

Rulison Monitoring Results **Noble Energy Well BM 35-21D**

Well: Gas production well Battlement Mesa 35-21D, API # 05-045-12505. (Pad 35 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: October 31, 2007

Samples of natural gas and production water were collected from production well BM 35-21D. Details concerning this well are listed in Table 1. A description of the samples collected is found in Table 2.

Table 1. Well BM 35-21D, API # 05-045-12505

Sample Point	Location	Sea Level Elevation (feet)	Perforation Interval (feet)	Distance (Feet) from		Subsurface		Distance from GZ (miles)	Comment
				N section Line (FNL)	E section Line (FEL)	Latitude	Longitude		
Surface Collection	NENW S35 T7S R95W	9236	---	754	2105	39.398821	-107.966606	1.07	NAD 83; plan
Subsurface Location	NENW S35 T7S R95W	NA	NA	1168.69	1862.70	39.397819	-107.967206	1.13	at TD=10245

NA: Not available

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

Link to Colorado Oil and Gas Conservation Commission information.

Well: BM 35-21D <http://oil-gas.state.co.us/cogis/FacilityDetail.asp?facid=04512505&type=WELL>

Table 2. Sample Description

Sample No.	Matrix	Sample Description
NDC 649	Gas	After flushing the sample lines, collected the gas sample at the temporary separation apparatus while gas from the well was flared. The input pressure was variable, 20–50 psi.
NDC 650	Water	Production water collected after the separator tank from a loosened pipe cap, near the gas line sample valve.

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 carbon-14 and tritium. The gas analysis results are listed in Table 4.

RESULTS REPORT
RIN: 07101216
Site: Rulison Site
Location: BM 35-21D
Ticket Number: NDC 650
Report Date: 3/4/2008

Parameter	Units	Sample		Result	Qualifiers		Standard ¹
		Date	ID		Lab	Data QA	
H-3	pCi/L	10/31/2007	N001	123	U	#	20,000
Ac-228	pCi/L	10/31/2007	N001	49.4		#	
Am-241	pCi/L	10/31/2007	N001	-16.8	U	#	
Ce-144	pCi/L	10/31/2007	N001	-10.4	U	#	
Co-60	pCi/L	10/31/2007	N001	-0.412	U	#	
Cs-134	pCi/L	10/31/2007	N001	-2.88	U	#	
Cs-137	pCi/L	10/31/2007	N001	-0.996	U	#	
Eu-152	pCi/L	10/31/2007	N001	-11.5	U	#	
Eu-154	pCi/L	10/31/2007	N001	-5.1	U	#	
Eu-155	pCi/L	10/31/2007	N001	6.83	U	#	
K-40	pCi/L	10/31/2007	N001	923		#	
Pb-212	pCi/L	10/31/2007	N001	1.02	U	#	
Pm-144	pCi/L	10/31/2007	N001	-7.19	U	#	
Pm-146	pCi/L	10/31/2007	N001	1.9	U	#	
Ru-106	pCi/L	10/31/2007	N001	-29.7	U	#	
Sb-125	pCi/L	10/31/2007	N001	4.1	U	#	
Th-234	pCi/L	10/31/2007	N001	-12.1	U	#	
U-235	pCi/L	10/31/2007	N001	-0.237	U	#	
Y-88	pCi/L	10/31/2007	N001	1.29	U	#	
GROSS ALPHA	pCi/L	10/31/2007	N001	121		#	
GROSS BETA	pCi/L	10/31/2007	N001	867		#	

¹USEPA Primary Radionuclide Drinking Water Standard.

Table 4. Natural Gas Sample NDC 649 Results, Isotech Laboratories

RESULTS REPORT							
RIN: 07101217							
Site: Rulison Site							
Location: BM 35-21D							
Ticket Number: NDC 649							
Report Date: 3/4/2008							
Parameter	Units	Sample Date	ID	Result	Lab	Qualifiers Data	QA Standard ²
Carbon Monoxide	percent	10/31/2007	N001	nd ¹	U		#
Hydrogen Sulfide	percent	10/31/2007	N001	nd	U		#
Helium	percent	10/31/2007	N001	0.0024			#
Hydrogen	percent	10/31/2007	N001	0.0062			#
Argon	percent	10/31/2007	N001	nd	U		#
Oxygen	percent	10/31/2007	N001	nd	U		#
Nitrogen	percent	10/31/2007	N001	0.11			#
Carbon Dioxide	percent	10/31/2007	N001	12.97			#
Methane	percent	10/31/2007	N001	80.34			#
Ethane	percent	10/31/2007	N001	4.28			#
Ethylene	percent	10/31/2007	N001	nd	U		#
Propane	percent	10/31/2007	N001	1.24			#
Isobutane	percent	10/31/2007	N001	0.272			#
Butane	percent	10/31/2007	N001	0.273			#
Isopentane	percent	10/31/2007	N001	0.112			#
Pentane	percent	10/31/2007	N001	0.0826			#
Hexanes	percent	10/31/2007	N001	0.314			#
Carbon-14	Percent modern carbon	10/31/2007	N001	0.2	U		#
Tritium	pCi/L methane	10/31/2007	N001	0.074	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.

J Estimated value.

L Less than 3 bore volumes purged prior to sampling.

R Unusable result.

U Parameter analyzed for but was not detected.

G Possible grout contamination, pH > 9.

Q Qualitative result due to sampling technique.

X Location is undefined.

QA QUALIFIER:

Validated at Level 1 according to quality assurance guidelines.