National Oilwell Varco - Certification Sheet

NATIONAL OILWELL VARCO

FloSurvey - Real Time Survey Tool
1200 Cypress Creek Road
Cedar Park, TX 78613
Phone: (512)340-5000
Fax: (512)340-5441

April 1, 2014

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

CLIENT: OXY
WELL: AYFU #17
FIELD: N/A
RIG: Savanna 415
COUNTY: Eddy
API NO: 30-015-41331

We hereby certify that the enclosed field survey data performed on the referenced well by National Oilwel Varco, contained in this report represents to the best of our knowledge, a true and accurate survey of the surveyed section of the well at the time the survey was run.

Other information required by your office is as follows.

Name & Title of Surveyor	Drainhole Number	Surveyed Depths		Dates Performed		Type of Survey
Jose Olivas Field Service Technician	AYFU #17 Original Hole	405.00 Ft 3880.00 Ft	to	March 26, 2014 March 30, 2014	to	FloSurvey

If any other information is required, please contact the undersigned at the above letterhead and phone number.
Sincerely,

Tyler Andreason
Field Service Manager

CC: OXY
Enclosures: [2]
County of Eddy
State of New Mexico

Attn: Kacie Cruz
5 Greenway Plaza, Suite 110
Houston, TX 77046

Attn: Ryan Yeatman
5 Greenway Plaza, Suite 110
Houston, TX 77046

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I, Jose Olivas certify that; I am employed by National Oilwell Varco, L.P.; that the surveys taken on the day(s) of March 26, 2014 through March 30, 2014, from a depth of 405.00 Ft feet to a depth of 3880 feet; are to the best of my knowledge, the data is true, correct, complete and within the limitations of the tool as set forth by National Oilwell Varco, L.P.; that I am authorized and qualified to make this report; that this survey was conducted at the request of OXY for the AYFU #17 Well (Original Hole) API No. 30-015-41331 in Eddy County, New Mexico; and that I have reviewed this report and find that it conforms to the principals and procedures as set forth by National Oilwell Varco, L.P.

Signature

Jose Olivas
Field Service Technician

OXY USA
Eddy County
AYFU #17
FloSurvey: Surveys 405 - 3880 MD
UWI No. 30-015-41331

National Oilwell Varco
Survey Report

19 May 2014

UWI No. 30-015-41331

Surface Coordinates: 664215.90 N, 546546.50 E (32° 49' 33.3291" N, 104° 10' 54.5048" W)
Grid Coordinate System: NAD27 New Mexico State Planes, Eastern Zone, US Foot

Surface Coordinates relative to Map Coordinates: 664215.90 N, 546546.50 E (Grid)
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Kelly Bushing Elevation: 3607.20ft above Mean Sea Level
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Kelly Bushing Elevation: 14.00ft above Ground Level
Ground Level: 3593.20ft

Survey Ref: svy45

Survey Depth (ft)	Incl. (°)	(Grid) Azim. (°)	Vertical Depth (ft)	Northings (ft)	Eastings (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
405.00	0.000	0.000	405.00	0.00 N	0.00 E	0.00	
445.00	0.720	232.432	445.00	0.15 S	0.20 W	0.24	1.800
909.00	0.750	244.432	908.96	3.24 S	5.25 W	5.66	0.034
1117.00	0.390	222.432	1116.95	4.35 S	6.96 W	7.54	0.200
1289.00	0.240	209.862	1288.95	5.10 S	7.53 W	8.48	0.096
1462.00	0.750	225.202	1461.94	6.21 S	8.51 W	9.95	0.302
1635.00	0.540	223.632	1634.93	7.60 S	9.88 W	11.87	0.122
1922.00	0.670	226.502	1921.91	9.73 S	12.03 W	14.85	0.046
2138.00	0.670	197.362	2137.90	11.80 S	13.32 W	17.29	0.156
2498.00	0.480	212.642	2497.88	15.08 S	14.76 W	20.81	0.067
2671.00	0.190	249.732	2670.88	15.79 S	15.42 W	21.77	0.201
2844.00	0.460	217.782	2843.88	16.44 S	16.12 W	22.70	0.182
3016.00	0.510	213.932	3015.87	17.62 S	16.97 W	24.15	0.035
3189.00	0.600	220.572	3188.86	18.95 S	17.99 W	25.82	0.064
3362.00	0.290	196.222	3361.86	20.06 S	18.70 W	27.14	0.206
3535.00	0.680	178.842	3534.85	21.50 S	18.80 W	28.38	0.238
3880.00	0.850	163.672	3879.82	26.01 S	18.04 W	31.65	0.076

All data is in Feet (US Survey) unless otherwise stated. Directions and coordinates are relative to Grid North.
Vertical depths are relative to AYFU #17. Northings and Eastings are relative to AYFU #17.

The dogleg severity is in Degrees per 100 feet (US Survey).
Vertical Section is from AYFU #17 calculated along an azimuth of 214.748° (Grid).

Based upon minimum curvature calculations, at a measured depth of 3880.00ft,
the bottom hole displacement is 31.65ft, in the direction of 214.748° (Grid).

The along-hole displacement is 34.11ft. The total accumulated dogleg is 4.432°.
The measured tortuosity is 0.120°/100ft. The directional difficulty index is 1.7.

Survey Tool Program for AYFU #17, FloSurvey: Surveys 405 - 3880 MD

From Measured Depth (ft)	From Vertical Depth (ft)	To Measured Depth (ft)	To Vertical Depth (ft)	Survey Tool Description
405.00	405.00	3880.00	3879.82	FloSurvey TiltOnlyMEM

REFERENCE DATA			
Ellipsoid	Clarke - 1866	Unit System	Feet (Us Survey)
Coord. System	NAD27 New Mexico State Planes, Eastern Zone, US Foc	North Ref.	Grid North
Mag. Model	igrf2010.dat	Vertical Ref.	Mean Sea Level
Calc. Date	24 Mar, 2014		

LOCATION DATA			
RKB Elevation	3607.20ft above MSL	Total Field	48631.7 nT
Map North	664215.90 N	Magnetic Dip	60.570°
Map East	546546.50 E	Declination	7.574°
Latitude	32° 49' 33.3291" N	Convergence	0.082°
Longitude	104° 10' 54.5048" W		

NORTH REFERENCE DATA	
Magnetic Model	igrf2010.dat
Calculation Date	Monday, March 24, 2014
Declination	7.574°
Inclination/Dip	60.570°
Horizontal Component	23895.8 nT
Northerly Component	23688.0 nT
Easterly Component	3149.1 nT
Vertical Component	42356.0 nT
Total Field Strength	48631.7 nT
Grid North is 0.082 degrees East of True North (Grid Convergence) Magnetic North is 7.574 degrees East of True North (Magnetic Declination) Magnetic North is 7.492 degrees East of Grid North (Magnetic Convergence)	
To convert a True Direction to a Grid Direction, Subtract 0.082 degrees. To convert a Magnetic Direction to a True Direction, Add 7.574 degrees. To convert a Magnetic Direction to a Grid Direction, Add 7.492 degrees.