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Docket No. 40-8728
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MEMORANDUM FOR: Docket File No. 40-8728

FROM: Sandra L. Wastler, Project Manager
Licensing Branch 1
Uranium Recovery Field Office, Region IV

SUBJECT: REVIEW OF DECOMMISSIONING PLAN FOR UNC TETON - LEUENBERGER SITE

Background

UNC Teton (Teton) has successfully completed test work for evaluating the feasibility of in-situ recovery from the "N" and "M" sandstone at the Leuenberger Research and Development Project. Teton and its joint venture partner, NEDCO, have discontinued project development activities and are initiating site decommissioning activities. By letter dated April 30, 1985, Teton submitted a decommissioning plan for the Leuenberger site.

Overview of Decommissioning Activities

The decommissioning activities will follow applicable guidelines contained in the Code of Federal Regulations, Title 10, Part 20, "Standards for Protection Against Radiation," January 1, 1983; Regulatory Guide 8.30, "Health Physics Surveys in Uranium Mills," June 1983; Regulatory Guide 8.31, "Information Relevant to Ensuring that Occupational Radiation Exposures at Uranium Mills Will Be As Low As Is Reasonably Achievable," May 1983; and "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of License for Byproduct, Source or Special Nuclear Material," September 1984.

Five decommissioning activities were evaluated:

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Wellfield Decommissioning

UNC Teton proposes to remove buried wellfield piping and apparatus, survey for contamination and remove it for disposal to a licensed disposal facility. Soil in the excavations around the buried piping will be surveyed, and contaminated soil will also be removed to a licensed disposal facility. Wells will be plugged and abandoned, the wellfield recontoured and a soil background radiation survey conducted. UNC Teton proposes that contaminated soils identified by this survey will be removed to a licensed disposal facility. UNC Teton will conduct a final radiation survey to verify that all contaminated soils have been removed.

Pond Area Decommissioning

At the present time, UNC Teton estimates the north and south solar evaporation ponds contain 175,000 gallons of water. Prior to pond decommissioning, the pond water will either be treated and released in surface discharge in accordance with a WDEQ NPDES permit, or trucked to a licensed disposal facility. The pond sludge will be removed by front-end loader or backhoe and loaded into plastic lined dump trucks for transport to a licensed disposal facility. The pond liners and pond leak detection system piping will also be removed and disposed of at a licensed disposal facility. UNC proposes to survey the soil for contamination, removing any soil material with Ra-226 concentrations greater than 15 pCi/g above background since recontouring the ponds places the original pond bottom greater than 15 cm depth. The EPA 192.42 regulation gives no credit for recontouring. Therefore, the NRC will require soil contaminated with Ra-226 greater than 5 pCi/g above background, averaged over 100 square meters, to be removed to a licensed disposal facility. Excavated areas will be resurveyed to ensure removal of all contaminated material. After removal of contaminated material, the security fence will be removed, the pond area recontoured and a final radiation background survey will be run.

Plant and Processing Equipment Decommissioning

Mining under R&D License SUA-1373 was terminated during the first quarter of 1981. Contaminated solids and liquid waste were removed from the site and delivered to a licensed disposal facility at that time. UNC Teton also decontaminated the plant and processing equipment by washing down exterior surfaces and acid washing of interior surfaces. The decontaminated equipment (provided on pg. I.7) was placed in storage

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either in processing building or the parking pad adjacent to the building.

Prior to removal from the site, the exterior surface of the decontaminated processing equipment will be resurveyed, re-decontaminated if necessary and removed to a licensed facility. The wellfield trailer will be moved to a licensed facility or decontaminated for release for unrestricted release. Buried process trunk lines and sump drain lines to the pond will be removed and shipped with other miscellaneous waste to a licensed disposal facility. The plant building and parking area will be decontaminated to meet the unrestricted use criteria defined in Table 1 of "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Materials," September 1984. The plant building, parking area, small fenced compound, unused insulated pipe, generator shed and plant loading bay will be left for the landowner upon approval by the WDEQ.

Health Physics and Radiation Safety Program

The Health Physics and Radiation Safety Program will be conducted by the Radiation Safety Officer (RSO) and the Radiation Safety Technician (RST). The NRC has reviewed the attached resumes and has qualified Sheryl McArt and Roger Garling as RSO and Richard Appel as RST in accordance with the qualifications outlined in Regulatory Guide 8.31. The RSO will design and implement a program to document decontamination processes and to ensure that occupational radiation exposure levels are ALARA. Records required to document health physics surveys will be maintained onsite by the RSO during decommmissioning.

All workers will participate in a worker training program implemented by the RSO. The training program will be consistent with Regulatory Guide 8.31. Should the use of respirators be deemed necessary by the RSO, UNC Teton should provide training in the correct use of respirators to the workers.

When decommissioning activities begin, access to the plant building and pond area will be controlled. In the plant, all process equipment and plant areas will be decontaminated for unrestricted release in accordance with NRC decontamination criteria. Ventilation in the building will be provided by opening all venting and doors for free circulation of outside air during decontamination.

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In the pond area, during decontamination, the sludge will be kept moist and if necessary other dust abatement techniques will be applied. If necessary, pond workers will wear special clothing, but at a minimum, workers will wear rubber boots or overshoes which are easily decontaminated. Respirators will be available should conditions warrant. A final determination of how to monitor this potential exposure and prevent the spreading of contamination while handling the sludge will be made once the results of the pond sludge analysis have been complete. The NRC will require UNC Teton to submit the results of the sludge analysis and changes to health safety program resulting from the analysis.

Health Physics surveys will be conducted in accordance with 10 CFR Part 20 and Regulatory Guide 8.30. The radiation equipment listed in Table 2.1 of the Decommissioning Plan will be available during decommissioning. The instruments will be calibrated prior to initial decontamintion activities and recalibrated at 6-month intervals or as necessary according to manufacturers' recommendations. The NRC will also require UNC Teton to calibrate the radiation instruments daily when in use against an appropriate radiation check source.

All workers will be monitored for alpha contamination prior to leaving the site. The action level for required decontamination will be 1000 dpm per 100 sq. cm. Any site equipment to be released for unrestiricted use will be surveyed in accordance with NRC decontamination guidelines. In-plant radon surveys will be continued as defined by License Condition Nos. 29 and 30 through decommissioning.

The decommissioning plan proposes radon daughter samples will be taken in the plant prior to beginning decontamination and in the pond area before and during decontamination. Because of the low levels of radon daughters expected within the plant and at the ponds during decontamination, the NRC does not consider the proposed radon daughter surveys to be adequate for worker protection. Whereas some residue (dust) may become airborne within the plant and in the pond area during decontamination activities, the NRC will require gross alpha air samples before and during decontamination activities within the plant and in the pond area. Air particulate gross alpha surveys will consist of at least a 3000 liter sample every 2 weeks. If gross alpha exceeds 25 percent of 1×10^{-10} uCi/l (or 2.5×10^{-11} uCi/ml) sampling frequency should increase to weekly. Time weighted exposure records should be kept for all workers. In the pond area, air particulate gross alpha surveys should be taken at the downwind edge of the pond every 2 weeks.

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Background samples should be taken upwind offsite prior to beginning decommissioning activities.

Transportation of all contaminated waste materials and equipment will be in accordance with the Department of Transportation and U.S. Nuclear Regulatory regulations. It is not anticipated that the materials being transported will exceed 2000 pCi/g specific activity, therefore placarding, special packaging or sampling requirements will not be necessary. Gamma exposure on the outside of the truck will not exceed 200 mRem/hour and inside the cab will not exceed 2 mRem/hour. Removable surface contamination on the trucks will be kept within the limits of 22,000 dpm/100 cm^2 of beta gamma and 2,200 dpm/100 cm^2 of alpha contamination.

Areas of possible soil contamination around the site, including the well fields, pond(s), discharge channel, and plant, will be identified using a gamma survey. The survey will be conducted using a grid with 100-foot intervals. Grid measurements will be supplemented with random readings taken in between grid points to ensure that a minimum of 25 measurements per feature (e.g., ponds, well fields, etc.) are obtained. Areas where gamma exposures in air, measured approximately 1 meter above the ground, are greater than 5 uR/hr above background may indicate concentrations of radium in the soil greater than 5 pCi/g. Those points with the greatest elevated gamma exposure will be sampled for soil profile information to determine the depth of radium contamination. The action level for flagging and subsequent soil sampling during the grid survey will be 20.1 uh/r.

Areas characterized by Ra-226 concentrations greater than 5 pCi/g in the first 15 cm of soil or 15 pCi/g in any 15 cm interval averaged over 100 square meters below the surface will require cleanup. The action level for soil removal will be 5.6 pCi/g average Ra-226 concentration over 100 square meters. Contaminated soils in these areas will be removed and hauled to a licensed disposal facility. A second gamma survey then will be performed to insure that the site is clean.

Well Abandonment and Surface Reclamation

The decommissioning plan states that all production, injection, observation and monitoring wells within the test site will be sealed in accordance with Wyoming Department of Environmental Quality (WDEQ) and State Engineers requirements. All areas of significant disturbance, including unreclaimed well field areas, evaporation pond access roads,

building or trailer sites will be reclaimed and reseeded in accordance with WDEQ and Surface Owner requirements. Certain structures such as the process building, generator shed and site fencing, will be decontaminated as necessary and left intact for landowner use after meeting unrestricted use standards.

Recommendations and Conclusions

Based on my review of the proposed decommissioning plan, I conclude that UNC Teton has determined adequately the proper course of action for decommissioning the Leuenberger site. The minor modifications discussed above should be incorporated into the decommissioning plan. I therefore recommend that Source Material License No. SUA-1373 be amended by addition of License Condition No. 37, to read as follows:

37. The decommissioning plan submitted by UNC Teton on April 30, 1985, is approved with the following modifications:

(a) The licensee shall remove any contaminated soils exceeding 5 pCi/g Ra-226 above background at the surface or 15 pCi/g Ra-226 above background at 15 centimeter intervals below the surface averaged over 100 square meters, regardless of whether after recontouring the original surface (i.e., pond bottom) is 15 centimeters or greater below the surface.

(b) The licensee shall submit for NRC review and approval, the results of pond sludge analysis and any changes to the radiation health safety program resulting from this analysis.

(c) The licensee shall calibrate the radiation instruments daily when in use against an appropirate radiation check source.

(d) The licensee shall conduct air particulate gross alpha surveys, rather than radon daughter surveys, before and during decommissioning activities within the plant and in the pond area. In the plant area, air particulate gross alpha surveys will consist of at least a 3000 liter sample every 2 weeks. If concentrations of gross alpha exceed 25 percent of 1×10^{-10} pCi/l (or 2.5 uCi/ml), the sampling frequency should increase to weekly. Time

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weighted exposure records should be kept for all workers. In the pond area, air particulate gross alpha surveys should be taken at the downwind edge of the pond every 2 weeks. Background samples should be taken upwind offsite prior to beginning decommissioning activities.

/s/

Sandra L. Wastler, Project Manager
Licensing Branch 1
Uranium Recovery Field Office
Region IV

Original Signed By
Edward F. Hawkins

Approved by: _____
Edward F. Hawkins, Chief
Licensing Branch 1
Uranium Recovery Field Office, Region IV

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