STATE OF COLORADO

Roy Romer, Governor
Patti Shwayder, Acting Executive Director

Dedicated to protecting and improving the health and environment of the people of Colorado

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Colorado Department
of Public Health
and Environment

January 25, 1996

Ms. Sharon Arp
Rifle Site Manager
U.S. Department of Energy
2155 Louisiana Blvd. NE, Suite 4000
Albuquerque, New Mexico 87110

Re: Rifle Well Closure Plan

Dear Sharon:

The Colorado Department of Public Health and Environment has completed our preliminary review of the documents titled: " Operation and Contingency Plan for Monitoring Well Closure" and " UNSAT2 Modeling for Monitoring Well Closure, Estes Gulch Disposal Cell, Rifle, Colorado" dated, November, 1995. We have several specific comments on each of the documents which are detailed in the attachments to this letter.

Our most significant concern with the Well Closure Plan revolves around the choice of critical elevations for pumping the leachate that accumulates in the disposal cell. Due to the many uncertainties involved in the UNSAT2 modeling, we believe that a conservative approach to dealing with the accumulated leachate should be taken. If the retention basin and spray evaporation system will be installed at the site as a contingency, in any case the majority of the costs should be associated with construction and installation as opposed to operation and maintenance. Therefore, the system should be operated as much as possible to take advantage of the capital outlay. We question allowing leachate to accumulate up to the 6016 foot elevation before pumping will begin, and correspondingly, we question why pumping will cease when only two feet of drawdown has been achieved. We would rather see the plan based on maximizing the amount of water that can effectively be removed from the cell and treated using the spray evaporation system. This will assure that after five years, the long-term effects would be minimized.

Please give me a call at (970) 248-7170 if you need more information or would like to discuss the comments.

Sincerely,

Jim Hams

Rifle Site Manager

cc: W. Naugle, CDPHE-Den / J. Lambert, NRC

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ATTACHMENT ONE

CDPHE COMMENTS ON THE OPERATION AND CONTINGENCY PLAN FOR MONITORING WELL CLOSURE, ESTES GULCH DISPOSAL CELL, NOVEMBER, 1995

GENERAL COMMENTS:

1. The plan does not specifically mention how or when the observed conditions at the site over the next five years will be compared against the conditions predicted in the model. Specific points in time should be selected for comparison against the modeled predictions. A proposed course of action should then be selected if large deviations occur. Criteria for assessing the significance of the deviation should be described, i.e. what degree of accuracy do we expect from the model?

2. The plan does not explain why the elevation of 6016 feet was chosen for the critical elevation to begin pumping and the elevation of 6014 feet to stop pumping. Correlation should be made between the 6016/6014 elevation at the wells and the leachate levels at the toe. It is unclear why the plan does not use a lower trigger point for pumping and why we aren't maximizing the amount of water that will be removed. Allowing the water level to rise to 6016 feet shows a large degree of confidence in the integrity of the liner system and the accuracy of the UNSAT2 Model results. A justification for these decisions should be provided in the document.

3. The plan does not explain why a change in the water level of 0.6 feet was chosen as critical for determining when to change the monitoring frequency. The value chosen should be based on an analysis of the rate of rise of the phreatic surface. It appears that this value may in fact be too high based on how rapidly the phreatic surface has risen historically. If the water level were to rise 0.59 feet for two months, and the monitoring frequency is changed to quarterly, a rise of 0.59 feet for the following three months could result in a water level rise of almost two feet in one quarter. Since the bedrock elevation in the UNSAT2 model varied by almost two feet and the pumping criteria is based on only two feet, it seems that the 0.6 feet value is too great.

4. Use of the Mann-Kendall test:
The use of this test needs to be discussed in more detail and certain parameters must be agreed upon in the plan. If pumping does take place, the criteria for when a data point becomes valid for use in the statistical test must be established. That is, a water level measurement that has been impacted by pumping cannot be used in the analyses of a declining trend (nor can any data points collected prior to pumping). This should be based on analysis of how long after pumping ceases it will take for the water level to recover. Other parameters that should be decided upon include: the number of data points that will be required to use the test, the significance level, and whether a two-tailed or a one-tailed test will be used.

SPECIFIC COMMENTS:

5. Page B-2, Table B-1:
The last column on this table shows the amount of water that is expected to drain, which appears to be based on an assumed specific yield. How was the specific yield determined and what value was used? Also, this column references Note C. However, no Note C. is included in the footnotes.

6. Page 2-1:
The first sentence states that figures 3 and 4 show the monitoring procedures and well closure criteria for all three monitor wells. However, it apprears that these flow charts really apply to MW-2 and MW-3, since it is impossible for a water level of 6016 feet to occur in MW-1. The footnotes clarify that the closure criteria apply to all three wells. While it is unlikely that water will build up in MW-1, the text should still address this possibility. The text should clearly indicate that if water were to appear in MW-1, that the same statisitical test will be applied to this well to determine the significance of a declining trend. Also, the document should specify what will happen if water is detected in MW-1. If it rises to a certain level, will it be pumped?

7. Page 2-6, Construction Schedule:
This section does not clearly indicate when construction of the retention basin will begin. Is it tied to the water levels? If the water levels do not appear to be rising above the level mandating pumping (6016 feet), will the plans to build the retention basin be abandoned?

8. Page 204.
For a safety factor, the freezing weather conditions at Estes Gulch were addressed in the leachate evaporation schedule. The factor appears to take the longest freeze cycle, 7 days, and then double it. Fourteen days doesn't seem to account for enough average days lost to freezing conditions.

9. Figure 2, Page 2-9/Figure 5, Page 2-12.
Run 21EE and the graphs show that for short term duration, less than 30 years, the water level at the toe will be at the 6011/6011.6 foot elevation. In the event that the seam between the lower and upper toe liners fails, and the water level is above the 6011.5 foot level, the leachate would need to be pumped down rapidly at least 2 feet. The contingency plan should include this scenario and address the amount of water that would need to be removed and the schedule required to accomplish it.

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ATTACHMENT TWO

CDPHE COMMENTS ON UNSAT2 MODELING FOR MONITOR WELL CLOSURE, ESTES GULCH DISPOSAL CELL, NOVEMBER, 1995

SPECIFIC COMMENTS:

1. Pages 1-2, 2-4.
   This section explains that the presence of the HDPE liner only shows an impact after 70 years, but does not clearly compare the maximum elevation of the phreatic surface that was reached in this simulation to the critical elevation of the upper liner at 6020 feet. Since it may not be conservative to assume that the geomembrane disintegrates in 30 years, we need to be assured that the water level will not rise above 6020 feet in the future if the membrane does not degrade. Figure B-8 shows that the toe water level may be 6014 feet beyond 100 years if the lower liner doesn't degenerate. The liners come with guarantees to perform for many years. What are the risks if the lower liner doesn't begin to fail after 30 years?

2. Page 2-5, Table 2-1.
   Run 21EE is shown to be for a 30 year simulation. However, no value for the permeability of the radon barrier is provided for that period of time between years 20 and 30. In addition, we are curious as to how 20 years was chosen as the amount of time before the radon barrier becomes saturated. Also, how sensitive are the model results to this assumption?

3. Page 2-5, Table 2-1.
   A footnote should be added to explain why the bedrock elevations are different between model runs. How does this difference in bedrock elevation impact the model results? Should all data points be assumed to be within two feet?

4. Page A-4.
   This discussion refers to Table A-1. The table is not included in the document.

5. Page B-5.
   Table B-1 is missing from the document.

6. Page B-9, Figure B-4.
   The figure does not show the location of node 355.

7. Page B-10, Run 21HH.
   This section is unclear. The reference to upstream and downstream should be changed to upgradient and downgradient. Figure B-14 should clearly indicate the locations of the phreatic surface referenced in the text.

8. Pages B-25, B-26, Figures B-14, B-15.
These figures, which are critical to the conclusions of this report are not legible. Please provide clearer copies of these figures.

9. Page B-10,Run 21HH.
The text should more clearly explain the modeling shown in Figure B-14 (since figure B-14 is difficult to read) and the conditions and water elevations at the toe ditch.

10. Page 4-1, Conclusions.
The document states that it may take 100-200 years for the leachate to attain their maximum levels. The leachate levels at the toe are sensitive to the final permeability of the cover, whether the liners degenerate, and moisture content of tailings in the northern cell (partially accounting for a surge in Figure B-8). Rather than wait beyond 20 years to discover the impact of long term risks, why not pump the leachate now? The new retention basin will probably be installed in all scenarios so it might as well be used to reduce water in the cell and act as a contingency against late developing risks of increased leachate levels at the toe.