

District I
1625 N. French Dr., Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone: (575) 748-1283 Fax: (575) 748-9720
District III
1000 Rio Brazos Road, Aztec, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

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

Form C-102
AUG 24 2015 Revised August 1, 2011
Submit one copy to appropriate District Office
RECEIVED
☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number 30-015-41900	² Pool Code 97020	³ Pool Name Hackberry; Bone Spring, NW
⁴ Property Code 40305	⁵ Property Name BETELGEUSE 19 FEDERAL	⁶ Well Number 8H
⁷ OGRID No. 6137	⁸ Operator Name DEVON ENERGY PRODUCTION COMPANY, L.P.	⁹ Elevation 3409.0

¹⁰ Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
L	20	19 S	31 E		2300	SOUTH	265	WEST	EDDY

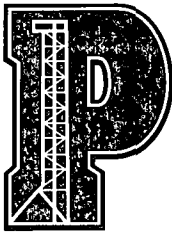
¹¹ Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
4	19	19 S	31 E		585	SOUTH	280	WEST	EDDY

¹² Dedicated Acres 158.43	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ Order No.
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No allowable will be assigned to this completion until all interests have been consolidated or a non-standard unit has been approved by the division.

17 OPERATOR CERTIFICATION I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division. <i>Megan Moravec</i> 8/21/2015 Signature Date Megan Moravec; Regulatory Analyst Printed Name Megan.Moravec@dvn.com E-mail Address 18 SURVEYOR CERTIFICATION I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief. MAY 18, 2013 Date of Survey <i>[Signature]</i> Signature and Seal of Professional Surveyor Certificate Number: 12797 SURVEY NO. 1838	17 OPERATOR CERTIFICATION I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division. <i>Megan Moravec</i> 8/21/2015 Signature Date Megan Moravec; Regulatory Analyst Printed Name Megan.Moravec@dvn.com E-mail Address 18 SURVEYOR CERTIFICATION I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief. MAY 18, 2013 Date of Survey <i>[Signature]</i> Signature and Seal of Professional Surveyor Certificate Number: 12797 SURVEY NO. 1838
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NM OIL CONSERVATION

ARTESIA DISTRICT

AUG 24 2015

RECEIVED

PATRIOT DRILLING, LLC

OPERATOR: COG Operating, LLC
WELL/LEASE: Firefox Fed Com 4H
COUNTY: Eddy Co., New Mexico
Sec. 4, T 19S, R 31E

30015 41571

STATE OF NEW MEXICO

DEVIATION REPORT

<u>Depth</u>	<u>Deviation</u>	<u>Depth</u>	<u>Deviation</u>
352	1/2	4,224	1/4
650	1/4	4,751	1 1/2
1,042	1	5,180	2 1/4
1,546	3/4	5,679	1 3/4
1,923	1 3/4	6,165	2 1/4
2,491	1	6,639	2
2,770	2 1/2	7,023	2 1/2
3,268	3/4	7,433	2 1/4
3,742	1/4	7,911	1

Patriot Drilling, LLC

M. Leroy Peterson, Executive Vice-President

The foregoing instrument was acknowledged before me on this 8th day of June, 2015 by M. Leroy Peterson, Executive Vice-President of Patriot Drilling, LLC.

My Commission Expires: 02/01/2019

Lori T. Rowan
Notary Public for Ector Co., Texas



AUG 24 2015

RECEIVED

June 4, 2015

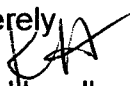
Concho Resources, Inc.
One Concho Center
600 W. Illinois Avenue
Midland, Texas 79701

Attn: Kanicia Castillo

RE: **Firefox Federal Com 4H**

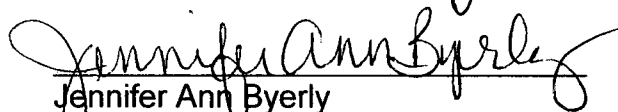
Please find enclosed a copy of the survey from 0' to 8100' ran on the above referenced well.

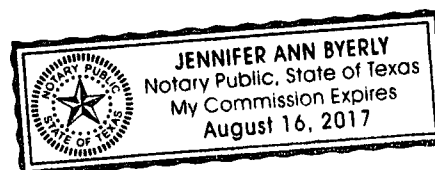
Sincerely,


Keith Havelka
Operations

STATE OF TEXAS §
 §
COUNTY OF NUECES §

This instrument was acknowledged before me on the 4 day of June,
A.D., 2015, by Keith Havelka.


Jennifer Ann Byerly
Notary Public, State of Texas





Company: Concho
Lease/Well: FireFox Federal Com/4H
Location: L-04-19S-31E 1800 FSL 275 FWL
Rig Name: Patriot Drilling Rig 6
State/County: New Mexico/Eddy
VS-Azi: 0.00 Degrees
Latitude: 32.68719, Longitude: -103.88214
Grid Convergence Applied = -0.24 degs
Grid North = True North -0.24 degs



RKB : 18 Feet

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: gyro survey.ut
Minimum Curvature Method
Report Date/Time: 6/4/2015 / 15:42

VES Survey International
Fort Worth Tx
Surveyor: Jason Wilson
(817) 718-1320

Firefox Federal Com 4H / API 30-015-41571

NM OIL CONSERVATION
ARTESIA DISTRICT

AUG 24 2015

RECEIVED

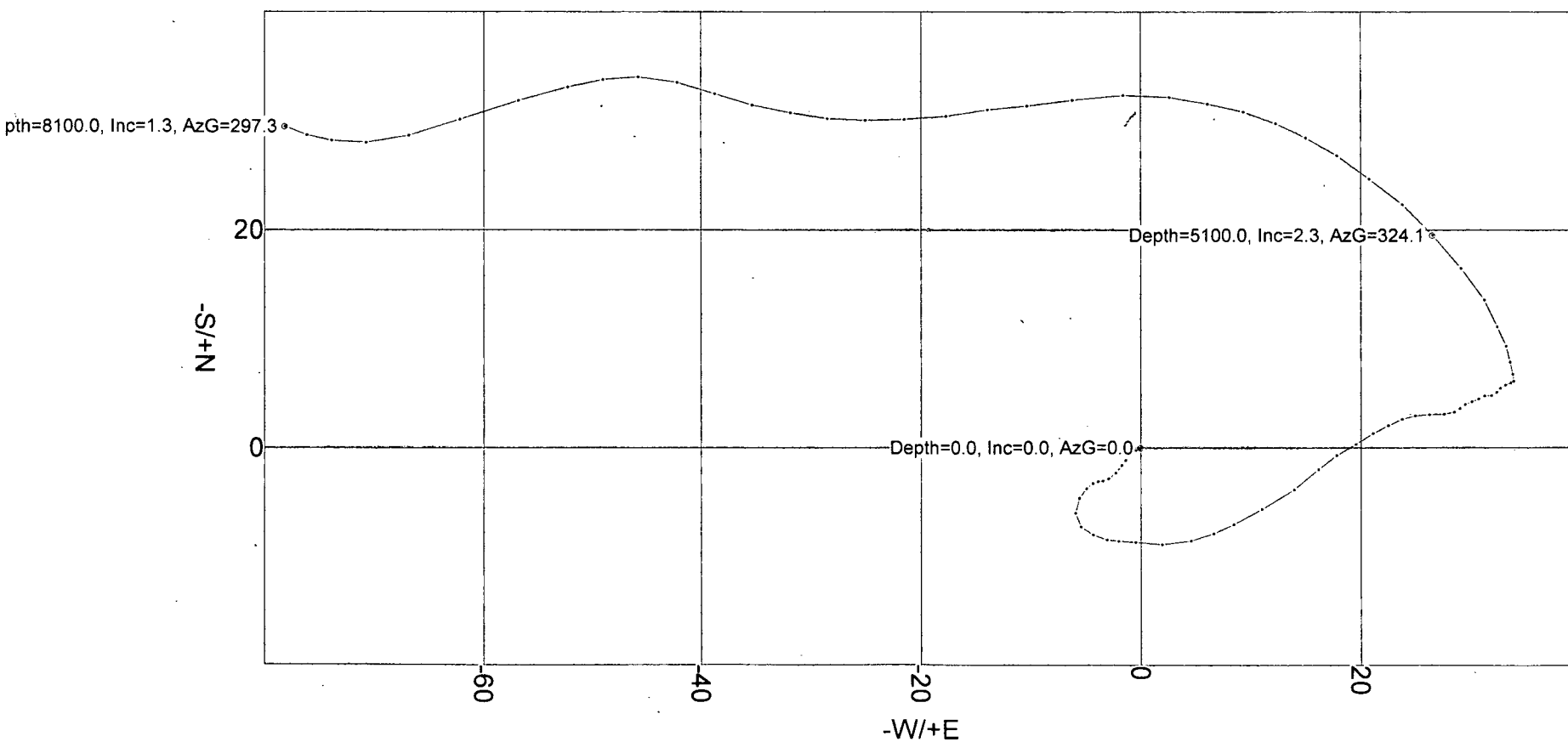
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
50.00	0.41	248.21	50.00	-0.07	-0.17	-0.07	0.18	248.21	0.82
100.00	0.36	230.90	100.00	-0.23	-0.45	-0.23	0.51	243.00	0.26
200.00	0.42	224.54	200.00	-0.69	-0.95	-0.69	1.18	234.14	0.07
300.00	0.31	221.92	299.99	-1.15	-1.39	-1.15	1.80	230.40	0.11
400.00	0.38	213.60	399.99	-1.62	-1.75	-1.62	2.38	227.16	0.09
500.00	0.61	222.22	499.99	-2.29	-2.29	-2.29	3.24	224.98	0.25
600.00	0.39	243.41	599.98	-2.84	-2.96	-2.84	4.10	226.13	0.29
700.00	0.24	258.27	699.98	-3.04	-3.47	-3.04	4.61	228.77	0.17
800.00	0.25	263.10	799.98	-3.11	-3.89	-3.11	4.97	231.37	0.02
900.00	0.34	241.58	899.98	-3.27	-4.37	-3.27	5.46	233.12	0.14
1000.00	0.53	224.43	999.98	-3.75	-4.95	-3.75	6.21	232.89	0.22
1100.00	0.75	210.57	1099.97	-4.64	-5.61	-4.64	7.28	230.40	0.27
1200.00	0.92	179.80	1199.96	-6.01	-5.94	-6.01	8.44	224.67	0.47
1300.00	0.74	135.02	1299.95	-7.27	-5.48	-7.27	9.10	217.00	0.65
1400.00	0.83	112.60	1399.94	-8.00	-4.35	-8.00	9.11	208.51	0.32
1500.00	0.70	107.35	1499.93	-8.47	-3.10	-8.47	9.01	200.10	0.15

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
1600.00	0.58	81.46	1599.93	-8.57	-2.02	-8.57	8.81	193.23	0.31
1700.00	1.20	99.33	1699.92	-8.67	-0.48	-8.67	8.68	183.16	0.68
1800.00	1.57	92.24	1799.89	-8.89	1.92	-8.89	9.10	167.79	0.40
1900.00	1.54	72.90	1899.85	-8.55	4.57	-8.55	9.70	151.85	0.52
2000.00	0.92	70.77	1999.83	-7.89	6.61	-7.89	10.30	140.03	0.63
2100.00	1.41	62.22	2099.81	-7.05	8.45	-7.05	11.01	129.84	0.52
2200.00	1.94	61.10	2199.76	-5.66	11.02	-5.66	12.39	117.19	0.54
2300.00	1.99	55.64	2299.70	-3.86	13.94	-3.86	14.47	105.49	0.19
2400.00	1.36	41.73	2399.66	-2.00	16.17	-2.00	16.29	97.04	0.74
2500.00	1.09	64.98	2499.64	-0.71	17.82	-0.71	17.83	92.27	0.56
2600.00	1.25	55.58	2599.62	0.31	19.58	0.31	19.58	89.10	0.25
2700.00	0.88	60.12	2699.60	1.30	21.14	1.30	21.18	86.47	0.38
2800.00	0.88	64.06	2799.59	2.02	22.49	2.02	22.58	84.87	0.06
2900.00	0.73	65.49	2899.58	2.62	23.76	2.62	23.90	83.71	0.15
3000.00	0.68	86.26	2999.57	2.92	24.92	2.92	25.10	83.32	0.26
3100.00	0.80	84.01	3099.56	3.03	26.21	3.03	26.38	83.40	0.12
3200.00	0.73	92.20	3199.55	3.08	27.54	3.08	27.71	83.62	0.13
3300.00	0.41	56.44	3299.55	3.25	28.47	3.25	28.66	83.48	0.47
3400.00	0.28	57.66	3399.55	3.58	28.98	3.58	29.20	82.95	0.13
3500.00	0.41	45.87	3499.55	3.97	29.45	3.97	29.71	82.33	0.15
3600.00	0.44	88.40	3599.54	4.23	30.09	4.23	30.39	82.01	0.31
3700.00	0.36	42.47	3699.54	4.47	30.69	4.47	31.01	81.71	0.32
3800.00	0.39	82.84	3799.54	4.74	31.24	4.74	31.60	81.36	0.26
3900.00	0.35	89.66	3899.54	4.79	31.88	4.79	32.24	81.46	0.06
4000.00	0.40	31.28	3999.54	5.09	32.36	5.09	32.76	81.07	0.37
4100.00	0.18	61.05	4099.53	5.46	32.68	5.46	33.13	80.52	0.26
4200.00	0.46	56.70	4199.53	5.75	33.15	5.75	33.65	80.15	0.28
4300.00	0.18	95.55	4299.53	5.96	33.64	5.96	34.16	79.96	0.34
4400.00	0.24	35.61	4399.53	6.11	33.92	6.11	34.46	79.78	0.22
4500.00	0.60	335.86	4499.53	6.77	33.82	6.77	34.49	78.69	0.53
4600.00	0.70	357.86	4599.52	7.86	33.59	7.86	34.49	76.83	0.27
4700.00	1.07	337.99	4699.51	9.33	33.21	9.33	34.50	74.31	0.47
4800.00	1.19	333.96	4799.49	11.13	32.41	11.13	34.27	71.05	0.15
4900.00	1.92	333.91	4899.45	13.56	31.22	13.56	34.04	66.52	0.73
5000.00	2.27	315.43	4999.39	16.47	29.09	16.47	33.43	60.49	0.75
5100.00	2.32	324.07	5099.31	19.52	26.52	19.52	32.93	53.65	0.35
5200.00	2.23	307.64	5199.23	22.34	23.79	22.34	32.64	46.80	0.66
5300.00	2.16	308.01	5299.16	24.69	20.77	24.69	32.26	40.07	0.07
5400.00	1.97	304.85	5399.09	26.83	17.87	26.83	32.24	33.67	0.23

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
5500.00	1.79	293.39	5499.04	28.43	15.03	28.43	32.16	27.86	0.41
5600.00	1.71	298.61	5598.99	29.77	12.29	29.77	32.20	22.43	0.18
5700.00	1.91	281.82	5698.94	30.82	9.35	30.82	32.21	16.87	0.57
5800.00	1.92	283.45	5798.89	31.55	6.09	31.55	32.14	10.92	0.05
5900.00	2.16	276.71	5898.82	32.16	2.59	32.16	32.27	4.60	0.34
6000.00	2.66	269.53	5998.74	32.36	-1.60	32.36	32.40	357.17	0.58
6100.00	2.68	258.88	6098.63	31.89	-6.21	31.89	32.49	348.98	0.50
6200.00	2.11	267.60	6198.54	31.37	-10.34	31.37	33.03	341.75	0.67
6300.00	2.02	261.13	6298.48	31.02	-13.93	31.02	34.00	335.82	0.25
6400.00	2.37	261.15	6398.40	30.43	-17.71	30.43	35.21	329.79	0.35
6500.00	2.04	271.06	6498.33	30.14	-21.53	30.14	37.04	324.46	0.51
6600.00	2.07	266.32	6598.26	30.06	-25.11	30.06	39.17	320.13	0.17
6700.00	1.91	279.06	6698.20	30.21	-28.55	30.21	41.57	316.61	0.47
6800.00	1.95	279.29	6798.15	30.74	-31.88	30.74	44.29	313.96	0.04
6900.00	2.12	283.31	6898.08	31.44	-35.37	31.44	47.32	311.64	0.22
7000.00	1.95	290.97	6998.02	32.48	-38.76	32.48	50.57	309.96	0.32
7100.00	2.14	282.99	7097.96	33.51	-42.16	33.51	53.86	308.47	0.34
7200.00	2.03	273.53	7197.89	34.04	-45.75	34.04	57.02	306.65	0.36
7300.00	1.73	256.78	7297.84	33.80	-48.98	33.80	59.51	304.61	0.62
7400.00	2.12	258.80	7397.78	33.10	-52.26	33.10	61.86	302.35	0.39
7500.00	3.30	252.14	7497.67	31.85	-56.81	31.85	65.13	299.28	1.23
7600.00	3.20	252.17	7597.51	30.12	-62.21	30.12	69.12	295.83	0.11
7700.00	2.44	253.16	7697.39	28.65	-66.90	28.65	72.77	293.18	0.76
7800.00	2.13	268.79	7797.31	27.99	-70.79	27.99	76.12	291.58	0.69
7900.00	1.44	279.43	7897.26	28.16	-73.89	28.16	79.07	290.86	0.76
8000.00	1.19	286.87	7997.23	28.67	-76.13	28.67	81.35	290.64	0.30
8100.00	1.26	297.32	8097.21	29.47	-78.10	29.47	83.48	290.68	0.23



VES Survey International
Fort Worth Tx
Surveyor: Jason Wilson
(817) 718-1320
Firefox Federal Com 4H / API 30-015-41571



VES Survey Date: 5/30/2015



NM OIL CONSERVATION
ARTESIA DISTRICT

AUG 24 2015

RECEIVED

COG Operating LLC

Eddy County, NM

Firefox Federal

#4H

OH

Survey: MWD #1

Survey Report - Geographic

04 June, 2015



Wellplanning
Survey Report - Geographic

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #4H
Project:	Eddy County, NM	TVD Reference:	WELL @ 3585.6usft (Original Well Elev)
Site:	Firefox Federal	MD Reference:	WELL @ 3585.6usft (Original Well Elev)
Well:	#4H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User Db

Project	Eddy County, NM		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site	Firefox Federal		
Site Position:		Northing:	613,946.30 usft
From:	Map	Easting:	638,985.50 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 41' 13.287 N
		Longitude:	103° 52' 53.712 W
		Grid Convergence:	0.24 °

Well	#4H		
Well Position	+N/-S	0.0 usft	Northing: 613,946.30 usft
	+E/-W	0.0 usft	Easting: 638,985.50 usft
Position Uncertainty	0.0 usft	Wellhead Elevation:	usft
		Latitude:	32° 41' 13.287 N
		Longitude:	103° 52' 53.712 W
		Ground Level:	3,567.6 usft

Wellbore	OH		
Magnetics	Model Name	Sample Date	Declination
			(°)
	IGRF2010	5/18/2015	7.28
			Dip Angle
			(°)
			60.46
			Field Strength
			(nT)
			48,467

Design	OH		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.0	0.0	0.0
			Direction
			(°)
			87.45

Survey Program	Date 6/4/2015		
From	To	Survey (Wellbore)	Tool Name
(usft)	(usft)		
50.0	13,365.0	MWD #1 (OH)	MWD
			Description
			MWD - Standard

Survey									
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Map	Map	Latitude	Longitude
Depth	(°)	(°)	Depth	(usft)	(usft)	Northing	Easting		
(usft)			(usft)			(usft)	(usft)		
0.0	0.00	0.00	0.0	0.0	0.0	613,946.30	638,985.50	32° 41' 13.287 N	103° 52' 53.712 W
50.0	0.41	248.21	50.0	-0.1	-0.2	613,946.24	638,985.34	32° 41' 13.286 N	103° 52' 53.714 W
100.0	0.36	230.90	100.0	-0.2	-0.5	613,946.07	638,985.05	32° 41' 13.284 N	103° 52' 53.717 W
200.0	0.42	224.54	200.0	-0.7	-1.0	613,945.61	638,984.55	32° 41' 13.280 N	103° 52' 53.723 W
300.0	0.31	221.92	300.0	-1.2	-1.4	613,945.15	638,984.11	32° 41' 13.275 N	103° 52' 53.728 W
400.0	0.38	213.60	400.0	-1.6	-1.8	613,944.67	638,983.75	32° 41' 13.270 N	103° 52' 53.732 W
500.0	0.61	222.22	500.0	-2.3	-2.3	613,944.00	638,983.21	32° 41' 13.264 N	103° 52' 53.739 W
600.0	0.39	243.41	600.0	-2.8	-3.0	613,943.46	638,982.54	32° 41' 13.258 N	103° 52' 53.746 W
700.0	0.24	258.27	700.0	-3.0	-3.5	613,943.26	638,982.03	32° 41' 13.257 N	103° 52' 53.752 W
800.0	0.25	263.10	800.0	-3.1	-3.9	613,943.19	638,981.61	32° 41' 13.256 N	103° 52' 53.757 W
900.0	0.34	241.58	900.0	-3.3	-4.4	613,943.02	638,981.14	32° 41' 13.254 N	103° 52' 53.763 W
1,000.0	0.53	224.43	1,000.0	-3.8	-5.0	613,942.55	638,980.55	32° 41' 13.250 N	103° 52' 53.770 W



Wellplanning
Survey Report - Geographic

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #4H
Project:	Eddy County, NM	TVD Reference:	WELL @ 3585.6usft (Original Well Elev)
Site:	Firefox Federal	MD Reference:	WELL @ 3585.6usft (Original Well Elev)
Well:	#4H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User Db

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
1,100.0	0.75	210.57	1,100.0	-4.6	-5.6	613,941.66	638,979.89	32° 41' 13.241 N	103° 52' 53.777 W
1,200.0	0.92	179.80	1,200.0	-6.0	-5.9	613,940.29	638,979.56	32° 41' 13.227 N	103° 52' 53.781 W
1,300.0	0.74	135.02	1,300.0	-7.3	-5.5	613,939.03	638,980.02	32° 41' 13.215 N	103° 52' 53.776 W
1,400.0	0.83	112.60	1,399.9	-8.0	-4.4	613,938.30	638,981.15	32° 41' 13.207 N	103° 52' 53.763 W
1,500.0	0.70	107.35	1,499.9	-8.5	-3.1	613,937.84	638,982.40	32° 41' 13.203 N	103° 52' 53.748 W
1,600.0	0.58	81.46	1,599.9	-8.6	-2.0	613,937.73	638,983.48	32° 41' 13.202 N	103° 52' 53.736 W
1,700.0	1.20	99.33	1,699.9	-8.7	-0.5	613,937.64	638,985.02	32° 41' 13.201 N	103° 52' 53.718 W
1,800.0	1.57	92.24	1,799.9	-8.9	1.9	613,937.41	638,987.42	32° 41' 13.198 N	103° 52' 53.690 W
1,900.0	1.54	72.90	1,899.9	-8.5	4.6	613,937.75	638,990.07	32° 41' 13.202 N	103° 52' 53.659 W
2,000.0	0.92	70.77	1,999.8	-7.9	6.6	613,938.41	638,992.12	32° 41' 13.208 N	103° 52' 53.635 W
2,100.0	1.41	62.22	2,099.8	-7.1	8.5	613,939.25	638,993.96	32° 41' 13.216 N	103° 52' 53.613 W
2,200.0	1.94	61.10	2,199.8	-5.7	11.0	613,940.64	638,996.53	32° 41' 13.230 N	103° 52' 53.583 W
2,300.0	1.99	55.64	2,299.7	-3.9	13.9	613,942.44	638,999.45	32° 41' 13.248 N	103° 52' 53.549 W
2,400.0	1.36	41.73	2,399.7	-2.0	16.2	613,944.31	639,001.67	32° 41' 13.266 N	103° 52' 53.522 W
2,500.0	1.09	64.98	2,499.6	-0.7	17.8	613,945.59	639,003.32	32° 41' 13.279 N	103° 52' 53.503 W
2,600.0	1.25	55.58	2,599.6	0.3	19.6	613,946.61	639,005.08	32° 41' 13.289 N	103° 52' 53.482 W
2,700.0	0.88	60.12	2,699.6	1.3	21.1	613,947.61	639,006.65	32° 41' 13.299 N	103° 52' 53.464 W
2,800.0	0.88	64.06	2,799.6	2.0	22.5	613,948.33	639,008.01	32° 41' 13.306 N	103° 52' 53.448 W
2,900.0	0.73	65.49	2,899.6	2.6	23.8	613,948.93	639,009.28	32° 41' 13.312 N	103° 52' 53.433 W
3,000.0	0.68	86.26	2,999.6	2.9	24.9	613,949.23	639,010.45	32° 41' 13.314 N	103° 52' 53.420 W
3,100.0	0.80	84.01	3,099.6	3.0	26.2	613,949.35	639,011.73	32° 41' 13.316 N	103° 52' 53.404 W
3,200.0	0.73	92.20	3,199.6	3.1	27.6	613,949.39	639,013.07	32° 41' 13.316 N	103° 52' 53.389 W
3,300.0	0.41	56.44	3,299.5	3.3	28.5	613,949.57	639,014.00	32° 41' 13.318 N	103° 52' 53.378 W
3,400.0	0.28	57.66	3,399.5	3.6	29.0	613,949.90	639,014.50	32° 41' 13.321 N	103° 52' 53.372 W
3,500.0	0.41	45.87	3,499.5	4.0	29.5	613,950.28	639,014.97	32° 41' 13.325 N	103° 52' 53.367 W
3,600.0	0.44	88.40	3,599.5	4.2	30.1	613,950.54	639,015.61	32° 41' 13.327 N	103° 52' 53.359 W
3,700.0	0.36	42.47	3,699.5	4.5	30.7	613,950.78	639,016.20	32° 41' 13.330 N	103° 52' 53.352 W
3,800.0	0.39	82.84	3,799.5	4.7	31.2	613,951.05	639,016.75	32° 41' 13.332 N	103° 52' 53.346 W
3,900.0	0.35	89.66	3,899.5	4.8	31.9	613,951.10	639,017.40	32° 41' 13.333 N	103° 52' 53.338 W
4,000.0	0.40	31.28	3,999.5	5.1	32.4	613,951.40	639,017.88	32° 41' 13.336 N	103° 52' 53.332 W
4,100.0	0.18	61.05	4,099.5	5.5	32.7	613,951.77	639,018.20	32° 41' 13.339 N	103° 52' 53.329 W
4,200.0	0.46	56.70	4,199.5	5.8	33.2	613,952.07	639,018.68	32° 41' 13.342 N	103° 52' 53.323 W
4,300.0	0.18	95.55	4,299.5	6.0	33.7	613,952.27	639,019.17	32° 41' 13.344 N	103° 52' 53.317 W
4,400.0	0.24	35.61	4,399.5	6.1	33.9	613,952.43	639,019.45	32° 41' 13.346 N	103° 52' 53.314 W
4,500.0	0.60	335.86	4,499.5	6.8	33.8	613,953.08	639,019.35	32° 41' 13.352 N	103° 52' 53.315 W
4,600.0	0.70	357.86	4,599.5	7.9	33.6	613,954.16	639,019.12	32° 41' 13.363 N	103° 52' 53.318 W
4,700.0	1.07	337.99	4,699.5	9.3	33.2	613,955.64	639,018.74	32° 41' 13.378 N	103° 52' 53.322 W
4,800.0	1.19	333.96	4,799.5	11.1	32.4	613,957.44	639,017.94	32° 41' 13.395 N	103° 52' 53.332 W
4,900.0	1.92	333.91	4,899.5	13.6	31.2	613,959.88	639,016.75	32° 41' 13.420 N	103° 52' 53.345 W
5,000.0	2.27	315.43	4,999.4	16.5	29.1	613,962.79	639,014.62	32° 41' 13.448 N	103° 52' 53.370 W
5,100.0	2.32	324.07	5,099.3	19.5	26.5	613,965.84	639,012.04	32° 41' 13.479 N	103° 52' 53.400 W
5,200.0	2.23	307.64	5,199.2	22.4	23.8	613,968.67	639,009.31	32° 41' 13.507 N	103° 52' 53.432 W
5,300.0	2.16	308.01	5,299.2	24.7	20.8	613,971.02	639,006.29	32° 41' 13.530 N	103° 52' 53.467 W
5,400.0	1.97	304.85	5,399.1	26.9	17.9	613,973.16	639,003.39	32° 41' 13.552 N	103° 52' 53.501 W
5,500.0	1.79	293.39	5,499.0	28.5	15.0	613,974.76	639,000.55	32° 41' 13.567 N	103° 52' 53.534 W
5,600.0	1.71	298.61	5,599.0	29.8	12.3	613,976.10	638,997.80	32° 41' 13.581 N	103° 52' 53.566 W
5,700.0	1.91	281.82	5,698.9	30.8	9.4	613,977.15	638,994.86	32° 41' 13.591 N	103° 52' 53.601 W
5,800.0	1.92	283.45	5,798.9	31.6	6.1	613,977.88	638,991.60	32° 41' 13.599 N	103° 52' 53.639 W
5,900.0	2.16	276.71	5,898.8	32.2	2.6	613,978.49	638,988.10	32° 41' 13.605 N	103° 52' 53.680 W
6,000.0	2.66	269.53	5,998.7	32.4	-1.6	613,978.69	638,983.91	32° 41' 13.607 N	103° 52' 53.729 W
6,100.0	2.68	258.88	6,098.6	31.9	-6.2	613,978.22	638,979.30	32° 41' 13.603 N	103° 52' 53.783 W
6,200.0	2.11	267.60	6,198.5	31.4	-10.3	613,977.70	638,975.16	32° 41' 13.598 N	103° 52' 53.831 W
6,300.0	2.02	261.13	6,298.5	31.0	-13.9	613,977.35	638,971.58	32° 41' 13.594 N	103° 52' 53.873 W
6,400.0	2.37	261.15	6,398.4	30.5	-17.7	613,976.76	638,967.80	32° 41' 13.589 N	103° 52' 53.917 W
6,500.0	2.04	271.06	6,498.3	30.2	-21.5	613,976.47	638,963.98	32° 41' 13.586 N	103° 52' 53.962 W



Wellplanning
Survey Report - Geographic

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #4H
Project:	Eddy County, NM	TVD Reference:	WELL @ 3585.6usft (Original Well Elev)
Site:	Firefox Federal	MD Reference:	WELL @ 3585.6usft (Original Well Elev)
Well:	#4H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User Db

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
6,600.0	2.07	266.32	6,598.3	30.1	-25.1	613,976.39	638,960.39	32° 41' 13.585 N	103° 52' 54.004 W
6,700.0	1.91	279.06	6,698.2	30.2	-28.6	613,976.54	638,956.95	32° 41' 13.587 N	103° 52' 54.044 W
6,800.0	1.95	279.29	6,798.1	30.8	-31.9	613,977.07	638,953.62	32° 41' 13.592 N	103° 52' 54.083 W
6,900.0	2.12	283.31	6,898.1	31.5	-35.4	613,977.77	638,950.14	32° 41' 13.599 N	103° 52' 54.124 W
7,000.0	1.95	290.97	6,998.0	32.5	-38.8	613,978.81	638,946.75	32° 41' 13.610 N	103° 52' 54.163 W
7,100.0	2.14	282.99	7,098.0	33.5	-42.2	613,979.84	638,943.35	32° 41' 13.620 N	103° 52' 54.203 W
7,200.0	2.03	273.53	7,197.9	34.1	-45.7	613,980.37	638,939.76	32° 41' 13.626 N	103° 52' 54.245 W
7,300.0	1.73	256.78	7,297.8	33.8	-49.0	613,980.13	638,936.52	32° 41' 13.623 N	103° 52' 54.283 W
7,400.0	2.12	258.80	7,397.8	33.1	-52.3	613,979.42	638,933.24	32° 41' 13.616 N	103° 52' 54.321 W
7,500.0	3.30	252.14	7,497.7	31.9	-56.8	613,978.18	638,928.68	32° 41' 13.604 N	103° 52' 54.375 W
7,600.0	3.20	252.17	7,597.5	30.1	-62.2	613,976.45	638,923.29	32° 41' 13.587 N	103° 52' 54.438 W
7,700.0	2.44	253.16	7,697.4	28.7	-66.9	613,974.97	638,918.59	32° 41' 13.573 N	103° 52' 54.493 W
7,800.0	2.13	268.79	7,797.3	28.0	-70.8	613,974.32	638,914.70	32° 41' 13.567 N	103° 52' 54.539 W
7,900.0	1.44	279.43	7,897.3	28.2	-73.9	613,974.48	638,911.60	32° 41' 13.569 N	103° 52' 54.575 W
8,000.0	1.19	286.87	7,997.2	28.7	-76.1	613,974.99	638,909.37	32° 41' 13.574 N	103° 52' 54.601 W
8,100.0	1.26	297.32	8,097.2	29.5	-78.1	613,975.80	638,907.40	32° 41' 13.582 N	103° 52' 54.624 W
8,127.0	1.30	295.60	8,124.2	29.8	-78.6	613,976.07	638,906.86	32° 41' 13.584 N	103° 52' 54.630 W
8,258.0	1.50	324.10	8,255.2	31.8	-81.0	613,978.10	638,904.51	32° 41' 13.605 N	103° 52' 54.658 W
8,290.0	1.40	352.50	8,287.2	32.5	-81.3	613,978.82	638,904.21	32° 41' 13.612 N	103° 52' 54.661 W
8,322.0	3.20	66.50	8,319.1	33.3	-80.5	613,979.57	638,904.98	32° 41' 13.619 N	103° 52' 54.652 W
8,353.0	5.50	85.10	8,350.0	33.7	-78.2	613,980.04	638,907.26	32° 41' 13.624 N	103° 52' 54.625 W
8,385.0	7.80	88.50	8,381.8	33.9	-74.5	613,980.23	638,910.95	32° 41' 13.625 N	103° 52' 54.582 W
8,417.0	11.30	88.50	8,413.4	34.1	-69.2	613,980.37	638,916.26	32° 41' 13.627 N	103° 52' 54.520 W
8,448.0	14.80	88.10	8,443.6	34.3	-62.2	613,980.58	638,923.26	32° 41' 13.628 N	103° 52' 54.438 W
8,480.0	18.00	88.90	8,474.3	34.5	-53.2	613,980.81	638,932.29	32° 41' 13.630 N	103° 52' 54.333 W
8,512.0	20.80	90.10	8,504.4	34.6	-42.6	613,980.89	638,942.91	32° 41' 13.631 N	103° 52' 54.208 W
8,543.0	23.80	88.80	8,533.1	34.7	-30.8	613,981.01	638,954.67	32° 41' 13.631 N	103° 52' 54.071 W
8,575.0	27.30	88.50	8,562.0	35.0	-17.0	613,981.34	638,968.47	32° 41' 13.634 N	103° 52' 53.909 W
8,607.0	30.70	88.40	8,590.0	35.5	-1.5	613,981.76	638,983.98	32° 41' 13.637 N	103° 52' 53.728 W
8,638.0	34.20	88.40	8,616.1	35.9	15.1	613,982.23	639,000.60	32° 41' 13.641 N	103° 52' 53.533 W
8,670.0	38.00	88.30	8,642.0	36.5	33.9	613,982.77	639,019.44	32° 41' 13.646 N	103° 52' 53.313 W
8,702.0	41.90	88.30	8,666.5	37.1	54.5	613,983.38	639,039.98	32° 41' 13.651 N	103° 52' 53.072 W
8,734.0	45.40	88.90	8,689.7	37.6	76.6	613,983.92	639,062.06	32° 41' 13.655 N	103° 52' 52.814 W
8,765.0	49.10	89.10	8,710.7	38.0	99.3	613,984.31	639,084.81	32° 41' 13.658 N	103° 52' 52.548 W
8,797.0	52.50	88.90	8,730.9	38.4	124.1	613,984.75	639,109.60	32° 41' 13.662 N	103° 52' 52.258 W
8,829.0	55.70	88.00	8,749.7	39.1	150.0	613,985.45	639,135.51	32° 41' 13.668 N	103° 52' 51.954 W
8,861.0	59.40	87.00	8,766.8	40.3	177.0	613,986.63	639,162.48	32° 41' 13.678 N	103° 52' 51.639 W
8,892.0	63.30	87.20	8,781.7	41.7	204.1	613,988.01	639,189.65	32° 41' 13.691 N	103° 52' 51.321 W
8,924.0	67.10	88.10	8,795.1	42.9	233.2	613,989.20	639,218.67	32° 41' 13.701 N	103° 52' 50.981 W
8,956.0	70.60	88.80	8,806.7	43.7	263.0	613,990.00	639,248.50	32° 41' 13.708 N	103° 52' 50.632 W
8,987.0	73.70	88.50	8,816.2	44.4	292.5	613,990.70	639,277.99	32° 41' 13.713 N	103° 52' 50.287 W
9,019.0	77.10	87.60	8,824.2	45.4	323.4	613,991.75	639,308.94	32° 41' 13.723 N	103° 52' 49.925 W
9,051.0	80.70	87.20	8,830.4	46.9	354.8	613,993.18	639,340.30	32° 41' 13.735 N	103° 52' 49.558 W
9,083.0	84.20	88.30	8,834.6	48.1	386.5	613,994.42	639,371.99	32° 41' 13.746 N	103° 52' 49.187 W
9,114.0	86.10	87.80	8,837.2	49.2	417.4	613,995.47	639,402.86	32° 41' 13.755 N	103° 52' 48.826 W
9,146.0	87.80	88.70	8,838.9	50.1	449.3	613,996.45	639,434.80	32° 41' 13.764 N	103° 52' 48.452 W
9,209.0	89.00	87.30	8,840.7	52.3	512.2	613,998.65	639,497.73	32° 41' 13.783 N	103° 52' 47.715 W
9,273.0	91.20	87.30	8,840.6	55.4	576.2	614,001.66	639,561.66	32° 41' 13.810 N	103° 52' 46.967 W
9,399.0	87.20	87.90	8,842.3	60.6	702.0	614,006.94	639,687.51	32° 41' 13.857 N	103° 52' 45.494 W
9,494.0	88.40	85.80	8,846.0	65.8	796.8	614,012.15	639,782.29	32° 41' 13.904 N	103° 52' 44.385 W
9,590.0	88.20	87.40	8,848.8	71.5	892.6	614,017.84	639,878.08	32° 41' 13.957 N	103° 52' 43.264 W
9,685.0	89.50	87.10	8,850.7	76.1	987.4	614,022.40	639,972.94	32° 41' 13.998 N	103° 52' 42.154 W
9,780.0	89.30	87.50	8,851.7	80.6	1,082.3	614,026.87	640,067.83	32° 41' 14.038 N	103° 52' 41.043 W
9,875.0	90.80	88.30	8,851.6	84.1	1,177.3	614,030.36	640,162.77	32° 41' 14.068 N	103° 52' 39.932 W
9,970.0	89.70	86.80	8,851.2	88.1	1,272.2	614,034.42	640,257.67	32° 41' 14.105 N	103° 52' 38.822 W



Wellplanning
Survey Report - Geographic

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #4H
Project:	Eddy County, NM	TVD Reference:	WELL @ 3585.6usft (Original Well Elev)
Site:	Firefox Federal	MD Reference:	WELL @ 3585.6usft (Original Well Elev)
Well:	#4H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User Db

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
10,065.0	89.20	88.60	8,852.1	91.9	1,367.1	614,038.23	640,352.59	32° 41' 14.138 N	103° 52' 37.711 W
10,160.0	88.70	87.80	8,853.9	94.9	1,462.0	614,041.21	640,447.53	32° 41' 14.164 N	103° 52' 36.600 W
10,255.0	88.20	87.20	8,856.5	99.1	1,556.9	614,045.35	640,542.40	32° 41' 14.201 N	103° 52' 35.490 W
10,350.0	89.40	86.80	8,858.4	104.0	1,651.7	614,050.33	640,637.25	32° 41' 14.246 N	103° 52' 34.380 W
10,445.0	88.50	88.00	8,860.2	108.3	1,746.6	614,054.63	640,732.13	32° 41' 14.284 N	103° 52' 33.269 W
10,541.0	89.30	87.20	8,862.0	112.3	1,842.5	614,058.65	640,828.03	32° 41' 14.320 N	103° 52' 32.147 W
10,636.0	88.70	89.00	8,863.7	115.5	1,937.5	614,061.80	640,922.96	32° 41' 14.347 N	103° 52' 31.036 W
10,731.0	89.40	89.70	8,865.3	116.6	2,032.4	614,062.88	641,017.94	32° 41' 14.354 N	103° 52' 29.925 W
10,826.0	90.50	90.40	8,865.3	116.5	2,127.4	614,062.80	641,112.93	32° 41' 14.349 N	103° 52' 28.813 W
10,952.0	87.70	88.30	8,867.3	117.9	2,253.4	614,064.23	641,238.89	32° 41' 14.358 N	103° 52' 27.339 W
11,047.0	89.30	88.30	8,869.8	120.7	2,348.3	614,067.04	641,333.81	32° 41' 14.381 N	103° 52' 26.228 W
11,142.0	88.00	87.60	8,872.0	124.1	2,443.2	614,070.44	641,428.72	32° 41' 14.411 N	103° 52' 25.118 W
11,237.0	89.40	87.50	8,874.2	128.2	2,538.1	614,074.50	641,523.61	32° 41' 14.447 N	103° 52' 24.007 W
11,332.0	88.70	87.80	8,875.8	132.1	2,633.0	614,078.39	641,618.52	32° 41' 14.482 N	103° 52' 22.896 W
11,427.0	89.80	86.40	8,877.0	136.9	2,727.9	614,083.20	641,713.38	32° 41' 14.525 N	103° 52' 21.786 W
11,522.0	88.80	88.00	8,878.2	141.5	2,822.8	614,087.84	641,808.26	32° 41' 14.567 N	103° 52' 20.676 W
11,617.0	90.10	88.20	8,879.1	144.7	2,917.7	614,090.99	641,903.20	32° 41' 14.594 N	103° 52' 19.565 W
11,712.0	88.70	88.90	8,880.1	147.1	3,012.7	614,093.39	641,998.16	32° 41' 14.614 N	103° 52' 18.454 W
11,807.0	87.40	86.90	8,883.3	150.6	3,107.5	614,096.87	642,093.03	32° 41' 14.644 N	103° 52' 17.343 W
11,902.0	87.80	87.10	8,887.3	155.5	3,202.3	614,101.84	642,187.82	32° 41' 14.689 N	103° 52' 16.234 W
11,997.0	89.10	87.80	8,889.9	159.8	3,297.2	614,106.06	642,282.69	32° 41' 14.727 N	103° 52' 15.124 W
12,092.0	89.90	87.20	8,890.7	163.9	3,392.1	614,110.21	642,377.59	32° 41' 14.764 N	103° 52' 14.013 W
12,187.0	89.20	87.20	8,891.4	168.5	3,487.0	614,114.85	642,472.48	32° 41' 14.806 N	103° 52' 12.903 W
12,282.0	88.40	87.10	8,893.4	173.3	3,581.8	614,119.57	642,567.34	32° 41' 14.848 N	103° 52' 11.792 W
12,409.0	87.30	86.10	8,898.2	180.8	3,708.5	614,127.10	642,694.02	32° 41' 14.917 N	103° 52' 10.310 W
12,535.0	88.70	89.10	8,902.6	186.1	3,834.3	614,132.37	642,819.82	32° 41' 14.964 N	103° 52' 8.837 W
12,630.0	90.20	88.70	8,903.5	187.9	3,929.3	614,134.19	642,914.79	32° 41' 14.978 N	103° 52' 7.726 W
12,757.0	90.10	87.80	8,903.2	191.8	4,056.2	614,138.07	643,041.73	32° 41' 15.011 N	103° 52' 6.241 W
12,852.0	91.60	87.50	8,901.8	195.7	4,151.1	614,141.96	643,136.64	32° 41' 15.045 N	103° 52' 5.130 W
12,947.0	93.00	87.50	8,898.0	199.8	4,246.0	614,146.11	643,231.47	32° 41' 15.082 N	103° 52' 4.020 W
13,074.0	90.40	88.00	8,894.2	204.8	4,372.8	614,151.09	643,358.30	32° 41' 15.126 N	103° 52' 2.536 W
13,169.0	91.60	88.40	8,892.5	207.8	4,467.7	614,154.07	643,453.24	32° 41' 15.151 N	103° 52' 1.425 W
13,365.0	91.60	88.40	8,887.1	213.2	4,663.6	614,159.54	643,649.09	32° 41' 15.197 N	103° 51' 59.133 W
PBL(FFF#4H)									

Checked By: _____ Approved By: _____ Date: _____