

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

Well: Battlement Mesa 36-13D, API # 05-045-15468. (Pad 36L 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: 22 July 2008

Samples of drilling mud and make-up water were collected from well BM 36-13D during drilling. Location data for the surface collection point and the estimated sample location are in Table 1. A description of the samples collected is in Table 2.

Table 1. Well BM 36-13D, API # 05-045-15468

Sample Point	Location	Sea Level elevation (feet)	Perforation interval (feet)	Sample Point Location					
				Distance (feet) from		Latitude (NAD 27)	Longitude (NAD 27)	Distance from GZ (miles)	Heading from GZ (deg)
				N-S section line	E-W section line				
Surface collection	NWSW S36 T7S R95W	8,901.0	NA	208.21 FSL	502.55 FSL	39.392076	- 107.952937	0.957	S21.1°W
Subsurface Location	TBD (drilling)	5,588							

NA = not applicable

The sample location elevation is at the mid-point of the perforation zone.

Location data updated 22 July 2008.

The subsurface elevation is the approximate location of the drilling-mud sample collection point. Make-up water was collected at the surface.

Link to Colorado Oil and Gas Conservation Commission information about well BM 36-13D
<http://oil-gas.state.co.us/cogis/FacilityDetail.asp?facid=04515468&type=WELL>

Table 2. Sample Description

Sample Ticket No.	Location			Field Sample Matrix	Analytes	Sample Vol. (L)	Comments
	Name	Type	Sub-type				
GIZ-719	BM 36L-13D	WL	Angl	Susp. Sol.	3H, Cl ⁻	1	Collected at drill bit depth = 5,588 ft.
GIZ-719	BM 36L-13D	WL	Angl	Susp. Sol.	γ spectroscopy	1	Collected at drill bit depth = 5,588 ft.
GIZ-719	BM 36L-13D	WL	Angl	Susp. Sol.	Gross alpha/beta	1	Collected at drill bit depth = 5,588 ft.
GIZ-714	BM 36L-13Dw	SL		Water	3H, Cl ⁻	1	Make-up water
GIZ-714	BM 36L-13Dw	SL		Water	γ spectroscopy	1	Make-up water
GIZ-714	BM 36L-13Dw	SL		Water	Gross alpha/beta	1	Make-up water

3H: tritium

Cl⁻:chloride

The drilling mud and water samples were submitted to Paragon Analytics in Fort Collins, Colorado, for tritium, chloride, gamma emitting radionuclides, gross alpha, and gross beta analyses. The drilling mud results are listed in Tables 3a and 3b and the make-up water results in Table 4.

Table 3a. Specific-Analyte Drilling Mud Results for Sample GIZ-719 (Paragon Analytics)

RESULTS REPORT
RIN: 08071731
Site: Rulison Site
Location: BM 36L-13D
Ticket Number: GIZ 719
Report Date: 10/29/2008

Parameter	Units	Date Sampled	Date Analyzed	Result	Qualifier(s)	Uncertainty	Detection Limit	Method
Actinium-228	pCi/L	07/22/2008	08/19/2008	250		40.4	47	713R10
Americium-241	pCi/L	07/22/2008	08/19/2008	3.42	U	8.85	15	713R10
Antimony-125	pCi/L	07/22/2008	08/19/2008	7.88	U	12.9	23	713R10
Cerium-144	pCi/L	07/22/2008	08/19/2008	3.4	U	26.3	44	713R10
Cesium-134	pCi/L	07/22/2008	08/19/2008	0.635	U	4.68	9.9	713R10
Cesium-137	pCi/L	07/22/2008	08/19/2008	-1.23	U	5.52	9.7	713R10
Cobalt-60	pCi/L	07/22/2008	08/19/2008	3.57	U	6.4	11	713R10
Europium-152	pCi/L	07/22/2008	08/19/2008	31.4	U	31.7	51	713R10
Europium-154	pCi/L	07/22/2008	08/19/2008	-10.7	U	32.8	58	713R10
Europium-155	pCi/L	07/22/2008	08/19/2008	8.55	U	8.97	15	713R10
Lead-212	pCi/L	07/22/2008	08/19/2008	250		33.2	16	713R10
Potassium-40	pCi/L	07/22/2008	08/19/2008	3000		403	150	713R10
Promethium-144	pCi/L	07/22/2008	08/19/2008	-1.16	U	5.63	9.8	713R10
Promethium-146	pCi/L	07/22/2008	08/19/2008	4.26	U	6.49	11	713R10

RESULTS REPORT
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Site: Rulison Site
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Report Date: 10/29/2008

Parameter	Units	Date Sampled	Date Analyzed	Result	Qualifier(s)	Uncertainty	Detection Limit	Method
Ruthenium-106	pCi/L	07/22/2008	08/19/2008	-16.7	U	50.8	89	713R10
Thorium-234	pCi/L	07/22/2008	08/19/2008	293	J	73.4	130	713R10
Uranium-235	pCi/L	07/22/2008	08/19/2008	14.8	U	26.6	44	713R10
Yttrium-88	pCi/L	07/22/2008	08/19/2008	1.24	U	7.2	12	713R10
H-3	pCi/L	07/22/2008	08/17/2008	-41.7	U	208	350	704R9
CHLORIDE	MG/L	07/22/2008	08/06/2008	510			20	EPA300.0

Table 3b. Gross Alpha/Beta Drilling Mud Results for Sample GIZ-719 (Paragon Analytics)

RESULTS REPORT
RIN: 08071731
Site: Rulison Site
Location: BM 36L-13D
Ticket Number: GIZ 719
Report Date: 10/29/2008

Parameter	Units	Date Sampled	Date Analyzed	Result	Qualifier(s)	Uncertainty	Detection Limit	Method
GROSS ALPHA	pCi/L	07/22/2008	09/24/2008	2040		417	240	724R10
GROSS BETA	pCi/L	07/22/2008	09/24/2008	4340		773	460	724R10

Table 4. Make-up Water Results for Sample GIZ-714 (Paragon Analytics)

RESULTS REPORT
RIN: 08071731
Site: Rulison Site
Location: BM 36L-13DW
Ticket Number: GIZ 714
Report Date: 10/29/2008

Parameter	Units	Date Sampled	Date Analyzed	Result	Qualifier(s)	Uncertainty	Detection Limit	Method
Actinium-228	pCi/L	07/22/2008	08/19/2008	1.41	U	24.5	41	713R10
Americium-241	pCi/L	07/22/2008	08/19/2008	-13.1	U	33.3	57	713R10
Antimony-125	pCi/L	07/22/2008	08/19/2008	-6.73	U	12.6	23	713R10
Cerium-144	pCi/L	07/22/2008	08/19/2008	-16.9	U	20.5	35	713R10
Cesium-134	pCi/L	07/22/2008	08/19/2008	-0.251	U	3.86	6.6	713R10
Cesium-137	pCi/L	07/22/2008	08/19/2008	-1.57	U	3.6	6.4	713R10
Cobalt-60	pCi/L	07/22/2008	08/19/2008	4.03	U	4.27	6.9	713R10
Europium-152	pCi/L	07/22/2008	08/19/2008	19.3	U	18.7	30	713R10
Europium-154	pCi/L	07/22/2008	08/19/2008	-4.08	U	19.6	35	713R10
Europium-155	pCi/L	07/22/2008	08/19/2008	4.34	U	11.3	19	713R10
Lead-212	pCi/L	07/22/2008	08/19/2008	-5.43	U	8.74	15	713R10
Potassium-40	pCi/L	07/22/2008	08/19/2008	14.2	U	70.3	120	713R10
Promethium-144	pCi/L	07/22/2008	08/19/2008	1.9	U	4.21	7.0	713R10
Promethium-146	pCi/L	07/22/2008	08/19/2008	-4.05	U	4.72	8.3	713R10

RESULTS REPORT**RIN: 08071731****Site: Rulison Site****Location: BM 36L-13DW****Ticket Number: GIZ 714****Report Date: 10/29/2008**

Parameter	Units	Date Sampled	Date Analyzed	Result	Qualifier(s)	Uncertainty	Detection Limit	Method
Ruthenium-106	pCi/L	07/22/2008	08/19/2008	-14.6	U	33.3	59	713R10
Thorium-234	pCi/L	07/22/2008	08/19/2008	8.36	U	93.8	160	713R10
Uranium-235	pCi/L	07/22/2008	08/19/2008	5.17	U	19	32	713R10
Yttrium-88	pCi/L	07/22/2008	08/19/2008	4.65	U	4.65	7.5	713R10
GROSS ALPHA	pCi/L	07/22/2008	08/20/2008	2.13	J	1.26	1.9	724R10
GROSS BETA	pCi/L	07/22/2008	08/20/2008	6.98	J	1.93	2.8	724R10
H-3	pCi/L	07/22/2008	08/16/2008	-73	U	211	360	704R9
CHLORIDE	MG/L	07/22/2008	08/06/2008	72			2	EPA300.0

LAB QUALIFIERS:

- * Replicate analysis not within control limits.
- > Result above upper detection limit.
- A TIC is a suspected aldol-condensation product.
- B Inorganic: Result is between the IDL and CRDL. Organic: Analyte also found in method blank.
- C Pesticide result confirmed by GC-MS.
- D Analyte determined in diluted sample.
- E Inorganic: Estimate value because of interference, see case narrative. Organic: Analyte exceeded calibration range of the GC-MS.
- H Holding time expired, value suspect.
- I Increased detection limit due to required dilution.
- J Estimated
- N Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compound (TIC).
- P > 25% difference in detected pesticide or Aroclor concentrations between 2 columns.
- U Analytical result below detection limit.
- W Post-digestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.