



Department of Energy
Albuquerque Operations Office
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NOV 20 1989

Mr. Paul H. Lohaus
Branch Chief, Operations Branch
Division of Low-Level Waste
Management & Decommissioning
Office of Nuclear Materials Safety
and Safeguards
Mail Stop 5-E-4
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Paul,

Enclosed are the revised pages for the Spook Final Remedial Action Plan (RAP) which reflect changes on the cleanup standards for the Spook site. (See enclosed Phone Conversation Record dated November 3, 1989, between Robert Murphy (TAC) and Dennis Sollenberger (NRC)). The revisions are typed in bold print and text deletions are indicated by brackets. We recommend these pages be incorporated into the Final Spook RAP and made an attachment to PID No. 15-S-03.

Should you have any questions, please contact Chris Watson of my staff at PTS 845-4628.

Sincerely,

Mark L. Matthews
Acting Project Manager
Uranium Mill Tailings Project Office

2 Enclosures

cc w/enclosures:
D. Gillen, NRC

cc w/o enclosures:
S. Hill, JEG
K. Agogino, JEG
J. McBee, JEG
R. Murphy, JEG
J. Oldham, MK-F

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PDR WASTE PDC
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dry-weight basis. Because the standards are based upon average areas of 100 square meters, the excavation control monitoring will be performed on areas of this characteristic size as well.

Elevated gamma-ray radiation fields preclude exclusive use of in situ monitoring devices to estimate the surface radionuclide concentrations in soil on or immediately adjacent to the tailings pile. When in situ measurements cannot be performed, the suggested method for analysis is to take individual or composite samples of soil, seal by canning, and immediately count the sample by gamma-ray spectrometry. Errors associated with this approach will be reduced by taking several samples 30 days prior to starting work to determine calibration factors. They will be counted later after the radon-222 (Rn-222) daughters reach equilibrium. Analyses of these prepared samples can then be compared to standards. Several samples will be collected weekly during the remedial action and analyzed to provide a measure of the variation of the calibration factor.

Certain areas of the Spook site may be contaminated with radionuclides other than Ra-226. For these areas, alternative excavation control monitoring techniques will be employed. Certain areas in and around the mill yard and small ore piles area may be contaminated with spilled or leached liquids containing mostly uranium. If necessary, soil samples will be analyzed for uranium in such areas. In the acid pond area and other areas associated with spent acid, the primary contaminant, especially subsurface, is thorium-230 (Th-230). Soil samples may be required for excavation control in these areas.

C.3.3 BUILDING AND EQUIPMENT MONITORING

There are various building foundations, walls, and miscellaneous equipment pieces remaining on the site. It is assumed that these materials will be buried in the stabilized pile. If these materials are salvaged and released for unrestricted use, monitoring will be required to assure that release limits for surface contamination are met (DOE, 1985 or revisions).

C.3.4 CLEANUP STANDARDS FOR THE SPOOK SITE

Because of the circumstances at the Spook site, which are specified later in this section, a variety of [] supplemental cleanup standards will be used in addition to the normal five pCi/g and 15 pCi/g Ra-226 standards. Justification for application of these [] supplemental standards and criteria specifying when they will be applied are presented in this section. The normal EPA standards of five and 15 pCi/g Ra-226 above background will be applied except as noted below. In addition, the typical verification methodology will be modified as noted below.

As discussed in Appendix D, Site Characterization, additional characterization data have been obtained to define the boundary of the

area contaminated by windblown materials more accurately. In addition, data will be collected at the start of remedial action to define the boundary of Area C-1 (see Figure D.2.1). This boundary will be determined based on radium to uranium ratios. Once the boundary is agreed upon, all material inside the boundary will be cleaned under the Uranium Mill Tailings Remedial Action (UMTRA) Project and no further measurements or excavation will occur outside the boundary. This boundary will be assumed to be absolute, so verification inside the boundary will consist of only Ra-226 measurements. Isolated cases may occur inside the boundary where information on uranium activity is required, but these should be infrequent. If radium to uranium ratios are used, ratios greater than or equal to 3.0 Ra-226 to uranium-238 (U-238) equivalent (in pCi/g per pCi/g) will be considered tailings material, as discussed in Appendix D.

A supplemental standard of 15 pCi/g Ra-226 above background levels will be applied to all UMTRA Project contaminated areas outside of the designated processing site such as Area C (see Figure D.2.1), whether or not backfill will be applied. Criterion (c) of 40 CFR 192.21 states that supplemental standards may be applied if the cost of remedial action to satisfy the Ra-226 cleanup limits at a vicinity site is unreasonably high compared to long-term benefits. Because of circumstances at the Spook site, any benefit of cleaning (and verifying) to five pCi/g Ra-226 (with no backfill) would be negligible, and additional costs would be incurred. The current land use is for grazing, and this is not expected to change in the foreseeable future. No homes will be built on the Spook site, because better locations exist in the immediate area, and very few, if any, additional homes will be built in the area because the population is not expected to increase.

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Part of the uncontaminated Spook site is the vertical walls of the Spook pit. Cleanup and verification of these walls will, in general, not be performed. Criterion (a) of 40 CFR 192.21 states that supplemental standards may be applied when remedial action to meet the standards for land cleanup would pose a significant threat of injury to workers. In order to remediate and verify the walls, workers would have to place themselves in a clearly threatening position. Thus, a supplemental standard will be applied to the walls of the Spook pit, stating that only areas where workers can safely operate will be remediated and verified.

If uranium or Th-230 are encountered in significant concentrations after the Ra-226 has been removed to within the EPA standards, supplemental standards under criterion (f) of 40 CFR 192.21 will be imposed. For uranium contamination, a supplemental standard of 35 pCi/g uranium (total) will be used. This limit was recommended by the Nuclear Regulatory Commission as a level for which no restrictions on burial method were required (NRC, 1981). For Th-230 contamination, a supplemental standard of either 15 pCi/g projected Ra-226 in 1000 years (above background levels) or a calculated projected radon daughter concentration in a slab-on-grade house of 0.02 WL in 1000 years will be applied. This same method will be applied to the acid pond during remedial action (MK-F, 1989).

As discussed in Appendix D, Site Characterization, contamination in the area of the former Ioma pits within the windblown contamination boundary consists of a thin surface layer of windblown tailings above variable thicknesses and variable concentrations of ore-related contamination. The characterization in Appendix D has determined that excavation of at least six inches of surface material will remove virtually all of the tailings materials. Thus, remedial action will consist of the excavation of at least six inches of surface material, with no verification measurements. This is considered to be reasonable assurance, when considering the underlying contamination, that the cleanup standards will be met. Typical verification (soil sampling or gamma measurements) will not be performed since the naturally occurring radioactive material prevents the use of these methods. However, the characterization data indicate that excavation of six inches of surface material provides reasonable assurance of meeting the EPA standards for tailings. The remaining material is not residual radioactive material as defined by the UMTRCA (Public Law 95-604) and is not the responsibility of the UMTRA Project. Supplemental standards will not be applied.

Scattered tailings contamination exists in the bottom of the Spook pit. For this area, reasonable assurance that the EPA cleanup standards have been met can be achieved through removal of visually identifiable tailings. It is known that some of the uranium ore body remains as the floor of the pit and that much scattered ore exists in the pit. Thus, removal of tailings from the pit bottom will not make a significant difference in the radioactivity present. In addition, verification of tailings removal would be very difficult. Any residual radioactive material left in the pit bottom will be covered with at least 50 feet of backfill. Thus, only visually identifiable tailings will be excavated from the bottom of the pit. This is considered reasonable, under the circumstances. The typical verification methodology will be modified to allow confirmation of reasonable assurance of meeting the EPA standards by visual examination. Supplemental standards will not be applied.

As discussed in Appendix D, Site Characterization, metal and metalloid contaminants have been characterized at the Spook site. From the characterization data, a screening-level risk assessment was performed. Based on the calculated risks, cleanup of the Ra-226 contaminated material will reduce residual metals to levels which will not constitute a hazard to people in the area. No additional excavation for metals will be performed. No metals verification measurements will be required.

C.3.5 FINAL RADIOLOGICAL VERIFICATION SURVEY FOR LAND

In general, the radiological verification survey for remediated land will be based on 100-square-meter areas. A variety of measurement techniques may be used, dependent on circumstances. It is expected that at least preliminary results from the verification samples, which can be used to estimate the final results, will be obtained prior to backfilling an excavated area.

PHONE CONVERSATION RECORD

Conversation with:
Name DENNIS SOLLENBERGER
Company MRC
Address _____
Phone FIS 492-0579
Subject SUPPLEMENTAL STANDARDS FOR SPOOK SITE

Date NOV, 3, 89
Time 2:15 AM PM
 Originator Placed Call
 Originator Received Call (RETURNING MY CALL)
W.O. NO. _____

Notes: We discussed Dennis' draft note to Dan Gillen dated Sept. 1, 1989 concerning supplemental standards at the Spook site. The text in section 4.3.7 in the RAP does need correction as stated in the note. I stated the final version will be corrected to indicate a ratio of 3.0.

1) Dennis' understanding of supplemental standards for Area C (excluding the Loma pits) is correct. I suggested adding the words "outside the designated site" since criterion (c) only applies to vicinity properties. Dennis suggested deleting the words "and possibly (b)" since this is not what we were proposing. He also suggested the text be modified to clearly specify only criterion (c). I agreed to look at it and correct it as necessary.

2) In the Loma pit area, I stated that we were not proposing a supplemental standard; instead we were stating the material was not residual radioactive material as defined in UMRCA. After some discussion, we concluded that the UMTRA Project was changing the verification methodology. Dennis stated we should clarify this in the text. He also suggested that the text should be reorganized so that the information on the Loma pits was not buried within supplemental standards text.

3) I had no suggestions/comments on his discussion for the vertical wall.

4) For the floor of the Spook pit, I stated that again we were asserting that the material was not UMTRA responsibility. We agreed that this was also a change in verification methodology. The modifications to the text discussed in point 2) above also apply.

5) I stated that we did not use the uranium supplemental standard. Dennis suggested we clearly indicate this in the completion report. I stated the Th-230 supplemental standard was either soil concentration, as stated in his note, or a projected 0.02 WL in a habitual structure. Dennis agreed.

I offered to send him an informal mark-up of his note, for his information, indicating how I personally would change it. He accepted. Two other items of interest came out of the discussions. First, he suggested that in the future we use the format of clearly specifying the supplemental standard, the work practice, and which criterion was being used. This could be similar to his format. Second, he suggested that completion reports be like Cannonsburg's, especially the site map with results on it.

File DOC. CONTROL
 Tickle File _____
 Follow-Up By: MURPHY / ADDING
 Copy/Route To: MILLER, ADDING
WATSON, CHARLTON, PETELKA

Follow-Up-Action: MODIFY RAP
TEXT AS NECESSARY

Originator's Initials RM