

September 20, 1996

Mr. R. S. Ziegler, Operations Manager  
Atlantic Richfield Company  
Bluewater Mill  
P.O. Box 638  
Grants, New Mexico 87020

SUBJECT: COMMENTS ON RADIOLOGICAL SECTIONS OF THE COMPLETION REPORT

Dear Mr. Ziegler:

This letter formally transmits the Nuclear Regulatory Commission technical staff comments on the radiological sections of the Bluewater Uranium Mill Site Reclamation Completion Report which Atlantic Richfield Company transmitted to the NRC by letter dated April 30, 1996. These comments were previously sent to ARCO by fax on August 6, 1996, and draft ARCO responses to the comments have been discussed between Nat Patel of AVM Environmental and Elaine Brummett of the NRC staff.

The NRC requests that ARCO provide written responses to these comments, with copies to NRC Region IV and the Oak Ridge Institute for Science and Education, prior to the scheduled inspection at the Bluewater site on October 3, 1996. If you have any questions regarding this request, please contact Ken Hooks, the NRC Project Manager for the Bluewater Mill site, at (301) 415-7777.

Sincerely,

/s/ Charlotte Abrams For J. Holonich

Joseph J. Holonich, Chief  
Uranium Recovery Branch  
Division of Waste Management  
Office of Nuclear Material Safety  
and Safeguards

Docket No. 40-8902  
License No. SUA-1470

Enclosure: As stated

cc: R. Ohrbom, NMED  
J. Virgona, DOE GJ

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COMMENTS ON THE RADIOLOGICAL SECTIONS OF  
THE ARCO COMPLETION REPORT  
FOR THE BLUEWATER URANIUM MILL SITE

1. Follow-up to 1992 Cleanup Report

ARCO should provide information in the Completion Report (CR) to follow-up on the information in the 1992 Windblown Contamination Cleanup Report, such as:

- a. Area H was determined to have elevated gamma levels due to natural material. Indicate how this was determined and where the data resides, or if the area was excavated, which grid approximates this area.
- b. Indicate the location of the verification data for the other 2 areas with anomalous gamma readings (Areas A and C) that were determined to be due to tailings. Area A is not indicated on Figure 6-1 or 6-3, but using the coordinates on map B-3 of the 1992 report, it appears to extend well beyond the exemption area.
- c. Indicate whether or not the 1.3 acre wet area was determined to be "official" wetlands.

2. In CR Section 4.5 (Off-pile Contamination), ARCO indicates that approximately 400 acres of windblown tailings plus portions of the golf course, housing area, and other areas (evaporation pond area 325 acres) were remediated.

- a. Resolve the inconsistency of this statement with the account in the 1992 Windblown Contamination Cleanup Report which states that 590 acres were known to be contaminated, 210 acres of these are in the Malpais exemption, 30 acres are rock, and an additional 20 acres of contamination were found. That left 388 (370?) acres to be cleaned, but 188 acres "rocked out" so 116 acres of these exceed the standard (p. 18). Thus, 273 areas were cleaned to meet the standards. In addition, present the information so that the cleanup history of each area (location & size of areas cleaned or partially cleaned, when & why exemption obtained) is clearer.
- b. Clarify if the 42 acres with elevated readings/Ra-226 mentioned on the bottom of page 22 as granted an exemption to the cleanup standards (no indication of why the exemption was granted), are related to the statement on the top of page 22 that license amendment 23 addressed rock outcrops.
- c. For the housing area, indicate the estimated size of the remaining area of elevated gamma that is attributed to high levels of K-40.

3. Section 4.6.2 (Figure 4-3), indicates the location of the El Paso gas line near the east end of the evaporation ponds. CR page 70, states that the old pipeline was left in place, but there is no mention whether or not

tailings were found in the trench, or if the new trench was dug in clean soil. Indicate the cleanup status of the trenches and if Figure 4-3 depicts the new or the old trench.

4. Table 5.1 (page 77) presents background exposure rates, but does not indicate or reference the measurement locations and what year the study was done. Also, the paragraph following the table should indicate that exposure rates on the disposal piles are provided in Appendices G - I.
5. Several figures in Section 6 indicate an exemption boundary, but the bounded area seems to include much more than the Malpais exemption area (see Drawing 1 in the 1992 Cleanup Report). ARCO should clarify why the areas between the disposal cells and west of the Main Tailings Cell are included within the exemption boundary, and perhaps provide the map from the 1994 exemption request.
6. On Figure 6-9, indicate the position of the former golf course, housing areas, county road, and guard station. Also, correct the north coordinate numbers and provide block numbers that correspond to those used on the other figures in Section 6.
7. Page 82, first paragraph of Section 6.4, indicates that a soil sample was analyzed for grid D3-10-35, but the data do not appear in Appendix J. Provide the Ra-226 data or an explanation.
8. Page 82, second paragraph of Section 6.4, indicates that the area south of the exemption boundary meets the criteria, but ARCO should explain why Figure 6-5 indicates approximately 13 grids above the 3350 cplm action level. If these are the same grids mentioned at the bottom of page 86 as being "rocked out" areas of the former golf course, page 82 should be revised to include this discussion.
9. The same paragraph also indicates that Figure 6-6 shows that all Ra-226 measurements are below 6.9 pCi/g, but ARCO should explain why Figure 6-6 indicates 5 grids have Ra-226 values above 6.9 pCi/g (supported by Appendix J elevated values in grids 07-8-8, P5-18-8, P8-18-26, P10-8-29, and P10-13-11).
10. Figure 6-4 is missing the Ra-226 data symbol for grids in block F12 and Ra-226 data is not in Appendix J, but gamma data is presented on Figure 6-3. ARCO should explain if this area was excavated.
11. Figure 6-5:
  - a. The grid gamma readings stop abruptly at the Q block row. Indicate why there are not readings for every 1000-foot grid (unaffected area, Figure 6-7) to demonstrate that no removal was necessary. The restricted area boundary is not a sufficient reason for lack of data.
  - b. Explain why there are gamma readings where part of the Plant Site Disposal Cell should be (refer to Figure 6-1).

12. Explain why Figure 6-6 indicates 3 soil samples in block K11, but there are no corresponding gamma readings in Figure 6-5.
13. Comparing Figure 6-6 to Appendix J Ra-226 data, it appears that grids N4-16 to 20, with values of 11.6 to 7.5 pCi/g, should be outside the exemption zone and on the figure. Similarly, grids N5-21 to 23, with values of 33.4 to 8.3 pCi/g, should be on the figure. Explain why Figure 6-6 appears incomplete, or provide a corrected figure.
14. The bottom of page 82 and top of 83 discuss sampling for Th-230 in the residue beneath the liner of the evaporation ponds. It indicates that no soil samples were taken for evaporation Pond 3A because the pond was in use at the time the other pond areas were sampled. Data should have been obtained for the CR, or justification provided concerning the lack of sampling. This should be addressed in the proposed plan for additional sampling (see b).
  - a. The CR indicates that 5 samples exceed the Th-230 guideline of 17 pCi/g for surface contamination. ARCO should note that, in calculating the 1000-year Ra-226 (including background), one must consider the contribution from existing Ra-226 that is not always at background levels and should chose a Th-230 cleanup guideline of approximately 14.5 pCi/g (plus consider ALARA) for surface material.
  - b. ARCO has submitted (June 24, 1996) a plan for additional Th-230 sampling in order to demonstrate that the location of the highest value has been mixed with clean soil during excavation of the ditch, and to clarify how much contamination remains uncontrolled (in surface 6 inches). ARCO should provide the test results to NRC with a cleanup plan, or a discussion of the potential long-term health hazards and environmental damage that could result from the residual Th-230.
15. Page 83 discusses verification data from the outlying (unaffected) areas where soil samples were taken every 1000 feet (Figure 6-7) and gamma readings every 500 feet (Figure 6-8). Figure 6-7 indicates that no soil samples exceed 6.9 pCi/g, but Ra-226 data at the end of Appendix J (without grid numbers) indicates that 5 samples exceed the guideline. ARCO should explain why these elevated radiation areas were not cleaned.
16. Table 6.2 (page 84) indicates that one of the QA samples from the bottom of the evaporation pond area has a Ra-226 value of 12.0 pCi/g. ARCO should discuss the conclusion that the grid meets the standard.
17. Revise page 89 (Section 7.3) to include justification for indicating that values up to 25 uR/hr are within the variation of local background, or otherwise justify the acceptability of values above background for this site (background 10-14 uR/hr, CR page 77).
18. In Appendix G (Radon Flux and Gamma Data), the radon flux measurement information for the Main and Carbonate Tailings Piles were reviewed and approved by staff previously (March 10 and November 13, 1995). The flux data for the other disposal cells were provided by letter dated June 17,

1996. NRC staff has reviewed this report that presumably will be incorporated into the CR and determined that:

- a. The typographic error in paragraph 1 of Section 1.0 (date for completion of barrier should be 1995) should be corrected.
  - b. ARCO should demonstrate that the error on duplicate counts (precision) and the accuracy is acceptable per Method 115 Section 4.0 E.
19. Ra-226 verification data in Appendix J was compared to information represented on Figures 6-4, 6-6, and 6-7 and resulted in the following concerns:
- a. Grids N5-22-8, N5-22-11 appear to be outside the exemption boundary, but the Ra-226 values are 15.6 and 9.1 pCi/g, respectively. ARCO should clarify why these grids meet the cleanup criterion.
  - b. For the outlying areas (end of Appendix J), there is no Ra-226 value for grid point N38000 E22000, but data are indicated on Figure 6-7.
  - c. The outlying area Ra-226 data in Appendix J are difficult to compare to Figure 6-7, because many of the values are not in order by either the N or E coordinate. ARCO should revise the last 6 pages of Appendix J to make the information easier to evaluate by comparison to Figure 6-7.
20. Appendix L contains the raffinate trench verification data, and
- a. ARCO should indicate if the gamma readings for the walls were obtained from the mid-point of the wall, or if the value is the average obtained by scanning the entire section of wall.
  - b. ARCO should indicate why the area of wall 1 reading 12900 cphm was not excavated and resurveyed.
21. The first paragraph of Section 2 indicates that 3,766 acres were within the radiological restricted area. ARCO should indicate the map that demonstrates this boundary, and also indicate the number of acres within the transfer and exemption boundaries.
22. Attachment 13 in Appendix E provides Ra-226 data from three laboratories and two types of analysis. Indicate the evaluation and conclusions from these data.

#### MINOR (EDITORIAL) COMMENTS

1. The second paragraph of the CR Executive Summary indicates that milling operations were discontinued in 1992. This should indicate 1982.
2. On page 11, Table 4.3.1 is incomplete for data on amendment 18.



3. Section 6.5 (pages 84 to 87) discusses characterization and verification in the golf course, housing, and miscellaneous areas, but the text should refer to Figures 6-5 and 6-6, not 6-7 and 6-8.
4. Revise Figure 7-1 to include labels for areas discussed in the text. For example, acid tailings pile, asbestos disposal area, and landfill areas.
5. Revise Section 7.2 to indicate that the Asbestos Disposal Area data is with that for Disposal Area 1 (Figure 7-4).
6. Correct the typographic error in Section 7.4, as 100 radon flux measurements were not performed on the landfills.
7. The first paragraph of Section 10 (page 97) states that the transfer boundary is indicated on Figure 1-1, but it is on Figure 2.1.
8. The title page of Appendix D indicates that the appendix contains the Technical Evaluation Reports for the license amendments, but Appendix D only contains the cover letters.
9. The second page of Appendix K is titled Appendix H and the second page of Appendix L is titled Appendix I.

Staff has yet to review:

The January 1994 exemption request to confirm that the CR exemption boundary is correct;

the July/August 1996 Th-230 report;

page corrections and response to the above comments; and

the October 1996 (follow-up) inspection report.

When review of these items is complete, the radiological evaluation section of the Completion Review Report will be provided.