



Bluewater Mill
Post Office Box 538
Grants, New Mexico 87020
Telephone 505 876 2211
Facsimile 505 876 2772

October 18, 1996

Mr. Joseph Holonich
Uranium Recovery Branch
Division of Waste Management (Mail Stop T7J9)
United States Nuclear Regulatory Commission
11545 Rockville Pike
Rockville, Maryland 20852

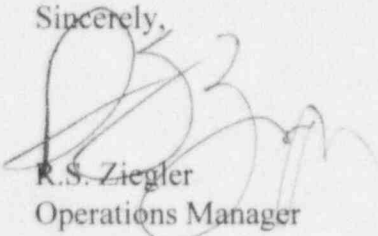
**RE: NCR's October 3, 1996 Inspection Exit Meeting Comments
Bluewater Uranium Mill Site, License No. SUA-1470, Docket No. 40-8902**

Dear Mr. Holonich:

Enclosed please find five copies of responses to the U.S. Nuclear Regulatory Commission's October 3, 1996 Inspection exit meeting comments for Atlantic Richfield Company's Bluewater Uranium Mill Site. The responses are prepared as Addendum 2 to the Completion Report.

Should you have any questions, please do not hesitate to contact me or Mr. Natver Patel of AVM Environmental Services, Inc. At (505) 287-4593.

Sincerely,



R.S. Ziegler
Operations Manager

Enclosure

CC: J. Virgona, US DOE
C. Cains, USNRC, Region IV
R. Ohrbom, NMED
E. Abelquist, ORISE
N. Brody, ARCO
N. Patel, AVM

9610230278 961018
PDR ADOCK 04008902
C PDR

230114

11
N 45

Responses to the NRC's October 3, 1996
Inspection Site Exit Meeting Comments

Comment: 1

Figure 6-6 shows five grid locations (O7-8-8, P5-18-8, P8-18-26, P10-8-29, and P10-13-11) with soil Ra-226 concentrations above the 6.9 pCi/gm cleanup criterion. ARCO's September 23, 1996 Response 9 to the NRC's September 20, 1996 Bluewater Mill Completion Report comments (CR Addendum 1), clarifies that the soil was removed to the bedrock, and since these locations rocked out, no additional remediation was practical. ARCO should provide additional discussion on any long term health hazard that could result from residual Ra-226 because it is above the cleanup criterion.

Response: 1

As discussed in Response No. 9 of the CR Addendum 1, these locations rocked out during remediation with small amount of residual soils which was impractical for equipment to remove. Residual soil, with average depth of generally less than two inches was sampled and analyzed. Routine sampling procedure for collection of full six inch depth soil plugs could not be followed at these locations. In this case, sufficient soil for composite sample was gathered from area larger than the routine sampling point. The Ra-226 concentration in soil at these grid locations range from 7.1 to 10.2 pCi/gm, slightly above the cleanup criterion of 6.9 pCi/gm. However, these Ra-226 concentrations are only for the top two inches of residual soil, not average for top six inch layer of the grids. The cleanup criterion applies to the average for the entire top six inch layer.

The Ra-226 concentration in the lava (malpais) bedrock underlying these areas is 1.4 pCi/gm, which was determined from malpais rock sampling as described in the January 1994 Exemption request. Therefore, the average Ra-226 concentration for the top six inch layer (two inches of soils and four inches of malpais rock) for these grids would be less than the cleanup criterion of 6.9 pCi/gm. The top six inch layer average Ra-226 concentration for the grid with the approximate two inch soil highest Ra-226 content (10.2 pCi/gm) would be 4.3 pCi/gm. Therefore, these five locations meet the cleanup criterion, and do not pose an unacceptable health hazards to human health or the environment.

Comment: 2

Revise Table 6-2 of the Completion Report for Ra-226 concentration of Sample No. 93-2500S in order to be consistent with the Response No. 16 of the CR Addendum 1.

Response: 2

Table 6-2 has been revised, and page 84 containing the revised table is attached with this response.

Comment: 3

Correct typographic error of date (should be May 10, 1996 instead of May 24, 1996) on line 2, page 19 of ARCO's CR Addendum 1.

Response: 3

The typographic error has been corrected and a revised page is attached with this response.

Comment: 4

Revise reference numbers to appropriate figures on page 87 of the Completion Report.

Response: 4

Page 87 of the Completion Report have been revised for reference to appropriate figure numbers (Figure 6-5 and 6-6) and is attached with this response.

Comment: 5

Provide results of QA/QC samples for additional Ra-226 soil samples (August 1996) results included in Attachment 2 of CR Addendum 1.

Response: 5

Table AD2-1, containing QA/QC sample results, is attached to this response for inclusion into Attachment 2 of CR Addendum 1.

Comment: 6

Please provide a map showing NRC's October 3, 1996 sampling locations at the Bluewater Mill Site.

Response: 6

Map AD2-1, showing the sampling locations is attached with this response.

Table 6.2
Ra-226 and Th-230 Results for QA Samples from the Evaporation Pond Area

Sample Number	Th-230, pCi/gm	Ra-226, pCi/gm	Sample Number	Th-230, pCi/gm	Ra-226, pCi/gm
93-1620 S	2.1	1.5	93-3840 S	3.1	1.7
93-1640 S	1.2	1.6	93-3860 S	2.7	1.6
93-1660 S	9.2	2.1	93-3920 S	10.4	1.2
93-1680 S	1.9	2.1	93-3940 S	1.5	0.8
93-1700 S	1.8	1.8	93-3980 S	7.5	1.0
93-1720 S	1.7	0.7	93-4100 S	2.9	0.6
93-1740 S	3.8	1.7	93-4120 S	0.7	0.6
93-1760 S	0.0	1.0	93-4260 S	2.9	0.8
93-1780 S	2.8	1.2	93-4280 S	19.3	3.8
93-1800 S	11.6	1.2	93-4360 S	2.6	0.6
93-1820 S	12.6	1.4	93-4380 S	3.5	0.8
93-1860 S	3.0	1.9	93-4560 S	21.4	0.9
93-1900 S	3.2	1.8	93-4620 S	4.1	0.8
93-1920 S	79.9	1.5	93-4700 D	2.3	0.9
93-1940 S	5.2	1.0	93-4720 S	0.7	0.7
93-1960 S	6.5	2.3	93-4760 S	0.4	0.7
93-2040 S	1.4	1.6	93-4780 S	17.8	0.9
93-2060 S	3.4	4.8	93-4800 S	4.9	1.5
93-2080 S	17.3	1.4	93-4820 S	0.6	1.1
93-2380 S	0.9	3.0	93-4840 S	1.2	1.2
93-2480 S	5.5	1.2	93-4860 S	1.2	1.4
94-0630 S	10.9	4.5	93-4880 S	2.9	3.1
93-3720 S	0.9	1.2	92-0040 S	9.2	0.9
93-3820 S	1.3	1.3	AVERAGE	6.6	1.5

6.5 Golf Course Area, Housing Area, and other Miscellaneous Areas

During mill operations, two housing areas and recreational facilities were developed to support the staff of the mill. A cursory walk-over survey of the housing areas where the houses and other structures once stood and the golf course revealed elevated gamma ray count rates. Additional areas

paragraph 1 of section 1.0 has been corrected. The entire report is included in Attachment 5 for inclusion in the CR.

Comment: 18b

ARCO should demonstrate that the error on duplicate counts (precision) and the accuracy is acceptable per Method 115 Section 4.0 E.

Response: 18b

The accuracy requirement of Method 115 is to calibrate the spectrometer using two independent sources which agree within 10 percent. On May 10, 1996, the two sources were run at the radon flux counting geometry. The measured efficiency of the 609 keV photopeak for the two sources was 0.00716 and 0.00691. On May 24, 1996, the two sources were run prior to running the second batch of canisters at the radon flux counting geometry with measured efficiencies for the 609 keV peak of 0.00753 and 0.00763, clearly within 10 percent. Each batch showed that the two sources agreed within 10 percent. The slight change in efficiency from the first batch to the second batch was probably due to the background determination for the runs. These data clearly indicate that the accuracy requirement was met. Printouts of the standard runs are given in Table 18-1 and Table 18-2.

TABLE 18-1

Date	Count Time	Standard (nCi)	Counts	Error	Bkg. Counts	Bkg. Error	Efficiency	Error (1.00 SD)
05/10	1200	80	25505	433	71	176	0.00716	0.00013
05/10	1200	78.83	24259	432	71	176	0.00691	0.00013

TABLE 18-2

Date	Count Time	Standard (nCi)	Counts	Error	Bkg. Counts	Bkg. Error	Efficiency	Error (1.00 SD)
05/24	1200	80	26540	457	-213	190	0.00753	0.00014
05/24	1200	78.83	26494	454	-213	190	0.00763	0.00014

exemption area and within the Site boundary that will be transferred to the DOE for long-term surveillance.

Areas shown on Figure 6-9 that exceeded 14,000 cpm were investigated and either cleaned up or sampled using soil sample verification procedures. After the contaminated soil was removed, the affected areas were verified using Verification Method B. A count rate of 3,350 cphm on the shielded 2x2 NaI detectors was used as the verification level. The results of the verification measurements are shown on Figures 6-5 and 6-6.

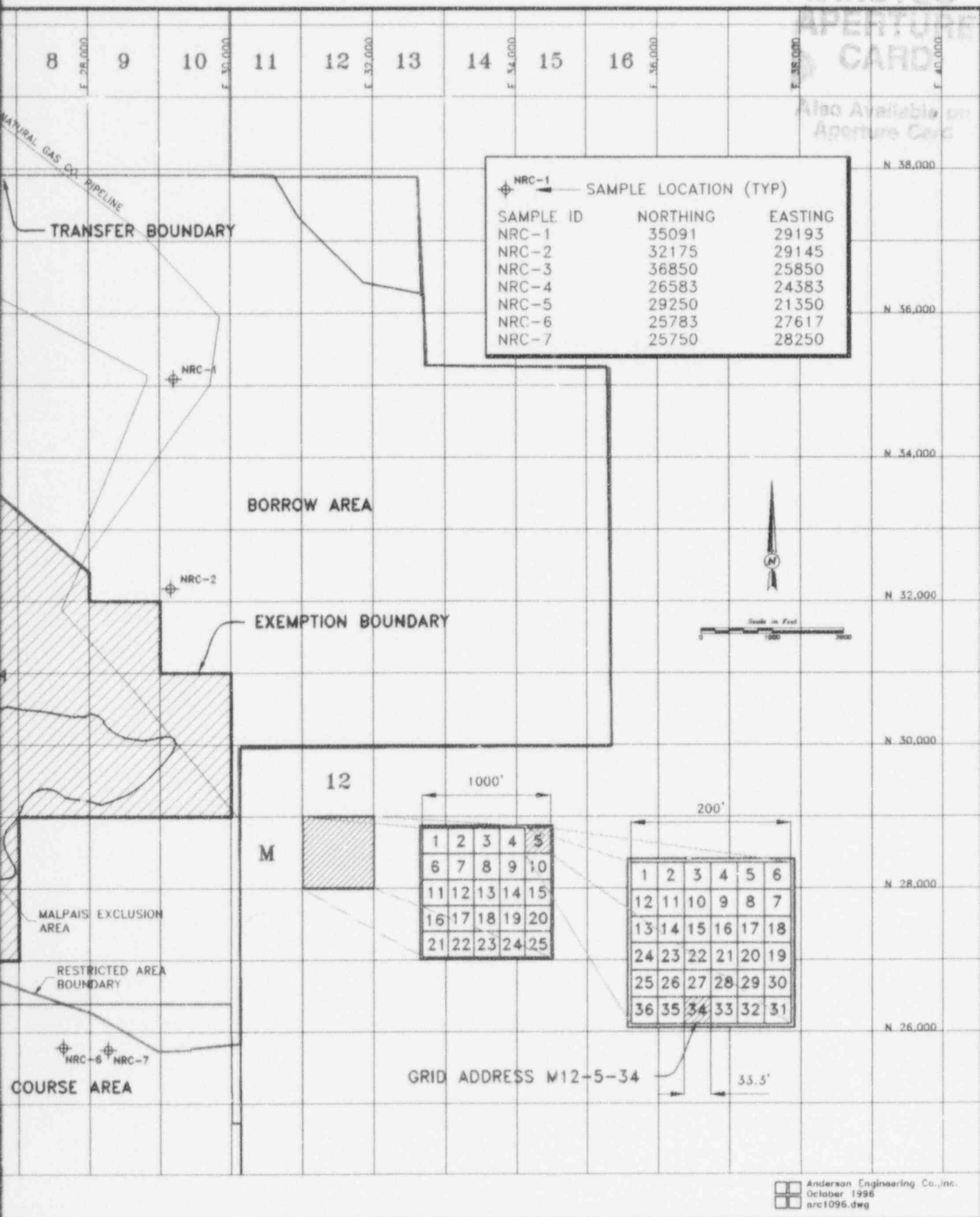
Intra-laboratory Ra-226 QA/QC Sample Results
For
August 1996 Soil Sampling in Grid Block E03, E04, and F12

Table AD2-1

Sample No.	Grid Mo.	Vendor Lab Results, pCi/gm	ARCO Results, pCi/gm
96-050S	F12-10-08	1.6 +/- 0.3	1.1 +/- 0.3
96-060S	F12-07-08	1.3 +/- 0.2	1.1 +/- 0.3
96-080S	E04-22-08	1.3 +/- 0.2	2.7 +/- 0.4
96-100S	E03-10-08	1.2 +/- 0.2	1.3 +/- 0.3



Figure AD2-1 NRC Soil Sample Locations (Sampled 10/03/96)



9610230278-01