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40-1341

## TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

RETURN ORIGINAL TO PDR, HQ

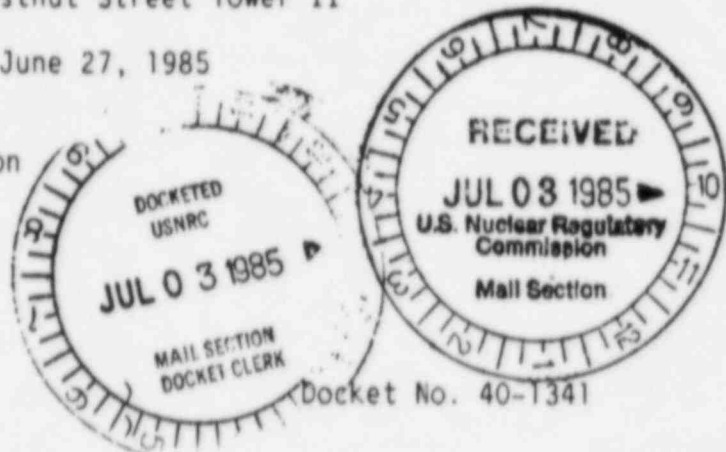
1630 Chestnut Street Tower II

June 27, 1985

Mr. R. Dale Smith  
 U.S. Nuclear Regulatory Commission  
 Uranium Recovery Field Office  
 P.O. Box 25325  
 Denver, Colorado 80225

Dear Mr. Smith:

In the Matter of  
 Tennessee Valley Authority



Docket No. 40-1341

Enclosed for your review and coordination are our revised cleanup criteria for the Edgemont Uranium Mill decommissioning project. Our previous submittal, contained in a letter from L. M. Mills to R. A. Scarano on April 1, 1982 has been updated based on regulatory guidance changes and discussions with your staff. Our previous submittal dealt with three separate areas in the mill site vicinity. Only one of these areas, the mill site, will be considered in this cleanup discussion.

The discussion on mill site cleanup criteria is presented as a proposal for developing and implementing criteria for use in determining the effectiveness of cleanup operations on the mill site. The objective of this approach is to determine the relationship between the concentration of radium in the soil with the external gamma radiation level. The correlations determined from this relationship will be used to develop criteria for determining the effectiveness of the cleanup operations. The correlations obtained from this program will be provided for your review by late summer 1985.

If you have any questions regarding this information, please get in touch with Mark Belvin of my staff at FTS 858-2693.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

J. W. Hufham, Manager  
 Licensing and Risk Protection

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Enclosure

DESIGNATED ORIGINAL

Certified By Mary C. Howard

FEE EXEMPT

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## CLEANUP CRITERIA FOR THE EDMONTON URANIUM MILL

### DECOMMISSIONING PROJECT

TVA proposes the following approach to be used in developing and implementing criteria for use in determining the effectiveness of cleanup operations on the Edgemont Uranium Mill site. The objective of the study is to determine the relationship between the concentration of radium in soil with an external gamma radiation level and to use these data to develop criteria for determining the effectiveness of cleaning operations.

#### CORRELATION DEVELOPMENT

In 1981, TVA conducted tests directed at correlating gamma radiation levels with concentrations of radium in the soil. This data set was submitted in TVA's April 1, 1982 transmittal from L. M. Mills to Ross A. Scarano and the approach is summarized in the Final Environmental Statement for the project (NUREG 0846, section 2.2.2.6). The data was obtained at offsite locations which exhibited radiation levels considered representative of background levels at the site. The data is considered applicable to conditions which will exist in the windblown tailings area after all onsite cleanup activities are completed. However, it is not indicative of conditions existing on the mill site during active tailings removal. This proposal is designated to develop correlations which will allow the radiation safety officer (RSO) to certify specific areas as clean with respect to the requirements of 40 CFR Part 192.32. These correlations will be developed from survey measurements taken in other than background conditions with consideration given to the influence of surrounding radioactive materials on the survey results.

TVA intends to utilize instrumentation available onsite in performing the surveys. It is envisioned that the  $\mu$ R scintillometer will be the primary instrument used. If other available instruments, such as a scaler with a sodium iodide scintillation detector, prove effective, they may also be used.

Calibration curves will be developed for each instrument under various conditions. The primary calibration will be performed in conjunction with a pressurized ionization chamber (PIC). This will provide a direct correlation of the  $\mu$ R meter reading with the more sensitive PIC measurement. If possible, the instruments will also be calibrated against radium-226 calibration pads at the Department of Energy's Grand Junction, Colorado, facility. In conjunction with these calibrations, the detectors response to a check source will be determined for use in evaluating instrument response on a day-to-day basis. The final "calibration" will be the determination of the correlation of the instrument response to the concentration of radium-226 in soil. Where possible, these measurements will be performed onsite under conditions similar to those expected during the operational phase of the program. This will account for other materials in the soil, reducing the need for additional correction factors.

In order to reduce the influence of radiation from remaining materials onsite, the detectors will be surrounded by a shield consisting of approximately two centimeters (three-fourths of an inch) of lead. A removable shield will also be utilized beneath the detector to permit the differentiation between radiation from the sample area and those from the surrounding environment. This difference will be correlated to a known concentration of radium-226 in soil by analyzing a sample of soil from the sample area. Approximately 20-50 measurement/sample surveys will be made in areas of varying radium-226 concentrations so that a valid relationship can be determined. Unshielded measurements will also be made at each location to account for the varying radiation levels from the surroundings. A detector holding device will be utilized to ensure reproducible detector geometry with respect to the sample. In addition to the field measurements, soil samples will be counted at the onsite facility with the field or similar equipment before they are forwarded to the offsite laboratory. This will provide a rough calibration permitting onsite screening of soil samples for radium-226 content when necessary.

TVA intends to remove radioactive materials so that remaining concentrations, when averaged over any area of 100 square meters, will not exceed: (a) 5 pCi/g radium-226 in the first 15 centimeters of soil, and (b) 15 pCi/g in subsequent 15-centimeter intervals. Correlations will be determined in soils containing less than and greater than 15 pCi/g Ra-226 to provide optimum reliability around the 5 and 15 pCi/g action levels.

#### OPERATIONS

Onsite procedures will be developed to guide the staff in determining if an area is "clean" using the developed correlations. The specifics of these procedures are dependent on the results obtained and experience gained in the developmental phase described above.

All personnel involved in making the measurements will receive training in accordance with onsite procedures. The training will include the operation of the equipment, the application of appropriate calibration factors, and any other applicable aspects of the program. This training will consist of classroom presentations and field demonstrations and will include observation by the instructor of technician's application of the techniques presented. The RSO will routinely monitor field measurements to ensure that procedures are being followed.

As indicated earlier, each instrument will be checked daily for proper response to a check source. A control chart will be developed to track each instrument response. Should an instrument fail to respond properly, it will be recalibrated against the PIC and new calibration curves developed. Detailed procedures directing the calibration will be developed and maintained onsite.