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State of West Virginia
Department of Environmental Protection - Office of Oil and Gas
Well Operator's Report of Well Work

API 47-051-01737 County Marshall District Franklin
Quad Powhatan Point Pad Name MND 3 Field/Pool Name NA
Farm name Consol Mining Co., LLC Well Number MND 3 AHS
Operator (as registered with the OOG) Noble Energy, Inc.
Address 333 Technology Drive, Suite 116 City Canonsburg State PA Zip 15317

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 4411190.92 Easting 517801.03
Landing Point of Curve Northing 4411589.98 Easting 518246.40
Bottom Hole Northing 4409893.46 Easting 519478.47

Elevation (ft) 1128.39' GL Type of Well New Existing Type of Report Interim Final
Permit Type Deviated Horizontal Horizontal 6A Vertical Depth Type Deep Shallow
Type of Operation Convert Deepen Drill Plug Back Redrilling Rework Stimulate
Well Type Brine Disposal CBM Gas Oil Secondary Recovery Solution Mining Storage Other _____
Type of Completion Single Multiple Fluids Produced Brine Gas NGL Oil Other _____
Drilled with Cable Rotary

Drilling Media Surface hole Air Mud Fresh Water Intermediate hole Air Mud Fresh Water Brine
Production hole Air Mud Fresh Water Brine
Mud Type(s) and Additive(s)
Synthetic Oil Based

Date permit issued 3/25/2014 Date drilling commenced 4/10/2014 Date drilling ceased 6/17/2014
Date completion activities began 10/9/2014 Date completion activities ceased 11/29/2014
Verbal plugging (Y/N) N Date permission granted _____ Granted by _____

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

Freshwater depth(s) ft 165' and 298' Open mine(s) (Y/N) depths N
Salt water depth(s) ft None noted for Offsets Void(s) encountered (Y/N) depths N
Coal depth(s) ft 612' Pittsburgh Base Cavern(s) encountered (Y/N) depths RECEIVED
Is coal being mined in area (Y/N) Y - Ireland Mine Office of Oil and Gas

Reviewed by: _____

FEB 02 2015

API 47-051 - 01737 Farm name Consol Mining Co., LLC Well number MND 3 AHS

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/ft	Basket Depth(s)	Did cement circulate (Y/ N) * Provide details below*
Conductor	36	30	40	N			
Surface	24	20	420	N	J-55 94#		Y
Coal							
Intermediate 1	17 1/2	13 3/8	1081	N	J-55 54.5#		Y
Intermediate 2	12 3/8	9 5/8	2618		J 55 36#		Y
Intermediate 3							
Production	8 3/4	5 1/2	13,825	N	P-110 20#		Y
Tubing							
Packer type and depth set							

Comment Details _____

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft ³ /sks)	Volume (ft ³)	Cement Top (MD)	WOC (hrs)
Conductor							
Surface	Type I	579	15.6	1.19	123.0	0	8
Coal							
Intermediate 1	Class A	912	15.6	1.19	183.0	0	8
Intermediate 2	Spacer						
Intermediate 3							
Production	Class A	Lead - 576 Tail - 1560	Lead 14.2 Tail 14.8	Lead - 1.54 Tail - 1.37	Lead 157 - Tail 380	4784	8
Tubing							

Drillers TD (ft) 13,850 Loggers TD (ft) 13,764
 Deepest formation penetrated Marcellus Plug back to (ft) Not a Pilot Hole
 Plug back procedure Not a Pilot Hole

Kick off depth (ft) 7,157

Check all wireline logs run caliper density deviated/directional induction
 neutron resistivity gamma ray temperature sonic

Well cored Yes No Conventional Sidewall Were cuttings collected Yes No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING _____
4 Centralizers on Surface Casing, 9 Centralizers on Intermediate 1 Casing, 21 Centralizer used on the Intermediate 2 String, and on the Production 213 Centralizers were utilized.
 On the Surface and Intermediate strings the centralizers are on every 3 joint of casing.
 On the Production String, they are on every 3rd joint from the Surface to Top of Curve, then every joint until TD.

WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS _____

WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS _____

WERE TRACERS USED Yes No TYPE OF TRACER(S) USED _____

Perforation Record

API: 47-051-01737

Farm name:

Consol Mining
Co. LLC

Well Name: MND-3A-HS

Stage No.	Stim Date	Top Perf	Bottom Perf	# of Perfs	Formation
Toe Prep Inj Test	10/8/2014	-	-	-	Marcellus
1	10/9/2014	13393	13,667	50	Marcellus
2	10/10/2014	13094	13,362	50	Marcellus
3	10/11/2014	12795	13,065	50	Marcellus
4	10/12/2014	12496	12,767	40	Marcellus
5	10/12/2014	12197	12,470	50	Marcellus
6	10/13/2014	11898	12,169	50	Marcellus
7	10/14/2014	11599	11,869	50	Marcellus
8	10/14/2014	11300	11,572	50	Marcellus
9	10/15/2014	11001	11,272	27	Marcellus
10	10/15/2014	10702	10,968	50	Marcellus
12	10/17/2014	10104	10,378	50	Marcellus
13	10/17/2014	9805	10,077	50	Marcellus
14	10/18/2014	9606	9,780	50	Marcellus
15	10/18/2014	9407	9,579	50	Marcellus
16	10/18/2014	9208	9,382	50	Marcellus
17	10/19/2014	9009	9,182	50	Marcellus
18	10/19/2014	8710	8,982	50	Marcellus
19	10/20/2014	8413	8,683	50	Marcellus
20	10/20/2014	8112	8,385	50	Marcellus
21	10/21/2014	7913	8,087	50	Marcellus
22	10/21/2014	7514	7,785	50	Marcellus
23	10/21/2014	7215	7,488	50	Marcellus
24	10/21/2014	6916	7,190	50	Marcellus

STIMULATION INFORMATION PER STAGE

API: 47-051-01737

Farm name:

Consol Mining Co.
LLC.

Well Name: MND-3A-HS

Stage No.	Stim Date	Avg Rate (bpm)	ATP (psi)	Max BD Pressure	ISIP (psi)	Proppant (lbs)	Water (BBLS)	Amount of N ² / other (units)
Toe Prep Inj Test	10/8/2014	17.7	6,465	-	5,838	-	137.95	
1	10/9/2014	79.5	7,899	5,972	2,765	599,099	17,412.12	
2	10/10/2014	90.3	8,365	5,695	4,312	604,093	17,759.12	
3	10/11/2014	84.6	8,854	6,521	4,363	600,243	14,341.76	
4	10/12/2014	89.3	8,251	5,557	4,800	600,936	12,874.98	
5	10/12/2014	86.6	7,465	6,261	3,927	600,037	13,082.50	
6	10/13/2014	85.8	7,489	6,443	4,987	598,633	12,918.19	
7	10/14/2014	86.9	7,239	6,729	3,654	601,053	12,657.48	
8	10/14/2014	86.2	7,430	6,118	4,945	602,486	12,954.14	
9	10/15/2014	90	7,791	6,442	3,496	604,551	12,700.00	
10	10/15/2014	87.1	7,219	5,812	4,952	601,870	12,999.62	
12	10/17/2014	89.8	7,086	6,224	4,471	603,766	11,331.34	
13	10/17/2014	84.7	7,604	6,169	4,666	598,384	12,039.90	
14	10/18/2014	89.1	6,798	6,010	4,212	601,469	12,544.57	
15	10/18/2014	90	6,755	6,225	4,095	596,533	12,389.79	
16	10/18/2014	88.7	6,878	6,426	4,842	598,921	13,040.14	
17	10/19/2014	90.1	6,622	6,172	4,063	603,885	12,461.67	
18	10/19/2014	104.3	7,387	5,507	4,429	600,232	18,986.37	
19	10/20/2014	81.5	9,963	6,465	4,008	601,967	17,581.76	
20	10/20/2014	107.2	7,203	6,199	4,317	603,317	12,774.79	
21	10/21/2014	105.3	7,037	5,566	4,567	602,099	12,414.45	
22	10/21/2014	70.4	5,985	5,923	4,804	600,172	12,792.90	
23	10/21/2014	70.3	6,131	6,242	4,160	597,457	12,710.03	
24	10/21/2014	89.2	6,526	6,232	5,180	602,831	12,185.92	

API 47- 051 - 01737 Farm name Consol Mining Co., LLC Well number MND 3 AHS

<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>		
<u>Marcellus</u>	<u>6,288</u>	<u>TVD</u>	<u>13,850</u> <u>MD</u>
_____	_____	_____	_____
_____	_____	_____	_____

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump

SHUT-IN PRESSURE Surface _____ psi Bottom Hole _____ psi DURATION OF TEST _____ hrs

OPEN FLOW Gas 2,315 mcfpd Oil 132 bpd NGL 354 bpd Water 862 bpd GAS MEASURED BY Estimated Orifice Pilot

LITHOLOGY/ FORMATION	TOP	BOTTOM	TOP	BOTTOM	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H ₂ S, ETC)
	DEPTH IN FT NAME TVD	DEPTH IN FT TVD	DEPTH IN FT MD	DEPTH IN FT MD	
	0		0		
PLEASE SEE ATTACHED FORMATION SHEET					

Please insert additional pages as applicable.

Drilling Contractor Precision Drilling Company
Address 5400 D Big Tyler Road City Charleston State WV Zip 25313

Logging Company _____
Address _____ City _____ State _____ Zip _____

Cementing Company Schlumberger
Address 4600 J Barry Court, Suite 200 City Canonsburg State PA Zip 15317

Stimulating Company Halliburton Energy SRCS
Address 121 Champion Way, Suite 110 City Canonsburg State PA Zip 15317

Please insert additional pages as applicable.

Completed by Regina A. Logue Telephone 724-820-3559
Signature Regina A. Logue Title Regulatory Analyst Date 1/27/15

MND 3A 47-051-01737

Formations	Top TVD	Base TVD	Top MD	Base MD	Fluid
Shale and Sandstone	0	606	0	606	
Pittsburgh Coal	606	616	606	616	
Shale and Sandstone	616	1069	616	1069	
Dunkard Sand	1069	1090	1069	1090	
Shale	1090	1239	1090	1239	
Gas Sand	1239	1310	1239	1310	
Shale	1310	1379	1310	1379	
1st Salt Sand	1379	1395	1379	1395	
Shale	1395	1502	1395	1502	
2nd Salt Sand	1502	1531	1502	1531	
Shale and Sandstone	1531	1661	1531	1661	
Maxton Sand	1661	1708	1661	1708	
Shale	1708	1726	1708	5044	
Big Lime	1726	1798	1726	5120	
Big Injun	1798	2068	1798	5711	
Price	2068	2166	2068	6033	
Murrysville	2166	2273	2166	6107	
Shale and Sandstone	2273	2811	2273	6131	
Gordon	2811	2841	2811	6194	
Shale and Sandstone	2841	3362	2841	6220	
Fifth Sand	3362	3415	3363	6247	
Shale and Sandstone	3415	4217	3416	not encountered	
Warren Sand	4217	4226	4226	not encountered	
Shale	4226	4943	4236	not encountered	
Java Shale	4943	5027	4960	not encountered	
Pipe Creek Shale	5027	5102	5044	5120	
Angola Shale	5102	5686	5120	5711	
Rhinestreet	5686	6005	5711	6033	
Cashaqua	6005	6077	6033	6107	
Middlesex	6077	6100	6107	6131	
West River	6100	6161	6131	6194	
Burkett	6161	6185	6194	6220	
Tully Limestone	6185	6211	6220	6247	Gas
Hamilton	6211	6246	6247	not encountered	
Marcellus	6246	6299	not encountered	not encountered	
Onondaga	6299		not encountered	not encountered	

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	10/9/2014
Job End Date:	10/21/2014
State:	West Virginia
County:	Marshall
API Number:	47-051-01737-08-00
Operator Name:	Noble Energy, Inc.
Well Name and Number:	MND3 A
Longitude:	-80.79210000
Latitude:	39.85047800
Datum:	NAD27
Federal/Tribal Well:	NO
True Vertical Depth:	6,288
Total Base Water Volume (gal):	13,768,518
Total Base Non Water Volume:	0



51-01737

Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Fresh Water	Operator	Base Fluid	Fresh Water	7732-18-5	100.00000	88.20705	Density = 8.340
SAND - PREMIUM WHITE	Halliburton	Proppant	Crystalline silica, quartz	14808-60-7	100.00000	8.78790	
SAND - COMMON WHITE	Halliburton	Proppant	Crystalline silica, quartz	14808-60-7	100.00000	2.28036	
HYDROCHLORIC ACID 5-10%	Halliburton	Solvent	Hydrochloric acid	7647-01-0	10.00000	0.05973	
FR-66	Halliburton	Friction Reducer	Hydrotreated light petroleum distillate	64742-47-8	30.00000	0.02031	
LGC-36 UC	Halliburton	Liquid Gel Concentrate	Guar gum	9000-30-0	60.00000	0.00525	
			Naphtha, hydrotreated heavy	64742-48-9	60.00000	0.00525	
FE-1A ACIDIZING COMPOSITION	Halliburton	Additive	Acetic anhydride	108-24-7	100.00000	0.00310	
			Acetic acid	64-19-7	60.00000	0.00186	

Scalechek® LP-65 Scale Inhibitor	Halliburton	Scale Inhibitor					
			Ammonium chloride	12125-02-9	10.00000	0.00246	
BE-9	Halliburton	Biocide					
			Tributyl tetradecyl phosphonium chloride	81741-28-8	10.00000	0.00206	
LCA-1	Halliburton	Solvent					
			Paraffinic solvent	Confidential	100.00000	0.00141	Denise Tuck, Halliburton 3000 N. Sam Houston Pkwy E., Houston, TX 77032 281-871-6226
LoSurf-300D	Halliburton	Non-ionic Surfactant					
			Ethanol	64-17-5	60.00000	0.00031	
			Heavy aromatic petroleum naphtha	64742-94-5	30.00000	0.00016	
			Naphthalene	91-20-3	5.00000	0.00003	
			Poly(oxy-1,2-ethanediyl), alpha-(4-nonylphenyl)-omega-hydroxy-, branched	127087-87-0	5.00000	0.00003	
			1,2,4 Trimethylbenzene	95-63-6	1.00000	0.00001	
HAI-OS ACID INHIBITOR	Halliburton	Corrosion Inhibitor					
			Methanol	67-56-1	60.00000	0.00031	
			Propargyl alcohol	107-19-7	10.00000	0.00005	
SP BREAKER	Halliburton	Breaker					
			Sodium persulfate	7775-27-1	100.00000	0.00020	
Ingredients shown above are subject to 29 CFR 1910.1200(i) and appear on Material Safety Data Sheets (MSDS). Ingredients shown below are Non-MSDS							
		Other Ingredient(s)					
			Water	7732-18-5		0.67329	
		Other Ingredient(s)					
			Polyacrylamide copolymer	Confidential		0.02031	
		Other Ingredient(s)					
			Organic phosphonate	Confidential		0.01475	
		Other Ingredient(s)					
			Fatty acid tall oil amide	Confidential		0.00338	
		Other Ingredient(s)					
			Alcohols, C12-16, ethoxylated	68551-12-2		0.00338	
		Other Ingredient(s)					
			Ammonium chloride	12125-02-9		0.00338	
		Other Ingredient(s)					
			Sodium chloride	7647-14-5		0.00338	
		Other Ingredient(s)					
			Sorbitan, mono-9-octadecenoate, (Z)	1338-43-8		0.00068	
		Other Ingredient(s)					
			Sorbitan monooleate polyoxyethylene derivative	9005-65-6		0.00068	
		Other Ingredient(s)					

51.01737

		Quaternary ammonium compounds, bis(hydrogenated tallow alkyl) dimethyl, salts with bentonite	68953-58-2		0.00044
	Other Ingredient(s)				
		Formaldehyde	50-00-0		0.00025
	Other Ingredient(s)				
		Oxyalkylated phenolic resin	Confidential		0.00016
	Other Ingredient(s)				
		Alcohols, C14-C15, ethoxylated	68951-67-7		0.00015
	Other Ingredient(s)				
		Fatty acids, tall oil	Confidential		0.00015
	Other Ingredient(s)				
		Reaction product of acetophenone, formaldehyde, thiourea and oleic acid in dimethyl formamide	68527-49-1		0.00015
	Other Ingredient(s)				
		Fatty alcohol polyglycol ether surfactant	9043-30-5		0.00009
	Other Ingredient(s)				
		Oxyalkylated phenolic resin	Confidential		0.00005
	Other Ingredient(s)				
		Olefins	Confidential		0.00003
	Other Ingredient(s)				
		Olefins	Confidential		0.00003
	Other Ingredient(s)				
		Crystalline silica, quartz	14808-60-7		0.00001
	Other Ingredient(s)				
		Olefins	Confidential		0.00001
	Other Ingredient(s)				
		Olefins	Confidential		0.00001
	Other Ingredient(s)				
		Sodium sulfate	7757-82-6		0.00000

51-01737

* Total Water Volume sources may include fresh water, produced water, and/or recycled water

** Information is based on the maximum potential for concentration and thus the total may be over 100%

Note: For Field Development Products (products that begin with FDP), MSDS level only information has been provided.

Ingredient information for chemicals subject to 29 CFR 1910.1200(i) and Appendix D are obtained from suppliers Material Safety Data Sheets (MSDS)

51-01737



Noble Energy MND-3A-HS Gyro+MWD 0ft to 13850ft MD Survey Report



(Def Survey)

Report Date: Jun 16, 2014 - 08:54 AM
Client: Noble Energy
Field: WV Marshall County (NAD 27)
Structure / Slot: Noble Energy MND-3 Pad / MND-3A-HS
Well: MND-3A-HS
Borehole: Original Borehole
UWI / AP# : Unknown / Unknown
Survey Name: Noble Energy MND-3A-HS Gyro+MWD 0ft to 13850ft MD
Survey Date: May 30, 2014
Tort / AHD / DDI / ERD Ratio: 287.291 / 1041.084 ft / 6.775 / 1.997
Coordinate Reference System: NAD27 West Virginia State Plane, Northern Zone, US Feet
Location Lat / Long: N 39° 51' 1.71683", W 80° 47' 31.5095"
Location Grid NE YX: N 49485.565 NUS, E 163724.725 NUS
CRS Grid Convergence Angle: -0.8241"
Grid Scale Factor: 0.9959484
Version / Patch: 2.7.1043.0
Survey / DLS Computation: Vertical Section Azimuth: 128.827 (Grid North)
Vertical Section Origin: 0.000 ft, 0.000 ft
TVD References Datum: KB
TVD References Elevation: 1134.280 ft above MSL
Seated / Ground Elevation: 1115.700 ft above MSL
Magnetic Declination: -7.693"
Total Gravity Field Strength: 993.355mgal (9.80665 Basees)
Gravity Model: GARM
Total Magnetic Field Strength: 52785.908 nT
Magnetic Dip Angle: 67.321"
Declination Date: May 30, 2014
Magnetic Declination Model: IGM01 2013
Grid North: Grid North
Grid Convergence Used: -0.8241"
Total Corr Mag North-Grid North: -6.7691"
Local Coord Referenced To: Well Head

Table with columns: Comments, MD (ft), Incl (°), Azim (°), TVD (ft), TVDSS (ft), VSEC (ft), NS (ft), EW (ft), DLS (ft/100ft), BK (ft/100ft), TR (ft/100ft), Northing (ftUS), Easting (ftUS), Latitude (NS °"), Longitude (EW °"), Directional Drift Index

51-01737

Comments	MD (ft)	Incl (°)	Azlm Grid (°)	TVD (ft)	TVD89 (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLs (°100ft)	BR (°100ft)	TR (°100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S °'")	Longitude (E/W °'")	Directional Difficulty Index
	131.00	0.83	106.38	130.99	-1003.29	1.83	-0.51	1.55	0.72	0.00	50.00	494486.06	1637236.28	N 39 51 1.71 W	80 47 31.54	0.35
	132.00	0.83	106.39	131.99	-1002.29	1.54	-0.52	1.58	0.29	0.00	20.00	494486.05	1637236.29	N 39 51 1.71 W	80 47 31.54	0.35
	133.00	0.82	106.89	132.99	-1001.29	1.56	-0.52	1.58	1.10	-1.00	-31.00	494486.05	1637236.30	N 39 51 1.71 W	80 47 31.54	0.36
	134.00	0.82	110.15	133.99	-1000.29	1.49	-0.52	1.59	0.37	0.00	26.00	494486.04	1637236.32	N 39 51 1.71 W	80 47 31.54	0.37
	135.00	0.82	110.25	134.99	-999.29	1.80	-0.53	1.60	0.14	0.00	10.00	494486.04	1637236.33	N 39 51 1.71 W	80 47 31.54	0.37
	136.00	0.81	110.29	135.99	-998.29	1.80	-0.53	1.60	1.29	-1.00	-8.00	494486.03	1637236.34	N 39 51 1.71 W	80 47 31.54	0.38
	137.00	0.82	110.35	136.99	-997.29	1.81	-0.54	1.63	1.02	0.00	15.00	494486.03	1637236.35	N 39 51 1.71 W	80 47 31.54	0.38
	138.00	0.82	110.10	137.99	-996.29	1.62	-0.54	1.64	0.36	0.00	-25.00	494486.02	1637236.37	N 39 51 1.71 W	80 47 31.54	0.39
	139.00	0.82	110.35	138.99	-995.29	1.64	-0.55	1.66	0.36	0.00	25.00	494486.02	1637236.38	N 39 51 1.71 W	80 47 31.54	0.39
	140.00	0.82	110.39	139.99	-994.29	1.65	-0.55	1.67	0.29	0.00	-20.00	494486.01	1637236.40	N 39 51 1.71 W	80 47 31.54	0.40
	141.00	0.83	110.25	140.99	-993.29	1.67	-0.56	1.68	1.01	1.00	10.00	494486.01	1637236.41	N 39 51 1.71 W	80 47 31.54	0.40
	142.00	0.83	110.04	141.99	-992.29	1.68	-0.56	1.70	0.30	0.00	-21.00	494486.00	1637236.42	N 39 51 1.71 W	80 47 31.54	0.41
	143.00	0.83	110.14	142.99	-991.29	1.69	-0.57	1.71	0.14	0.00	10.00	494486.00	1637236.44	N 39 51 1.71 W	80 47 31.54	0.41
	144.00	0.83	109.93	143.99	-990.29	1.71	-0.57	1.73	0.30	0.00	-21.00	494485.99	1637236.45	N 39 51 1.71 W	80 47 31.54	0.42
	145.00	0.84	109.87	144.99	-989.29	1.72	-0.58	1.74	1.00	1.00	4.00	494485.99	1637236.46	N 39 51 1.71 W	80 47 31.54	0.42
	146.00	0.83	109.71	145.99	-988.29	1.73	-0.58	1.75	1.07	-1.00	-26.00	494485.98	1637236.48	N 39 51 1.71 W	80 47 31.54	0.43
	147.00	0.84	109.81	146.99	-987.29	1.75	-0.59	1.77	1.01	1.00	10.00	494485.98	1637236.49	N 39 51 1.71 W	80 47 31.54	0.44
	148.00	0.84	109.50	147.99	-986.29	1.76	-0.59	1.78	0.45	0.00	-31.00	494485.97	1637236.51	N 39 51 1.71 W	80 47 31.54	0.44
	149.00	0.83	109.39	148.99	-985.29	1.78	-0.60	1.79	1.01	-1.00	-11.00	494485.97	1637236.52	N 39 51 1.71 W	80 47 31.54	0.45
	150.00	0.83	109.24	149.99	-984.29	1.79	-0.60	1.81	0.22	0.00	-15.00	494485.96	1637236.53	N 39 51 1.71 W	80 47 31.54	0.45
	151.00	0.83	109.18	150.99	-983.29	1.80	-0.61	1.82	0.09	0.00	-6.00	494485.96	1637236.55	N 39 51 1.71 W	80 47 31.54	0.46
	152.00	0.82	109.08	151.99	-982.29	1.82	-0.61	1.84	1.01	-1.00	-10.00	494485.95	1637236.56	N 39 51 1.71 W	80 47 31.54	0.46
	153.00	0.82	108.92	152.99	-981.29	1.83	-0.62	1.85	0.23	0.00	-16.00	494485.95	1637236.57	N 39 51 1.71 W	80 47 31.54	0.47
	154.00	0.81	108.80	153.99	-980.29	1.84	-0.62	1.86	1.10	-1.00	-32.00	494485.94	1637236.59	N 39 51 1.71 W	80 47 31.54	0.47
	155.00	0.81	108.48	154.99	-979.29	1.86	-0.63	1.88	0.17	0.00	-12.00	494485.94	1637236.60	N 39 51 1.71 W	80 47 31.54	0.48
	156.00	0.80	108.17	155.99	-978.29	1.87	-0.63	1.89	1.09	-1.00	-31.00	494485.93	1637236.61	N 39 51 1.71 W	80 47 31.54	0.48
	157.00	0.80	108.32	156.99	-977.29	1.88	-0.64	1.90	0.29	0.00	15.00	494485.93	1637236.63	N 39 51 1.71 W	80 47 31.54	0.48
	158.00	0.79	107.94	157.99	-976.29	1.90	-0.64	1.92	1.13	-1.00	-39.00	494485.93	1637236.64	N 39 51 1.71 W	80 47 31.54	0.49
	159.00	0.78	107.87	158.99	-975.29	1.91	-0.64	1.93	1.00	-1.00	-7.00	494485.92	1637236.65	N 39 51 1.71 W	80 47 31.54	0.50
	160.00	0.78	108.03	159.99	-974.29	1.92	-0.65	1.94	0.22	0.00	-16.00	494485.92	1637236.67	N 39 51 1.71 W	80 47 31.54	0.50
	161.00	0.77	107.96	160.99	-973.29	1.93	-0.65	1.95	1.03	-1.00	-17.00	494485.91	1637236.68	N 39 51 1.71 W	80 47 31.54	0.51
	162.00	0.76	108.02	161.99	-972.29	1.95	-0.66	1.97	1.02	1.00	16.00	494485.91	1637236.69	N 39 51 1.71 W	80 47 31.54	0.51
	163.00	0.75	107.96	162.99	-971.29	1.96	-0.66	1.98	1.11	-1.00	-36.00	494485.91	1637236.70	N 39 51 1.71 W	80 47 31.54	0.52
	164.00	0.74	107.76	163.99	-970.29	1.97	-0.66	1.99	1.01	-1.00	10.00	494485.90	1637236.72	N 39 51 1.71 W	80 47 31.53	0.52
	165.00	0.74	108.04	164.99	-969.29	2.00	-0.67	2.00	0.30	0.00	28.00	494485.90	1637236.73	N 39 51 1.71 W	80 47 31.53	0.53
	166.00	0.73	107.85	165.99	-968.29	2.00	-0.67	2.02	1.03	1.00	-19.00	494485.89	1637236.74	N 39 51 1.71 W	80 47 31.53	0.53
	167.00	0.72	108.13	166.99	-967.29	2.01	-0.68	2.03	1.06	-1.00	28.00	494485.89	1637236.75	N 39 51 1.71 W	80 47 31.53	0.54
	168.00	0.72	108.01	167.99	-966.29	2.02	-0.68	2.04	0.15	0.00	-12.00	494485.89	1637236.77	N 39 51 1.71 W	80 47 31.53	0.54
	169.00	0.71	107.99	168.99	-965.30	2.03	-0.69	2.05	1.00	-1.00	-2.00	494485.88	1637236.78	N 39 51 1.71 W	80 47 31.53	0.55
	170.00	0.71	108.40	169.99	-964.30	2.04	-0.69	2.06	0.51	0.00	0.00	494485.88	1637236.79	N 39 51 1.71 W	80 47 31.53	0.55
	171.00	0.70	108.41	170.99	-963.30	2.05	-0.69	2.08	1.00	-1.00	1.00	494485.87	1637236.80	N 39 51 1.71 W	80 47 31.53	0.55
	172.00	0.70	108.70	171.99	-962.30	2.07	-0.70	2.09	0.35	0.00	29.00	494485.87	1637236.81	N 39 51 1.71 W	80 47 31.53	0.56
	173.00	0.69	108.52	172.99	-961.30	2.08	-0.70	2.10	1.02	-1.00	-18.00	494485.87	1637236.82	N 39 51 1.71 W	80 47 31.53	0.56
	174.00	0.70	108.71	173.99	-960.30	2.09	-0.70	2.11	1.03	1.00	19.00	494485.86	1637236.84	N 39 51 1.71 W	80 47 31.53	0.57
	175.00	0.70	108.83	174.99	-959.30	2.10	-0.71	2.12	0.15	0.00	12.00	494485.86	1637236.85	N 39 51 1.71 W	80 47 31.53	0.57
	176.00	0.70	108.71	175.99	-958.30	2.11	-0.71	2.13	0.15	0.00	-12.00	494485.85	1637236.86	N 39 51 1.71 W	80 47 31.53	0.57
	177.00	0.69	108.95	176.99	-957.30	2.12	-0.72	2.15	1.04	-1.00	24.00	494485.85	1637236.87	N 39 51 1.71 W	80 47 31.53	0.58
	178.00	0.69	108.83	177.99	-956.30	2.13	-0.72	2.16	0.14	0.00	-12.00	494485.85	1637236.88	N 39 51 1.71 W	80 47 31.53	0.58
	179.00	0.69	108.83	178.99	-955.30	2.15	-0.72	2.17	0.00	0.00	0.00	494485.84	1637236.89	N 39 51 1.71 W	80 47 31.53	0.58
	180.00	0.69	109.13	179.99	-954.30	2.16	-0.73	2.18	0.36	0.00	30.00	494485.84	1637236.90	N 39 51 1.71 W	80 47 31.53	0.59
	181.00	0.70	108.82	180.99	-953.30	2.17	-0.73	2.19	1.07	1.00	-31.00	494485.83	1637236.92	N 39 51 1.71 W	80 47 31.53	0.59
	182.00	0.70	108.70	181.99	-952.30	2.18	-0.74	2.20	0.15	0.00	-12.00	494485.83	1637236.93	N 39 51 1.71 W	80 47 31.53	0.59
	183.00	0.70	108.33	182.99	-951.30	2.19	-0.74	2.21	0.45	0.00	-37.00	494485.83	1637236.94	N 39 51 1.71 W	80 47 31.53	0.60
	184.00	0.70	108.25	183.99	-950.30	2.20	-0.74	2.23	0.10	0.00	-8.00	494485.82	1637236.95	N 39 51 1.71 W	80 47 31.53	0.60
	185.00	0.69	108.30	184.99	-949.30	2.21	-0.75	2.24	1.00	-1.00	-5.00	494485.82	1637236.96	N 39 51 1.71 W	80 47 31.53	0.61
	186.00	0.69	107.99	185.99	-948.30	2.22	-0.75	2.25	0.10	0.00	-19.00	494485.82	1637236.97	N 39 51 1.71 W	80 47 31.53	0.61
	187.00	0.69	107.81	186.99	-947.30	2.24	-0.75	2.26	0.22	0.00	-18.00	494485.81	1637236.98	N 39 51 1.71 W	80 47 31.53	0.61
	188.00	0.69	107.86	187.99	-946.30	2.25	-0.76	2.27	0.06	0.00	5.00	494485.81	1637237.00	N 39 51 1.71 W	80 47 31.53	0.61
	189.00	0.68	107.73	188.99	-945.30	2.26	-0.76	2.28	1.01	-1.00	-13.00	494485.80	1637237.01	N 39 51 1.71 W	80 47 31.53	0.62
	190.00	0.68	107.71	189.99	-944.30	2.27	-0.76	2.29	0.02	0.00	-2.00	494485.80	1637237.02	N 39 51 1.71 W	80 47 31.53	0.62
	191.00	0.67	107.82	190.99	-943.30	2.28	-0.77	2.31	1.02	-1.00	-1.00	494485.80	1637237.03	N 39 51 1.71 W	80 47 31.53	0.63
	192.00	0.66	107.50	191.99	-942.30	2.29	-0.77	2.32	1.00	-1.00	-2.00	494485.79	1637237.04	N 39 51 1.71 W	80 47 31.53	0.63
	193.00	0.65	107.49	192.99	-941.30	2.30	-0.78	2.33	1.00	-1.00	-1.00	494485.79	1637237.05	N 39 51 1.71 W	80 47 31.53	0.63
	194.00	0.65	107.40	193.99	-940.30	2.31	-0.78	2.34	0.10	0.00	-8.00	494485.79	1637237.06	N 39 51 1.71 W	80 47 31.53	0.64
	195.00	0.65	107.46	194.99	-939.30	2.32	-0.78	2.35	0							

51-01737

Comments	MD (ft)	Incl (°)	Azlm Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (ft/100ft)	BR (ft/100ft)	TR (ft/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° °)	Longitude (W/E ° °)	Directional Difficulty Index
	248.00	0.80	110.64	247.98	-866.30	2.85	-0.95	2.89	1.05	-1.00	31.00	494485.62	1637237.61	N 39 51 1.71 W	80 47 31.52	0.81
	249.00	0.59	111.14	248.98	-885.30	2.88	-0.95	2.90	1.13	-1.00	50.00	494485.61	1637237.62	N 39 51 1.71 W	80 47 31.52	0.82
	250.00	0.58	111.23	249.98	-884.30	2.87	-0.96	2.91	1.00	-1.00	9.00	494485.61	1637237.63	N 39 51 1.71 W	80 47 31.52	0.82
	251.00	0.57	111.78	250.98	-883.30	2.88	-0.96	2.91	1.14	-1.00	55.00	494485.61	1637237.64	N 39 51 1.71 W	80 47 31.52	0.82
	252.00	0.57	112.15	251.98	-882.30	2.89	-0.96	2.92	0.37	0.00	37.00	494485.60	1637237.65	N 39 51 1.71 W	80 47 31.52	0.83
	253.00	0.56	112.08	252.98	-881.30	2.90	-0.97	2.93	1.00	-1.00	-7.00	494485.60	1637237.66	N 39 51 1.71 W	80 47 31.52	0.83
	254.00	0.56	111.94	253.98	-880.30	2.91	-0.97	2.94	0.14	0.00	-14.00	494485.59	1637237.67	N 39 51 1.71 W	80 47 31.52	0.83
	255.00	0.56	111.78	254.98	-879.30	2.91	-0.98	2.95	0.16	0.00	-16.00	494485.59	1637237.68	N 39 51 1.71 W	80 47 31.52	0.83
	256.00	0.56	111.54	255.98	-878.30	2.92	-0.98	2.96	0.23	0.00	-24.00	494485.59	1637237.69	N 39 51 1.71 W	80 47 31.52	0.83
	257.00	0.56	110.80	256.98	-877.30	2.93	-0.98	2.97	0.72	0.00	-74.00	494485.58	1637237.69	N 39 51 1.71 W	80 47 31.52	0.84
	258.00	0.56	110.48	257.98	-876.30	2.94	-0.99	2.98	0.31	0.00	-32.00	494485.58	1637237.70	N 39 51 1.71 W	80 47 31.52	0.84
	259.00	0.56	109.65	258.98	-875.30	2.95	-0.99	2.99	0.81	0.00	-83.00	494485.58	1637237.71	N 39 51 1.71 W	80 47 31.52	0.84
	260.00	0.56	108.82	259.98	-874.30	2.96	-0.99	3.00	1.01	0.00	-103.00	494485.57	1637237.72	N 39 51 1.71 W	80 47 31.52	0.85
	261.00	0.56	107.77	260.98	-873.30	2.97	-1.00	3.01	0.63	0.00	-85.00	494485.57	1637237.73	N 39 51 1.71 W	80 47 31.52	0.85
	262.00	0.57	106.21	261.98	-872.30	2.98	-1.00	3.02	2.09	1.00	-188.00	494485.57	1637237.74	N 39 51 1.71 W	80 47 31.52	0.85
	263.00	0.58	104.37	262.98	-871.30	2.99	-1.00	3.03	1.84	1.00	-154.00	494485.56	1637237.75	N 39 51 1.71 W	80 47 31.52	0.86
	264.00	0.58	103.26	263.98	-870.30	3.00	-1.00	3.04	1.12	0.00	-111.00	494485.56	1637237.76	N 39 51 1.71 W	80 47 31.52	0.86
	265.00	0.59	102.17	264.98	-869.30	3.01	-1.00	3.05	1.50	1.00	-109.00	494485.56	1637237.77	N 39 51 1.71 W	80 47 31.52	0.87
	266.00	0.60	101.49	265.98	-868.30	3.02	-1.01	3.06	1.22	0.00	-88.00	494485.56	1637237.78	N 39 51 1.71 W	80 47 31.52	0.87
	267.00	0.61	100.18	266.98	-867.30	3.03	-1.01	3.07	1.71	1.00	-131.00	494485.56	1637237.79	N 39 51 1.71 W	80 47 31.52	0.88
	268.00	0.61	99.19	267.98	-866.30	3.04	-1.01	3.08	1.05	0.00	-99.00	494485.55	1637237.80	N 39 51 1.71 W	80 47 31.52	0.88
	269.00	0.61	98.43	268.98	-865.30	3.04	-1.01	3.09	0.81	0.00	-78.00	494485.55	1637237.81	N 39 51 1.71 W	80 47 31.52	0.88
	270.00	0.61	97.98	269.98	-864.30	3.05	-1.01	3.10	0.48	0.00	-45.00	494485.55	1637237.82	N 39 51 1.71 W	80 47 31.52	0.88
	271.00	0.61	97.75	270.98	-863.30	3.06	-1.02	3.11	0.24	0.00	-23.00	494485.55	1637237.83	N 39 51 1.71 W	80 47 31.52	0.89
	272.00	0.61	97.77	271.98	-862.30	3.07	-1.02	3.12	0.02	0.00	2.00	494485.55	1637237.84	N 39 51 1.71 W	80 47 31.52	0.89
	273.00	0.61	98.56	272.98	-861.30	3.08	-1.02	3.13	0.84	0.00	79.00	494485.55	1637237.85	N 39 51 1.71 W	80 47 31.52	0.89
	274.00	0.60	99.33	273.98	-860.30	3.09	-1.02	3.14	1.29	-1.00	77.00	494485.55	1637237.86	N 39 51 1.71 W	80 47 31.52	0.89
	275.00	0.60	99.63	274.98	-859.30	3.10	-1.02	3.15	0.31	0.00	30.00	494485.54	1637237.87	N 39 51 1.71 W	80 47 31.52	0.90
	276.00	0.59	100.13	275.98	-858.30	3.11	-1.02	3.16	1.13	-1.00	50.00	494485.54	1637237.88	N 39 51 1.71 W	80 47 31.52	0.90
	277.00	0.59	100.45	276.98	-857.30	3.12	-1.03	3.17	0.33	0.00	32.00	494485.54	1637237.89	N 39 51 1.71 W	80 47 31.52	0.90
	278.00	0.58	101.19	277.98	-856.30	3.13	-1.03	3.18	1.25	-1.00	74.00	494485.54	1637237.91	N 39 51 1.71 W	80 47 31.52	0.90
	279.00	0.58	102.17	278.98	-855.30	3.14	-1.03	3.19	0.99	0.00	98.00	494485.54	1637237.92	N 39 51 1.71 W	80 47 31.52	0.91
	280.00	0.58	102.72	279.98	-854.30	3.14	-1.03	3.20	0.56	0.00	55.00	494485.53	1637237.92	N 39 51 1.71 W	80 47 31.52	0.91
	281.00	0.57	103.47	280.98	-853.30	3.15	-1.03	3.21	1.25	-1.00	75.00	494485.53	1637237.93	N 39 51 1.71 W	80 47 31.52	0.91
	282.00	0.57	104.43	281.98	-852.30	3.16	-1.04	3.22	0.96	0.00	96.00	494485.53	1637237.94	N 39 51 1.71 W	80 47 31.52	0.92
	283.00	0.57	104.93	282.98	-851.30	3.17	-1.04	3.23	0.50	0.00	50.00	494485.53	1637237.95	N 39 51 1.71 W	80 47 31.52	0.92
	284.00	0.58	105.05	283.98	-850.30	3.18	-1.04	3.24	1.01	1.00	12.00	494485.52	1637237.96	N 39 51 1.71 W	80 47 31.52	0.92
	285.00	0.58	105.45	284.98	-849.30	3.19	-1.04	3.25	0.40	0.00	40.00	494485.52	1637237.97	N 39 51 1.71 W	80 47 31.52	0.92
	286.00	0.58	106.10	285.98	-848.30	3.20	-1.05	3.26	0.66	0.00	65.00	494485.52	1637237.98	N 39 51 1.71 W	80 47 31.52	0.93
	287.00	0.59	106.99	286.98	-847.30	3.21	-1.05	3.27	1.03	1.00	23.00	494485.52	1637237.99	N 39 51 1.71 W	80 47 31.52	0.93
	288.00	0.59	106.77	287.98	-846.30	3.22	-1.05	3.28	0.45	0.00	44.00	494485.51	1637238.00	N 39 51 1.71 W	80 47 31.52	0.93
	289.00	0.59	107.19	288.98	-845.30	3.23	-1.06	3.29	0.43	0.00	42.00	494485.51	1637238.01	N 39 51 1.71 W	80 47 31.52	0.93
	290.00	0.60	107.04	289.98	-844.30	3.24	-1.06	3.30	1.01	1.00	-15.00	494485.51	1637238.02	N 39 51 1.71 W	80 47 31.52	0.94
	291.00	0.60	107.48	290.98	-843.30	3.25	-1.06	3.31	0.46	0.00	-44.00	494485.50	1637238.03	N 39 51 1.71 W	80 47 31.52	0.94
	292.00	0.61	107.50	291.98	-842.30	3.26	-1.07	3.32	1.00	1.00	2.00	494485.50	1637238.04	N 39 51 1.71 W	80 47 31.52	0.94
	293.00	0.62	107.32	292.98	-841.30	3.27	-1.07	3.33	1.02	1.00	-18.00	494485.50	1637238.05	N 39 51 1.71 W	80 47 31.52	0.95
	294.00	0.63	107.54	293.98	-840.30	3.28	-1.07	3.34	1.03	1.00	22.00	494485.49	1637238.06	N 39 51 1.71 W	80 47 31.52	0.95
	295.00	0.63	107.74	294.98	-839.30	3.29	-1.08	3.35	0.22	0.00	20.00	494485.49	1637238.07	N 39 51 1.71 W	80 47 31.52	0.95
	296.00	0.63	107.63	295.98	-838.30	3.30	-1.08	3.36	0.12	0.00	-11.00	494485.49	1637238.08	N 39 51 1.71 W	80 47 31.52	0.95
	297.00	0.63	107.77	296.98	-837.30	3.31	-1.08	3.37	0.15	0.00	14.00	494485.48	1637238.09	N 39 51 1.71 W	80 47 31.52	0.95
	298.00	0.64	107.98	297.98	-836.30	3.32	-1.09	3.38	1.03	1.00	21.00	494485.48	1637238.11	N 39 51 1.71 W	80 47 31.52	0.96
	299.00	0.65	107.81	298.98	-835.30	3.33	-1.09	3.39	1.02	1.00	-17.00	494485.48	1637238.12	N 39 51 1.71 W	80 47 31.52	0.96
	300.00	0.66	107.83	299.98	-834.30	3.34	-1.09	3.40	1.00	1.00	2.00	494485.47	1637238.13	N 39 51 1.71 W	80 47 31.52	0.96
	301.00	0.66	108.40	300.98	-833.30	3.35	-1.10	3.41	0.66	0.00	57.00	494485.47	1637238.14	N 39 51 1.71 W	80 47 31.52	0.96
	302.00	0.66	108.21	301.98	-832.30	3.36	-1.10	3.42	0.22	0.00	-19.00	494485.47	1637238.15	N 39 51 1.71 W	80 47 31.52	0.97
	303.00	0.66	108.41	302.98	-831.30	3.37	-1.10	3.43	0.23	0.00	20.00	494485.46	1637238.16	N 39 51 1.71 W	80 47 31.52	0.97
	304.00	0.66	108.60	303.98	-830.30	3.38	-1.11	3.45	0.22	0.00	19.00	494485.46	1637238.17	N 39 51 1.71 W	80 47 31.52	0.97
	305.00	0.66	108.41	304.98	-829.30	3.39	-1.11	3.46	0.22	0.00	-19.00	494485.46	1637238.18	N 39 51 1.71 W	80 47 31.52	0.97
	306.00	0.66	108.55	305.98	-828.30	3.40	-1.11	3.47	0.16	0.00	14.00	494485.45	1637238.19	N 39 51 1.71 W	80 47 31.52	0.97
	307.00	0.66	108.73	306.98	-827.30	3.42	-1.12	3.48	0.21	0.00	18.00	494485.45	1637238.20	N 39 51 1.71 W	80 47 31.52	0.98
	308.00	0.66	108.48	307.98	-826.30	3.43	-1.12	3.49	0.29	0.00	-25.00	494485.44	1637238.21	N 39 51 1.71 W	80 47 31.52	0.98
	309.00	0.66	108.47	308.98	-825.30	3.44	-1.13	3.50	0.01	0.00	-1.00	494485.44	1637238.23	N 39 51 1.71 W	80 47 31.52	0.98
	310.00	0.65	108.58	309.98	-824.30	3.45	-1.13	3.51	1.01	-1.00	11.00	494485.44	1637238.24	N 39 51 1.71 W	80 47 31.52	0.98
	311.00	0.65	108.49	310.98	-823.30	3.46	-1.13	3.52	0.10	0.00	-8.00	494485.43	1637238.25	N 39 51 1.71 W	80 47 31.52	0.98
	312.00	0.64	107.91	311.98	-822.30	3.47	-1.14	3.53								

51-01737

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLs (°/100ft)	BR (°/100ft)	TR (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (NS °'")	Longitude (EW °'")	Directional Difficulty Index
	364.00	0.66	109.82	363.97	-770.31	4.00	-1.29	4.09	0.01	0.00	-1.00	494485.28	1637238.81	N 39 51 1.70 W	80 47 31.51	1.11
	365.00	0.66	109.83	364.97	-769.31	4.01	-1.29	4.10	0.02	0.00	-1.00	494485.29	1637238.82	N 39 51 1.70 W	80 47 31.51	1.11
	366.00	0.66	109.89	365.97	-768.31	4.02	-1.29	4.11	0.07	0.00	8.00	494485.27	1637238.84	N 39 51 1.70 W	80 47 31.51	1.11
	367.00	0.66	109.55	366.97	-767.31	4.03	-1.30	4.12	0.16	0.00	-14.00	494485.27	1637238.85	N 39 51 1.70 W	80 47 31.51	1.11
	368.00	0.65	109.42	367.97	-766.31	4.04	-1.30	4.13	1.01	-1.00	-13.00	494485.26	1637238.86	N 39 51 1.70 W	80 47 31.51	1.11
	369.00	0.65	109.46	368.97	-765.31	4.05	-1.31	4.14	0.05	0.00	4.00	494485.26	1637238.87	N 39 51 1.70 W	80 47 31.51	1.12
	370.00	0.65	109.94	369.97	-764.31	4.06	-1.31	4.15	0.59	0.00	-52.00	494485.26	1637238.88	N 39 51 1.70 W	80 47 31.51	1.12
	371.00	0.64	108.80	370.97	-763.31	4.07	-1.31	4.17	1.01	-1.00	-14.00	494485.25	1637238.89	N 39 51 1.70 W	80 47 31.51	1.12
	372.00	0.63	108.60	371.97	-762.31	4.08	-1.32	4.18	1.02	-1.00	-20.00	494485.25	1637238.90	N 39 51 1.70 W	80 47 31.51	1.12
	373.00	0.63	108.20	372.97	-761.31	4.09	-1.32	4.19	0.44	0.00	-40.00	494485.25	1637238.91	N 39 51 1.70 W	80 47 31.51	1.12
	374.00	0.62	108.12	373.97	-760.31	4.10	-1.32	4.20	1.00	-1.00	-8.00	494485.24	1637238.92	N 39 51 1.70 W	80 47 31.51	1.13
	375.00	0.62	107.78	374.97	-759.31	4.11	-1.33	4.21	0.37	0.00	-34.00	494485.24	1637238.93	N 39 51 1.70 W	80 47 31.51	1.13
	376.00	0.62	107.83	375.97	-758.31	4.12	-1.33	4.22	0.05	0.00	5.00	494485.24	1637238.94	N 39 51 1.70 W	80 47 31.51	1.13
	377.00	0.61	107.70	376.97	-757.31	4.13	-1.33	4.23	1.01	-1.00	-13.00	494485.23	1637238.95	N 39 51 1.70 W	80 47 31.51	1.13
	378.00	0.61	107.77	377.97	-756.31	4.14	-1.34	4.24	0.07	0.00	7.00	494485.23	1637238.96	N 39 51 1.70 W	80 47 31.51	1.13
	379.00	0.61	107.83	378.97	-755.31	4.15	-1.34	4.25	0.08	0.00	6.00	494485.23	1637238.97	N 39 51 1.70 W	80 47 31.51	1.13
	380.00	0.60	107.71	379.97	-754.31	4.16	-1.34	4.26	1.01	-1.00	-12.00	494485.22	1637238.98	N 39 51 1.70 W	80 47 31.51	1.14
	381.00	0.60	107.97	380.97	-753.31	4.17	-1.35	4.27	0.27	0.00	26.00	494485.22	1637238.99	N 39 51 1.70 W	80 47 31.51	1.14
	382.00	0.60	108.04	381.97	-752.31	4.18	-1.35	4.28	0.00	0.00	7.00	494485.22	1637239.00	N 39 51 1.70 W	80 47 31.51	1.14
	383.00	0.60	108.04	382.97	-751.31	4.19	-1.35	4.29	0.00	0.00	0.00	494485.21	1637239.01	N 39 51 1.70 W	80 47 31.51	1.14
	384.00	0.60	108.18	383.97	-750.31	4.20	-1.36	4.30	0.15	0.00	14.00	494485.21	1637239.02	N 39 51 1.70 W	80 47 31.51	1.14
	385.00	0.61	108.14	384.97	-749.31	4.21	-1.36	4.31	1.00	1.00	-4.00	494485.21	1637239.03	N 39 51 1.70 W	80 47 31.51	1.14
	386.00	0.61	108.47	385.97	-748.31	4.22	-1.36	4.32	0.35	0.00	33.00	494485.20	1637239.04	N 39 51 1.70 W	80 47 31.51	1.15
	387.00	0.61	108.34	386.97	-747.31	4.23	-1.37	4.33	0.14	0.00	-13.00	494485.20	1637239.05	N 39 51 1.70 W	80 47 31.51	1.15
	388.00	0.62	108.03	387.97	-746.31	4.24	-1.37	4.34	1.05	1.00	-31.00	494485.20	1637239.06	N 39 51 1.70 W	80 47 31.51	1.15
	389.00	0.62	108.09	388.97	-745.31	4.25	-1.37	4.35	0.08	0.00	6.00	494485.19	1637239.07	N 39 51 1.70 W	80 47 31.51	1.15
	390.00	0.63	107.95	389.97	-744.31	4.26	-1.38	4.36	1.01	1.00	-19.00	494485.19	1637239.08	N 39 51 1.70 W	80 47 31.51	1.15
	391.00	0.63	107.83	390.97	-743.31	4.27	-1.38	4.37	0.35	0.00	-32.00	494485.19	1637239.09	N 39 51 1.70 W	80 47 31.51	1.15
	392.00	0.64	107.51	391.97	-742.31	4.28	-1.38	4.38	1.01	1.00	-12.00	494485.18	1637239.10	N 39 51 1.70 W	80 47 31.51	1.16
	393.00	0.64	107.43	392.97	-741.31	4.30	-1.39	4.39	0.09	0.00	-8.00	494485.18	1637239.11	N 39 51 1.70 W	80 47 31.51	1.16
	394.00	0.64	107.17	393.97	-740.31	4.31	-1.39	4.40	0.29	0.00	-26.00	494485.18	1637239.12	N 39 51 1.70 W	80 47 31.51	1.16
	395.00	0.64	107.02	394.97	-739.31	4.32	-1.39	4.41	0.17	0.00	-15.00	494485.17	1637239.13	N 39 51 1.70 W	80 47 31.51	1.16
	396.00	0.63	106.92	395.97	-738.31	4.33	-1.40	4.42	1.01	-1.00	-10.00	494485.17	1637239.14	N 39 51 1.70 W	80 47 31.51	1.16
	397.00	0.63	106.64	396.97	-737.31	4.34	-1.40	4.43	0.31	0.00	-28.00	494485.17	1637239.15	N 39 51 1.70 W	80 47 31.51	1.17
	398.00	0.62	106.69	397.97	-736.31	4.35	-1.40	4.44	1.00	-1.00	5.00	494485.16	1637239.16	N 39 51 1.70 W	80 47 31.51	1.17
	399.00	0.60	106.98	398.97	-735.31	4.36	-1.41	4.45	2.02	-2.00	29.00	494485.16	1637239.17	N 39 51 1.70 W	80 47 31.51	1.17
	400.00	0.59	106.74	399.97	-734.31	4.37	-1.41	4.46	1.03	-1.00	-24.00	494485.16	1637239.18	N 39 51 1.70 W	80 47 31.51	1.17
	401.00	0.57	106.95	400.97	-733.31	4.38	-1.41	4.47	2.01	-2.00	21.00	494485.15	1637239.19	N 39 51 1.70 W	80 47 31.51	1.18
	402.00	0.56	107.42	401.97	-732.31	4.38	-1.41	4.48	1.10	-1.00	47.00	494485.15	1637239.20	N 39 51 1.70 W	80 47 31.51	1.18
	403.00	0.54	107.51	402.97	-731.31	4.39	-1.42	4.49	2.00	-2.00	9.00	494485.15	1637239.21	N 39 51 1.70 W	80 47 31.51	1.18
	404.00	0.52	107.49	403.97	-730.31	4.40	-1.42	4.50	2.00	-2.00	-2.00	494485.15	1637239.22	N 39 51 1.70 W	80 47 31.51	1.19
	405.00	0.51	108.04	404.97	-729.31	4.41	-1.42	4.51	1.12	-1.00	56.00	494485.14	1637239.23	N 39 51 1.70 W	80 47 31.51	1.19
	406.00	0.49	108.81	405.97	-728.31	4.42	-1.43	4.52	2.06	-2.00	57.00	494485.14	1637239.24	N 39 51 1.70 W	80 47 31.51	1.19
	407.00	0.48	108.74	406.97	-727.31	4.43	-1.43	4.53	1.01	-1.00	-15.00	494485.14	1637239.25	N 39 51 1.70 W	80 47 31.51	1.19
	408.00	0.47	108.99	407.97	-726.31	4.43	-1.43	4.53	1.02	-1.00	25.00	494485.14	1637239.26	N 39 51 1.70 W	80 47 31.51	1.20
	409.00	0.45	109.57	408.97	-725.31	4.44	-1.43	4.54	2.05	-2.00	58.00	494485.13	1637239.27	N 39 51 1.70 W	80 47 31.51	1.20
	410.00	0.44	109.96	409.97	-724.31	4.45	-1.44	4.55	1.04	-1.00	39.00	494485.13	1637239.28	N 39 51 1.70 W	80 47 31.51	1.20
	411.00	0.44	110.53	410.97	-723.31	4.46	-1.44	4.56	0.44	0.00	57.00	494485.13	1637239.29	N 39 51 1.70 W	80 47 31.51	1.20
	412.00	0.43	110.95	411.97	-722.31	4.46	-1.44	4.56	1.05	-1.00	42.00	494485.12	1637239.29	N 39 51 1.70 W	80 47 31.51	1.21
	413.00	0.42	111.19	412.97	-721.31	4.47	-1.44	4.57	1.02	-1.00	24.00	494485.12	1637239.29	N 39 51 1.70 W	80 47 31.51	1.21
	414.00	0.42	111.90	413.97	-720.31	4.48	-1.45	4.58	0.52	0.00	71.00	494485.12	1637239.30	N 39 51 1.70 W	80 47 31.51	1.21
	415.00	0.42	112.76	414.97	-719.31	4.49	-1.45	4.59	0.55	0.00	60.00	494485.11	1637239.31	N 39 51 1.70 W	80 47 31.51	1.21
	416.00	0.42	112.80	415.97	-718.31	4.49	-1.45	4.59	0.09	0.00	12.00	494485.11	1637239.31	N 39 51 1.70 W	80 47 31.51	1.21
	417.00	0.42	113.24	416.97	-717.31	4.50	-1.46	4.60	0.25	0.00	34.00	494485.11	1637239.32	N 39 51 1.70 W	80 47 31.51	1.21
	418.00	0.42	114.35	417.97	-716.31	4.51	-1.46	4.60	0.81	0.00	111.00	494485.11	1637239.33	N 39 51 1.70 W	80 47 31.51	1.21
	419.00	0.42	115.06	418.97	-715.31	4.51	-1.46	4.61	0.52	0.00	71.00	494485.10	1637239.33	N 39 51 1.70 W	80 47 31.51	1.22
	420.00	0.42	115.39	419.97	-714.31	4.52	-1.46	4.62	0.24	0.00	33.00	494485.10	1637239.34	N 39 51 1.70 W	80 47 31.51	1.22
	421.00	0.42	116.11	420.97	-713.31	4.53	-1.47	4.62	0.53	0.00	72.00	494485.10	1637239.35	N 39 51 1.70 W	80 47 31.51	1.22
	422.00	0.42	116.83	421.97	-712.31	4.53	-1.47	4.63	0.53	0.00	72.00	494485.10	1637239.35	N 39 51 1.70 W	80 47 31.51	1.22
	423.00	0.42	117.43	422.97	-711.31	4.54	-1.47	4.64	0.44	0.00	60.00	494485.09	1637239.36	N 39 51 1.70 W	80 47 31.51	1.22
	424.00	0.42	118.14	423.97	-710.31	4.55	-1.48	4.64	0.52	0.00	71.00	494485.09	1637239.37	N 39 51 1.70 W	80 47 31.51	1.22
	425.00	0.42	118.56	424.97	-709.31	4.56	-1.48	4.65	0.31	0.00	42.00	494485.09	1637239.37	N 39 51 1.70 W	80 47 31.51	1.22
	426.00	0.42	118.87	425.97	-708.31	4.56	-1.48	4.66	0.23	0.00	31.00	494485.08	1637239.38	N 39 51 1.70 W	80 47 31.51	1.22
	427.00	0.42	119.58	426.97	-707.31	4.57	-1.49	4.66	0.52	0.00	71.00	494485.08	1637239.39	N 39 51 1.70 W	80 47 31.51	1.22
	428.00	0.42	119.97	427.97	-706.31	4.58	-1.49	4.67	0.29</							

51-01737

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	TVDS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (ft/100ft)	BR (ft/100ft)	TR (ft/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S °'")	Longitude (E/W °'")	Directional Difficulty Index
	479.00	0.52	123.62	478.97	-655.31	4.97	-1.68	5.01	0.25	0.00	26.00	494484.88	1637239.74	N 39 51	1 70 W 80 47 31.50	1.29
	480.00	0.52	124.04	478.97	-654.31	4.98	-1.69	5.02	0.39	0.00	42.00	494484.88	1637239.74	N 39 51	1 70 W 80 47 31.50	1.29
	481.00	0.52	124.34	480.97	-653.31	4.98	-1.70	5.03	0.27	0.00	30.00	494484.87	1637239.76	N 39 51	1 70 W 80 47 31.50	1.29
	482.00	0.53	124.77	481.97	-652.31	4.99	-1.70	5.03	1.07	1.00	43.00	494484.87	1637239.76	N 39 51	1 70 W 80 47 31.50	1.29
	483.00	0.52	125.07	482.97	-651.31	5.00	-1.71	5.04	1.04	-1.00	30.00	494484.86	1637239.77	N 39 51	1 70 W 80 47 31.50	1.29
	484.00	0.53	125.48	483.97	-650.31	5.01	-1.71	5.05	1.08	1.00	39.00	494484.86	1637239.77	N 39 51	1 70 W 80 47 31.50	1.30
	485.00	0.53	125.20	484.87	-649.31	5.02	-1.72	5.06	0.24	0.00	26.00	494484.85	1637239.78	N 39 51	1 70 W 80 47 31.50	1.30
	486.00	0.54	125.53	485.97	-648.31	5.03	-1.72	5.06	1.05	1.00	33.00	494484.84	1637239.79	N 39 51	1 70 W 80 47 31.50	1.30
	487.00	0.54	125.57	486.97	-647.31	5.04	-1.73	5.07	0.04	0.00	4.00	494484.84	1637239.80	N 39 51	1 70 W 80 47 31.50	1.30
	488.00	0.54	126.18	487.97	-646.31	5.05	-1.73	5.08	0.57	0.00	61.00	494484.83	1637239.80	N 39 51	1 70 W 80 47 31.50	1.30
	489.00	0.55	125.81	488.97	-645.31	5.06	-1.74	5.09	1.06	1.00	-37.00	494484.83	1637239.81	N 39 51	1 70 W 80 47 31.50	1.30
	490.00	0.56	126.17	489.97	-644.31	5.07	-1.74	5.09	1.06	1.00	36.00	494484.82	1637239.82	N 39 51	1 70 W 80 47 31.49	1.31
	491.00	0.56	125.90	490.97	-643.31	5.08	-1.75	5.10	0.28	0.00	-27.00	494484.82	1637239.83	N 39 51	1 70 W 80 47 31.49	1.31
	492.00	0.57	125.33	491.97	-642.31	5.09	-1.76	5.11	1.06	1.00	-37.00	494484.81	1637239.83	N 39 51	1 70 W 80 47 31.49	1.31
	493.00	0.58	125.47	492.97	-641.31	5.10	-1.78	5.12	1.00	1.00	-6.00	494484.80	1637239.84	N 39 51	1 70 W 80 47 31.49	1.31
	494.00	0.59	124.85	493.97	-640.31	5.11	-1.77	5.13	1.18	1.00	-62.00	494484.80	1637239.85	N 39 51	1 70 W 80 47 31.49	1.31
	495.00	0.60	124.59	494.97	-639.31	5.12	-1.77	5.14	1.04	1.00	-26.00	494484.79	1637239.86	N 39 51	1 70 W 80 47 31.49	1.32
	496.00	0.61	124.12	495.97	-638.31	5.13	-1.78	5.14	1.12	1.00	-47.00	494484.79	1637239.87	N 39 51	1 70 W 80 47 31.49	1.32
	497.00	0.62	123.65	496.97	-637.31	5.14	-1.78	5.15	1.12	1.00	-47.00	494484.78	1637239.88	N 39 51	1 70 W 80 47 31.49	1.32
	498.00	0.63	123.26	497.97	-636.31	5.15	-1.79	5.16	1.09	1.00	-39.00	494484.78	1637239.89	N 39 51	1 70 W 80 47 31.49	1.32
	499.00	0.64	122.38	498.97	-635.31	5.16	-1.80	5.17	1.40	1.00	-88.00	494484.77	1637239.90	N 39 51	1 70 W 80 47 31.49	1.32
	500.00	0.65	122.25	499.97	-634.31	5.17	-1.80	5.18	1.01	1.00	-13.00	494484.76	1637239.91	N 39 51	1 70 W 80 47 31.49	1.33
	501.00	0.66	121.49	500.97	-633.31	5.18	-1.81	5.19	1.32	1.00	-76.00	494484.76	1637239.92	N 39 51	1 70 W 80 47 31.49	1.33
	502.00	0.67	121.39	501.97	-632.31	5.20	-1.82	5.20	1.01	-1.00	-10.00	494484.75	1637239.93	N 39 51	1 70 W 80 47 31.49	1.33
	503.00	0.67	121.06	502.97	-631.31	5.21	-1.82	5.21	0.39	0.00	-33.00	494484.74	1637239.94	N 39 51	1 70 W 80 47 31.49	1.33
	504.00	0.68	120.43	503.97	-630.31	5.22	-1.83	5.22	1.25	1.00	-63.00	494484.74	1637239.95	N 39 51	1 70 W 80 47 31.49	1.33
	505.00	0.68	120.54	504.97	-629.31	5.23	-1.83	5.23	0.13	0.00	11.00	494484.73	1637239.96	N 39 51	1 70 W 80 47 31.49	1.34
	506.00	0.68	120.22	505.97	-628.31	5.24	-1.84	5.24	0.38	0.00	-32.00	494484.73	1637239.97	N 39 51	1 70 W 80 47 31.49	1.34
	507.00	0.68	120.28	506.97	-627.31	5.25	-1.85	5.25	0.07	0.00	6.00	494484.72	1637239.98	N 39 51	1 70 W 80 47 31.49	1.34
	508.00	0.68	119.97	507.97	-626.31	5.27	-1.85	5.26	0.37	0.00	-31.00	494484.71	1637239.99	N 39 51	1 70 W 80 47 31.49	1.34
	509.00	0.68	119.31	508.97	-625.31	5.28	-1.86	5.27	0.79	0.00	-66.00	494484.71	1637240.00	N 39 51	1 70 W 80 47 31.49	1.34
	510.00	0.68	119.26	509.97	-624.31	5.29	-1.86	5.28	0.08	0.00	-5.00	494484.70	1637240.01	N 39 51	1 70 W 80 47 31.49	1.34
	511.00	0.68	118.51	510.97	-623.31	5.30	-1.87	5.29	0.89	0.00	-75.00	494484.70	1637240.02	N 39 51	1 70 W 80 47 31.49	1.34
	512.00	0.68	118.38	511.97	-622.31	5.31	-1.87	5.30	0.15	0.00	-13.00	494484.69	1637240.03	N 39 51	1 70 W 80 47 31.49	1.34
	513.00	0.68	117.63	512.97	-621.31	5.32	-1.88	5.31	0.89	0.00	-75.00	494484.69	1637240.04	N 39 51	1 70 W 80 47 31.49	1.35
	514.00	0.68	117.52	513.97	-620.31	5.34	-1.89	5.32	0.13	0.00	-11.00	494484.68	1637240.05	N 39 51	1 70 W 80 47 31.49	1.35
	515.00	0.68	117.14	514.97	-619.31	5.35	-1.89	5.33	0.45	0.00	-38.00	494484.68	1637240.06	N 39 51	1 70 W 80 47 31.49	1.35
	516.00	0.68	116.31	515.97	-618.31	5.36	-1.90	5.35	0.99	0.00	-83.00	494484.67	1637240.07	N 39 51	1 70 W 80 47 31.49	1.35
	517.00	0.69	115.95	516.97	-617.31	5.37	-1.90	5.36	1.09	1.00	-36.00	494484.66	1637240.08	N 39 51	1 70 W 80 47 31.49	1.35
	518.00	0.69	115.45	517.97	-616.31	5.38	-1.91	5.37	0.60	0.00	-50.00	494484.66	1637240.09	N 39 51	1 70 W 80 47 31.49	1.35
	519.00	0.70	115.31	518.97	-615.31	5.39	-1.91	5.38	1.01	1.00	-14.00	494484.65	1637240.10	N 39 51	1 70 W 80 47 31.49	1.36
	520.00	0.71	115.64	519.97	-614.31	5.41	-1.92	5.39	1.08	1.00	33.00	494484.65	1637240.11	N 39 51	1 70 W 80 47 31.49	1.36
	521.00	0.71	115.51	520.97	-613.31	5.42	-1.92	5.40	0.16	0.00	-13.00	494484.64	1637240.12	N 39 51	1 70 W 80 47 31.49	1.36
	522.00	0.72	116.09	521.97	-612.31	5.43	-1.93	5.41	1.23	1.00	58.00	494484.64	1637240.13	N 39 51	1 70 W 80 47 31.49	1.36
	523.00	0.72	116.37	522.97	-611.31	5.44	-1.93	5.42	0.35	0.00	29.00	494484.63	1637240.15	N 39 51	1 70 W 80 47 31.49	1.36
	524.00	0.73	117.10	523.97	-610.31	5.46	-1.94	5.43	1.36	1.00	73.00	494484.63	1637240.16	N 39 51	1 70 W 80 47 31.49	1.37
	525.00	0.73	117.37	524.97	-609.31	5.47	-1.94	5.45	0.34	0.00	27.00	494484.62	1637240.17	N 39 51	1 70 W 80 47 31.49	1.37
	526.00	0.74	118.14	525.97	-608.31	5.48	-1.95	5.46	1.41	1.00	77.00	494484.62	1637240.18	N 39 51	1 70 W 80 47 31.49	1.37
	527.00	0.74	119.11	526.97	-607.31	5.49	-1.96	5.47	1.25	0.00	97.00	494484.61	1637240.19	N 39 51	1 70 W 80 47 31.49	1.37
	528.00	0.74	119.93	527.97	-606.31	5.51	-1.96	5.48	1.06	0.00	82.00	494484.60	1637240.20	N 39 51	1 70 W 80 47 31.49	1.37
	529.00	0.75	120.98	528.97	-605.31	5.52	-1.97	5.49	1.69	1.00	105.00	494484.60	1637240.21	N 39 51	1 70 W 80 47 31.49	1.38
	530.00	0.75	121.85	529.97	-604.31	5.53	-1.98	5.50	1.14	0.00	87.00	494484.59	1637240.22	N 39 51	1 70 W 80 47 31.49	1.38
	531.00	0.76	122.72	530.97	-603.31	5.54	-1.98	5.51	1.52	1.00	87.00	494484.58	1637240.23	N 39 51	1 70 W 80 47 31.49	1.38
	532.00	0.76	123.72	531.97	-602.31	5.56	-1.99	5.52	1.33	0.00	100.00	494484.57	1637240.25	N 39 51	1 70 W 80 47 31.49	1.38
	533.00	0.76	124.52	532.97	-601.31	5.57	-2.00	5.53	1.06	0.00	80.00	494484.57	1637240.26	N 39 51	1 70 W 80 47 31.49	1.39
	534.00	0.76	125.32	533.97	-600.31	5.58	-2.01	5.55	1.06	0.00	80.00	494484.56	1637240.27	N 39 51	1 70 W 80 47 31.49	1.39
	535.00	0.76	126.12	534.97	-599.31	5.60	-2.01	5.56	1.06	0.00	80.00	494484.55	1637240.28	N 39 51	1 70 W 80 47 31.49	1.39
	536.00	0.77	127.17	535.96	-598.32	5.61	-2.02	5.57	1.72	1.00	105.00	494484.54	1637240.29	N 39 51	1 70 W 80 47 31.49	1.39
	537.00	0.77	127.86	536.96	-597.32	5.62	-2.03	5.58	0.93	0.00	69.00	494484.54	1637240.30	N 39 51	1 70 W 80 47 31.49	1.40
	538.00	0.77	128.60	537.96	-596.32	5.64	-2.04	5.59	0.99	0.00	74.00	494484.53	1637240.31	N 39 51	1 70 W 80 47 31.49	1.40
	539.00	0.77	129.24	538.96	-595.32	5.65	-2.05	5.60	0.86	0.00	64.00	494484.52	1637240.32	N 39 51	1 70 W 80 47 31.49	1.40
	540.00	0.77	129.88	539.96	-594.32	5.66	-2.06	5.61	0.86	0.00	64.00	494484.51	1637240.33	N 39 51	1 70 W 80 47 31.49	1.40
	541.00	0.77	130.49	540.96	-593.32	5.68	-2.06	5.62	0.82	0.00	61.00	494484.50	1637240.34	N 39 51	1 70 W 80 47 31.49	1.40
	542.00	0.77	130.86	541.96	-592.32	5.69	-2.07	5.63	0.50	0.00	37.00	494484.49	1637240.35	N 39 51	1 70 W 80 47 31.49	1.40
	543.00	0.77	131.34	542.96	-591.32	5.71	-2.08									

51-01737

Comments	MD (ft)	Incl (°)	Azlm Grid (°)	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (ft/100ft)	BR (ft/100ft)	TR (ft/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ° °)	Longitude (E/W ° ° °)	Directional Difficulty Index
9616.00	89.34	143.80	6222.06	5087.78	2888.02	-884.69	3002.65	0.12	0.10	0.07	493601.92	1640237.21	N 39 50 53.40	W 80 46 52.90	6.33	
9706.00	89.25	144.18	6223.17	5088.89	2984.80	-857.48	3055.57	0.41	-0.10	0.40	493529.14	1640239.13	N 39 50 52.69	W 80 46 52.21	6.34	
9796.00	89.25	144.28	6224.35	5090.07	3071.48	-1030.48	3108.20	0.11	0.00	0.11	493456.14	1640342.78	N 39 50 51.97	W 80 46 51.52	6.35	
9885.00	89.34	144.14	6225.44	5091.16	3157.21	-1102.66	3160.28	0.17	0.10	-0.13	493383.87	1640394.81	N 39 50 51.27	W 80 46 50.84	6.36	
9975.00	89.43	144.52	6226.41	5092.13	3243.85	-1175.77	3212.74	0.43	0.10	0.42	493310.86	1640447.29	N 39 50 50.55	W 80 46 50.16	6.38	
10064.00	89.34	144.16	6227.36	5093.08	3329.51	-1248.08	3264.82	0.42	-0.10	-0.40	493238.56	1640499.17	N 39 50 49.85	W 80 46 49.48	6.39	
10154.00	88.99	144.53	6228.67	5094.39	3416.14	-1321.20	3317.07	0.57	-0.39	0.41	493165.44	1640551.62	N 39 50 49.13	W 80 46 48.79	6.40	
10244.00	88.72	144.57	6230.47	5096.19	3502.67	-1394.50	3369.26	0.30	0.04	0.04	493092.14	1640603.81	N 39 50 48.41	W 80 46 48.11	6.41	
10333.00	88.81	144.88	6232.39	5098.11	3588.16	-1467.14	3420.65	0.36	0.10	0.35	493019.51	1640655.19	N 39 50 47.70	W 80 46 47.44	6.42	
10423.00	88.81	144.71	6234.26	5099.98	3674.58	-1540.66	3472.52	0.19	0.00	-0.19	492945.99	1640707.06	N 39 50 46.98	W 80 46 46.76	6.43	
10512.00	88.90	144.75	6236.04	5101.76	3760.07	-1613.31	3523.90	0.11	0.10	0.04	492873.34	1640758.44	N 39 50 46.27	W 80 46 46.09	6.44	
10602.00	88.90	144.94	6237.77	5103.49	3846.47	-1686.88	3575.71	0.21	0.00	0.21	492799.78	1640810.25	N 39 50 45.55	W 80 46 45.41	6.45	
10691.00	88.90	145.25	6239.47	5105.19	3931.81	-1759.86	3626.30	0.35	0.00	0.35	492726.80	1640861.16	N 39 50 44.84	W 80 46 44.75	6.46	
10781.00	88.90	144.96	6241.20	5106.92	4018.16	-1833.53	3676.30	0.86	0.00	-0.68	492653.14	1640912.83	N 39 50 44.12	W 80 46 44.07	6.47	
10870.00	88.90	144.29	6242.91	5108.63	4103.76	-1905.95	3730.01	0.42	0.00	-0.42	492580.72	1640964.53	N 39 50 43.41	W 80 46 43.39	6.48	
10960.00	88.72	143.76	6244.78	5110.50	4190.51	-1978.78	3782.86	0.62	-0.20	-0.59	492507.91	1641017.39	N 39 50 42.70	W 80 46 42.70	6.49	
11049.00	88.72	144.26	6246.77	5112.49	4276.30	-2050.76	3835.15	0.56	0.00	0.56	492435.92	1641069.67	N 39 50 41.99	W 80 46 42.02	6.50	
11139.00	88.81	143.84	6248.71	5114.43	4363.04	-2123.60	3887.98	0.48	0.10	-0.47	492363.08	1641122.49	N 39 50 41.28	W 80 46 41.33	6.51	
11228.00	89.52	144.30	6250.00	5115.72	4448.92	-2195.66	3940.19	0.95	0.80	0.52	492291.03	1641174.71	N 39 50 40.58	W 80 46 40.65	6.52	
11318.00	89.16	145.37	6251.04	5116.76	4535.23	-2269.23	3992.02	1.25	-0.40	1.19	492217.46	1641226.54	N 39 50 39.88	W 80 46 39.97	6.53	
11408.00	89.34	146.07	6252.22	5117.94	4621.25	-2343.58	4042.71	0.80	0.20	0.78	492143.11	1641277.22	N 39 50 39.13	W 80 46 39.31	6.54	
11497.00	89.52	146.18	6253.10	5118.82	4706.13	-2417.47	4092.33	0.23	0.20	0.10	492069.23	1641328.83	N 39 50 38.41	W 80 46 38.66	6.55	
11587.00	89.34	146.25	6254.00	5119.72	4791.93	-2492.25	4142.39	0.22	-0.20	0.10	491994.44	1641379.39	N 39 50 37.67	W 80 46 38.00	6.56	
11676.00	89.25	145.70	6255.09	5120.81	4875.87	-2566.01	4192.18	0.63	-0.10	-0.62	491920.69	1641429.68	N 39 50 36.95	W 80 46 37.35	6.57	
11766.00	89.43	145.83	6256.13	5121.85	4962.87	-2640.41	4242.81	0.25	0.20	0.14	491846.29	1641477.31	N 39 50 36.22	W 80 46 36.69	6.58	
11855.00	89.34	145.68	6257.09	5122.81	5047.92	-2713.97	4292.91	0.22	-0.10	-0.19	491772.74	1641527.40	N 39 50 35.50	W 80 46 36.03	6.59	
11944.00	89.43	146.12	6258.04	5123.76	5132.91	-2787.65	4342.81	0.53	0.10	0.52	491699.06	1641577.30	N 39 50 34.78	W 80 46 35.38	6.60	
12034.00	89.43	147.00	6259.94	5124.66	5218.53	-2862.75	4392.41	0.98	0.00	0.96	491623.97	1641626.89	N 39 50 34.05	W 80 46 34.73	6.61	
12124.00	89.34	146.32	6259.90	5125.62	5304.10	-2937.94	4441.87	0.76	-0.10	-0.76	491548.79	1641676.35	N 39 50 33.31	W 80 46 34.08	6.62	
12214.00	89.25	145.52	6261.01	5126.73	5390.03	-3012.47	4492.29	0.89	-0.10	-0.89	491474.26	1641726.78	N 39 50 32.58	W 80 46 33.42	6.63	
12303.00	89.34	145.16	6262.11	5127.83	5475.26	-3086.67	4542.90	0.42	0.10	-0.40	491401.06	1641777.39	N 39 50 31.87	W 80 46 32.76	6.64	
12393.00	89.34	145.96	6263.14	5128.86	5561.35	-3159.89	4593.80	0.89	0.00	0.89	491326.84	1641828.28	N 39 50 31.14	W 80 46 32.09	6.65	
12482.00	89.25	145.89	6264.24	5129.96	5646.32	-3233.61	4643.66	0.13	-0.10	-0.10	491253.13	1641878.14	N 39 50 30.42	W 80 46 31.44	6.66	
12571.00	89.34	145.67	6265.33	5131.05	5731.38	-3307.19	4693.71	0.27	0.10	-0.25	491179.55	1641928.18	N 39 50 29.70	W 80 46 30.78	6.66	
12661.00	89.43	146.03	6266.30	5132.02	5817.32	-3381.67	4744.23	0.41	0.10	0.40	491105.08	1641978.70	N 39 50 28.97	W 80 46 30.12	6.67	
12750.00	89.43	145.80	6267.18	5132.90	5902.29	-3455.38	4794.10	0.28	0.00	-0.28	491031.38	1642028.57	N 39 50 28.25	W 80 46 29.47	6.68	
12840.00	88.90	145.33	6268.50	5134.22	5988.38	-3529.60	4844.99	0.79	-0.59	-0.52	490957.16	1642079.45	N 39 50 27.52	W 80 46 28.81	6.69	
12929.00	88.90	146.07	6270.20	5135.92	6073.44	-3603.11	4895.13	0.83	0.00	0.83	490883.65	1642129.60	N 39 50 26.80	W 80 46 28.15	6.70	
13018.00	88.90	146.03	6271.91	5137.63	6158.34	-3676.92	4944.83	0.04	0.00	-0.04	490809.84	1642179.29	N 39 50 26.08	W 80 46 27.50	6.70	
13108.00	88.81	145.72	6273.71	5139.43	6244.27	-3751.41	4995.31	0.35	-0.10	-0.34	490735.36	1642229.76	N 39 50 25.35	W 80 46 26.84	6.71	
13197.00	88.99	144.74	6275.42	5141.14	6329.55	-3824.50	5046.05	1.12	0.20	-1.10	490662.27	1642280.51	N 39 50 24.64	W 80 46 26.17	6.72	
13287.00	88.81	143.50	6277.15	5142.87	6416.26	-3897.41	5096.79	1.39	-0.20	-1.38	490589.38	1642333.24	N 39 50 23.92	W 80 46 25.49	6.73	
13376.00	88.99	143.87	6278.86	5144.58	6502.23	-3969.02	5151.61	0.28	0.20	0.19	490517.78	1642386.06	N 39 50 23.22	W 80 46 24.80	6.74	
13466.00	88.90	143.83	6280.51	5146.23	6589.14	-4041.49	5204.95	0.11	-0.10	-0.04	490445.29	1642439.39	N 39 50 22.51	W 80 46 24.10	6.74	
13556.00	89.08	143.56	6282.10	5147.82	6676.07	-4113.92	5256.35	0.21	0.20	-0.08	490372.87	1642492.80	N 39 50 21.81	W 80 46 23.40	6.75	
13646.00	88.81	143.54	6283.76	5149.48	6763.02	-4186.30	5311.82	0.30	-0.30	-0.02	490300.49	1642546.26	N 39 50 21.10	W 80 46 22.70	6.76	
13735.00	88.90	143.32	6285.54	5151.26	6849.05	-4257.76	5364.83	0.27	0.10	-0.25	490229.03	1642599.27	N 39 50 20.40	W 80 46 22.01	6.77	
13764.00	88.90	143.26	6286.09	5151.81	6877.10	-4281.01	5382.16	0.21	0.00	-0.21	490205.79	1642616.60	N 39 50 20.17	W 80 46 21.78	6.77	
13850.00	88.90	143.26	6287.74	5153.46	6960.29	-4349.91	5433.60	0.00	0.00	0.00	490136.89	1642668.03	N 39 50 19.50	W 80 46 21.11	6.77	

Survey Type: Def Survey

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

Description	Part	MD From (ft)	MD To (ft)	EOU Freq (ft)	Hole Size (in)	Casing Diameter (in)	Survey Tool Type	Borehole / Survey
	1	0.000	18.580	Act Stns	30.000	30.000	SLB_NSG+MSHOT-Depth Only	Original Borehole / Noble Energy MND-3A-HS Gyro+MWD Off to 13850ft (MD)
	1	18.580	579.000	Act Stns	30.000	30.000	SLB_NSG+MSHOT	Original Borehole / Noble Energy MND-3A-HS Gyro+MWD Off to 13850ft (MD)
	1	579.000	592.000	Act Stns	30.000	30.000	SLB_MWD-STD	Original Borehole / Noble Energy MND-3A-HS Gyro+MWD Off to 13850ft (MD)
	1	592.000	1130.000	Act Stns	30.000	30.000	SLB_INC_ONLY<10	Original Borehole / Noble Energy MND-3A-HS Gyro+MWD Off to 13850ft (MD)
	1	1130.000	13764.000	Act Stns	30.000	30.000	SLB_MWD-STD	Original Borehole / Noble Energy MND-3A-HS Gyro+MWD Off to 13850ft (MD)
	1	13764.000	13850.000	Act Stns	30.000	30.000	SLB_BLIND+TREND	Original Borehole / Noble Energy MND-3A-HS Gyro+MWD Off to 13850ft (MD)

51-01737



Noble Energy



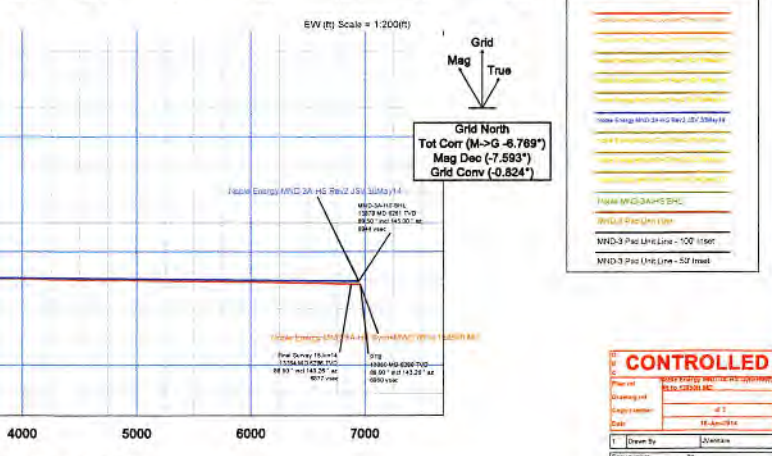
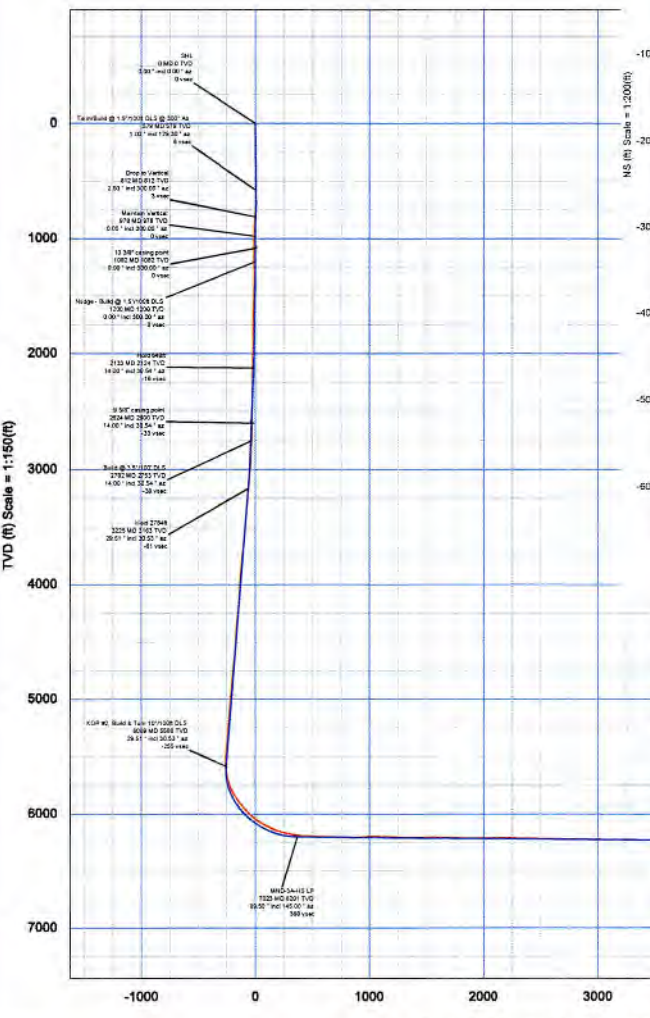
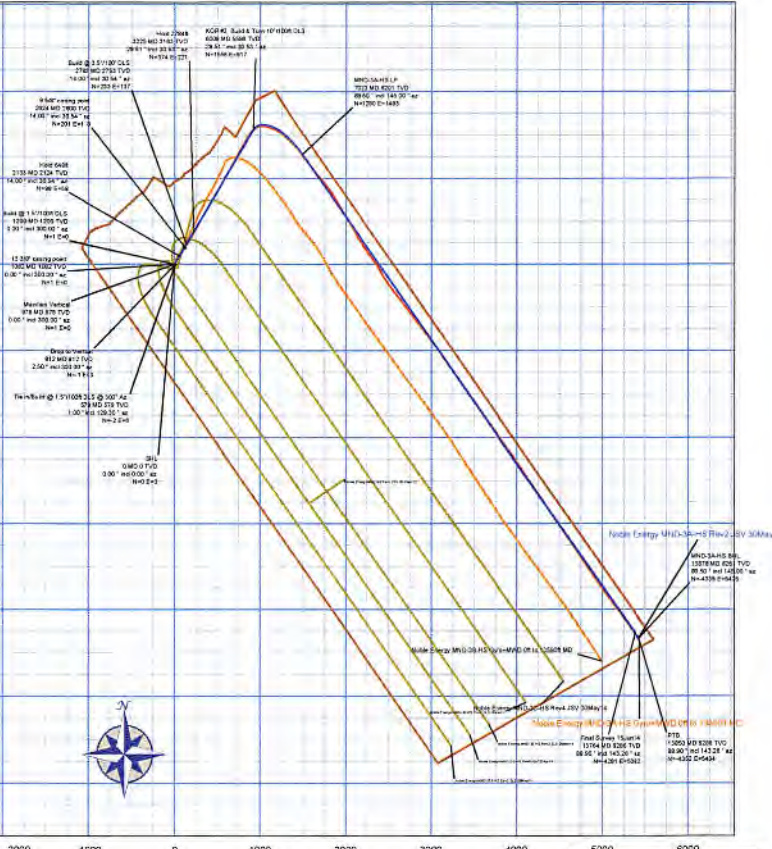
Borehole: Original Borehole	Well: MND-3A-HS	Field: WV Marshall County (NAD 27)	Structure: Precision 543
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Gravity & Magnetic Parameters Model: HDGM 2013 Mag Dec: -7.593°	Dip: 67.821° FB: 52765.906mT	Date: 30-May-2014 Gravity FS: 999.356mgal (9.80665 Based)	Surface Location NAD27 West Virginia State Plane, Northern Zone, US Feet Lat: N 39 51 1.72 Lon: W 80 47 31.56	Miscellaneous NAD27: 494486.956RUS Northing: 1837234.729RUS Easting: 0.9999484	Well Data Well: MND-3A-HS Plan: Noble Energy MND-3A-HS Gyro/MND 0it to 13650ft MD TVD Ref: KB (1134.20ft above MSL)
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Target Description	Depth (ft)	Interval (ft)	Grd Elev (ft)	Grd Elev (ft)	Grd Elev (ft)	Grd Elev (ft)	Grd Elev (ft)	Grd Elev (ft)	Grd Elev (ft)	
Target Name	Depth	Dimension	Latitude	Longitude	Northing	Easting	TVD	W-156	W-156	W-156
MND-3 Pad (3rd Line)	102	102	N 39 51 1.77	W 80 47 31.52	494486.956	1837234.718	1134.20	-0.27	4.90	3.43
MND-3 Pad (2nd Line - 102 Inset)	102	102	N 39 51 1.77	W 80 47 31.52	494486.956	1837234.718	1134.20	-0.27	4.90	3.43
MND-3 Pad (1st Line - 52 Inset)	102	102	N 39 51 1.77	W 80 47 31.52	494486.956	1837234.718	1134.20	-0.27	4.90	3.43
Noble MND-3A-HS S/L	102	102	N 39 51 1.77	W 80 47 31.52	494486.956	1837234.718	1134.20	-0.27	4.90	3.43

Part	Sec	Survey Tool	Vendor/Tool	WOB	Casing Size	MD (ft)	MD To (ft)	Survey Frequency (Hz)	EDU Size (Gauss)	EDU Size (Gauss)	Contour/Contour
1	1	SLR_MDS-MSHOT-Open Only		30	30	0	1553	Adi Str	1.25	1.25	
1	2	SLR_MDS-MSHOT		30	30	1553	574	Adi Str	2.73	1.71	
1	3	SLR_MDS-MSHOT		30	30	574	562	Adi Str	2.73	1.71	
1	4	SLR_MDS-MSHOT		30	30	562	1150	Adi Str	45.67	42.81	
1	5	SLR_MDS-MSHOT		30	30	1150	13764	Adi Str	198.25	41.7	
1	6	SLR_MDS-MSHOT		30	30	13764	13800	Adi Str	220.30	44.1	

Well	MD	INCL	AZM	TVD	VSEC	H-156	W-156	W-156
0E	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Final Survey 15Jun14	13764.00	89.30	143.28	3206.08	557.10	-401.21	532.18	0.31
FTS	13550.00	89.30	143.28	3207.74	560.39	-419.91	543.92	0.28



Vertical Section (ft) Azim = 128.828° Scale = 1:150(ft) Origin = 0N-S, 0E-W

AS DRILLED PLAT

Well is located on topo map 8,939' feet south of Latitude: 39° 52' 30"

Well is located on topo map 120' feet west of Longitude: 80° 47' 30"

PARCEL	LESSOR
1	BARBARA G. MATTHEWS, ET AL
2	PHYLLIS LEE MESSNER, ET AL
3	WILLIAM GARY MESSNER, ET UX, ET AL
4	CNX GAS COMPANY LLC ET AL
5	CNX GAS COMPANY LLC ET AL
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8	ROBERT W. GRAY JR., ET AL
9	ANDREW M. FASOULETOS, ET UX, ET AL
10	JAMES D. POTTS, ET UX



LINE	BEARING	DISTANCE
R1	E 66° 21' 56" W	111.39
R2	N 71° 12' 16" W	101.81
R3	E 64° 18' 06" W	114.37
R4	N 77° 54' 5" E	104.36
R5	E 14° 36' 4" E	140.58
R6	E 00° 52' 23" W	153.15

PERMITTED SURFACE HOLE LOCATION (SHL)
 UTM 17-NAD83
 N:4411190.936
 E:517801.020
 NAD27, WV NORTH
 N:494486.629
 E:1637234.689
 LAT/LON DATUM-NAD83
 LAT:39.850552503
 LON:-80.791911750

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 E:519478.47
 NAD27, WV NORTH
 N:490136.89
 E:1642668.03
 LAT/LON DATUM-NAD83
 LAT:39.83874959
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PERMITTED APPROX. LANDING POINT
 UTM 17-NAD83
 N:4411588.43
 E:518249.49
 NAD27, WV NORTH
 N:495766.39
 E:1638728.08
 LAT/LON DATUM-NAD83
 LAT:39.854124397
 LON:-80.786658257

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 LAT/LON DATUM-NAD83
 LAT:39.838865019
 LON:-80.772371976

LEGEND

- TOP MAP POINT
- WELL
- WELL POINT UNLESS OTHERWISE NOTED
- LEASE NUMBER
- MINERAL EASE Easement
- RANGE BOUNDARY
- WELL FIELD BOUNDARY
- PROPOSED HORIZONTAL WELL
- WELL
- SURFACE CENTER LINE
- AS DRILLED
- EXISTING WELLS
- EXISTING WELLS
- PROPOSED WELLS

- NOTES:**
- There are no water wells or developed springs within 250' of proposed well.
 - There are no existing buildings within 625' of proposed well.
 - Proposed well is greater than 100' from perennial stream, wetland, pond, reservoir or lake.
 - There are no native trout streams within 300' of proposed well.
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Blue Mountain Inc.
 10125 MASON DIXON HIGHWAY
 BURTON, WV 26562
 PHONE: (304) 662-6486

FILE #: MND3AHS-AS DRILLED
 DRAWING #: MND3AHS-AS DRILLED
 SCALE: 1" = 2000'
 MINIMUM DEGREE OF ACCURACY: 1/2500
 PROVEN SOURCE OF ELEVATION: U.S.G.S. MONUMENT THOMAS 1498.81'

I, THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND THE REGULATIONS ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.

Signed: *George D. Six*
 R.P.E.: _____ L.L.S.: P.S. No. 2000

GEORGE D. SIX
 LICENSED
 No. 2000
 STATE OF
 WEST VIRGINIA
 PROFESSIONAL SURVEYOR

PLACE SEAL HERE

(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS WVDEP
 OFFICE OF OIL & GAS
 601 57TH STREET
 CHARLESTON, WV 25304

DATE: JANUARY 6, 2015
 OPERATOR'S WELL #: MND3AHS-AS DRILLED
 API WELL #: 47 51 01737
 STATE COUNTY PERMIT

Well Type: Oil Waste Disposal Production Deep
 Gas Liquid Injection Storage Shallow

WATERSHED: SHORT CREEK ELEVATION: 1121.27'
 COUNTY/DISTRICT: MARSHALL / FRANKLIN QUADRANGLE: POWHATAN POINT, OH-WV 7.5'
 SURFACE OWNER: CONSOLIDATION COAL COMPANY - CONSOL MINING CO. ACREAGE: 180.214±
 OIL & GAS ROYALTY OWNER: BARBARA G. MATTHEWS, ET AL ACREAGE: 587.068±

DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE
 PLUG OFF OLD FORMATION PERFORATE NEW FORMATION PLUG & ABANDON
 CLEAN OUT & REPLUG OTHER CHANGE (SPECIFY): _____

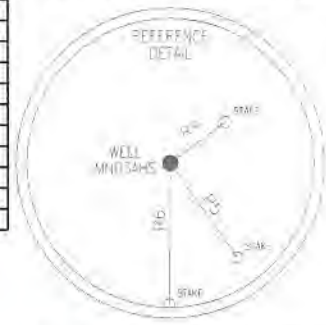
TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: TVD: 6,279'± TMD: 14,071'±
 WELL OPERATOR NOBLE ENERGY, INC. DESIGNATED AGENT STEVEN M. GREEN
 Address 333 TECHNOLOGY DRIVE, SUITE 116 Address 500 VIRGINIA STREET EAST, UNITED CENTER SUITE 590
 City CANONSBURG State PA Zip Code 15317 City CHARLESTON State WV Zip Code 25301

AS DRILLED PLAT

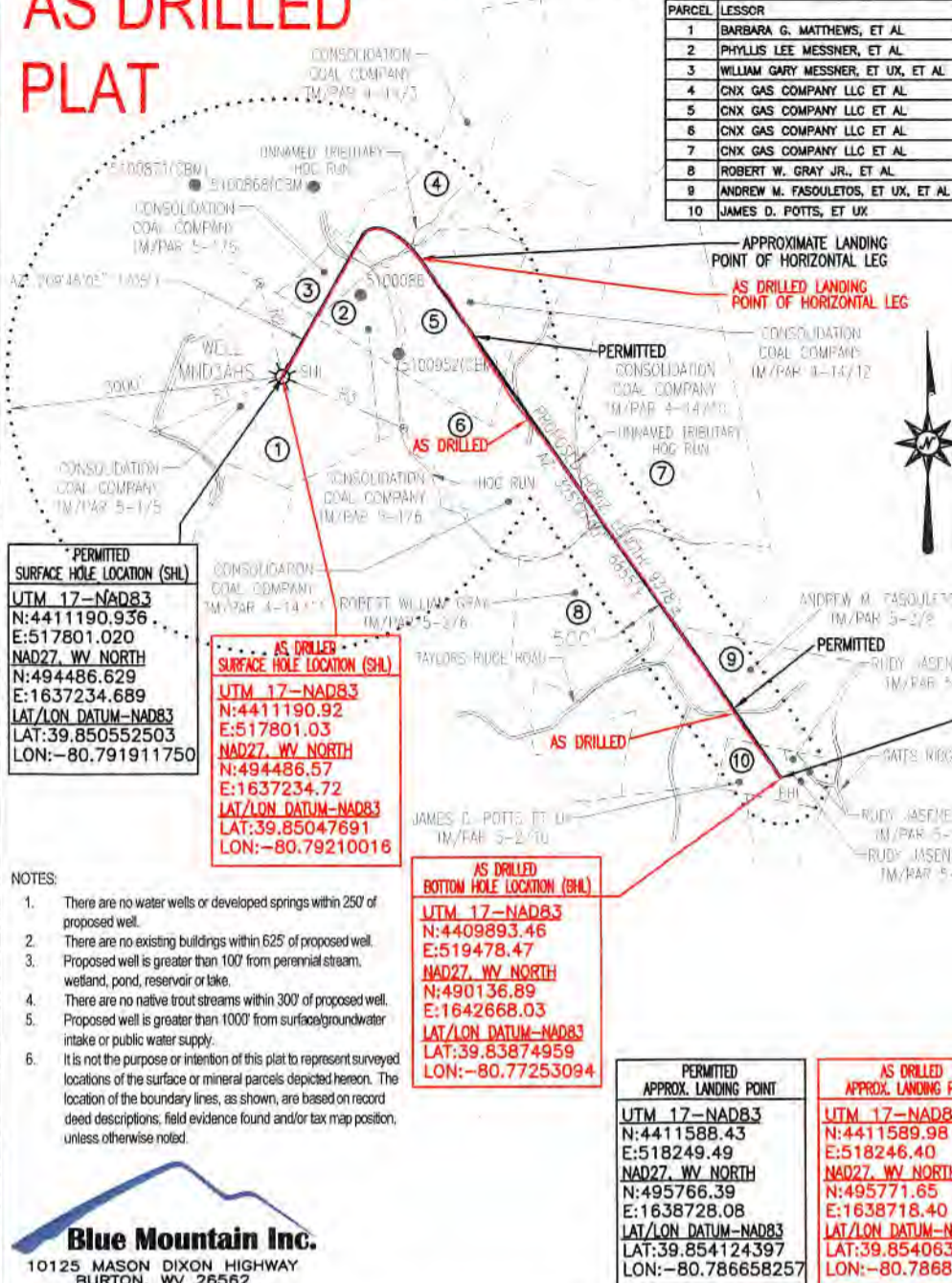
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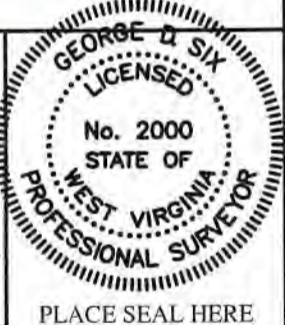
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