

Rulison Monitoring Results **Noble Energy Well BM 36-13**

Well: Gas production well, Battlement Mesa 36-13, API # 05-045-10840. (Pad 26 is near the Rulison, CO, Site.)

Operator: Noble Energy, Incorporated

Sampler: U.S. Department of Energy, Office of Legacy Management, Grand Junction, CO.

Date of Sampling Event: 28 May 2008

Samples of natural gas and produced water were collected from production well BM 26-42. Location data for the surface collection point and the sample location are given in Table 1. A description of the samples collected is found in Table 2.

Table 1. Well BM 36-13, API # 05-045-10840

Sample Point Location	Location	Sample Location						
		Sea Level elevation (feet)	Distance (feet) from		Surface		Distance from GZ (miles)	Heading from GZ (deg)
			N-S Section line	E-W Section line	Latitude (NAD 27)	Longitude (NAD 27)		
Surface	SESW S26 T7S R95W	8683.5	730.69 FNL	2,122.01 FEL	39.398186	-107.943295	0.552	E65.5°S
Subsurface	SESW S26 T7S R95W	881.0	850.90 FNL	2,172.45 FEL	39.397750	-107.943250	0.569	E67.3°S

Location data updated 28 May 2008.

NA: not available

The subsurface elevation is at the midpoint of the perforation interval.

Link to Colorado Oil and Gas Conservation Commission information about well BM 36-13
<http://oil-gas.state.co.us/cogis/FacilityDetail.asp?facid=04510840&type=WELL>

Table 2. Sample Description

Sample Ticket No.	Location			Field Sample Matrix	Analytes	Samp Vol. (L)	Comments
	Name	Type	Sub-type				
NFD-371	BM 36-13	WL	Angl	Gas	3H, 14C	18.8	P _a ~20 psi
NFD-371	BM 36-13	WL	Angl	Water	3H, Cl ⁻	0.9	Sample volume decanted from condensate.
NFD-371	BM 36-13	WL	Angl	Water	γ spectroscopy	0.9	Sample volume decanted from condensate.
NFD-371	BM 36-13	WL	Angl	Water	Gross alpha/beta	0.2	Sample volume decanted from condensate.

3H: tritium 14C: carbon 14 P_a : pressure Cl⁻: chloride

The water sample was submitted to Paragon Analytics in Fort Collins, Colorado for the determination of gross alpha, gross beta, gamma emitting nuclides, and tritium. The results are listed in Table 3.

The natural gas sample was submitted to Isotech Laboratories in Champaign, Illinois, for natural gas analysis and the determination of tritium and carbon-14. The gas analysis results are listed in Table 4.

Table 3. Water Sample NFD-371 Results, Paragon Analytics

RESULTS REPORT

RIN: 08051601

Site: Rulison Site

Location: BM 36-13

Ticket Number: NFD 371

Report Date: 7/2 4/2008

Parameter	Units	Sample Date	Sample ID	Result	Lab	Qualifiers Data	QA	Standard ¹
H-3	pCi/L	05/28/2008	N001	-5.62	U			20,000
Actinium-228	pCi/L	05/28/2008	N001	24.3	U			
Americium-241	pCi/L	05/28/2008	N001	-3.5	U			
Antimony-125	pCi/L	05/28/2008	N001	2.45	U			
Cerium-144	pCi/L	05/28/2008	N001	-6.56	U			
Cesium-134	pCi/L	05/28/2008	N001	-0.955	U			
Cesium-137	pCi/L	05/28/2008	N001	-1.04	U			
Cobalt-60	pCi/L	05/28/2008	N001	1.82	U			
Europium-152	pCi/L	05/28/2008	N001	6.52	U			
Europium-154	pCi/L	05/28/2008	N001	-1.76	U			
Europium-155	pCi/L	05/28/2008	N001	2.44	U			
Lead-212	pCi/L	05/28/2008	N001	3.48	U			
Potassium-40	pCi/L	05/28/2008	N001	131		J		
Promethium-144	pCi/L	05/28/2008	N001	-0.624	U			
Promethium-146	pCi/L	05/28/2008	N001	0.0308	U			
Ruthenium-106	pCi/L	05/28/2008	N001	-8.8	U			
Thorium-234	pCi/L	05/28/2008	N001	35	U			
Uranium-235	pCi/L	05/28/2008	N001	4.4	U			
Yttrium-88	pCi/L	05/28/2008	N001	2.74	U			
GROSS ALPHA	pCi/L	05/28/2008	N001	84.3		J		
GROSS BETA	pCi/L	05/28/2008	N001	172				
CHLORIDE	MG/L	05/28/2008	N001	12000				

¹USEPA Primary Radionuclide Drinking Water Standard.

Table 4. Natural Gas Sample NFD-371 Results, Isotech Laboratories

RESULTS REPORT
RIN: 08051602
Site: Rulison Site
Location: BM 36-13
Ticket Number: NFD 371
Report Date: 7/24/2008

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers		Standard ²
					Lab	Data QA	
Helium	percent	05/28/2008	N001	0.0025			
Hydrogen	percent	05/28/2008	N001	0.0040			
Argon	percent	05/28/2008	N001	nd	U		
Oxygen	percent	05/28/2008	N001	0.0304			
Nitrogen	percent	05/28/2008	N001	0.21			
Carbon Dioxide	percent	05/28/2008	N001	1.94			
Methane	percent	05/28/2008	N001	91.14			
Ethane	percent	05/28/2008	N001	4.54			
Propane	percent	05/28/2008	N001	1.22			
Isobutane	percent	05/28/2008	N001	0.237			
Butane	percent	05/28/2008	N001	0.241			
Isopentane	percent	05/28/2008	N001	0.105			
Pentane	percent	05/28/2008	N001	0.0830			
Hexanes	percent	05/28/2008	N001	0.247			
Carbon-14	Percent modern carbon	05/28/2008	N001	0.3	U		
Tritium	pCi/L methane	05/28/2008	N001	0.0514	U		

¹ Not detected.

² There are no applicable standards for natural gas.

SAMPLE ID CODES: 000X = Filtered sample (0.45 µm). N00X = Unfiltered sample. X = replicate number.

LAB QUALIFIERS:

U Analytical result below detection limit.

DATA QUALIFIERS:

F Low flow sampling method used. G Possible grout contamination, pH > 9.
 J Estimated value.
 L Less than 3 bore volumes purged prior to sampling. Q Qualitative result due to sampling technique.
 R Unusable result.
 U Parameter analyzed for but was not detected. X Location is undefined.

QA QUALIFIER:

Validated at Level 1 according to quality assurance guidelines.