



UNITED STATES
NUCLEAR REGULATORY COMMISSION

REGION IV
URANIUM RECOVERY FIELD OFFICE
BOX 25325
DENVER, COLORADO 80225

MAY 30 1990

URFO:DLJ
Docket No. 40-8902
040089021400

ARCO Coal
ATTN: R. S. Ziegler
Project Manager
P.O. Box 638
Grants, New Mexico 87020

Dear Mr. Ziegler:

My staff has completed their review of the engineering aspects of your March 21, 1990, Reclamation Plan for the ARCO Coal Company Bluewater Uranium Mill. Specific comments on the plan that will require your response are attached to this letter. You will note that some of our concerns may have been addressed previously. However, changes to the plan have necessitated that these areas be revisited.

As you have prepared your March 21, 1990, submittal as a stand-alone document, we would like to suggest that your responses to our comments be incorporated into the document. Your responses should be submitted by July 13, 1990.

Criterion 9 of Appendix A to 10 CFR 40 requires that uranium mill licensees establish surety arrangements based on approved plans for reclamation of tailings in accordance with technical criteria specified elsewhere in Appendix A. Our plans call for us to complete our review, prepare a technical evaluation report, and amend your license by the end of summer, 1990. We would therefore expect your surety to be in place prior to the end of October, 1990. Your submittal by July 13, 1990, will aid us in approval of your plan.

Should you identify that you will not be able to meet the July 13, 1990, submittal date, or that you will not be able to provide complete responses, you are requested to contact us so that we may adjust our schedules accordingly. If you have any questions regarding this letter, please contact me at (303) 236-2805.

Sincerely,

Ramon E. Hall
Director

Attachment:
As stated

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Review of the ARCO Coal Company
Bluewater Mill Reclamation Plan
submitted March 21, 1990

1. The rock mulch proposed for the pile top has a D_{50} of 1.5 inches. Our analysis shows that this is adequate for most of the pile where the slope is less than about 4 percent. However, there is an area near the south side of the pile top where the slope is between 4 and 6 percent, where the required D_{50} is 2.0 inches.

You should therefore increase the D_{50} to at least 2.0 inches in areas where the reclaimed pile top slopes are greater than 4 percent. Alternately, you may provide additional justification for using a D_{50} of 1.5 inches in the steeper areas of the pile.

2. The D_{50} values proposed for the filter, pile top, outslopes, and spillway are 0.5 inches, 1.5 inches, 2.5 inches, and 8.0 inches, respectively. Except as stated in (1) above, these stone diameters are acceptable. In reviewing the material specifications in Appendix "A" of your March 21, 1990, submittal, it appears that the rock gradations were derived assuming that the D_{50} values listed above are average values. This is not correct. The D_{50} values should be considered to be minimum values. A comparison between your proposed minimum D_{50} values and the minimum D_{50} values in your specifications is as follows:

| Area | D_{50} in inches | |
|-----------|--------------------|-------------------|
| | Proposed | In specifications |
| Filter | 1/2 | 5/16 |
| Pile top | 1-1/2 | 1 |
| Outslopes | 2-1/2 | 1-1/2 |
| Spillway | 8 | 4.7 |

Please revise your rock gradation specifications as required.

3. In order to determine the acceptability of your rock gradation specifications, the staff plotted the values given in Appendix "A." For the filter, pile top, and spillway, the gradations appear reasonable. For the outslope, however, there appears to be an error because the difference between the minimum D_{50} and the maximum D_{50} is only about 0.3 inch. Because of this very small difference, it will be very difficult to meet this specification. We therefore suggest that you review the gradation specification for the 2.5-inch D_{50} rock and revise it as necessary.
4. Figure 5.7-4 in Volume 1 of your March 21, 1990, submittal is a detailed drawing of the soil-rock matrix. Although we understand that a 3-inch layer of soil will be compacted into the rock to form the soil-rock matrix, Figure 5.7-4 does not clearly show this. Therefore, we suggest the figure be revised to avoid any misunderstandings that may arise in the future.

5. The February 1990, cover thickness analyses submitted in your March 21, 1990, plan are substantially different from the cover thickness analyses previously submitted. The most significant differences are in the physical property parameters for the slimes portion of the tailings data. Your consultants' February 1990, report does not provide sufficient justification as to why these parameters were changed. As the changes that were made are not conservative, additional information will be required before NRC can concur in designs. Please provide a more detailed assessment of why changes were made in the physical properties applied in the models.
6. There are no specifications for the placement of the engineered fill at the toe of the reclaimed main tailings embankment. As this material will be constructed out of approved cover materials, the same specifications should be provided for these areas. Please provide revisions to the specifications outlining the placement criteria for the fill areas.
7. The specifications require that the radon cover materials classify as SM, SC, ML, or CL material. Atterberg limit determinations are required for classification in accordance with the Unified Soil Classification System. Please revise the specifications to include Atterberg limit determination.
8. The specifications do not require any specified placement criteria for the first 24 inches of materials placed on the geofabric. Please provide specifications or justification for the lack of compaction criteria.
9. Volume of each type of material placed must be maintained in the daily report. Please revise the specifications accordingly.
10. The plan calls for additional testing of the proposed borrow prior to construction. The results of this exploration program should be submitted for NRC review and possible adjustment of the cover design. This requirement will be made part of the license condition.
11. The frequency of testing in-place compaction is adequate for fills other than the cover material. The Staff Technical Position recommends testing the cover material three times more frequently than the proposed specifications. Please revise the specifications to provide a testing frequency for the cover material that is in agreement with the Staff Technical Position or justify the use of the lower testing frequency.
12. The primary method for testing of in-place compaction will be the nuclear densometer. The proposed calibration frequency with the sand cone test is adequate. However, the specifications must contain provisions for establishing a good correlation at the start of construction. For example, the specifications may require that the first 20 tests be calibrated with a sand cone to establish that a good correlation exists. Additionally, the specifications provide for correction of the material tested by each fifteenth in-place test, but not for the previous fourteen test results that were obtained by the nuclear densometer. Please revise the specifications to incorporate these items.

13. The specifications require that the moisture-density relationship and gradations of the borrow soils (cover materials) be determined every 20,000 cubic yards for the first 20,000 cubic yards of material placed and then the frequency may be relaxed to once for each 30,000 cubic yards. This test frequency is not adequate for cover materials. The Staff Technical Paper recommends that moisture-density relationships be established for every 5,000 to 7,500 cubic yards of material placed and verified with a one-point test every 2,500 cubic yards of material placed. Gradations are recommended for each 1,000 cubic yards of material placed. Please revise the specifications for cover placement and classification to reflect the Staff Technical Position or justify a lower frequency.
14. The specifications do not require that moisture-density relationships be determined for fill other than cover materials even though a percentage of Proctor compaction is required for all fill. Please revise the specifications to include this requirement.

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