



March 31, 2011

Mr. Brandon Danforth  
Noble Energy Inc.  
800 Airport Road, No. 3  
Rifle, Colorado 81650-8517

Subject: Transmittal of Rulison Federal 19-41C Drill Cuttings Radiological Analysis Results

Dear Mr. Danforth:

Per Noble's request, URS Corporation (URS) collected on February 25, 2011 two composite samples of drill cuttings from the recently drilled Tier II Rulison Federal (RF) 19-41C gas well on the 17M well pad in Rulison monitoring sector 2. The drill cuttings were collected and analyzed in accordance with the Rulison Sampling and Analysis Plan (RSAP) Revision 3 dated July 31, 2010.

The composite samples were prepared by collecting drill cuttings from two 500-foot depth intervals in the boring between depths of 7,630 and 8,130 and 8,130 and 8,630 feet below ground surface. These depth intervals are approximately equivalent to the Rulison test interval corrected for dip and distance. The drill cuttings were collected every 50 feet within each depth interval and placed in a clean five gallon bucket. After sampling was completed, the cuttings in each bucket were mixed and sample aliquots of each composite sample were placed in laboratory-supplied sample jars. Once filled, the jars were capped, labeled, and placed in an iced cooler for shipment. The samples were sent by overnight carrier to GEL Laboratories LLC (GEL) in Charleston, South Carolina for analysis of gross alpha, gross beta, gamma-emitting radionuclides, strontium-90, and technetium-99. The samples were analyzed under GEL sample data group (SDG) number 273058.

The results of the radiological analyses indicate that gross alpha, gross beta, and some gamma-emitting radionuclides were detected in the drill cuttings samples. Gross alpha and gross beta were detected at activities typical of natural background for subsurface drill cuttings. Gross alpha and gross beta activities are sourced from the decay of naturally occurring alpha emitters (uranium-238, thorium-232 and their daughters) and beta emitters (potassium-40 and uranium-238, thorium-232 and their daughters) in the surface soils and subsurface rock formations beneath the pad.



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Gamma-emitting radionuclides detected included naturally-occurring potassium-40 and naturally occurring daughter products of the uranium-238 (bismuth-214, lead-214, radium-226, and thorium-230), and thorium-232 (radium-228, actinium-228, lead-212, thallium-208) decay series. Gamma-emitting radionuclide activities detected in the drill cuttings are typical of natural background radioactivity for the subsurface rock formations.

No verified Project Rulison-related radionuclides were detected in either drill cuttings sample. Therefore, per the RSAP, the drill cuttings can be transported, re-used, or disposed without approval from the Colorado Oil & Gas Conservation Commission (COGCC). This letter, along with a Sundry Notice Form 4 shall be submitted by Noble to the COGCC to document the drill cuttings results and demonstrate compliance with the RSAP.

A summary of the radiological analyses is provided in Table 1. Table 1 includes both the radionuclides detected and those that were analyzed but were not detected. The table is sorted so that the detected radionuclides are found at the top. Laboratory data were independently validated by URS and were generally found to be usable without qualification. Data that are deemed usable as qualified or unusable are identified in the data validation report and the laboratory certificates of analysis. The data validation report and laboratory certificates of analysis are attached for your reference.

URS appreciates the opportunity to perform these services for Noble. Please call me if you have any questions concerning this transmittal.

Sincerely,

A handwritten signature in black ink, reading "Richard L. Henry".

Richard L. Henry, PG  
Senior Project Manager

cc: Project File

**Table 1**  
**Noble Rulison Federal RF 17-41C Drill Cuttings Radiological Results**

Sample ID	Sample Date	Depth Interval (ft bgs tvd)	Parameter	Activity	Counting Error	Reporting Activity	Units	Flag	Detected ?
RF19-41C-DC-CPTF-01	02/25/2011	7,630 - 8,130	Ac-228	0.99	0.249	0.176	pCi/g		Yes
RF19-41C-DC-CPTF-02	02/25/2011	8,130 - 8,630	Ac-228	0.823	0.267	0.191	pCi/g		Yes
RF19-41C-DC-CPTF-01	02/25/2011	7,630 - 8,130	Bi-214	0.769	0.142	0.108	pCi/g		Yes
RF19-41C-DC-CPTF-02	02/25/2011	8,130 - 8,630	Bi-214	0.597	0.134	0.107	pCi/g		Yes
RF19-41C-DC-CPTF-01	02/25/2011	7,630 - 8,130	Gross Alpha	14.9	5.18	3.15	pCi/g		Yes
RF19-41C-DC-CPTF-02	02/25/2011	8,130 - 8,630	Gross Alpha	15	5.2	3.13	pCi/g		Yes
RF19-41C-DC-CPTF-01	02/25/2011	7,630 - 8,130	Gross Beta	16.1	3.68	3.24	pCi/g		Yes
RF19-41C-DC-CPTF-02	02/25/2011	8,130 - 8,630	Gross Beta	16.5	3.68	3.25	pCi/g		Yes
RF19-41C-DC-CPTF-01	02/25/2011	7,630 - 8,130	K-40	11.5	1.66	0.275	pCi/g		Yes
RF19-41C-DC-CPTF-02	02/25/2011	8,130 - 8,630	K-40	11.1	1.54	0.471	pCi/g		Yes
RF19-41C-DC-CPTF-01	02/25/2011	7,630 - 8,130	Pb-212	0.939	0.14	0.0797	pCi/g		Yes
RF19-41C-DC-CPTF-02	02/25/2011	8,130 - 8,630	Pb-212	0.839	0.124	0.0931	pCi/g		Yes
RF19-41C-DC-CPTF-01	02/25/2011	7,630 - 8,130	Pb-214	0.76	0.167	0.12	pCi/g		Yes
RF19-41C-DC-CPTF-02	02/25/2011	8,130 - 8,630	Pb-214	0.678	0.143	0.114	pCi/g		Yes
RF19-41C-DC-CPTF-01	02/25/2011	7,630 - 8,130	Ra-226	0.769	0.142	0.108	pCi/g		Yes
RF19-41C-DC-CPTF-02	02/25/2011	8,130 - 8,630	Ra-226	0.597	0.134	0.107	pCi/g		Yes
RF19-41C-DC-CPTF-01	02/25/2011	7,630 - 8,130	Ra-228	0.99	0.249	0.176	pCi/g		Yes
RF19-41C-DC-CPTF-02	02/25/2011	8,130 - 8,630	Ra-228	0.823	0.267	0.191	pCi/g		Yes
RF19-41C-DC-CPTF-01	02/25/2011	7,630 - 8,130	Th-230	0.769	0.136	0.108	pCi/g		Yes
RF19-41C-DC-CPTF-02	02/25/2011	8,130 - 8,630	Th-230	0.597	0.13	0.107	pCi/g		Yes
RF19-41C-DC-CPTF-01	02/25/2011	7,630 - 8,130	Tl-208	0.281	0.0757	0.045	pCi/g		Yes
RF19-41C-DC-CPTF-02	02/25/2011	8,130 - 8,630	Tl-208	0.235	0.0744	0.0549	pCi/g		Yes

**Table 1**  
**Noble Rulison Federal RF 17-41C Drill Cuttings Radiological Results**

Sample ID	Sample Date	Depth Interval (ft bgs tvd)	Parameter	Activity	Counting Error	Reporting Activity	Units	Flag	Detected ?
RF19-41C-DC-CPTF-01	02/25/2011	7,630 - 8,130	Ag-110m	-0.0134	0.0266	0.0429	pCi/g	U	No
RF19-41C-DC-CPTF-02	02/25/2011	8,130 - 8,630	Ag-110m	0.0444	0.0329	0.0615	pCi/g	U	No
RF19-41C-DC-CPTF-01	02/25/2011	7,630 - 8,130	Am-241	-0.087	0.147	0.216	pCi/g	U	No
RF19-41C-DC-CPTF-02	02/25/2011	8,130 - 8,630	Am-241	0.0592	0.0951	0.145	pCi/g	U	No
RF19-41C-DC-CPTF-01	02/25/2011	7,630 - 8,130	Ba-133	0.0162	0.044	0.0679	pCi/g	U	No
RF19-41C-DC-CPTF-02	02/25/2011	8,130 - 8,630	Ba-133	-0.0383	0.0467	0.0601	pCi/g	U	No
RF19-41C-DC-CPTF-01	02/25/2011	7,630 - 8,130	Ba-140	-0.0123	0.21	0.365	pCi/g	U	No
RF19-41C-DC-CPTF-02	02/25/2011	8,130 - 8,630	Ba-140	-0.0933	0.203	0.323	pCi/g	U	No
RF19-41C-DC-CPTF-01	02/25/2011	7,630 - 8,130	Be-7	0.102	0.269	0.465	pCi/g	U	No
RF19-41C-DC-CPTF-02	02/25/2011	8,130 - 8,630	Be-7	0.0521	0.289	0.498	pCi/g	U	No
RF19-41C-DC-CPTF-02	02/25/2011	8,130 - 8,630	Bi-212	0.894	0.811	1.09	pCi/g	U	No
RF19-41C-DC-CPTF-01	02/25/2011	7,630 - 8,130	Ce-139	-0.0133	0.0238	0.0409	pCi/g	U	No
RF19-41C-DC-CPTF-02	02/25/2011	8,130 - 8,630	Ce-139	0.00928	0.0265	0.0458	pCi/g	U	No
RF19-41C-DC-CPTF-01	02/25/2011	7,630 - 8,130	Ce-141	0.0366	0.0502	0.0928	pCi/g	U	No
RF19-41C-DC-CPTF-02	02/25/2011	8,130 - 8,630	Ce-141	-0.0603	0.0525	0.0837	pCi/g	U	No
RF19-41C-DC-CPTF-01	02/25/2011	7,630 - 8,130	Ce-144	-0.0583	0.158	0.279	pCi/g	U	No
RF19-41C-DC-CPTF-02	02/25/2011	8,130 - 8,630	Ce-144	-0.0224	0.173	0.294	pCi/g	U	No
RF19-41C-DC-CPTF-01	02/25/2011	7,630 - 8,130	Co-56	-0.00623	0.0298	0.0487	pCi/g	U	No
RF19-41C-DC-CPTF-02	02/25/2011	8,130 - 8,630	Co-56	-0.00271	0.0361	0.0587	pCi/g	U	No
RF19-41C-DC-CPTF-01	02/25/2011	7,630 - 8,130	Co-57	-0.00809	0.0221	0.0363	pCi/g	U	No
RF19-41C-DC-CPTF-02	02/25/2011	8,130 - 8,630	Co-57	-0.0161	0.0233	0.0356	pCi/g	U	No
RF19-41C-DC-CPTF-01	02/25/2011	7,630 - 8,130	Co-58	-0.00664	0.0305	0.0501	pCi/g	U	No

**Table 1**  
**Noble Rulison Federal RF 17-41C Drill Cuttings Radiological Results**

Sample ID	Sample Date	Depth Interval (ft bgs tvd)	Parameter	Activity	Counting Error	Reporting Activity	Units	Flag	Detected ?
RF19-41C-DC-CPTF-02	02/25/2011	8,130 - 8,630	Co-58	-0.0315	0.0364	0.0533	pCi/g	U	No
RF19-41C-DC-CPTF-01	02/25/2011	7,630 - 8,130	Co-60	0.00244	0.0351	0.0601	pCi/g	U	No
RF19-41C-DC-CPTF-02	02/25/2011	8,130 - 8,630	Co-60	0.0198	0.0354	0.0639	pCi/g	U	No
RF19-41C-DC-CPTF-01	02/25/2011	7,630 - 8,130	Cr-51	-0.231	0.319	0.513	pCi/g	U	No
RF19-41C-DC-CPTF-02	02/25/2011	8,130 - 8,630	Cr-51	0.113	0.343	0.578	pCi/g	U	No
RF19-41C-DC-CPTF-01	02/25/2011	7,630 - 8,130	Cs-134	0.0579	0.0406	0.0785	pCi/g	U	No
RF19-41C-DC-CPTF-02	02/25/2011	8,130 - 8,630	Cs-134	0.0544	0.052	0.0805	pCi/g	U	No
RF19-41C-DC-CPTF-01	02/25/2011	7,630 - 8,130	Cs-136	0.15	0.0908	0.179	pCi/g	U	No
RF19-41C-DC-CPTF-02	02/25/2011	8,130 - 8,630	Cs-136	-0.0161	0.0977	0.163	pCi/g	U	No
RF19-41C-DC-CPTF-01	02/25/2011	7,630 - 8,130	Cs-137	0.0162	0.0294	0.0536	pCi/g	U	No
RF19-41C-DC-CPTF-02	02/25/2011	8,130 - 8,630	Cs-137	-0.0286	0.0379	0.0586	pCi/g	U	No
RF19-41C-DC-CPTF-01	02/25/2011	7,630 - 8,130	Eu-152	0.00401	0.0909	0.144	pCi/g	U	No
RF19-41C-DC-CPTF-02	02/25/2011	8,130 - 8,630	Eu-152	-0.0422	0.1	0.145	pCi/g	U	No
RF19-41C-DC-CPTF-01	02/25/2011	7,630 - 8,130	Eu-154	0.0473	0.0922	0.169	pCi/g	U	No
RF19-41C-DC-CPTF-02	02/25/2011	8,130 - 8,630	Eu-154	-0.0839	0.107	0.156	pCi/g	U	No
RF19-41C-DC-CPTF-01	02/25/2011	7,630 - 8,130	Eu-155	0.0747	0.0917	0.162	pCi/g	U	No
RF19-41C-DC-CPTF-02	02/25/2011	8,130 - 8,630	Eu-155	0.0303	0.0933	0.153	pCi/g	U	No
RF19-41C-DC-CPTF-01	02/25/2011	7,630 - 8,130	Fe-59	0.00255	0.0786	0.136	pCi/g	U	No
RF19-41C-DC-CPTF-02	02/25/2011	8,130 - 8,630	Fe-59	0.0194	0.0854	0.148	pCi/g	U	No
RF19-41C-DC-CPTF-01	02/25/2011	7,630 - 8,130	Hg-203	-0.0298	0.0339	0.0549	pCi/g	U	No
RF19-41C-DC-CPTF-02	02/25/2011	8,130 - 8,630	Hg-203	-0.0171	0.0359	0.0576	pCi/g	U	No
RF19-41C-DC-CPTF-01	02/25/2011	7,630 - 8,130	Ir-192	0.00852	0.0317	0.0552	pCi/g	U	No

**Table 1**  
**Noble Rulison Federal RF 17-41C Drill Cuttings Radiological Results**

Sample ID	Sample Date	Depth Interval (ft bgs tvd)	Parameter	Activity	Counting Error	Reporting Activity	Units	Flag	Detected ?
RF19-41C-DC-CPTF-02	02/25/2011	8,130 - 8,630	Ir-192	0.00481	0.0328	0.0546	pCi/g	U	No
RF19-41C-DC-CPTF-02	02/25/2011	8,130 - 8,630	Kr-85	3.14	7.3	11.3	pCi/g	U	No
RF19-41C-DC-CPTF-01	02/25/2011	7,630 - 8,130	Mn-54	-0.00504	0.0357	0.0593	pCi/g	U	No
RF19-41C-DC-CPTF-02	02/25/2011	8,130 - 8,630	Mn-54	-0.0323	0.0363	0.0534	pCi/g	U	No
RF19-41C-DC-CPTF-01	02/25/2011	7,630 - 8,130	Na-22	0.0172	0.0326	0.0599	pCi/g	U	No
RF19-41C-DC-CPTF-02	02/25/2011	8,130 - 8,630	Na-22	-0.0274	0.037	0.0547	pCi/g	U	No
RF19-41C-DC-CPTF-01	02/25/2011	7,630 - 8,130	Nb-94	0.0107	0.0311	0.0549	pCi/g	U	No
RF19-41C-DC-CPTF-02	02/25/2011	8,130 - 8,630	Nb-94	0.00789	0.0329	0.056	pCi/g	U	No
RF19-41C-DC-CPTF-01	02/25/2011	7,630 - 8,130	Nb-95	0.0184	0.0368	0.0656	pCi/g	U	No
RF19-41C-DC-CPTF-02	02/25/2011	8,130 - 8,630	Nb-95	0.0126	0.0389	0.0664	pCi/g	U	No
RF19-41C-DC-CPTF-01	02/25/2011	7,630 - 8,130	Nd-147	-0.281	0.406	0.655	pCi/g	U	No
RF19-41C-DC-CPTF-02	02/25/2011	8,130 - 8,630	Nd-147	-0.188	0.442	0.717	pCi/g	U	No
RF19-41C-DC-CPTF-01	02/25/2011	7,630 - 8,130	Np-239	-0.35	0.347	0.546	pCi/g	U	No
RF19-41C-DC-CPTF-02	02/25/2011	8,130 - 8,630	Np-239	0.22	0.379	0.626	pCi/g	U	No
RF19-41C-DC-CPTF-01	02/25/2011	7,630 - 8,130	Pb-210	0.113	3.78	6.54	pCi/g	U	No
RF19-41C-DC-CPTF-02	02/25/2011	8,130 - 8,630	Pb-210	-1.07	1.6	2.34	pCi/g	U	No
RF19-41C-DC-CPTF-01	02/25/2011	7,630 - 8,130	Pm-144	-0.00523	0.0293	0.0491	pCi/g	U	No
RF19-41C-DC-CPTF-02	02/25/2011	8,130 - 8,630	Pm-144	0.0225	0.0343	0.0604	pCi/g	U	No
RF19-41C-DC-CPTF-01	02/25/2011	7,630 - 8,130	Pm-146	0.00665	0.0399	0.0676	pCi/g	U	No
RF19-41C-DC-CPTF-02	02/25/2011	8,130 - 8,630	Pm-146	0.00458	0.042	0.0684	pCi/g	U	No
RF19-41C-DC-CPTF-01	02/25/2011	7,630 - 8,130	Ru-106	0.274	0.506	0.494	pCi/g	U	No
RF19-41C-DC-CPTF-02	02/25/2011	8,130 - 8,630	Ru-106	0.142	0.3	0.524	pCi/g	U	No

**Table 1**  
**Noble Rulison Federal RF 17-41C Drill Cuttings Radiological Results**

Sample ID	Sample Date	Depth Interval (ft bgs tvd)	Parameter	Activity	Counting Error	Reporting Activity	Units	Flag	Detected ?
RF19-41C-DC-CPTF-01	02/25/2011	7,630 - 8,130	Sb-124	-0.0195	0.0595	0.0889	pCi/g	U	No
RF19-41C-DC-CPTF-02	02/25/2011	8,130 - 8,630	Sb-124	0.0573	0.0814	0.151	pCi/g	U	No
RF19-41C-DC-CPTF-01	02/25/2011	7,630 - 8,130	Sb-125	0.0394	0.0813	0.142	pCi/g	U	No
RF19-41C-DC-CPTF-02	02/25/2011	8,130 - 8,630	Sb-125	0.0463	0.0783	0.134	pCi/g	U	No
RF19-41C-DC-CPTF-01	02/25/2011	7,630 - 8,130	Sn-113	-0.000303	0.0384	0.0648	pCi/g	U	No
RF19-41C-DC-CPTF-02	02/25/2011	8,130 - 8,630	Sn-113	0.0177	0.0428	0.072	pCi/g	U	No
RF19-41C-DC-CPTF-01	02/25/2011	7,630 - 8,130	Sr-90	0.627	0.534	0.871	pCi/g	U	No
RF19-41C-DC-CPTF-02	02/25/2011	8,130 - 8,630	Sr-90	0.487	0.445	0.731	pCi/g	U	No
RF19-41C-DC-CPTF-01	02/25/2011	7,630 - 8,130	Tc-99	-0.307	1.8	3.16	pCi/g	U	No
RF19-41C-DC-CPTF-02	02/25/2011	8,130 - 8,630	Tc-99	2.31	1.63	2.68	pCi/g	U	No
RF19-41C-DC-CPTF-01	02/25/2011	7,630 - 8,130	Th-234	0.745	1.64	1.92	pCi/g	U	No
RF19-41C-DC-CPTF-02	02/25/2011	8,130 - 8,630	Th-234	-0.526	0.968	1.42	pCi/g	U	No
RF19-41C-DC-CPTF-01	02/25/2011	7,630 - 8,130	U-235	-0.0428	0.182	0.318	pCi/g	U	No
RF19-41C-DC-CPTF-02	02/25/2011	8,130 - 8,630	U-235	0.0504	0.18	0.298	pCi/g	U	No
RF19-41C-DC-CPTF-01	02/25/2011	7,630 - 8,130	U-238	0.745	1.64	1.92	pCi/g	U	No
RF19-41C-DC-CPTF-02	02/25/2011	8,130 - 8,630	U-238	-0.526	0.968	1.42	pCi/g	U	No
RF19-41C-DC-CPTF-01	02/25/2011	7,630 - 8,130	Y-88	-0.00996	0.0285	0.0418	pCi/g	U	No
RF19-41C-DC-CPTF-02	02/25/2011	8,130 - 8,630	Y-88	-0.00527	0.0363	0.0596	pCi/g	U	No
RF19-41C-DC-CPTF-01	02/25/2011	7,630 - 8,130	Zn-65	-0.0627	0.0928	0.121	pCi/g	U	No
RF19-41C-DC-CPTF-02	02/25/2011	8,130 - 8,630	Zn-65	-0.0118	0.102	0.145	pCi/g	U	No
RF19-41C-DC-CPTF-01	02/25/2011	7,630 - 8,130	Zr-95	0.039	0.0649	0.117	pCi/g	U	No
RF19-41C-DC-CPTF-02	02/25/2011	8,130 - 8,630	Zr-95	0.031	0.0691	0.119	pCi/g	U	No

**Table 1**  
**Noble Rulison Federal RF 17-41C Drill Cuttings Radiological Results**

Sample ID	Sample Date	Depth Interval (ft bgs tvd)	Parameter	Activity	Counting Error	Reporting Activity	Units	Flag	Detected ?
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**Notes:**

ft bgs tvd = feet below ground surface true vertical depth

U = analyte was analyzed for but was not detected above the reporting activity (i.e., minimum detectable activity)

pCi/g = picoCuries per gram



## NOBLE ENERGY, INC. – RULISON AREA DATA REVIEW SUMMARY

Data Package Numbers: GEL 273058  
 Sample-specific Parameter Review? **Yes**  
 Data Reviewer: Liz Best  
 Peer Reviewer: Sheri O'Connor

Sampling Event: February 25<sup>th</sup>, 2011  
 Laboratory Performance Parameters? **No**  
 Date Completed: 03/22/2011  
 Date Completed: 03/23/2011

The table below summarizes the results presented in this data package.

Field ID	Sample Type	Lab ID	Matrix	Analyses					
				Gross Alpha/ Beta	Gamma Spec	Technetium-99	Strontium-90	Chlorine-36	Total Uranium
RF19-41C-DC-CPTF-01	SA	273058001	S	X <sup>m</sup>	X	X <sup>m</sup>	X <sup>m</sup>	---	---
RF19-41C-DC-CPTF-02	SA	273058002	S	X	X	X	X	---	---

Matrix: S = Soil

QC Type: SA = Sample

--- = Not analyzed for this parameter.

X<sup>m</sup>= Matrix Spike (MS) and/ or Matrix Spike Duplicate (MSD)

The data review was conducted in accordance with the Rulison Sampling and Analysis Plan for Operational and Environmental Radiological Monitoring within a Three-Mile Radius of Project Rulison, Revision 3, July 31, 2010.

### General Overall Assessment:

       Data are usable without qualification.

  X   Data are usable with qualification; some data were qualified as unusable (noted below).

**Case Narrative Summary:** Except as noted below, any of the issues noted in the laboratory case narrative potentially affecting data quality are addressed in the appropriate sections in the following table.

Review Parameter	Criteria Met?	Comments
<i>Sample-specific Parameters</i>	Complete with "Yes", "No", or "Not Applicable (N/A)".	For each "No" response, list what was out, associated acceptance limits, all qualified data, and bias direction or reference associated table with pertinent details.
Chain of Custody (COC) & Sample Receipt	Yes	The samples were received intact. The cooler temperature was 5.0 degrees Celsius (°C) upon arrival at the laboratory meeting the criterion of ≤ 6 °C.
Holding Times	Yes	All holding times were met.
Method Blanks	Yes	No target analytes were reported as detected within the associated method blanks.

Review Parameter	Criteria Met?	Comments
Matrix Quality Control <ul style="list-style-type: none"> <li><b>Matrix Spike/ Matrix Spike Duplicate (MS/MSD)</b> RF19-41C-DC-CPTF-01 (Gross Alpha/ Beta)</li> <li><b>Matrix Spike (MS)</b> RF19-41C-DC-CPTF-01 (Strontium-90, Technetium-99)</li> <li><b>Laboratory Duplicate (LD)</b> RF19-41C-DC-CPTF-01 (Gamma Spec, Strontium-90, Technetium-99)</li> </ul>	Yes	<p>The recoveries for the MS/MSD were within the Quality Assurance Project Plan (QAPP) acceptance limits of 70-130% for soils.</p> <p>The agreement between parent sample results and the laboratory duplicate (LD) sample results and/or the matrix spike results and the matrix spike duplicate results was evaluated. The duplicate error ratios (DERs) met the QC criterion. Data qualification was not necessary.</p>
Method Quality Control <ul style="list-style-type: none"> <li>Implied Detection Limits</li> <li>Sample Specific Chemical Recovery (Chemical Yield)</li> <li>Laboratory Control Sample</li> </ul>	Yes	<p><b>Implied Detection Limits</b></p> <p>No values for radionuclides were reported as detected with associated uncertainties greater than the reported result.</p> <p><b>Sample Specific Chemical Recovery</b></p> <p>The sample specific recoveries were within the QAPP acceptance limits of 50-120% for the applicable methods. Data qualification was not necessary.</p> <p><b>Laboratory Control Sample (LCS)</b></p> <p>The LCS recoveries were within the QAPP acceptance limits of 70-130% for soils. Data qualification was not necessary.</p>
Field Quality Control <ul style="list-style-type: none"> <li>Field Duplicate N/A</li> <li>Rinsate Blank N/A</li> </ul>	N/A	A field duplicate and rinsate blank were not collected in association with this sampling event.
Maximum Detected Concentrations (MDCs) Met?	Yes	
Total Uncertainty	Yes	The total uncertainty for gross alpha and gross beta met the QAPP acceptance criterion of $\leq 50\%$ . Therefore, data qualification on the basis of total uncertainty was not necessary. As the technetium-99 and strontium-90 parent sample results were reported as not detected, the total uncertainty was not determined for these parameters.
All Data Usable?	No	<p><b>Unusable Data</b></p> <p>With the exceptions noted below, all data met criteria for the field samples and were usable as qualified.</p> <p><b>Gamma Spectroscopy</b></p> <p>Identification of the following isotopes was rejected by the laboratory due to low abundance, high counting uncertainty, high peak-width, or no valid peak and the identification was also rejected during data validation:</p> <p><b>RF19-41C-DC-CPTF-01</b></p> <ul style="list-style-type: none"> <li>Bismuth-212</li> <li>Krypton-85</li> </ul>
Package Completeness	Yes	Analytical data package was complete.
Other Parameters	Yes	

N/A = Not applicable

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## Certificate of Analysis

Report Date: March 21, 2011

Company : URS Corporation  
Address : 8181 E. Tufts Avenue  
  
Denver, Colorado 80237  
Contact: Ms. Sheri O'Connor  
Project: Noble 2009 - Vendor ID 1168722

Client Sample ID: RF19-41C-DC-CPTF-01  
Sample ID: 273058001  
Matrix: Surface Soil  
Collect Date: 25-FEB-11 12:00  
Receive Date: 01-MAR-11  
Collector: Client

Project: URSC01101  
Client ID: URSC011

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Solid + Kr-85 "Dry Weight Corrected"												
Actinium-228		0.990	+/-0.249	0.176		pCi/g		MXR1	03/10/11	0836	1079391	1
Americium-241	U	-0.087	+/-0.147	0.216		pCi/g						
Antimony-124	U	-0.0195	+/-0.0595	0.0889		pCi/g						
Antimony-125	U	0.0394	+/-0.0813	0.142		pCi/g						
Barium-133	U	0.0162	+/-0.044	0.0679		pCi/g						
Barium-140	U	-0.0123	+/-0.210	0.365		pCi/g						
Beryllium-7	U	0.102	+/-0.269	0.465		pCi/g						
Bismuth-212 R	UL	0.00	+/-0.568	0.964		pCi/g						
Bismuth-214		0.769	+/-0.142	0.108		pCi/g						
Cerium-139	U	-0.0133	+/-0.0238	0.0409		pCi/g						
Cerium-141	U	0.0366	+/-0.0502	0.0928		pCi/g						
Cerium-144	U	-0.0583	+/-0.158	0.279		pCi/g						
Cesium-134	U	0.0579	+/-0.0406	0.0785		pCi/g						
Cesium-136	U	0.150	+/-0.0908	0.179		pCi/g						
Cesium-137	U	0.0162	+/-0.0294	0.0536	0.100	pCi/g						
Chromium-51	U	-0.231	+/-0.319	0.513		pCi/g						
Cobalt-56	U	-0.00623	+/-0.0298	0.0487		pCi/g						
Cobalt-57	U	-0.00809	+/-0.0221	0.0363		pCi/g						
Cobalt-58	U	-0.00664	+/-0.0305	0.0501		pCi/g						
Cobalt-60	U	0.00244	+/-0.0351	0.0601		pCi/g						
Europium-152	U	0.00401	+/-0.0909	0.144		pCi/g						
Europium-154	U	0.0473	+/-0.0922	0.169		pCi/g						
Europium-155	U	0.0747	+/-0.0917	0.162		pCi/g						
Iridium-192	U	0.00852	+/-0.0317	0.0552		pCi/g						
Iron-59	U	0.00255	+/-0.0786	0.136		pCi/g						
Krypton-85 R	UL	0.00	+/-7.38	13.3		pCi/g						
Lead-210	U	0.113	+/-3.78	6.54		pCi/g						
Lead-212		0.939	+/-0.140	0.0797		pCi/g						
Lead-214		0.760	+/-0.167	0.120		pCi/g						
Manganese-54	U	-0.00504	+/-0.0357	0.0593		pCi/g						
Mercury-203	U	-0.0298	+/-0.0339	0.0549		pCi/g						
Neodymium-147	U	-0.281	+/-0.406	0.655		pCi/g						
Neptunium-239	U	-0.35	+/-0.347	0.546		pCi/g						
Niobium-94	U	0.0107	+/-0.0311	0.0549		pCi/g						
Niobium-95	U	0.0184	+/-0.0368	0.0656		pCi/g						
Potassium-40		11.5	+/-1.66	0.275		pCi/g						
Promethium-144	U	-0.00523	+/-0.0293	0.0491		pCi/g						
Promethium-146	U	0.00665	+/-0.0399	0.0676		pCi/g						

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Denver, Colorado 80237  
Contact: Ms. Sheri O'Connor  
Project: Noble 2009 - Vendor ID 1168722

Client Sample ID: RF19-41C-DC-CPTF-01  
Sample ID: 273058001

Project: URSC01101  
Client ID: URSC011

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Solid + Kr-85 "Dry Weight Corrected"												
Radium-226		0.769	+/-0.142	0.108		pCi/g						
Radium-228		0.990	+/-0.249	0.176		pCi/g						
Ruthenium-106	U	0.274	+/-0.506	0.494		pCi/g						
Silver-110m	U	-0.0134	+/-0.0266	0.0429		pCi/g						
Sodium-22	U	0.0172	+/-0.0326	0.0599		pCi/g						
Thallium-208		0.281	+/-0.0757	0.045		pCi/g						
Thorium-230		0.769	+/-0.136	0.108		pCi/g						
Thorium-234	U	0.745	+/-1.64	1.92		pCi/g						
Tin-113	U	-0.000303	+/-0.0384	0.0648		pCi/g						
Uranium-235	U	-0.0428	+/-0.182	0.318		pCi/g						
Uranium-238	U	0.745	+/-1.64	1.92		pCi/g						
Yttrium-88	U	-0.00996	+/-0.0285	0.0418		pCi/g						
Zinc-65	U	-0.0627	+/-0.0928	0.121		pCi/g						
Zirconium-95	U	0.039	+/-0.0649	0.117		pCi/g						
Rad Gas Flow Proportional Counting												
GFPC, Gross A/B, solid "Dry Weight Corrected"												
Alpha		14.9	+/-5.18	3.15	4.00	pCi/g		VXC2	03/13/11	1829	1080947	2
Beta		16.1	+/-3.68	3.24	10.0	pCi/g						
GFPC, Sr90, solid "Dry Weight Corrected"												
Strontium-90	U	0.627	+/-0.534	0.871	2.00	pCi/g		JXR1	03/10/11	1349	1079207	3
Rad Liquid Scintillation Analysis												
Liquid Scint Tc99, Solid "As Received"												
Technetium-99	U	-0.307	+/-1.80	3.16	5.00	pCi/g		TYJ1	03/20/11	1003	1083217	4

### The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	DRS1	03/01/11	1215	1079042

### The following Analytical Methods were performed

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 900.0/SW846 9310/SM 7110B Modified	
3	EPA 905.0 Modified	
4	DOE EML HASL-300, Tc-02-RC Modified	

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Client Sample ID: RF19-41C-DC-CPTF-01  
Sample ID: 273058001

Project: URSC01101  
Client ID: URSC011

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Surrogate/Tracer recovery	Test				Result	Nominal	Recovery%					Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"						98.8					(25%-125%)
Technetium-99m Tracer	Liquid Scint Tc99, Solid "As Received"						98.2					(15%-125%)

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Contact: Ms. Sheri O'Connor  
Project: Noble 2009 - Vendor ID 1168722

Client Sample ID: RF19-41C-DC-CPTF-02

Project: URSC01101

Sample ID: 273058002

Client ID: URSC011

Matrix: Surface Soil

Collect Date: 25-FEB-11 12:00

Receive Date: 01-MAR-11

Collector: Client

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	AnalysDate	Time	Batch	Method
Rad Gamma Spec Analysis											
Gammaspec, Gamma, Solid + Kr-85 "Dry Weight Corrected"											
Actinium-228		0.823	+/-0.267	0.191		pCi/g		MXR1 03/10/11	0837	1079391	1
Americium-241	U	0.0592	+/-0.0951	0.145		pCi/g					
Antimony-124	U	0.0573	+/-0.0814	0.151		pCi/g					
Antimony-125	U	0.0463	+/-0.0783	0.134		pCi/g					
Barium-133	U	-0.0383	+/-0.0467	0.0601		pCi/g					
Barium-140	U	-0.0933	+/-0.203	0.323		pCi/g					
Beryllium-7	U	0.0521	+/-0.289	0.498		pCi/g					
Bismuth-212	U	0.894	+/-0.811	1.09		pCi/g					
Bismuth-214		0.597	+/-0.134	0.107		pCi/g					
Cerium-139	U	0.00928	+/-0.0265	0.0458		pCi/g					
Cerium-141	U	-0.0603	+/-0.0525	0.0837		pCi/g					
Cerium-144	U	-0.0224	+/-0.173	0.294		pCi/g					
Cesium-134	U	0.0544	+/-0.052	0.0805		pCi/g					
Cesium-136	U	-0.0161	+/-0.0977	0.163		pCi/g					
Cesium-137	U	-0.0286	+/-0.0379	0.0586	0.100	pCi/g					
Chromium-51	U	0.113	+/-0.343	0.578		pCi/g					
Cobalt-56	U	-0.00271	+/-0.0361	0.0587		pCi/g					
Cobalt-57	U	-0.0161	+/-0.0233	0.0356		pCi/g					
Cobalt-58	U	-0.0315	+/-0.0364	0.0533		pCi/g					
Cobalt-60	U	0.0198	+/-0.0354	0.0639		pCi/g					
Europium-152	U	-0.0422	+/-0.100	0.145		pCi/g					
Europium-154	U	-0.0839	+/-0.107	0.156		pCi/g					
Europium-155	U	0.0303	+/-0.0933	0.153		pCi/g					
Iridium-192	U	0.00481	+/-0.0328	0.0546		pCi/g					
Iron-59	U	0.0194	+/-0.0854	0.148		pCi/g					
Krypton-85	U	3.14	+/-7.30	11.3		pCi/g					
Lead-210	U	-1.07	+/-1.60	2.34		pCi/g					
Lead-212		0.839	+/-0.124	0.0931		pCi/g					
Lead-214		0.678	+/-0.143	0.114		pCi/g					
Mangancsc-54	U	-0.0323	+/-0.0363	0.0534		pCi/g					
Mercury-203	U	-0.0171	+/-0.0359	0.0576		pCi/g					
Neodymium-147	U	-0.188	+/-0.442	0.717		pCi/g					
Neptunium-239	U	0.220	+/-0.379	0.626		pCi/g					
Niobium-94	U	0.00789	+/-0.0329	0.056		pCi/g					
Niobium-95	U	0.0126	+/-0.0389	0.0664		pCi/g					
Potassium-40		11.1	+/-1.54	0.471		pCi/g					
Promethium-144	U	0.0225	+/-0.0343	0.0604		pCi/g					
Promethium-146	U	0.00458	+/-0.042	0.0684		pCi/g					

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Denver, Colorado 80237  
Contact: Ms. Sheri O'Connor  
Project: Noble 2009 - Vendor ID 1168722

Client Sample ID: RF19-41C-DC-CPTF-02  
Sample ID: 273058002

Project: URSC01101  
Client ID: URSC011

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	AnalysDate	Time	Batch	Method
Rad Gamma Spec Analysis											
Gammaspec, Gamma, Solid + Kr-85 "Dry Weight Corrected"											
Radium-226		0.597	+/-0.134	0.107		pCi/g					
Radium-228		0.823	+/-0.267	0.191		pCi/g					
Ruthenium-106	U	0.142	+/-0.300	0.524		pCi/g					
Silver-110m	U	0.0444	+/-0.0329	0.0615		pCi/g					
Sodium-22	U	-0.0274	+/-0.037	0.0547		pCi/g					
Thallium-208		0.235	+/-0.0744	0.0549		pCi/g					
Thorium-230		0.597	+/-0.130	0.107		pCi/g					
Thorium-234	U	-0.526	+/-0.968	1.42		pCi/g					
Tin-113	U	0.0177	+/-0.0428	0.072		pCi/g					
Uranium-235	U	0.0504	+/-0.180	0.298		pCi/g					
Uranium-238	U	-0.526	+/-0.968	1.42		pCi/g					
Yttrium-88	U	-0.00527	+/-0.0363	0.0596		pCi/g					
Zinc-65	U	-0.0118	+/-0.102	0.145		pCi/g					
Zirconium-95	U	0.031	+/-0.0691	0.119		pCi/g					
Rad Gas Flow Proportional Counting											
GFPC, Gross A/B, solid "Dry Weight Corrected"											
Alpha		15.0	+/-5.20	3.13	4.00	pCi/g	VXC2	03/13/11	1829	1080947	2
Beta		16.5	+/-3.68	3.25	10.0	pCi/g					
GFPC, Sr90, solid "Dry Weight Corrected"											
Strontium-90	U	0.487	+/-0.445	0.731	2.00	pCi/g	JXR1	03/10/11	1349	1079207	3
Rad Liquid Scintillation Analysis											
Liquid Scint Tc99, Solid "As Received"											
Technetium-99	U	2.31	+/-1.63	2.68	5.00	pCi/g	TYJ1	03/20/11	1020	1083217	4

### The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	DRS1	03/01/11	1215	1079042

### The following Analytical Methods were performed

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 900.0/SW846 9310/SM 7110B Modified	
3	EPA 905.0 Modified	
4	DOE EML HASL-300, Tc-02-RC Modified	

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Client Sample ID: RF19-41C-DC-CPTF-02  
Sample ID: 273058002

Project: URSC01101  
Client ID: URSC011

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Surrogate/Tracer recovery	Test				Result	Nominal	Recovery%				Acceptable Limits	
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"						112				(25%-125%)	
Technetium-99m Tracer	Liquid Scint Tc99, Solid "As Received"						98.8				(15%-125%)	

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