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 Docket No. 40-8745

MEMORANDUM FOR: Harry J. Pettengill, Chief  
 Licensing Branch 2  
 Uranium Recovery Field Office, RIV

FROM: George C. Pangburn, Senior Project Manager  
 Licensing Branch 2  
 Uranium Recovery Field Office, RIV

SUBJECT: STAFF GUIDANCE ON PREPARATION OF A PLAN FOR  
 GROUND-WATER RESTORATION, DECONTAMINATION,  
 DECOMMISSIONING AND RECLAMATION OF THE BISON BASIN  
 PROJECT

### Background

The purpose of this memorandum is to establish specific guidance for planning ground-water restoration, decontamination, decommissioning and reclamation of the Bison Basin project. The guidance contained herein reflect the staff's previous experience in reviewing in-situ facility decommissioning plans, knowledge of the specific layout of the Bison Basin project and criteria and standards from referenced sources. The staff believes that this guidance should provide the basis for an independent contractor to prepare a plan to return the site to a condition suitable for unrestricted use. The guidance is predicated on the limited resources available to fund these efforts in the form of surety bonds which are in the process of being forfeited by the State of Wyoming Attorney General's Office.

### Conceptual Sequence

Although it is not possible to lay out a specific schedule for the plan at this time, the staff believes that it is advisable to develop a general sequence of activities for achieving restoration and

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decommissioning. Because certain on-site equipment must be utilized in restoration, the staff feels that the sequence outlined below should be observed by the contractor in developing the plan:

1. Ground-water restoration
2. Wellfield decommissioning and decontamination
3. Plant and ancillary facility D&D
4. Evaporation pond D&D
5. Site reclamation.

#### Ground-Water Restoration

The staff has examined the limited data available on ground-water quality within the wellfield and, taking into account the resources available for achieving restoration, has concluded that the preferred methodology for consideration by the contractor is ground-water sweep/clean water recycle with the use of a reductant to reduce heavy metals. A less preferable alternative would be ground-water sweep alone with use of a reductant. (The staff notes here that restoration of the Bison Basin wellfield was achieved using a small reverse-osmosis unit and that the operator had based conceptual restoration plans for the commercial operation on the use of a scaled-up R-O unit. However, the cost of this scaled-up unit has been estimated at \$200,000 to 300,000. As such these figures represent 20 to 30 percent of the available funds for all site clean-up and reclamation operations, a fraction which the staff believes to be too high.) If recycle is not employed in concert with ground-water sweep, the contractor will need to incorporate into the plan provisions for disposal of recovered groundwater either through barium chloride treatment and surface discharge or accelerated evaporation. Choice of a restoration technique will also depend upon estimates by the contractor of the affected aquifer volume.

The methodology for restoration should specify pumping in an ordered sequence proposed by the contractor to optimize removal of lixiviant from the wellfield and containment zone (that area between the edge of the mined unit and the monitor wells). The pumping sequence should take into consideration the direction of major transmissivity as well as any excursions which took place during operations.

Irrespective of the methodology chosen, the contractor should plan to sample all wells prior to restoration activities for Guideline 8 constituents. Pumping rates during restoration should be maintained such

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that significant drawdown (greater than 6 inches) can be measured at the monitor wells. Pumped wells should be sampled regularly (at least weekly) and analyzed for restoration parameters. Pumped volumes and waste volumes discharged should be documented daily and monitor wells should be sampled monthly for restoration parameters.

The contractor should plan to prepare a monthly report to WDEQ and NRC detailing restoration progress, problems, deviations from the approved plan and any anomalous data recorded. The process of restoration will continue until restoration parameters stabilize at or near their respective target values as evidenced by at least three consecutive weekly samples. The plan should consider a minimum 12 month stabilization period with biweekly or monthly sampling of selected wellfield and monitor wells and analysis for restoration parameters. Monitoring frequency reduction may be considered if the first 4 months of data give no indication of problems.

#### Wellfield D&D

The existing wellfield (Mining Unit No. 1) consists of approximately 250 injection, recovery and monitor wells over an 11 acre area. In planning D&D of this area, the contractor should first propose a survey methodology for identifying contaminated areas of the wellfield. In addition, the contractor should specify procedures for plugging wells to meet WDEQ requirements. Methods for removal and disposal of piping and other wellfield apparatus as well as contamination surveys for any salvageable equipment should be identified. All materials to be released from the restricted area of the site will be required to meet the NRC's "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source of Special Nuclear Material." Disposal plans for contaminated soil including an identified disposal site, disposal costs associated with that site and criteria for identification of contaminated soil should be provided. Finally, the contractor should specify plans for final verification surveys of the decommissioned wellfield.

#### Plant and Ancillary Facility D&D

The contractor should itemize all major process and ancillary equipment on the site, and the potential radiological hazard associated with each. Pre-decommissioning decontamination measures designed to reduce these

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hazards, such as surface surveys, washdown or other measures, should be identified. The contractor should state the general sequence in which equipment will be removed and what the fate of major components will be (i.e., release for unrestricted use, disposal at a licensed facility, etc.). The plan should discuss what will happen with the process building once it is emptied of equipment. This discussion should address survey procedures, decontamination measures, waste disposal plans and costs and ultimate fate of the vacated structure. Additional considerations such as removal of utilities, staff trailers, non-process equipment, and other site improvements should be addressed as well.

#### Evaporation Pond D&D

D&D of the evaporation ponds will probably follow plant D&D, depending upon the time involved in evaporating the residual liquids in the ponds. The contractor should provide estimates of the volumes of sludges and liner material to be disposed of. Procedures for sludge removal, handling and transport to a pre-determined disposal site as well as radiation safety during these activities should be identified. Similar procedures for the liner and any contaminated subgrade material should be included. The contractor should also address the costs of liner and sludge disposal. The contractor should consider as a part of pond D&D, measures for regrading the constructed pond embankments and conducting final soil contamination surveys. Finally, the contractor should address removal and disposal of the security fence surrounding the existing pond area.

#### Site Reclamation

The last step in the conceptual sequence identified by the staff is reclamation of the site in accordance with terms and conditions of the State's Permit to Mine. The contractor should identify the post-mining land use and those measures designed to achieve that use. More specifically, the contractor should specify recontouring, final grading and site drainage, topsoil replacement and revegetation plans. The plan should specify seed mix, application rates and measures to enhance

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establishment of an adequate cover. Finally the plan should estimate the time frame necessary for such establishment and release of the site to the surface owner.

/S/

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Approved by:

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