27	14.44
9017.00	71.31	97.43	8859.58	31.00	333.97	32.33 N	334.52 E	336.08@	84.48	13.61

PathFinder Energy Services, Inc.

Survey Report

DEVON ENERGY
RIGEL 20 FEDERAL COM #3H - API#: 30-015-39725
EDDY COUNTY, NEW MEXICO
RIG:H&P 300

Page 02/03

Measured Depth (ft)	Incl (deg)	Drift Dir. (deg)	TVD (ft)	Course Length (ft)	Vertical Section (ft)	TOTAL Rectangular Offsets (ft) (ft)		Closure Dist Dir (ft) (deg)		DLS (dg/100ft)
9049.00	75.53	97.30	8868.71	32.00	364.44	28.40 N	364.93 E	366.03@	85.55	13.19
9079.00	80.11	96.94	8875.04	30.00	393.59	24.77 N	394.02 E	394.80@	86.40	15.31
9176.00	90.04	96.31	8883.35	97.00	489.62	13.64 N	489.89 E	490.08@	88.41	10.26
9271.00	90.04	93.85	8883.29	95.00	584.36	5.23 N	584.51 E	584.54@	89.49	2.59
9365.00	90.04	93.23	8883.22	94.00	678.26	0.58 S	678.33 E	678.33@	90.05	0.66
9459.00	89.60	92.97	8883.52	94.00	772.19	5.66 S	772.20 E	772.22@	90.42	0.54
9554.00	90.92	92.70	8883.09	95.00	867.13	10.36 S	867.08 E	867.14@	90.68	1.42
9648.00	90.57	92.18	8881.86	94.00	961.09	14.36 S	960.98 E	961.09@	90.86	0.67
9743.00	90.13	92.62	8881.28	95.00	1056.05	18.34 S	1055.90 E	1056.06@	91.00	0.65
9837.00	89.78	92.35	8881.36	94.00	1150.02	22.41 S	1149.81 E	1150.03@	91.12	0.47
9932.00	89.69	92.26	8881.80	95.00	1244.99	26.24 S	1244.73 E	1245.01@	91.21	0.13
10027.00	89.60	90.51	8882.38	95.00	1339.98	28.53 S	1339.70 E	1340.00@	91.22	1.84
10121.00	89.69	90.51	8882.97	94.00	1433.97	29.37 S	1433.69 E	1433.99@	91.17	0.10
10216.00	88.90	90.35	8884.14	95.00	1528.96	30.08 S	1528.68 E	1528.98@	91.13	0.85
10310.00	89.16	90.94	8885.73	94.00	1622.95	31.14 S	1622.66 E	1622.96@	91.10	0.69
10405.00	90.04	91.41	8886.39	95.00	1717.94	33.09 S	1717.64 E	1717.96@	91.10	1.05
10500.00	89.34	90.84	8886.90	95.00	1812.94	34.95 S	1812.62 E	1812.95@	91.10	0.95
10594.00	89.43	91.03	8887.91	94.00	1906.94	36.49 S	1906.60 E	1906.95@	91.10	0.22
10689.00	89.78	90.98	8888.57	95.00	2001.93	38.15 S	2001.58 E	2001.94@	91.09	0.37
10783.00	89.69	91.17	8889.00	94.00	2095.93	39.92 S	2095.56 E	2095.94@	91.09	0.22
10878.00	89.60	91.16	8889.59	95.00	2190.93	41.85 S	2190.54 E	2190.94@	91.09	0.10
10973.00	88.29	91.36	8891.34	95.00	2285.91	43.94 S	2285.50 E	2285.92@	91.10	1.40
11067.00	88.02	91.02	8894.37	94.00	2379.86	45.89 S	2379.43 E	2379.88@	91.10	0.46
11162.00	87.76	91.42	8897.87	95.00	2474.79	47.91 S	2474.35 E	2474.81@	91.11	0.50
11256.00	89.60	91.27	8900.03	94.00	2568.76	50.11 S	2568.29 E	2568.78@	91.12	1.96
11351.00	90.04	91.40	8900.33	95.00	2663.76	52.33 S	2663.26 E	2663.78@	91.13	0.48
11446.00	90.48	91.19	8899.90	95.00	2758.75	54.47 S	2758.24 E	2758.78@	91.13	0.51
11540.00	90.66	90.98	8898.96	94.00	2852.75	56.25 S	2852.22 E	2852.77@	91.13	0.29

PathFinder Energy Services, Inc.

Survey Report

DEVON ENERGY
RIGEL 20 FEDERAL COM #3H - API#: 30-015-39725
EDDY COUNTY, NEW MEXICO
RIG:H&P 300

Page 03/03

Measured Depth (ft)	Incl (deg)	Drift Dir. (deg)	TVD (ft)	Course Length (ft)	Vertical Section (ft)	TOTAL Rectangular Offsets (ft) (ft)		Closure Dist Dir (ft) (deg)		DLS (dg/100ft)
11635.00	91.19	90.60	8897.43	95.00	2947.73	57.56 S	2947.20 E	2947.76@	91.12	0.69
11729.00	90.31	91.97	8896.20	94.00	3041.72	59.67 S	3041.16 E	3041.75@	91.12	1.73
11824.00	90.48	92.15	8895.54	95.00	3136.70	63.09 S	3136.10 E	3136.73@	91.15	0.26
11918.00	90.57	91.92	8894.68	94.00	3230.68	66.42 S	3230.03 E	3230.72@	91.18	0.26
12013.00	90.75	91.99	8893.59	95.00	3325.65	69.66 S	3324.97 E	3325.70@	91.20	0.20
12107.00	89.16	92.32	8893.66	94.00	3419.63	73.20 S	3418.90 E	3419.69@	91.23	1.73
12202.00	89.16	92.18	8895.05	95.00	3514.59	76.93 S	3513.82 E	3514.66@	91.25	0.15
12296.00	89.16	91.73	8896.43	94.00	3608.56	80.14 S	3607.75 E	3608.64@	91.27	0.48
12391.00	89.34	91.77	8897.68	95.00	3703.54	83.04 S	3702.70 E	3703.63@	91.28	0.19
12485.00	89.60	92.73	8898.55	94.00	3797.51	86.73 S	3796.62 E	3797.61@	91.31	1.06
12580.00	90.04	91.28	8898.84	95.00	3892.49	90.05 S	3891.56 E	3892.60@	91.33	1.59
12675.00	90.13	91.42	8898.70	95.00	3987.49	92.29 S	3986.54 E	3987.60@	91.33	0.17
12769.00	89.87	92.18	8898.70	94.00	4081.48	95.24 S	4080.49 E	4081.60@	91.34	0.85
12864.00	89.96	91.74	8898.84	95.00	4176.46	98.49 S	4175.43 E	4176.59@	91.35	0.47
12935.00	89.60	91.03	8899.12	71.00	4247.46	100.21 S	4246.41 E	4247.59@	91.35	1.12
13030.00	90.57	90.51	8898.98	95.00	4342.45	101.48 S	4341.40 E	4342.59@	91.34	1.16
13124.00	91.45	90.42	8897.32	94.00	4436.43	102.25 S	4435.38 E	4436.56@	91.32	0.94
13218.00	92.77	89.98	8893.86	94.00	4530.36	102.57 S	4529.32 E	4530.48@	91.30	1.48
13235.00	93.12	89.89	8892.99	17.00	4547.34	102.55 S	4546.29 E	4547.45@	91.29	2.13
STRAIGH-LINE PROJECTION TO BIT @ 13305' MD										
13305.00	93.12	89.89	8889.17	70.00	4617.22	102.42 S	4616.19 E	4617.33@	91.27	0.00



A Schlumberger Company

TIE-IN SURVEY INFORMATION SHEET**CLIENT INFORMATION**

CLIENT:	Devon Energy		
LEASE / WELL No.:	Rigel 20 Federal Com	#3H	
WELL LOCATION:	EDDY COUNTY		
COUNTY / STATE / COUNTRY:	EDDY COUNTY	NEW MEXICO	USA
RIG:	H&P 300		
API WELL No:	30-015-39725		
JOB No:	700005256- WT-WT		
P.O. / AFE No.	58211		
DIRECTIONAL COMPANY:	PES PATHFINDER		

WELL SITE INFORMATION

TOTAL MAGNETIC CORRECTION (TMC):			
On Wall Plat:	7.45	LWD Calculated:	Agreed Upon: 7.45
X =	675052.990000	Feet	Y = 598138.050000 Feet
SITE LATITUDE:	32.643578 N	SITE LONGITUDE:	103.8989916 W
GRID SYSTEM:	TRUE ☐ UTM ☒ LAMBERT ☒	ZONE:	NEW MEXICO EAST
PROPOSED DRIFT DIRECTION:	90.89		
KELLY BUSHING ELEVATION:	26.2		
ALTITUDE:	3406.5	Feet	WATER DEPTH: N/A Feet

TIE-IN SURVEY

MEASURED DEPTH:	8255		
DRIFT ANGLE:	0.91		
DRIFT DIRECTION:	200.29		
TRUE VERTICAL DEPTH:	8252.11		
VERTICAL SECTION:	62.17		
RECTANGULAR COORDINATE (N / S) :	62.17		
RECTANGULAR COORDINATE (E / W) :	-58.34		
CLOSURE DISTANCE / DIRECTION:	85.25	316.82	
SURVEY CALCULATION METHOD:	AA ☐	MC ☒	RC ☐ BT ☐
SOURCE OF TIE-IN DATA (COMPANY):	Vaughn Energy Services		
COPY OF TIE-IN SURVEY REPORT	☒ YES ☐ NO		

WELL PLAN

KICKOFF DEPTH:	8244	TOTAL DEPTH:	13253
KICKOFF ANGLE:	0	MAX ANGLE:	89.68

PES Engineers:

P.DAS

M.ALIYEV

**Signature of both field engineers required if applicable

Directional Driller:

DATE: 02/21/12



Company: Devon Energy
Lease/Well: Rigel 20 Fed Com/3H
Location: S20 T19S R31E

Rig Name: H&P 300

State/County: New Mexico/Eddy

Latitude: 32.64, Longitude: -103.90

GRID North is 0.23 Degrees East of True North

VS-Azi: 0.00 Degrees



FIELD COPY ONLY (NOT DEFINITIVE)

RKB : 26.2 feet

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: gyrorun_int.ut

Minimum Curvature Method

Report Date/Time: 2/20/2012 / 01:02

Vaughn Energy Services

Gardendale, Texas

432-563-5444

Ray Seago

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
100.00	0.70	227.96	100.00	-0.41	-0.46	-0.41	0.61	227.96	0.70
200.00	1.41	235.93	199.98	-1.51	-1.93	-1.51	2.45	231.95	0.72
300.00	2.30	231.84	299.93	-3.44	-4.52	-3.44	5.68	232.77	0.90
400.00	3.20	227.76	399.81	-6.55	-8.17	-6.55	10.47	231.26	0.92
500.00	2.99	226.94	499.67	-10.20	-12.13	-10.20	15.85	229.94	0.21
600.00	2.78	226.12	599.54	-13.66	-15.78	-13.66	20.87	229.12	0.21
700.00	2.53	225.24	699.43	-16.89	-19.09	-16.89	25.49	228.50	0.25
800.00	2.28	224.36	799.34	-19.86	-22.05	-19.86	29.67	227.98	0.25
900.00	1.95	226.45	899.28	-22.45	-24.66	-22.45	33.35	227.69	0.34
1000.00	1.62	228.54	999.23	-24.56	-26.95	-24.56	36.46	227.66	0.34
1100.00	0.94	204.46	1099.20	-26.24	-28.35	-26.24	38.63	227.21	0.85
1200.00	0.27	180.39	1199.20	-27.23	-28.69	-27.23	39.55	226.50	0.70
1300.00	1.19	123.82	1299.19	-28.04	-27.83	-28.04	39.51	224.79	1.06
1400.00	2.10	57.26	1399.15	-27.63	-25.43	-27.63	37.55	222.63	1.96
1500.00	2.37	64.79	1499.08	-25.76	-22.03	-25.76	33.89	220.54	0.40
1600.00	2.63	52.32	1598.98	-23.47	-18.34	-23.47	29.79	218.00	0.61
1700.00	2.77	59.90	1698.87	-20.85	-14.43	-20.85	25.36	214.68	0.38
1800.00	2.91	47.47	1798.75	-17.92	-10.46	-17.92	20.75	210.27	0.63
1900.00	2.58	56.88	1898.64	-14.98	-6.71	-14.98	16.41	204.12	0.56
2000.00	2.24	46.29	1998.55	-12.40	-3.41	-12.40	12.85	195.37	0.56
2100.00	1.94	53.16	2098.48	-10.03	-0.64	-10.03	10.05	183.65	0.40
2200.00	1.63	50.03	2198.43	-8.10	1.80	-8.10	8.30	167.45	0.32
2300.00	1.41	50.23	2298.40	-6.40	3.84	-6.40	7.46	149.01	0.22
2400.00	1.20	50.43	2398.37	-4.94	5.60	-4.94	7.47	131.46	0.22
2500.00	1.12	52.55	2498.35	-3.68	7.18	-3.68	8.07	117.15	0.08
2600.00	1.05	54.66	2598.33	-2.56	8.71	-2.56	9.07	106.36	0.08
2700.00	0.88	165.20	2698.32	-2.77	9.65	-2.77	10.04	105.99	1.59
2800.00	0.71	275.73	2798.32	-3.45	9.23	-3.45	9.86	110.46	1.31
2900.00	0.90	311.35	2898.31	-2.86	8.03	-2.86	8.52	109.62	0.53
3000.00	1.10	336.97	2998.29	-1.46	7.06	-1.46	7.21	101.65	0.49
3100.00	1.24	326.49	3098.27	0.33	6.09	0.33	6.09	86.87	0.25
3200.00	1.38	336.01	3198.25	2.34	5.00	2.34	5.52	64.95	0.26
3300.00	1.38	324.30	3298.22	4.41	3.81	4.41	5.83	40.80	0.28
3400.00	1.37	332.58	3398.19	6.45	2.56	6.45	6.94	21.62	0.20
3500.00	1.70	323.79	3498.15	8.71	1.13	8.71	8.78	7.39	0.40

Depth FT	Angle Deg	Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Section FT	Distance FT	Direction Deg	Severity Deg/100
3600.00	2.02	325.00	3598.10	11.35	-0.76	11.35	11.37	356.18	0.33
3700.00	2.04	324.39	3698.04	14.24	-2.81	14.24	14.51	348.85	0.03
3800.00	2.06	323.79	3797.98	17.14	-4.90	17.14	17.83	344.03	0.03
3900.00	2.02	316.96	3897.91	19.88	-7.17	19.88	21.13	340.17	0.25
4000.00	1.98	320.14	3997.85	22.49	-9.48	22.49	24.40	337.15	0.12
4100.00	1.88	313.78	4097.79	24.95	-11.77	24.95	27.58	334.75	0.24
4200.00	1.78	327.42	4197.74	27.39	-13.79	27.39	30.67	333.28	0.45
4300.00	1.57	309.87	4297.70	29.58	-15.68	29.58	33.48	332.07	0.55
4400.00	1.36	302.32	4397.67	31.09	-17.74	31.09	35.80	330.30	0.28
4500.00	1.49	316.07	4497.64	32.67	-19.64	32.67	38.12	328.98	0.36
4600.00	1.61	329.82	4597.60	34.82	-21.25	34.82	40.79	328.60	0.39
4700.00	1.36	333.91	4697.57	37.10	-22.48	37.10	43.38	328.79	0.28
4800.00	1.10	338.01	4797.55	39.05	-23.36	39.05	45.50	329.11	0.27
4900.00	0.95	334.14	4897.53	40.68	-24.07	40.68	47.27	329.38	0.16
5000.00	0.80	330.27	4997.52	42.02	-24.78	42.02	48.79	329.47	0.16
5100.00	0.86	322.51	5097.51	43.23	-25.58	43.23	50.23	329.38	0.13
5200.00	0.93	314.76	5197.50	44.39	-26.62	44.39	51.76	329.06	0.14
5300.00	0.91	322.84	5297.48	45.60	-27.67	45.60	53.34	328.75	0.13
5400.00	0.90	330.92	5397.47	46.92	-28.53	46.92	54.91	328.69	0.13
5500.00	0.98	324.80	5497.46	48.30	-29.41	48.30	56.55	328.67	0.13
5600.00	1.06	318.69	5597.44	49.69	-30.51	49.69	58.31	328.45	0.13
5700.00	1.04	320.95	5697.42	51.09	-31.69	51.09	60.11	328.19	0.05
5800.00	1.02	313.21	5797.41	52.40	-32.90	52.40	61.87	327.87	0.14
5900.00	1.26	317.51	5897.39	53.81	-34.29	53.81	63.81	327.49	0.25
6000.00	1.50	311.82	5997.36	55.49	-36.00	55.49	66.15	327.02	0.28
6100.00	1.46	309.05	6097.33	57.16	-37.96	57.16	68.62	326.41	0.08
6200.00	1.42	306.27	6197.29	58.69	-39.95	58.69	71.00	325.76	0.08
6300.00	1.40	309.31	6297.26	60.20	-41.89	60.20	73.34	325.17	0.08
6400.00	1.38	292.35	6397.24	61.43	-43.94	61.43	75.52	324.42	0.41
6500.00	1.17	302.00	6497.21	62.42	-45.91	62.42	77.49	323.66	0.30
6600.00	0.97	291.64	6597.19	63.27	-47.56	63.27	79.16	323.07	0.28
6700.00	0.90	286.14	6697.18	63.81	-49.11	63.81	80.51	322.42	0.11
6800.00	0.84	280.64	6797.17	64.16	-50.59	64.16	81.71	321.75	0.10
6900.00	0.74	292.44	6897.16	64.54	-51.91	64.54	82.83	321.19	0.19
7000.00	0.65	304.25	6997.15	65.11	-52.98	65.11	83.94	320.86	0.17
7100.00	0.44	303.61	7097.15	65.64	-53.77	65.64	84.85	320.68	0.20
7200.00	0.24	302.98	7197.15	65.97	-54.27	65.97	85.42	320.56	0.20
7300.00	0.31	298.67	7297.14	66.21	-54.68	66.21	85.87	320.45	0.07
7400.00	0.37	294.37	7397.14	66.47	-55.21	66.47	86.41	320.29	0.07
7500.00	0.45	282.13	7497.14	66.69	-55.89	66.69	87.01	320.04	0.12
7600.00	0.54	269.89	7597.14	66.77	-56.74	66.77	87.63	319.64	0.13
7700.00	0.45	233.23	7697.13	66.54	-57.53	66.54	87.96	319.15	0.32
7800.00	0.37	196.57	7797.13	65.99	-57.94	65.99	87.81	318.72	0.27
7900.00	0.41	178.90	7897.13	65.31	-58.03	65.31	87.37	318.38	0.13
8000.00	0.45	161.23	7997.13	64.58	-57.89	64.58	86.73	318.12	0.14
8100.00	0.52	183.90	8097.12	63.75	-57.79	63.75	86.05	317.80	0.20
8200.00	0.59	206.57	8197.12	62.83	-58.06	62.83	85.55	317.26	0.23
8255.00	0.91	200.29	8252.11	62.17	-58.34	62.17	85.25	316.82	0.60

HORIZONTAL DISPLACEMENT IS
85.25 FEET AT 316.82 DEGREES

PathFinder Energy Services, Inc.

Magnetic & Grid Calculations

FIELD CALCULATION

Mon Feb 20 10:36:42 2012

Coordinates

Latitude: 32.643578 N (32 deg. 38 min. 36.8810 sec.)
Longitude: 103.898916 W (-103 deg. 53 min. 56.0990 sec.)
Elevation: 3432.70 feet.
Calculation Date: Feb/20/2012

Magnetic Calculations

Model: IGRF2010
Dip Angle: 60.5020 degrees
Total Magnetic Field: 0.48764 gauss
Magnetic Declination: 7.684503 degrees
Horizontal Intensity: 0.240113 gauss
To Convert a Magnetic Dir. to a TRUE North Dir. Add 7.684503 Degr

Transverse Mercator Grid Calculations NAD83

Grid System: Transverse Mercator: new mexico east
Ellipsoid: GRS80
X: 675052.9900 feet
Y: 598138.0500 feet
True to Grid: (convergence) -0.234333 degrees
Magnetic to Grid: 7.450170 degrees
To Convert a Magnetic Dir. to a GRID dir. Add 7.450170 Degr.



A Schlumberger Company

PathFinder Energy Services, Inc.

Magnetic & Grid Calculations

Devon Energy
Rigel 20 Federal Com #3H
Eddy County, Nm
Rig:HP 300

Mon Feb 06 14:34:15 2012

Coordinates

Latitude: 32.643578 N (32 deg. 38 min. 36.8810 sec.)
Longitude: 103.898916 W (-103 deg. 53 min. 56.0990 sec.)
Elevation: 3432.70 feet.
Calculation Date: Feb/06/2012

Magnetic Calculations

Model: IGRF2010
Dip Angle: 60.5030 degrees
Total Magnetic Field: 0.48768 gauss
Magnetic Declination: 7.689213 degrees
Horizontal Intensity: 0.240124 gauss
To Convert a Magnetic Dir. to a TRUE North Dir. Add 7.689213 Degr

Transverse Mercator Grid Calculations NAD83

Grid System: Transverse Mercator: new mexico east
Ellipsoid: GRS80
X: 675052.9900 feet
Y: 598138.0500 feet
True to Grid: (convergence) -0.234333 degrees
Magnetic to Grid: 7.454880 degrees
To Convert a Magnetic Dir. to a GRID dir. Add 7.454880 Degr.

Stimulations Summary

District PERMIAN BASIN	County EDDY		Field Name HACKBERRY			Project Group PB NEW MEXICO			State/Province NM						
Surface Legal Location SEC20 T19S R31E		API/UWI 3001539725		Latitude (DMS) 32° 38' 36.881" N		Longitude (DMS) 103° 53' 56.099" ...		Ground Elev ... 3,406.50		KB - GL (ft) 26.20		Orig KB Elev (ft) 3,432.70		TH Elev (ft)	
HYDRAULIC FRAC, 4/23/2012 06:00, BONE SPRING, ST01, 13,360.0 ftKB - 13,734.0 ftKB, BHI, 267301 LBS; White 8803 LBS															
Proppant De...	V (pumped) (bbl)	Pre Trt S/I Prs (psi)	Pst Trt S/I Prs (psi)	P(break) (psi)	ISIP (psi)	P (avg) (psi)	Rate (avg) (bbl/mi...	P (max) (psi)	Rate (max) (bbl/m...			Max Conc...			
289,925.0	4813.50	0.0	2,115.0	3,893.0	2,465.0	5,128.0	78	5,692.0	80			4.00			
HYDRAULIC FRAC, 4/23/2012 08:00, BONE SPRING, ST01, 12,368.0 ftKB - 12,716.0 ftKB, BHI, 286491 LBS; White 8805 LBS															
Proppant De...	V (pumped) (bbl)	Pre Trt S/I Prs (psi)	Pst Trt S/I Prs (psi)	P(break) (psi)	ISIP (psi)	P (avg) (psi)	Rate (avg) (bbl/mi...	P (max) (psi)	Rate (max) (bbl/m...			Max Conc...			
289,925.0	4905.00	1,673.0	2,303.0	4,525.0	2,631.0	4,093.0	79	5,878.0	80			4.00			
HYDRAULIC FRAC, 4/23/2012 10:00, BONE SPRING, ST01, 12,023.0 ftKB - 12,198.0 ftKB, BHI, White 5842 LBS; 192946 LBS															
Proppant De...	V (pumped) (bbl)	Pre Trt S/I Prs (psi)	Pst Trt S/I Prs (psi)	P(break) (psi)	ISIP (psi)	P (avg) (psi)	Rate (avg) (bbl/mi...	P (max) (psi)	Rate (max) (bbl/m...			Max Conc...			
193,280.0	3632.00	1,799.0	2,228.0	2,900.0	2,332.0	3,728.0	51	3,728.0	57			4.00			
HYDRAULIC FRAC, 4/23/2012 12:00, BONE SPRING, ST01, 10,575.0 ftKB - 10,746.0 ftKB, BHI, 192643 LBS; White 5861 LBS															
Proppant De...	V (pumped) (bbl)	Pre Trt S/I Prs (psi)	Pst Trt S/I Prs (psi)	P(break) (psi)	ISIP (psi)	P (avg) (psi)	Rate (avg) (bbl/mi...	P (max) (psi)	Rate (max) (bbl/m...			Max Conc...			
192,360.0	3552.10	1,606.0	2,262.0	3,936.0	2,381.0	3,896.0	56	4,697.0	62			4.00			
HYDRAULIC FRAC, 4/23/2012 14:00, BONE SPRING, ST01, 10,066.0 ftKB - 10,238.0 ftKB, BHI, White 8795 LBS; 283417 LBS															
Proppant De...	V (pumped) (bbl)	Pre Trt S/I Prs (psi)	Pst Trt S/I Prs (psi)	P(break) (psi)	ISIP (psi)	P (avg) (psi)	Rate (avg) (bbl/mi...	P (max) (psi)	Rate (max) (bbl/m...			Max Conc...			
289,925.0	4906.20	1,539.0	2,685.0	5,461.0	2,983.0	4,749.0	80	5,377.0	81			4.00			
HYDRAULIC FRAC, 4/23/2012 16:00, BONE SPRING, ST01, 9,558.0 ftKB - 9,899.0 ftKB, BHI, White 8967 LBS; 286633 LBS															
Proppant De...	V (pumped) (bbl)	Pre Trt S/I Prs (psi)	Pst Trt S/I Prs (psi)	P(break) (psi)	ISIP (psi)	P (avg) (psi)	Rate (avg) (bbl/mi...	P (max) (psi)	Rate (max) (bbl/m...			Max Conc...			
289,925.0	4946.70	2,103.0	2,843.0	2,911.0	2,958.0	5,210.0	77	5,880.0	81			4.00			
HYDRAULIC FRAC, 4/23/2012 18:00, BONE SPRING, ST01, 9,050.0 ftKB - 9,391.0 ftKB, BHI, 281518 LBS; White 8805 LBS															
Proppant De...	V (pumped) (bbl)	Pre Trt S/I Prs (psi)	Pst Trt S/I Prs (psi)	P(break) (psi)	ISIP (psi)	P (avg) (psi)	Rate (avg) (bbl/mi...	P (max) (psi)	Rate (max) (bbl/m...			Max Conc...			
289,925.0	4899.20	2,152.0	2,909.0	3,300.0	2,909.0	4,529.0	80	5,324.0	80			4.00			