DOE's APPROACH TO GROUNDWATER COMPLIANCE ON THE UMTRA PROJECT

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EXECUTIVE SUMMARY

Compliance with the mandate of the Uranium Mill Tailings Radiation Control Act (UMTRCA) at Uranium Mill Tailings Remedial Action (UMTRA) Project sites requires implementation of a groundwater remedial action plan that meets the requirements of Subpart B of the U.S. Environmental Protection Agency's (EPA) proposed groundwater protection standards (40 CFR 192).

The UMTRA Groundwater Project will ensure that unacceptable current risk or potential risk to the public health, safety and the environment resulting from the groundwater contamination attributable to the UMTRA sites, are mitigated in a timely and cost-efficient manner. For each UMTRA processing site and vicinity property where contamination exists, a groundwater remedial action plan must be developed that identifies hazardous constituents and establishes acceptable concentration limits for the hazardous constituents as either 1) alternate concentration limits (ACL), 2) maximum concentration limits (MCLs), 3) supplemental standards, or 4) background groundwater quality levels.

Project optimization is a strategy that will aggressively work within the current regulatory framework using all available options to meet regulatory requirements. This strategy is outlined below.

The recommended near-term strategy begins by moving forward with a Programmatic Environmental Impact Statement (PEIS) to cost-effectively provide the National Environmental Policy Act (NEPA) compliance framework for all sites. The PEIS effort will be accompanied by an aggressive public outreach Project that will be implemented in conjunction with the scoping process. The other important near term activities include the following:

- Using the Gunnison site to demonstrate the use of institutional controls.
- Using the Salt Lake City site as a demonstration project for application of supplemental standards.
- Using the new Rifle site for demonstrating secondary source term mitigation techniques and application of ACLs.
- Developing groundwater modeling requirements for natural flushing demonstration to the U.S. Nuclear Regulatory Commission (NRC).

The recommended long-term strategy will be based on the successful demonstration of the available regulatory options explored during the near-

term activities. Proposed decision-making processes are presented for each type of regulatory and technical option. The long-term strategic goal is to use site-specific risk assessments to select and justify the most cost-effective compliance option for each site.

The recommended near-term strategy can be accomplished with currently projected fiscal year (FY) 1993 and FY 1994 funding. However, as additional and more difficult sites are undertaken, higher levels of funding will be required.

To minimize these costs, the UMTRA Project advocates the use of the observational approach to accomplish all of these compliance goals. Data from the Superfund program have proven that site characterization followed by pilot plant installation, and implementation of the selected remediation is both costly and time consuming. The observational approach allows for immediate application of a selected corrective action approach without undue site characterization.

The estimated cost, fully loaded and escalated, of the proposed project optimization approach is $426 million with a contingency of $162 million. This represents a better than 50 percent cost savings over the earlier, more conventional approach to remedial action.

INTRODUCTION

LEGAL MANDATE

The U.S. Congress enacted the UMTRCA on November 8, 1978. The initial purpose of the Act was to conduct assessments and remedial actions at designated sites to "stabilize and control such tailings in a safe and environmentally sound manner and to minimize or eliminate radiation health hazards to the public..." (PL 95-604, 1978). Title I of the Act authorizes the Uranium Mill Tailings Remedial Action Project and directs the Secretary of Energy to enter into cooperative agreements with the affected states and Indian tribes. Title II of the Act sets forth licensing and regulatory requirements for uranium mill tailings.

Section 275 of the Atomic Energy Act (AEA), as amended by section 205 of the UMTRCA, requires the EPA to promulgate standards "for the protection of public health, safety and the environment from radiological and non-radiological hazards associated with residual radioactive material...located at uranium mill tailings sites and depository sites for such material... Standards promulgated pursuant to this subsection shall, to the maximum extent practicable, be consistent with the requirements of the Solid Waste Disposal Act, as amended... After October 1, 1982, if the Administrator has not promulgated standards in final form under this subsection, any action of the Secretary of Energy... shall comply with... the standards proposed by the Administrator under this subsection until the Administrator promulgates the standards in final form." UMTRCA further amends the AEA to give the NRC enforcement and licensing authority to ensure compliance with the EPA standards.

Although the 1978 Act has no explicit mention of groundwater, the need for groundwater protection is inferred from the requirement to be consistent with the Solid Waste Disposal Act (SWDA). Senate Report 100-543, which accompanied the 1988 UMTRA Amendments Act, explicitly authorizes the U.S. Department of Energy's (DOE) authority to perform groundwater restoration without limitation, and also recognizes that Section 112 contemplates a two-phased remedial action project at sites where long-term groundwater remedial action will be required. The need for the NRC to conduct concurrence and licensing in two phases is also recognized here.

In October 1982, the EPA issued a Final Environmental Impact Statement for 40 CFR 192 and on January 5, 1983, the EPA issued final standards for control and cleanup of residual radioactive material (RRM). On September 3, 1985, the Tenth Circuit Court of Appeals remanded the groundwater portion of the standards to the EPA because they were not consistent with the requirements of the Resource Conservation and Recovery Act (RCRA), which amends the SWDA. On September 24, 1987, the EPA issued new proposed standards for groundwater protection based on RCRA regulations for disposal facilities. The September 1987 proposed standard established the groundwater cleanup requirements with which the groundwater compliance strategy of the UMTRA Project must comply.

On January 9, 1990, the Office of Management and Budget (OMB) sent 40 CFR 192 back to EPA to resolve any outstanding issues raised by the DOE and the NRC. OMB still opposed promulgation of the proposed standards.

REGULATORY REQUIREMENTS

The proposed groundwater standards include the following requirements:

- Tailings remedial actions must protect groundwater.
- Groundwater under tailings pile must not exceed MCLs or local background concentrations for regulated constituents at the downgradient edge of the disposal facility.
- Groundwater contamination caused by milling and related activities must be cleaned up to meet MCLs or background.
- MCLs are based on EPA primary drinking water standards with the addition of uranium and other constituents of interest.
- For temporary and spatially limited seepage from tailings piles, an alternate concentration limit may be applied until MCLs or background can be met.
- If the local groundwater is already polluted or is not suitable as a domestic water supply, then supplemental standards may be assigned.
- Monitoring of disposal cell performance is required.
- Compliance with subpart B of the standards may not exceed 100 years.

In addition to meeting the requirements of proposed groundwater protection standards 40 CFR 192 (the September 24, 1987 version is still effective), DOE activities must comply with other relevant regulations.

Although DOE is not explicitly required to adhere to relevant state groundwater protection or cleanup standards, the states may withhold concurrence in any cost-shared remedial action if they are not satisfied with the remedial action plan. States may impose their own regulatory requirements on the UMTRA remedial actions.

PROJECT BACKGROUND

Section 206 of UMTRCA directs the EPA Administrator to "...promulgate standards of general application ... for the protection of the public health and safety, and the environment from radiological and non-radiological hazards associated with residual radioactive material ... Standards promulgated pursuant to this section shall, to the maximum extent practicable, be consistent with the requirements of the SWDA, as amended." The Uranium Mill Tailings Remedial Action Amendments Act of 1987, which went into effect on September 23, 1988, amended section 112(a) of the UMTRCA as follows:

> "...the authority of the Secretary to perform groundwater restoration activities under this title is without limitation."

This is the statutory language that explicitly allows for a groundwater remedial action project.

On January 5, 1983, the EPA Administrator promulgated final standards (40 CFR 192) for the disposal and cleanup of inactive uranium mill tailings sites under the UMTRCA. These standards were challenged in the U.S. Tenth Circuit Court of Appeals and on September 3, 1985, the court set aside the provisions

for groundwater protection because they were not consistent with the provisions of the SWDA, as amended by RCRA. The RCRA regulation set uniform, as opposed to site-specific, standards for the protection of groundwater. On September 24, 1987, standards were proposed for the protection and cleanup of groundwater. These proposed standards are essentially identical to the basic provisions of the RCRA standards of 40 CFR 264.92-94 regarding groundwater protection at waste disposal facilities. In addition, provisions were added allowing for the application of supplemental standards, institutional controls and natural restoration through passive flushing where no community drinking water source is involved. This is the standard to which the UMTRA Project is now subject.

As part of the surface remediation requirements, groundwater protection strategies were required for each site to ensure that continued contamination of groundwater resources does not occur. In the course of developing those strategies, groundwater data has been collected that documents that past milling and disposal activities have contaminated the underlying groundwater resources at 20 of the 24 UMTRA sites. Thirteen of the 20 sites may pose potential health risks or violate existing Federal or state groundwater regulations. The major contaminants are uranium and nitrate. The surface remediation activities have essentially been limited to removing or controlling the source of groundwater contamination but have not begun to address the groundwater contamination problems at each site.

Development of the groundwater protection strategies required for the surface remediation portion of the UMTRA Project has not only documented the nature of the groundwater problems at each site, but has also heightened the awareness of those problems at several sites to the general public, the states and tribes, and to the NRC. It is clear to all concerned that the surface remediation actions have not solved the groundwater contamination problems. In several communities, such as Gunnison, Colorado, the public is very anxious to not only have the visible contaminants at the surface removed or stabilized, but to eliminate the potential health hazard associated with the groundwater contamination migrating from the site. The state of Texas is similarly anxious to ensure that the DOE addresses the groundwater contamination problem at Falls City, Texas. The Navajos are concerned about cleaning up the groundwater contamination at the Monument Valley, Arizona site. Finally, the NRC anticipates that the UMTRA Project will quickly and efficiently address the groundwater problems at all sites so the total restoration and licensing of the sites can be accomplished in a timely and environmental sound fashion.

PROJECT PLANNING DOCUMENTS

Groundwater restoration will be guided by several programmatic documents. The PEIS will provide the decision-making methodology for selecting a compliance method. The Technical Approach to Groundwater Restoration (TAGR) document provides an overview of how technical business for the groundwater project will be conducted. The TAGR covers the regulatory basis and requirements for compliance and provides a framework for the field activities needed to meet those requirements. As discussed in the TAGR, the field activities will follow the observational method.

Procedures for field activities are specified in numerous standard operating procedures that are filed in the Jacobs Engineering Albuquerque Operations Manual. Quality assurance (QA) issues are addressed in the Quality Assurance Implementation Plan (QAIP), which provides QA specifications for the collection of environmental samples and data, and for the analysis of

environmental samples. The QAIP will specifically address data quality objectives for collection and analysis of data. Quality issues associated with data and samples related to geology, hydrology, chemistry, biology, and engineering are covered by the QAIP.

Other programmatic documents include the Environment, Safety, and Health Plan and the Public Information and Participation Plan. These two documents are very important to the Project and reveal a commitment to the "new culture" in the areas of environment, health and safety and, in particular, in the area of proactive public involvement.

THE GENERAL STRATEGY

OBSERVATIONAL APPROACH TO SITE CHARACTERIZATION

The traditional approach to site characterization has been to spend considerable time and money to characterize completely site conditions and the extent of groundwater contamination. The ultimate goals of site characterization are to identify the contaminants of concern, determine the extent of contamination, and gather adequate hydrologic and chemical data to design a remediation project and to predict how the system will react to the selected remedy. Once a remedy is selected, a pilot program is normally instituted to determine how the groundwater system will react to the proposed remediation and to gather adequate data for final treatment design parameters.

Data collected to date at the 24 UMTRA sites have identified the contaminants of concern and, at most sites, the extent of groundwater contamination. Preliminary hydrologic data have also been collected. However, these data are not adequate to determine how the groundwater system will react to various remediation strategies or what kinds of treatment equipment would be required, if pumping and treating were the necessary option. These data are not sufficient to conduct comprehensive baseline risk assessments.

To minimize expenditures and expedite groundwater remediation design, it is proposed that the observational approach to site characterization and remediation design be used. A minimum number of monitoring wells will be installed to gather appropriate water level and water quality data. Selected wells would be tested to determine necessary hydrologic data for modeling of the site to evaluate natural flushing or gradient manipulation techniques.

If contaminant removal is anticipated, a pumping well would also be installed somewhere in the contaminant plume to determine the reaction of the hydrologic system to pumping and the water quality to be treated. A portable treatment plant would be used to treat the contaminated water being pumped and to test the relative effectiveness of various combinations of treatment strategies. Modifications to the systems would be made and the resulting changes in system operations would be observed. Use of this approach to site characterization and remediation design collects only the required data in direct response to proposed remediation strategies. If pumping is required, early action also retards or checks the further spread of contaminants until the permanent remediation program can be approved and installed.

REMEDIAL ACTION DECISION-MAKING

Although the physical, chemical, and risk characteristics of the UMTRA sites vary, a common decision-making pattern for attaining compliance with the groundwater standards applies to all of them. The remedial action decision-making process is shown in Figure 1.

The remedial action decision-making process for all sites is guided by the PEIS. The first decision point in the PEIS comes after it is determined whether there is any groundwater contamination above MCLs or background. For those sites with no groundwater contamination, no action is required and the sites may proceed directly to the licensing stage.

For those sites with contamination, a series of steps follows, as shown in Figure 1. First, data are collected and a baseline risk assessment is performed. If there is an acceptable level or risk from the contamination, a

petition for supplemental standards or ACLs will be prepared. After acceptance of the petition, and completion of appropriate monitoring, licensing will be completed.

If the baseline risk assessment shows that the groundwater risk is unacceptable, site investigation using the observational method and selection of a remedial action will follow. Passive restoration (natural flushing) will be considered first. If a demonstration can be made that contaminant concentrations can be reduced to MCLs or background within 100 years, and that human health and the environment will be protected during this period, then licensing can be completed. Alternatively, an ACL petition may be filed to show that human health and the environment will be protected, even if MCLs or background will not be achieved in 100 years.

In other cases, it may be determined that passive groundwater restoration is not acceptable, and active restoration options must be considered. These options include the following:

- Plume management and redistribution
- Secondary source remediation ("hot-spot" removal)
- Bioremediation (particularly for nitrate)
- Extraction and land application
- Other innovative technologies

For any of these technologies, when background water quality for MCLs are achieved, licensing can be completed. In cases where even active restoration does not achieve background or MCLs, an ACL application may be submitted. Current plans call for applying for an ACL after 10 years of natural flushing, if it can be shown that no further improvement in aquifer quality can be expected. If the ACL demonstration is successful, then licensing can proceed. Alternatively, if an ACL demonstration cannot be made, then an additional investigation may be performed and another restoration option may be selected.

THE ROLE OF RISK ASSESSMENT

Risk assessment will be used, from the earliest stages, to aid in the evaluation of sites. Risk assessments are conducted for the following four purposes on the UMTRA Groundwater Project:

- Preliminary risk assessments are used to aid in prioritizing sites, scope data collection, and determine if a site presents immediate health risks.
- Baseline risk assessments, where needed, provide a comprehensive integration and interpretation of demographic, geographic, physical, chemical, and biological factors at a site to determine the extent of actual or potential harm. This information is useful in determining the need for remedial action.
- Risk evaluation of remedial alternatives is performed to evaluate risks to humans or the environment associated with the various remedial strategies. For example, this may include evaluation of environmental impact resulting from groundwater pumping and discharge or may include a demonstration of no impact for ACLs.

- After remediation, an evaluation of residual risks is conducted.

The information gathered for each of these risk evaluations is used to determine the need for subsequent evaluation. Several sites may be eliminated from active restoration consideration after a preliminary risk assessment if there is no current or future threat to the environment. Likewise, much of the data from a baseline risk assessment can be used to support ACL or supplemental standard demonstrations, or identify sensitive habitats or receptors that may be of concern in selecting a remedy. It is anticipated that this risk assessment process will provide a cost-effective basis for making remedial action decisions.

PROJECT OPTIMIZATION

Project optimization involves working within the current regulatory framework using all available regulatory compliance mechanisms. Since the DOE is under no legally-limiting time constraint to initiate or to complete groundwater remedial actions, the DOE is in a better position to aggressively pursue ACLs, supplemental standards and other mechanisms to achieve regulatory compliance. The UMTRA Project tended to yield to some less than reasonable regulatory demands during surface remedial action because of the statutory deadlines imposed on the project. Since there are no such severely limiting statutory deadlines for groundwater remediation, the DOE is free to explore with the regulators the use of alternative approaches that will allow for the most cost-effective approach to compliance with regulatory requirements.

ASSUMPTIONS

The following assumptions are made relative to project optimization:

- ACLs will be granted, if aggressively pursued and if states cooperate.
- It will be in the financial interest of the states to cooperate with the DOE in finding the most cost-effective approach to regulatory compliance.
- States will cooperate with the DOE in establishing effective institutional controls.
- Natural flushing will be acceptable where there is no significant potential for exposure.
- States can be persuaded to support DOE supplemental standards applications, where the groundwater resource is of minimal utility (as compared to zero utility).
- Provision of an alternate water supply system, as at Gunnison, Colorado may be viewed by the state as part of an acceptable institutional control mechanism.
- Baseline risk assessments will be an essential component for decision-making and implementation of the observational approach.

If DOE successfully obtains state support by optimizing its use of regulatory compliance options, the NRC may demonstrate a greater degree of flexibility than has been assumed in earlier groundwater project scenarios. It is

reasonable to believe that the NRC and the states and tribes will also be more receptive to innovative remediation approaches, since the traditional "pump-and-treat" schemes can be very expensive and have variable benefits. The DOE is not likely to have success with compliance optimization at all sites, but an aggressive implementation of this approach can be expected to have considerable success and substantial cost savings.

Positive observations

The following are positive observations:

- This approach results in full regulatory compliance.
- There is significant potential for cost savings over the previous project planning assumptions.
- The approach is fully consistent with management alternatives in the proposed PEIS.
- Developing this approach with the regulators and affected states/tribes may prove useful at other DOE sites.
- There is greater potential for early successes for the project.
- Programmatic guidance and policy documents, currently in draft form, are compatible with this approach.

Negative observations

The following are negative observations:

- The DOE may be perceived as uncooperative by performing the minimum amount of remediation instead of what the public may consider a complete job.
- There may be negative public reaction as the DOE aggressively seeks regulatory relief that will be perceived as non-compliance.
- States and tribes will need to be full partners as well as participants.
- Remediation of some low risk sites may still be required.
- The DOE may be perceived as taking a shortcut by addressing site-specific risks instead of cleaning the groundwater to numerical standards.

MEETING THE STANDARDS

As noted above, the primary form of complying with the standards is by meeting the MCLs. In the proposed approach, the preferred method of attaining MCLs would be via natural flushing. The actual method of compliance and the numeric limitation to be achieved will be determined, in conjunction with the states, tribes and regulatory authorities on a case-by-case basis.

Supplemental standards

At those processing sites where the groundwater is of limited use, the project may obtain a supplemental standard in lieu of meeting the MCL, background or an ACL. Limited use groundwater means the amount that can be withdrawn from a domestic well is not sufficient to meet the daily needs of a family of four (150 gpd), is of such poor quality that it is not suitable for any domestic use (>10,000 mg/L TDS), or there is widespread ambient contamination not due to the processing of RRM that cannot be cleaned up by using treatment methods reasonably employed in public water supply systems. In addition, a

supplemental standard may be obtained if restoration of groundwater is technically impracticable from an engineering perspective, or if the remedial actions would directly produce environmental harm that is excessive compared to the health benefits of remedial action.

Successful supplemental standard arguments have been made for surface remedial action at Spook, Wyoming; Falls City, Texas and for both surface and groundwater at Ambrosia Lake, New Mexico. The Falls City supplemental standard was based on the fact that the uppermost aquifer had wide-spread ambient contamination that was not amenable to remediation using treatment methods used in public water supply systems.

Alternate concentration limits

At sites that do not qualify for supplemental standards, ACLs may be btained in lieu of meeting MCLs or background under certain circumstances. To obtain an ACL for any constituent in the groundwater the DOE would have to provide data to support a finding that the proposed concentration limit would not pose a substantial present or potential hazard to human health or the environment. For hazardous constituents for which the EPA has not promulgated an MCL, background water quality is the standard. To obtain an ACL, the September 1987 version of the proposed groundwater protection standards requires that the DOE must demonstrate that the concentration is as low as reasonably achievable (ALARA). The May 1991 version of the standards now under review at OMB has omitted the ALARA requirement.

The EPA views the granting of ACLs as a standard setting activity, which it is unwilling to delegate to the NRC in the absence of a formal rule-making that would demonstrate that the NRC's ACL procedures would be as stringent as the EPA's. Thus, there is currently dual jurisdiction in the granting of ACLs, with concurrence by both the EPA and the NRC.

The DOE has not yet attempted to obtain an ACL for the UMTRA Project. If the states share costs in groundwater remedial actions, it is reasonable to expect their support in obtaining ACL approval from the NRC and/or EPA.

Natural flushing and institutional controls

Natural flushing is an option where passive restoration can be expected to occur naturally in less than 100 years and where groundwater is not now or projected to be used for a community water supply, provided that satisfactory institutional control of public water use and an adequate monitoring program is established and maintained throughout the remediation period. The EPA observes that this approach is particularly apropos where active methods are impracticable or if partially cleansed groundwater can achieve the levels required by the standards through natural flushing. Natural restoration is most viable when the contaminated aquifer discharges into a surface water body that will not be adversely affected by the contamination.

Natural flushing may be used as a follow-on to a period of active remediation methods. The rule implies that flushing to standards may be achieved by using an ACL as the ultimate cleanup goal.

Institutional controls will be required for the successful implementation of natural flushing. The institutional controls should be enforceable by permanent government entities or have a high degree of permanence. The controls should be reliable for the natural flushing period.

Institutional controls

As stated above, institutional controls are allowed as an adjunct to natural flushing. The greater the variety and effectiveness of institutional controls, the greater the viability of natural flushing as a remediation approach. Currently available institutional controls include the following:

- Physical control of land over the relic plume.
- Zoning restrictions.
- Property record annotations.
- Restrictions on well installation.

In some cases, the provision of alternate water supply systems may be a significant part of developing a viable institutional control plan; however, the provision of an alternate water supply should not be considered to be an institutional control mechanism. The DOE may also consider seeking legislation or rule-making by an affected state or tribe to provide additional control mechanisms. It should be noted that water rights in the western states are a very sensitive issue and any efforts to restrict them may be very controversial.

Risk-based strategies

Unless the regulatory basis for the UMTRA Groundwater Project is changed by amending the UMTRCA, DOE may not justify a "no action" decision solely on the basis of a lack of a current risk to human health or the environment. None the less, risk assessment will play an important role in the currently available regulatory strategies. Demonstrating a lack of significant current or potential risk to human health or the environment is a key factor in obtaining a supplemental standard or alternate concentration limit, or in justifying the use of natural flushing.

Active remediation techniques

The primary contaminants of concern at the 20 UMTRA sites where groundwater contamination has been documented are nitrates and uranium. Additional contaminants present at some sites do not constitute a major portion of the problem at any sites. If ACLs, supplemental standards, or natural flushing will not satisfy the regulatory requirements for all sites, active technical approaches to remediating contaminated groundwater at the UMTRA sites will be considered in conjunction with available passive techniques.

TARGET SITE REMEDIATION STRATEGIES

The basic approach to remedial action on a site-by-site basis was re-examined using the assumptions of project optimization and by applying the decision-making logic discussed earlier.

The re-evaluation process yielded only two candidate sites where active methods would be warranted, five sites where supplemental standards would be appropriate, four sites where ACLs would be the primary method of compliance, four no action sites that would be dealt with in the PEIS and nine natural flushing sites. Several of the natural flushing sites would be ACL candidates after a 10-year observation period.

Because the success of the aggressive project optimization approach relies on public support, a very thorough and attentive public participation and involvement activity is integral to the overall groundwater project.

NEW GROUNDWATER PROJECT COST ESTIMATES

The budget assumptions for the UMTRA Groundwater Project were re-examined in light of the proposed project optimization approach. The detail of the site-by-site budget is presented in Appendix A. The estimated cost, fully loaded and escalated, of the proposed project optimization approach is $426 million with a contingency of $162 million. This represents a better than 50 percent cost savings over the earlier, more conventional approach to remedial action.

Key budget assumptions that are not obvious from the project optimization assumptions include the following:

- An interim groundwater monitoring project to be conducted between the conclusion of surface remedial action and the initiation of groundwater remedial action.
- It is conservatively assumed that after 10 years of natural flushing the project will take an additional three years to obtain an ACL at each of the nine natural flushing sites.
- Monitoring periods are not expected to exceed a maximum of 13 years after initiation of a site-specific remedial action. Site-specific monitoring strategies are presented in Appendix A.
- NEPA documents and remedial action plans will be prepared for all but the "no action" sites.

NEPA COMPLIANCE

PROGRAMMATIC NEPA COMPLIANCE

The proposed approach to NEPA compliance is a two-phased plan that will provide an appropriate and responsive vehicle for meeting NEPA requirements related to the UMTRA Groundwater Project. The first phase would use the PEIS format to provide Project level guidance and an assessment of cumulative impacts. The second phase would evaluate site-specific issues in EAs.

The PEIS would provide project level guidance for identifying the criteria that would be used to 1) determine whether groundwater restoration would be pursued on a site-specific basis, 2) identify and evaluate appropriate methods of groundwater restoration, 3) indicate those UMTRA Project sites where the local groundwater quality is very poor and where it might be demonstrated that no action is appropriate, 4) identify sites where no contamination is present, and 5) contain a cumulative assessment of the programmatic and environmental impacts associated with the groundwater restoration phase. It is anticipated that the PEIS would result in the following:

- Identification of the criteria that would be used to determine the need for and extent of groundwater remediation at each site. Based on existing NEPA project guidance, the Project will develop a defensible, decision-making process that will evaluate the applicability of groundwater remediation methods to the variety of conditions encountered at UMTRA Project sites.

- Identification of UMTRA sites where no action may be appropriate and the identification of appropriate institutional controls.

The acceptance of a PEIS as a part of the NEPA decision-making process is well documented. The DOE, as well as other Federal agencies, has successfully used the PEIS as a means to facilitate project planning, to provide an early assessment of potential problems, to assess cumulative impacts, and to reduce the overall scope of subsequent NEPA documents.

Without a PEIS there is no up-front buy-in by the states, tribes and regulators on DOE's approach to compliance. The decision-making process will have to be rejustified in every site-specific NEPA document. The PEIS is also a very important mechanism for positively and proactively involving the public in the DOE's decision-making process at an early stage. This has great potential to reduce any controversy associated with future DOE actions on the UMTRA Project.

SITE-SPECIFIC NEPA COMPLIANCE

It is anticipated that the site-specific NEPA documents would tier off the PEIS and incorporate existing EAs and other technical reports by reference. It is assumed that the general EA format will be used for the site-specific documents. For the most part, these documents will 1) be between 10 to 20 pages in length, 2) reference the PEIS for detail on groundwater restoration methods and the criteria for selecting the type and extent of restoration, 3) reference other UMTRA Project EAs for environmental background information, and 4) reference in-house technical documents for specific information related to aquifer characteristics. A proposed EA format follows:

1. Summary: Provide a brief summary of relevant issues.

2. Proposed Action: Provides a brief summary of the proposed groundwater restoration project.

3. No Action: Provides a discussion of the impacts of not undertaking the proposed action.

4. Affected Environment: Provides geographic description, concentrates on potentially affected components, summarizes the characteristics of the aquifer relevant to the proposed restoration method, and references in-house technical documents.

5. Environmental Consequences: Evaluates only impacted components, but must include evaluation of threatened and endangered species, floodplain/wetland assessment, and archaeological analysis (one-sentence disclaimers).

6. Conclusions: Summarizes any significant impacts and recommended course of action.

PUBLIC INVOLVEMENT

The groundwater project is legally mandated to provide to the public information concerning the environmental consequences of proposed actions, and to "encourage and facilitate public involvement in decisions that affect the quality of the human environment" (40 CFR 1500.2(d) (CEQ, 1978)). Meaningful public involvement early on in the project will result not only in better decisions, but also in broader public acceptance of those decisions (Eiguren, 1991).

As stated by DOE Secretary Watkins in SEN-15-90:

> "... compliance with NEPA should be entirely consistent with efficiency in achieving mission goals if NEPA requirements are considered early in the planning process. Indeed, mission goals are best served by early and adequate NEPA planning ..." (DOE, 1990)

In light of the legal obligation to solicit public involvement and the potential for advancement of the Project's goals as a result, the groundwater restoration project has committed to proactive, relevant public involvement in the decision-making process.

Initially, public outreach orientation efforts will focus on communicating project scope, and on learning citizen values, concerns, and preferences. The public involvement program will be dynamic to accommodate the range of information and participation requirements for the various communities involved, and the decisions to be made regarding remediation activities.

Various project-related educational sources will be available to communities, including site-specific fact sheets, a toll-free telephone information line, site field trips, and demonstrations and discussions by technical professionals. The objectives of the project's educational outreach efforts are to familiarize the public with project specifics, developments, and implementation, and maintain a "no-surprises" approach to UMTRA groundwater restoration.

Early in the project, specific NEPA public involvement requirements will be fulfilled by conducting public scoping hearings for the PEIS, as described in Section 4.0 of this report. These activities are to be preceded, at each site, by community orientations in which the groundwater project is introduced, community concerns are ascertained, and community, state/tribal, and DOE contacts are reaffirmed. The vehicle for this orientation will depend on community needs and preference.

The following is a proposed agenda for community meetings to be held for orientation purposes. The orientation meeting will support public scoping efforts as there is no opportunity in the formal scoping process for interactive dialogue among participants.

COMMUNITY ORIENTATION MEETING AGENDA

An orientation meeting agenda is outlined as follows:

1. Prior to the orientation meeting, the community will be contacted to determine issues the community would like to have discussed at the orientation meeting. At this time, the community will be requested to address the participants at the orientation meeting.

2. The orientation meeting will begin with a community-specific update of UMTRA progress, a discussion of surface accomplishments and obstacles, and a suggestion for public involvement vehicle(s) to be used for resolving community concerns.

3. A presentation by the community will discuss community issues of importance. The DOE will request that suggestions be made for both DOE and community involvement in resolving any concerns.

   Community spokesperson: selected representative of the community who knows community concerns and viewpoints.

4. The groundwater restoration project will be introduced, and differentiated from the surface project. Key components of the new project will be discussed, including the application of the observational method, the role of risk assessment, the commitment to public involvement, the purpose of the PEIS, and public involvement in the scoping process and the implementation plan. In addition, the function and impact on the project of concurrence chains, regulatory framework, and cooperative agreements will be described.

5. A presentation by a state representative will explain the participation of the state in the project and factors impacting state progress.

   State spokesperson: A representative of the lead state agency.

COMMUNITY INVOLVEMENT IN SITE-SPECIFIC ACTIVITIES

After completion of the scoping process, public involvement will be focused on site-specific activities. The project will support extensive public outreach efforts at each site scheduled for site-specific remedial action. The project recommendation will be to hold six community meetings the first year of site-specific activity at each site, and then to reduce the number of meetings each successive year to a minimum of one meeting as long as remediation is conducted. Public involvement activities will be conducted under the umbrella of the program's Public Information/Public Participation (PI/PP) plan (see Appendix C). The PI/PP plan details the overall approach to public involvement and establishes a project philosophy for public outreach efforts.

RELATED ISSUES

VICINITY PROPERTY GROUNDWATER

The statutory and regulatory mandate that requires the remediation of processing sites also applies to groundwater contamination attributable to residual radioactive materials at vicinity properties. At this time, no vicinity properties that require groundwater remedial action have been identified. In order to fully satisfy its legal obligations, the DOE UMTRA Project must develop some reasonable means to ascertain which vicinity properties may warrant closer examination, and what criteria would be used to determine if a groundwater problem exists.

LICENSING

Title I of the UMTRCA of 1978, as amended, authorized the DOE, upon completion of the remedial actions, to care for the permanent disposal sites under a general license issued by the NRC to ensure future protection of public health and safety. The NRC's licensing regulations, 10 CFR 40.27, General License for Custody and Long-term Care of Residual Radioactive Material Disposal Sites, took effect on November 30, 1990 (55 FR 45591). A disposal site comes under the general license after the NRC concurs in DOE's certification that all remedial actions were completed in accordance with all applicable standards.

There are three types of disposal sites: 1) those where the RRM is stabilized-in-place (SIP) at the designated processing site; 2) those where the RRM is moved but stabilized in a disposal cell that is within the designated processing site boundary (i.e., stablized-on-site (SOS)); and 3) those where the RRM is moved to an off-site area. For the first two types of disposal sites, there is a potential need for additional remedial action to clean up the groundwater beneath the processing site that was contaminated as a result of the uranium processing activities.

The NRC will allow licensing of Title I disposal sites where the tailings are not being moved to occur in two steps, if needed, to avoid lengthy delays in licensing. Because groundwater restoration activities could take decades to complete, 10 CFR 40.27(b)(2) allows this two-step approach for those disposal sites where the RRM has not been relocated and where there are continuing groundwater restoration requirements. This allows the DOE to complete all remedial actions except groundwater restoration, which include complying with the groundwater protection standards addressing the design and performance at the disposal site for closure and licensing.

For the first step, when the surface remedial action activities are completed at the processing and disposal sites, the NRC will concur in DOE's certification that all remedial actions, except for groundwater restoration activities at the processing site, were completed in accordance with all applicable requirements. The general license will be in effect for these disposal sites after the surface remedial action activities are completed so the long-term care of the RRM and the disposal site can begin.

The second step in the certification, concurrence, and licensing process is completed when the NRC concurs in DOE's certification that all groundwater restoration requirements at the processing site have met the EPA standards.

For disposal sites where the RRM was relocated and there is no pre-existing groundwater contamination as a result of the uranium processing activities, the NRC will license the disposal site in one step. However, for the processing sites where the RRM was originally located, the NRC will concur in DOE's certification for the completion of all remedial action except groundwater. Certification and concurrence that groundwater restoration requirements at the processing site have met the EPA standards also will be completed as a separate activity.

INNOVATIVE TECHNOLOGY

In addition to the use of the PEIS and the observational method approach to site characterization and remediation design to minimize costs and speed the environmental restoration process, the UMTRA Project is committed to seeking out innovative technologies and applying them to the groundwater remediation problems associated with the UMTRA sites. Close communications with DOE research and development programs have already been instituted through the new UMTRA Technology Transfer Program. Dialogues with researchers at Los Alamos National Laboratory and Sandia National Laboratories and others are continuing to determine if the results of their programs are applicable to the UMTRA problems and to make them aware of the "field laboratories" available for testing of appropriate new technologies.

The experienced UMTRA Project staff are uniquely suited to seek out appropriate innovative technologies without impacting the ultimate regulatory compliance goals of the UMTRA Project. Knowledge of the NRC and EPA regulatory requirements and procedures coupled with practical state-of-the-art problem-solving experience will ensure that project goals are maintained and that only realistic new technologies are applied. Early successes of the UMTRA Project will be directly applicable to the problems associated with other DOE facilities.

REFERENCES

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