DOE/EIS-0198

UMTRA GROUND WATER PROJECT

FINAL PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT FOR THE URANIUM MILL TAILINGS REMEDIAL ACTION GROUND WATER PROJECT

VOLUME II

October 1996

Prepared by the
U.S. Department of Energy
Grand Junction Projects Office

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CONTENTS

LIST OF ACRONYMS

Acronym	Definition
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
NEPA	National Environmental Policy Act
PEIS	programmatic environmental impact statement
RCRA	Resource Conservation and Recovery Act
UMTRA	Uranium Mill Tailings Remedial Action
UMTRCA	Uranium Mill Tailings Radiation Control Act

VOLUME II USER'S GUIDE

Volume II of the programmatic environmental impact statement (PEIS) is a comment and response document; it is the collection of the comments received on the draft PEIS. The U.S. Department of Energy's (DOE) response to each comment is provided after each comment. If the comment resulted in a change to the PEIS, the affected section number of the PEIS is provided in the response.

Comments 1 through 259 were received at public hearings. The name of the hearing at which the comment was received is listed after each comment. Comments were recorded on flip charts and by notetakers. DOE representatives were present to hear the comments and respond to them. The DOE's written response is provided after each comment.

Comments 260 through 576 were received in writing at the hearings, and from various federal, tribal, and state agencies and from individuals during the public comment period. Copies of the written comments follow the comments and responses.

Public Hearings

Comments 1 through 41 were received at the Shiprock Chapter House public meeting in Shiprock, New Mexico, on June 7, 1995.

Comments 42 through 47 were received at the Durango City Hall public meeting in Durango, Colorado, on June 8, 1995.

Comments 48 through 73 were received at the Mexican Hat Elementary School public meeting in Halchita, Utah, on June 13, 1995.

Comments 74 through 108 were received at the Tuba City Chapter House public meeting in Tuba City, Arizona, on June 14, 1995.

Comments 109 through 143 were received at the Moenkopi Community Center public meeting in Moenkopi, Arizona, on June 14, 1995.

Comments 144 through 159 were received at the Gunnison County Court House public meeting in Gunnison, Colorado, on June 21, 1995.

Comments 160 through 203 were received at the Grand Junction City Hall Auditorium public meeting in Grand Junction, Colorado, on June 22, 1995.

Comments 204 through 236 were received at the Falls City Community Center public meeting in Falls City, Texas, on June 27, 1995.

Comments 237 through 259 were received at the St. Stephens School Cafeteria public meeting in Riverton, Wyoming, on June 28, 1995.

Written Comments

Comments 260 through 275 were received in writing at the public hearings.

Comments 276 through 289 were received from the Hopi Tribe.

Comments 290 through 303 were received from state of New Mexico agencies.

Comments 304 through 307 were received from David Rapstine.

Comments 308 through 311 were received from the city of Rifle.

Comments 312 through 313 were received from the U.S. Environmental Protection Agency, David Tomsovic.

Comments 314 through 327 were received from the U.S. Environmental Protection Agency, Region VIII.

Comments 328 through 369 were received from the Colorado Department of Public Health and Environment.

Comments 370 through 371 were received from the state of Wyoming.

Comments 372 through 381 were received from the Bureau of Indian Affairs.

Comments 382 through 417 were received from Concord Oil Company.

Comments 418 through 576 were received from the Navajo Nation.

COMMENTS AND RESPONSES

Comment 1. Explain the difference between no action and passive remediation. (Shiprock)

Response: Under the no action alternative, there would be no more federally sponsored UMTRA Ground Water Project; the DOE would complete the cleanup of the surface contamination at the UMTRA Project sites and end the Ground Water Project. Under the passive remediation alternative, the DOE would conduct a ground water characterization program to determine the degree and extent of ground water contamination just as it would under the proposed action and the active remediation to background levels alternatives. However, in terms of ground water compliance, the DOE would be limited to one of the two strategies: natural flushing or no remediation. Active ground water cleanup methods could not be used with this alternative. The DOE would continue to monitor the ground water at the sites as required and institutional controls would be implemented when necessary to limit access to or use of contaminated ground water. The text of the PEIS was changed in Section 2.4 to further clarify the difference between the no action and passive remediation alternatives.

Comment 2. Congressional funding uncertainties could require reevaluation of the passive compliance alternative. (Shiprock)

Response: The passive remediation alternative has the potential to be less costly than the proposed action, which may make it a more attractive alternative than the proposed action in this time of funding uncertainties. As explained in the PEIS, however, this alternative may not protect human health and the environment and meet the standards within a 100 year period for natural flushing or at sites that would require active ground water remediation. Therefore, DOE is not planning to consider this alternative as its proposed action. It is the intent of DOE to operate the Ground Water Project in such a way as to protect human health and the environment and the proposed action is the most cost-effective means to achieve this.

Comment 3. Can the passive alternative be changed to active remediation if necessary? Is this a provision of the alternative? (Shiprock)

Response: As indicated in the response to comment 1 above and Section 2.4 of the PEIS, the use of active ground water remediation is not an option with the passive remediation alternative. However, under the proposed action, the passive remediation strategy such as natural flushing could be changed to active ground water remediation strategy if natural flushing is not working. Conversely, the active remediation strategy can be changed to passive remediation strategy if conditions warrant, under the proposed action.

Comment 4. How would ground water conditions at the Shiprock site affect the natural flushing alternative? Wouldn't conditions at different places affect how "mother nature" was effective? (Shiprock)

Response: It is not known at this time if natural flushing would be a viable ground water compliance strategy for the Shiprock site. If either the proposed action alternative or the

passive remediation alternative is chosen for the Ground Water Project, an additional investigation would be performed on a site-specific basis to determine if natural flushing or another ground water compliance strategy would meet the EPA ground water standards and would be protective of human health and the environment.

Due to differences in environmental conditions, the effectiveness of natural flushing varies from site to site and over time and distance at a specific site. These conditions would be investigated as part of the risk-based decision-making process under either of the above alternatives.

Comment 5. The definition of passive compliance is to do nothing and let mother nature work toward remediation. Does this include a geochemical barrier? (Shiprock)

Response: Under the passive remediation alternative, active remediation technologies such as a geochemical barrier would not be in scope. Under this alternative, no physical manipulation or engineered change of the ground water would take place. As indicated in Section 2.4 of the PEIS, site characterization, monitoring, and possibly institutional controls are the major components of the passive remediation alternative.

Under the proposed action, it may be possible to employ a combination of the passive and active remediation strategies. For example, the active remediation strategy could include the use of a geochemical barrier to reduce contaminant concentrations to a level where natural flushing could then be applied.

Comment 6. Was the proposed action framework developed by the Department of Energy or is it in the Environmental Protection Agency standards? (Shiprock)

Response: The proposed action framework (Figure 2.1 in Section 2.0 of Volume I) was developed by the DOE and is not part of the EPA standards. It is a logic framework that represents the DOE's proposed action for meeting the EPA ground water standards.

Comment 7. Is it possible to go from a positive response on ground water contamination directly to active remediation? Or is it necessary to go through the other steps or strategies first? (Shiprock)

Response: It is possible to go directly to active remediation under the proposed action if enough site classification data are available to justify this. However, under the proposed action, which is a risk-based approach, the passive strategies would likely be considered for most sites because they are less disruptive to the environment and more cost effective. If it is determined that a passive approach such as natural flushing would not be effective or likely would not be protective of human health and/or the environment within 100 years, the active ground water remediation strategy would be evaluated.

Comment 8. Is cost effectiveness required in the legislation? (Shiprock)

Response: Cost effectiveness is not explicitly required in the legislation, but is rigorously encouraged. The EPA also expects the DOE to implement the most cost-effective strategy to meet the ground water standards and be protective of human health and the environment.

Comment 9. Are there any sites that will clean themselves in 100 years? Have any known contaminated sites naturally flushed? (Shiprock)

Response: It is not known at this time which UMTRA sites will comply with the EPA standards using the natural flushing ground water compliance strategy. Under the proposed action and passive remediation alternatives, further investigations would be performed at UMTRA sites to determine if natural flushing would meet the EPA ground water standards and would be protective of human health and the environment within 100 years.

Comment 10. Who would decide, over time, that a strategy is still protective? Will there be additional input as site conditions and the ground water remediation and compliance change over time? (Shiprock)

Response: Once a ground water compliance strategy such as natural flushing or active remediation is put into place, a monitoring program will be implemented to determine if the ground water is being cleaned up as predicted and public health and the environment are being protected. During the development of a ground water compliance strategy for each applicable site, the limitations and conditions under which the strategy may fail will be determined and presented in the site-specific remedial action plan and other Ground Water Project documents. These documents would be made available to the public for review and comment and to ensure the public is aware of the potential limitations and failures of a specific ground water compliance strategy before it is used. The public will always be kept informed of the effectiveness of the ground water compliance strategy during the Ground Water Project and then during the long-term surveillance. If it is determined by the DOE in consultation with affected tribes and states that the chosen strategy is not working as planned and/or not protecting public health and the environment, a new ground water compliance strategy may have to be used. The local residents would have been kept apprised of any problems with the chosen compliance strategy and the DOE would seek input from the public during the development of a new ground water compliance strategy. Every effort will be made to ensure that the proposed site-specific ground water compliance strategy will comply with the standards and not need to be revised.

Comment 11. The PEIS should clarify the partnership of the Navajo Nation with the Department of Energy. It is important to recognize the sovereignty of the Navajo Nation. (Note: a separate written statement submitted). (Shiprock)

Response: The DOE fully recognizes the sovereignty of the Navajo Nation pursuant to the DOE's American Indian Policy and DOE Order 1230.2, *American Indian Tribal Government*

Policy, dated April 8, 1992. The UMTRA Project is a cooperative effort and DOE acknowledges the importance of the tribal stakeholders.

We look forward to working with the Navajo Nation as well as our other Native American stakeholders to ensure we collectively meet our goals of protecting human health and the environment.

Comment 12. Will there be other opportunities to review data and information? Are other, local agencies participating in the decision making? (Shiprock)

Response: The DOE is committed to ongoing public participation in the Ground Water Project. Section 1.6 of the PEIS explains the public involvement process for the PEIS and describes future opportunities for public input in site-specific decisions regarding ground water compliance actions. DOE provides current information and opportunities for the public to discuss site specific issues during public meetings in the site communities. Technical documents for the Ground Water Project, such as baseline risk assessments, are being made available to state and local agencies and interested persons. Local agencies, such as city councils and county commissions, have been involved in the UMTRA Surface Project and continue to be involved in the Ground Water Project.

Comment 13. How will the Department of Energy know if a strategy is successful; are there annual benchmarks for evaluation of the information and compliance? (Shiprock)

Response: As part of the ground water compliance strategy, a monitoring program will be implemented in most cases to evaluate the progress of ground water compliance. For example, if natural flushing is the chosen compliance strategy, the site-specific analysis will estimate the rate of natural ground water cleanup and the monitoring program will determine if these goals are being met. The monitoring frequency will be determined on a site by site basis. Typically, ground water currently is monitored once or twice a year.

Comment 14. Community input is important in the choice of compliance. If a community wants active clean-up immediately, can we let our position be known? How can we give our opinion and influence the decision? (Shiprock)

Response: The DOE has actively sought input from the local communities during the PEIS process, starting with scoping meetings and continuing with the hearings and comment period on the PEIS. The DOE will continue to encourage communication with the public during the remainder of the PEIS process and throughout the remainder of the Ground Water Project. The DOE encourages the community to express its position and comments at community meetings and through direct communication with DOE representatives.

Comment 15. The PEIS is difficult to read and needs to be simpler and clearer. More graphics and visual are needed and there should be a "lay" explanation of terms. (Shiprock)

Response: As a result of comments received on the draft PEIS, modifications and additions have been made to the text and some of the graphics. These revisions have made the final PEIS simpler to comprehend and clearer to read.

Comment 16. Will the final PEIS rank the sites in order of priority for clean-up? (Shiprock)

Response: The DOE has prioritized the sites; see Section 2.7.1.

Comment 17. Will the Environmental Protection Agency approve the selected alternative? (Shiprock)

Response: No; however the EPA has reviewed the draft PEIS and provided comments (see Volume II of the PEIS for comments 312 through 327 and responses). The EPA has determined that the draft PEIS was well written and is a sound approach. The EPA determined that the preferred alternative (the proposed action) is acceptable.

Comment 18. Is July 17, 1995, the nationwide deadline for submittal of comments? (Shiprock)

Response: Yes; however, the deadline was extended 60 days to September 20, 1995 at the request of the Navajo Nation. A notice of the extension was published in the *Federal Register* on August 4, 1995 (60 FR 39953).

Comment 19. I am concerned that the public will receive the PEIS but not the comments that were submitted. (Shiprock)

Response: All comments submitted, including those recorded at public hearings, are included in a comment and response document that is part of the final PEIS. This document provides each comment, the DOE's response, and, as appropriate, indicates changes made to the draft PEIS in response to the comment. The comment and response document is Volume II of this final PEIS.

Comment 20. Why are we doing this? It is after the fact; the federal government has used our people and is still using us. We were not told of the risks of uranium mining. (Shiprock)

Response: The DOE understands your concern. While we cannot undo the past, the DOE is charged with completing remedial action of the abandoned tailings and contaminated materials associated with uranium processing and is taking the necessary steps to protect public health and the environment from risks associated with these past activities. The Ground Water Project is the next phase of this process to ensure that public health and the environment is protected from any unacceptable risk due to residual contamination of ground water that resulted from uranium processing. Baseline risk assessments are being

prepared to identify the type and extent of these risks. This information is being shared with site communities through DOE's continuing public involvement program which includes community meetings and review of technical documents.

Comment 21. We do not want the UMTRA budget compromised. We want the legislative intent of UMTRA to be met. (Shiprock)

Response: The DOE's goal is to meet the legislative intent of UMTRCA and, on an annual basis, request funds from Congress needed to achieve compliance at the UMTRA Project sites.

Comment 22. Is there a way to expedite the process? Scoping was conducted 2 years ago; how much did headquarters change the document anyway? (Shiprock)

Response: The DOE UMTRA Project worked closely with the DOE Headquarters office in Washington, D.C., so the final PEIS was reviewed and approved more quickly than the draft. Changes were made to the draft PEIS in response to public and internal comments.

Comment 23. Approximately $540 million was allocated to UMTRA under the legislation. What has been spent to date on administration and on clean-up for each of the two projects (ground water and surface)? What are the expenditures for each project's administrative costs versus actual clean-up? (Shiprock)

Response: The $540 million was not allocated to UMTRA under the legislation. That number is the total estimated cost of the project including contingencies and escalations. UMTRA receives a yearly allocation and budgets are requested annually, not as a total project.

The administrative costs of the Surface Water Project to date are $216,696,000 out of the $1,264,581,000 in total costs as of May 1994. The administrative costs of the Ground Water Project are $10,667,000 out of the total $19,796,000. The Ground Water Project is in the very early stages.

Comment 24. Competition between UMTRA sites may occur if funding is limited. How much control do we have in seeing that funds are appropriated for clean-up and not just for administrative paper work? (Shiprock)

Response: The DOE has initiated a prioritization process that will support action at the most significant sites first. The UMTRA Project will work to ensure the stakeholders will be involved in prioritization. This should keep the Project focused toward protecting human health and the environment. It is a clear goal of DOE to reduce administrative costs and increase compliance accomplishments. To this end, the DOE commissioned an independent technical review team to provide the Project team with recommendations to improve the Project; recommendations from this team have been factored into the operation of the Ground Water Project.

Comment 25. A lot has been spent to date and there has been no-clean-up; with questions about the fate and funding of the Department of Energy, this could affect clean-up. (Shiprock)

Response: The DOE is funded on a yearly basis. DOE will strive to obtain the necessary funding to complete the Project.

Comment 26. Have field investigations been started that will provide information to prioritize the sites? (Shiprock)

Response: Field investigations are being conducted for the purposes of site characterization. This new information will be used in future evaluations of site prioritization.

Comment 27. If the Department of Energy has already prioritized the sites, the priority list should be in the PEIS. (Shiprock)

Response: DOE has prioritized the sites into five groups as presented in Section 2.7.1. The basis for these prioritization activities was shared with the affected tribes and states in 1991 to receive input on the factors and weighting used in the process. The prioritization section in the final PEIS was expanded.

Comment 28. The PEIS has made conclusionary statements (see page 3-21, limited use aquifer at Ambrosia). Statements need to reworded or clarified so they do not appear to be conclusionary. (Shiprock)

Response: The sentence in Section 3.2.11 has been revised to indicate that the contaminated ground water beneath the Ambrosia Lake site was determined to be limited use in terms of the Surface Project ground water protection strategy. This conclusion was agreed upon by DOE, the state of New Mexico and the U.S. Nuclear Regulatory Commission. In terms of the Ground Water Project, no site-specific decision regarding a ground water compliance strategy at the Ambrosia Lake site or any other UMTRA Project site has been made.

Comment 29. How would the proposed action be affected if contamination is not caused exclusively by uranium processing, for instance if other activities contributed to the contamination? How would this affect the choice of remediation? Public input should be considered in making this decision. (Shiprock)

Response: The DOE is not responsible for contamination at or near the UMTRA Project sites resulting from activities such as mining that are not related to the uranium processing site. Of course, if contaminants from another source have mixed with the UMTRA contamination, these contaminants will need to be addressed during the development of a site-specific ground water compliance strategy.

The DOE intends to continue to seek public input in making decisions for the Ground Water Project. Section 1.6 of the PEIS describes the public participation process for the PEIS and future opportunities for public input.

Comment 30. Does the legislation indicate funding by priority? Will the Department of Energy spend its money based on the priorities? (Shiprock)

Response: The DOE has developed a ground water prioritization based on the urgency to conduct activities. The initial prioritization methodology and priority categories were shared in draft form with all the affected states and tribes in 1991. Each site will have its prioritization category identified in the new or modified cooperative agreement. To the greatest extent possible, DOE will spend its funds to proceed with implementing the compliance strategies based on priorities, availability of state share (as required), and Congressional appropriations to carry out the Project. It is expected that there are opportunities to address compliance at some of the lower risk sites concurrent with executing compliance strategies at the higher risk sites without impacting the higher risk sites.

Comment 31. What needs to be done in D.C. to assure funding is provided for the Navajo sites? Limited dollars could result in competition among sites. (Shiprock)

Response: Congress appropriates the funding for the UMTRA Ground Water Project budget. The DOE will continue requesting appropriations until all the sites are in compliance with the EPA standards and protective of human health and the environment.

Comment 32. When the priorities are established, will the money go to those sites? (Shiprock)

Response: The DOE has developed a ground water prioritization based on the urgency to conduct activities. The initial prioritization methodology and priority categories were shared in draft form with all the affected states and tribes in 1991. Each site will have its prioritization category identified in the new or modified cooperative agreement. To the greatest extent possible DOE will spend its funds to proceed with implementing the compliance strategies based on priorities, availability of state share (as required), and Congressional appropriations to carry out the Project. It is expected that there are opportunities to address compliance at some of the lower risk sites concurrent with executing compliance strategies at the higher risk sites without impacting the higher risk sites.

Comment 33. To what extent will political clout influence money spent and priorities? (Shiprock)

Response: DOE intends to comply with the EPA Ground Water compliance standards based on established priorities to the greatest extent possible. At times, other factors may affect priorities and program execution.

Comment 34. There should be more study of the surface cover to ensure that there is no more contamination. I want to assure that the source of contamination is secure. How does the Department of Energy determine that there is no more contamination? (Shiprock)

Response: The completion report document for the Shiprock site contains final verification data and as built plans and specifications for a disposal site. The disposal cell design and calculations are presented in the remedial action plan, which was approved by the DOE, the Navajo Nation and the Bureau of Indian Affairs (for Shiprock and other disposal cells within the Navajo Nation), and the U.S. Nuclear Regulatory Commission. In order to ensure that all tailings-related material and vicinity properties were remediated to EPA standards, verification procedures were employed. These procedures included systematic radiological measurements of surface soils during remedial action and after remedial action. The disposal cell cover was designed to reduce the average radon emissions to levels below EPA standards. Following completion of the Surface Project disposal cell at many of the processing sites, ground water is monitored at a point of compliance in the uppermost aquifer to ensure the disposal cell is performing as planned. This activity also occurs at the relocated disposal cells. In addition, the Long-Term Surveillance and Maintenance Program ensures continued disposal cell performance.

Comment 35. How can a community be aware of risks over 100 years? Will there be people to communicate risks? I want assurance that, over time, there will remain a way to communicate risks. (Shiprock)

Response: Awareness of future potential risks (associated with the contaminated ground water that resulted from the uranium mill tailings and former processing activities) can be accomplished through physical site markers, survey records, reports, publications, and education programs. At some UMTRA communities, local schools and colleges are involved with UMTRA activities. The more information that is available and the greater number of people, particularly local residents, that are made aware of the Project and potential risks, the better the likelihood that knowledge will remain in the communities.

The EPA regulations permit the use of institutional controls for limiting access to the contaminated ground water for up to 100 years. The purpose of institutional controls is to ensure that use of the contaminated ground water does not pose a threat to human health and the environment. The use of an institutional control can be applied for up to 100 years, if needed, to ensure improper use of the contaminated ground water does not create a health problem.

Tribal, state, and local governments can play a key role in developing and enforcing effective institutional controls. Changes may need to be made to tribal, state, or local laws and ordinances to ensure the enforceability of institutional controls by the administrative or judicial branches of government entities.

Comment 36. What are the health risks now and in the future? (Shiprock)

Response: Since, to the best of DOE's knowledge, no one uses the affected ground water at the Shiprock site for drinking or other domestic purposes, there are currently no human health risks directly associated with the contaminated ground water. Although the floodplain area below the Shiprock disposal cell is fenced and marked with hazardous materials signs, the possibility exists that humans and/or livestock could access this area. Therefore, there is the possibility of incidental exposure to the surface expression of contaminated ground water in this floodplain area. These potential exposures would likely be infrequent and are not expected to threaten public health.

If the most contaminated portion of the affected aquifer at the Shiprock site were used for domestic purposes in the future, there is the possibility of the occurrence of human health risks. However, it is unlikely that this contaminated ground water would be used for human consumption because good quality water is available from the Navajo Tribal Utility Authority water supply system.

Comment 37. Currently, a local college is participating in the ongoing research and monitoring at the Shiprock site. This local participation and knowledge is a way to enhance the longevity of information about the site and risks. (Shiprock)

Response: Thank you for your comment. The DOE agrees and will continue to provide opportunities for local participation in the Project and in making decisions regarding site-specific ground water compliance.

Comment 38. Have livestock down river from the Shiprock site been tested? Are the cows safe to eat? (Shiprock)

Response: No testing of livestock tissue is known to have occurred in the vicinity of the Shiprock site. However, livestock are not grazed or watered in the areas where site-related contamination may occur (i.e., the San Juan River floodplain immediately downgradient of the former Shiprock site). Although contaminated ground water from the floodplain probably discharges into the San Juan River, the effect of the contaminated ground water on the river water is negligible due to its great dilution by the river (see the baseline risk assessment of ground water contamination at the uranium mill tailings site near Shiprock, New Mexico). As evidenced by historical and recent sampling of the San Juan River water downstream of the Shiprock site, no exceedances of constituent concentrations protective of livestock were reported at the downstream location (DOE, 1994a; 1996). Therefore, there are currently no health risks to livestock from the river water downstream of the Shiprock site.

Comment 39. Are there any restrictions on land use between the Shiprock cell and the river (on the west side)? (Shiprock)

Response: Yes, the land between the cell and the San Juan River is part of the Shiprock site and access is restricted.

Access to the floodplain of the San Juan River below the Shiprock disposal cell is limited because this area is fenced off and hazardous materials warning signs are posted.

Comment 40. If the ground water is contaminated, has it moved to the river? Why don't we see contamination in the river? (Shiprock)

Response: Ground water that has been contaminated from former uranium processing activities at the Shiprock site can enter the San Juan River directly through the alluvium or indirectly after first discharging to the drainage ditch that runs through the floodplain and empties into the river. The UMTRA Project has established surface water sampling locations along the San Juan River, both upstream and downstream of the tailings pile, and at the confluence of the drainage ditch and the river, to monitor surface water quality in the San Juan River.

Contaminated ground water does discharge into the San Juan River at a very small flow rate compared to the river flow. This causes dilution of the contaminated ground water as it flows into the river. Limited data (three sampling rounds) suggest there is a slight increase in uranium levels at two river sampling locations when compared to background (0.009 milligrams per liter versus 0.002 milligrams per liter). These levels are below the EPA standard for uranium (0.044 milligrams per liter). No other site-related contaminants have been identified as being above background in the river.

Comment 41. What land uses or land improvements can be made to make the land useful to the community despite the ground water contamination without having to wait 100 years? (Shiprock)

Response: In most cases, the land overlying the contaminated ground water can be fully utilized with the exception of 1) a use that would pose a human or environmental health risk by creating a ground water exposure pathway or 2) a use that would inhibit site access or a ground water cleanup application.

Comment 42. The programmatic approach to environmental impact statement preparation is helpful when there are multiple sites; it is a way to focus issues. (Durango)

Response: The DOE prepared the draft PEIS with the intent of focusing issues and is confident that site-specific documentation will benefit from this programmatic approach.

The PEIS has been very helpful in terms of focusing on programmatic issues such as the scope of the Ground Water Project, the potential impacts of the ground water compliance strategies and alternatives, and the various ways the DOE could implement the Ground Water Project. DOE also anticipates that it will also help focus on site-specific issues.

Comment 43. Is the Department of Energy establishing an environmental (aquatic) baseline to provide data to determine an appropriate ground water strategy for each site? (Durango)

Response: Under the proposed action, the DOE will take action to protect human health and the environment from the contaminated ground water. From an aquatic biological perspective, the DOE has prepared screening level ecological risk assessments for most of the sites. In some cases, follow-up study has been conducted or may be conducted in the future based on the recommendations in the screening level ecological assessment. These assessments, which also consider terrestrial biological communities, are factored into the final choice of a ground water compliance strategy at a given site.

Comment 44. Has there been interaction with the Fish and Wildlife Service regarding the ecological risk assessments? (Durango)

Response: The U.S. Fish and Wildlife Service has not been involved in any aspect of the screening level ecological risk assessments prepared thus far. They will become involved if threatened and endangered species become an issue at a given site and may also review the site-specific NEPA documents that will be prepared once the site-specific ground water compliance strategy has been proposed.

Comment 45. Impacts from installation and maintenance of monitoring wells need to be considered; for example, the wells may have visual resource impacts. (Durango)

Response: The potential impacts from the installation and maintenance of monitor wells as well as other site characterization and monitoring impacts has been addressed in Section 4.1. Monitor wells may impact the visual resources in some areas and paragraphs regarding this were added to Sections 4.2.1.9, 4.2.2.9, and 4.2.3.9. The sections also state that DOE would work with the local residents to mitigate these impacts by using such measures as flush-mounted monitor wells or landscaping.

Comment 46. Other potential impacts that could occur if some strategies were implemented need to be considered in the PEIS; examples include: impacts to water rights, potential flooding, and aquifer draw down that could affect wetlands. (Durango)

Response: The PEIS was revised to address potential impacts to water rights in Sections 4.2.1.11, 4.2.2.11, and Table 4.4. It is unclear what is meant by the potential impacts of flooding. As indicated in Section 4.2.1.5, in most if not all cases, the construction of facilities required for active ground water remediation would be placed outside the floodplain of rivers and streams that run near a site. Therefore, flooding of the ground water remediation facilities will not likely occur and the issue of flooding was not addressed in the final PEIS. The potential impact of ground water drawdown on water levels in wetlands was considered in Section 4.2.1.5 of the PEIS.

Comment 47. Include a "laundry list" of potential impacts associated with the strategies and potential mitigation measures for these impacts; this would help in tiering to site-specific environmental documentation. (Durango)

Response: A summary of the potential impacts associated with the ground water characterization, monitoring, and compliance strategies is listed in Tables 4.3 and 4.4. It is agreed that a list will be useful in tiering to the site-specific documents. The DOE believes that a "laundry list" of mitigation measures may be of interest but that its utility for tiering to site-specific environmental documents would be limited because effective mitigation measures will be site-specific. Therefore, a list in the PEIS would not affect the way in which a mitigation measure is selected. However, examples of possible mitigation measures for specific impacts are provided throughout the PEIS. A discussion regarding how mitigation is addressed in the PEIS was added to the end of Section 4.0. In addition, the definition of mitigation as it appears in the Council on Environmental Quality implementing regulations for NEPA was added to the glossary.

Comment 48. Why not just analyze the proposed action since all of the alternatives are included in the proposed action? Addressing the alternatives separately from the proposed action is a waste of paper. It would be easier to just focus on the proposed action. (Halchita)

Response: As indicated in Section 2.0 of the PEIS, the DOE is required to "rigorously explore and objectively evaluate all reasonable alternatives" (40 CFR §1502.14(a). Therefore, consideration of only the proposed action would not be consistent with the regulations.

Comment 49. Residents of Halchita are not represented at the hearing since most of them have been evacuated due to asbestos abatement activities. (Halchita)

Response: We agree the public turnout was very small and that it was due to the asbestos abatement activities. We were unaware of the status of the abatement project and regret the unfortunate circumstances. We contacted the local communities to invite them to comment. In addition, public meetings were just one way of commenting on the PEIS. The DOE extended the public comment period by 60 days to allow all people to have adequate time to comment on the PEIS. Written, faxed, or telephoned comments were also accepted. Comments were also accepted via the internet.

Comment 50. Who approves the final PEIS and the Record of Decision? It took 15 months for Department of Energy Headquarters to approve the draft PEIS. This took too long. The Navajo Nation is concerned that time and money will run out before the necessary remediation is completed. The Ground Water Project will suffer if additional delays occur. The Department of Energy needs to meet the schedule presented at the hearing: completion of the PEIS process by the end of the 1995 calendar year. (Halchita)

Response: Final approval of the PEIS is granted by DOE Headquarters and the Record of Decision is signed by the Assistant Secretary for Environment, Safety, and Health. DOE Headquarters review of the PEIS was extensive and thorough, which contributed to the long approval process for the draft Ground Water Project PEIS. DOE intends to expedite the approval process of the final Ground Water Project PEIS and the publication of the Record of Decision. Funding for the Ground Water Project will be constrained only insofar as Congress limits appropriations to the DOE for conducting its environmental management activities. Budget requests occur annually, and DOE's goal is to receive sufficient funding for the Ground Water Project to implement site-specific ground water compliance strategies that are protective of human health and the environment and meet the EPA standards. The DOE is committed to completing the PEIS process in 1996.

Comment 51. The Navajo Nation requests a 60 day extension to the public comment period for the draft PEIS. More time is needed for tribal staff review of the document. Since the Halchita residents could not attend the hearing, additional time is needed to collect their comments. (Halchita)

Response: The 60-day extension was granted as requested, which extended the comment period to September 20, 1995.

Comment 52. Comments from the PEIS scoping were not published with the draft PEIS (Section 1.6). How did scoping comments impact the draft PEIS? (Halchita)

Response: The PEIS Implementation Plan summarizes comments received during scoping and provides DOE's response to these comments (DOE, 1994b). These comments were categorized into five areas: human health and environment, the National Environmental Policy Act process and programmatic issues, ground water monitoring and site characteristics, site-specific surface comments, and additional comments out of the scope of the PEIS (Section 3.3 of the PEIS Implementation Plan). A complete list of all comments received is archived in the UMTRA Project Document Control Center. The Implementation Plan was transmitted to UMTRA Project libraries and reading rooms. A copy of this document is also available through the National Atomic Museum, Albuquerque, New Mexico.

Comment 53. The PEIS Implementation Plan was not widely distributed. Comments from scoping should be included in the PEIS. (Halchita)

Response: The Implementation Plan was transmitted to tribes and states and other affected agencies and to persons who attended the scoping meetings. The plan was also sent to libraries and reading rooms; copies of the Implementation Plan are available by contacting the DOE Grand Junction Projects Office. Comments from scoping meetings were summarized in the implementation plan.

Comment 54. Department of Energy needs to identify how comments from the public comment period change the final PEIS. In addition, directions for finding a particular comment, its response, and, if applicable, resulting changes to the PEIS should be clear and easy to follow. (Halchita)

Response: A comment and response document (Volume II of the final PEIS) was prepared and accompanies the final PEIS. This document contains all comments received and DOE's response to those comments. This includes comments from public hearings, and written comments that are published verbatim. The response to each comment indicates if changes have been made to the PEIS and where the change can be found.

Comment 55. Page 2-11 of the draft PEIS only discusses water resources in the context of contamination and EPA compliance standards. Section 4.2 should include a water resource section that identifies potential users of water resources and potential uses of an aquifer. (Halchita)

Response: The impacts analysis of the PEIS considers the potential impacts to water resources of the ground water compliance strategies and alternatives. Sections 4.2

through 4.4 discuss and compare potential impacts that the ground water compliance strategies and alternative approaches for the UMTRA Ground Water Project may have on human users as well as on plant and animal communities. The DOE believes that the analysis of potential impacts to water resources is an important component of the impacts analysis in the PEIS and that this topic is adequately addressed from a programmatic perspective. The site-specific NEPA documents will provide a more detailed analysis of the impacts the proposed ground water compliance strategy may have on water resources at individual sites.

Comment 56. Why is the Mexican Hat, Arizona site a lower priority than the Falls City, Texas site, since the aquifer at Falls City is limited use and the site may qualify for supplemental standards? How can the prioritization process be applied to the Mexican Hat site if a baseline risk assessment has not been performed? (Halchita)

Response: The prioritization process has been based on objective determination, to the greatest extent possible. The prioritization discussion in the PEIS was expanded and now appears in Section 2.7.1. In that discussion, six scoring criteria were identified. Based on this scoring system, Falls City, Texas, was a higher priority than Mexican Hat, Utah. Falls City was scored as having a slightly higher health risk to population and individuals than Mexican Hat. It was also determined that the potential for future use of ground water was higher at the Falls City site.

Baseline risk assessments were not an integral part of the prioritization. However, they were used to review the prioritization during fiscal year 1996 and it was determined that the Falls City site still ranked higher than the Mexican Hat site. A preliminary ecological risk assessment and environmental impact evaluation have been completed for Mexican Hat, and these items will be considered in future prioritization considerations.

Comment 57. Psycho/social issues are not addressed in the draft PEIS. For example, the Navajo people have a strong tie to water. Seeps have a ceremonial significance. Traditional, symbolic plants are found at seeps and are used as part of religious activities. Modification of seeps will have a long term impact. Department of Energy needs to consider psycho/social concerns in the prioritization process. (Halchita)

Response: The DOE recognizes the special value water resources have for Native Americans. The PEIS discusses these issues in the cultural resource sections of Chapter 4. These sections have been retitled "Cultural/Traditional Resources" to more clearly encompass impacts to these resources of special significance to Native Americans. The impact discussion in these sections has also been expanded in response to your comment.

Comment 58. Trust-responsibility concerns (US government responsibilities to Indian nations) are not addressed in the PEIS. This should be factored into the prioritization process. (Halchita)

Response: DOE recognizes the trust-responsibility to Indian nations. Section 1.2.4 of the PEIS has been expanded to identify this trust-responsibility. DOE has and will continue to factor trust-responsibility to Indian nations and tribes into the prioritization process.

Comment 59. The Mexican Hat site should be ranked as a higher priority than the Falls City site. (Halchita)

Response: The prioritization process was based on objective determination to the greatest extent possible. The description of the process was expanded in the final PEIS and is now in Section 2.7.1. As identified in this section, six scoring criteria were considered. Based on this scoring system, the Falls City site fell in Category IV and Mexican Hat in Category V. Prioritization is a dynamic process and will be reviewed and updated when necessary. Revisions and updates will be discussed with all interested parties.

Comment 60. Indirect pathways need to be addressed in the baseline risk assessment for the Monument Valley site. (Halchita)

Response: It cannot be determined what indirect pathways are referred to here. However, in the exposure assessment section of the Monument Valley baseline risk assessment, several exposure pathways besides the direct ingestion of ground water as drinking water are evaluated. These pathways include dermal absorption of contaminants in ground water while bathing, the ingestion of garden produce irrigated with contaminated ground water, and the ingestion of meat and milk products obtained from livestock watered with contaminated ground water.

Comment 61. A baseline risk assessment should be prepared for the Mexican Hat site. (Halchita)

Response: Two preliminary risk assessments have been completed for the seeps in Gypsum Wash and North Arroyo near the Mexican Hat site. The first assessment was completed in 1990 and addressed potential human health and ecological risks that could result from the contaminated water in the seeps. The second preliminary draft assessment dealt with potential ecological risks from the contaminated water at the seeps. The DOE is in the process of finalizing the ecological risk assessment and is conducting additional sampling in the seeps in Gypsum Wash and the North Arroyo near the Mexican Hat site.

Comment 62. Not all of the definitions in the draft PEIS glossary are defined the same way in the text. For example, confining aquifer is referred to as a hydrogeologic barrier or a no flow boundary. The definitions in the glossary need to match the definitions in the text. (Halchita)

Response: In revising the draft PEIS, the DOE has made every effort to define words in the text the same way they are defined in the glossary.

Comment 63. The baseline risk assessments do not evaluate psycho/social risks. The baseline risk assessment methodology discussion in the PEIS is not adequate to determine if the methodology used as a basis for site-specific decisions was appropriate. (Halchita)

Response: The risk assessments identify potential health and environmental risks associated with contaminated ground water at the UMTRA sites; psycho/social issues are potential consequences of health and environmental risks. Site-specific National Environmental Policy Act documents for the Ground Water Project will discuss these issues in greater detail. Appendix B of the final PEIS provides an expanded discussion of risk assessment methodology. Site-specific ground water compliance decisions have not been made for any UMTRA processing sites.

Comment 64. The proposed action framework should be reversed since the contaminant concentrations for most sites indicate that some kind of remediation will be needed. The contaminant concentration numbers are high for the Navajo sites. (Halchita)

Response: It is true that there is some kind of ground water contamination at most sites (see Table 3.3) and as presented, the DOE believes that the proposed action is the most effective way to address this contamination. The information needed to determine the site-specific ground water compliance strategy will be available after the completion of site characterization work, the revisions of the baseline risk assessment, if necessary, and the site-specific National Environmental Policy Act document. The DOE believes that if the data and information collected during this process support the use of passive remediation ground water strategies for protecting human health and the environment, the consideration of the use of active ground water remediation is not required. The use of active remediation at a site where it is not warranted would not be the most cost-effective approach and may result in adverse impacts and the unnecessary disturbance of land. Therefore, the proposed action framework, which considers the use of passive remediation before the use of active ground water remediation, should provide the most cost-effective and environmentally sound approach for protecting human health and the environment in accordance with the EPA standards.

Comment 65. There is an economic and social impact from contaminated ground water left at a site. (Halchita)

Response: Comment acknowledged. These impacts are discussed in the socioeconomic resources sections of Section 4.0. For the final PEIS, these sections have been retitled social and economic resources and have been expanded to provide more discussion of these potential impacts. In addition, new environmental justice sections have been added to the final PEIS.

Comment 66. The current risk based approach does not incorporate key areas of concern that are important for making site-specific decisions. (Halchita)

Response: The proposed action in the PEIS focuses on protection of human health and the environment in identifying appropriate ways to comply with the EPA ground water standards. However, other considerations would go into determining compliance strategies and methods. Other supporting documents, such as the baseline risk assessments and data gathered during site characterization, would also provide information that would be part of decision making. Issues and concerns expressed by affected states and tribes, local governments and other affected groups and persons will also be considered in decision making. Finally, site-specific NEPA documents will assess potential impacts of implementing compliance alternatives. Public input will be important to ensure that local concerns are evaluated in the impact assessments.

Comment 67. Cost should not be a consideration for cleaning up contaminated ground water. (Halchita)

Response: DOE's ultimate mission with the Ground Water Project is to protect human health and the environment by meeting the EPA ground water standards at the former processing sites. The EPA explains in the final rule to the ground water standards that it is desirable and appropriate for the DOE to implement the most cost-effective strategy that meets the intent of the standards and protects human health and the environment.

Comment 68. Contaminated water that needs to get cleaned up may or may not be cleaned up. (Halchita)

Response: As indicated in the draft PEIS in several sections, the DOE is committed to cleaning up the contaminated ground water at the UMTRA sites to levels that are protective of human health and the environment by meeting the EPA standards. This means that the contaminated ground water at the sites will be characterized to the degree necessary so that potential risks, if any, to human health and environment can be determined. From this information, a ground water compliance strategy will be proposed, and the impacts of implementing this strategy will be analyzed in a site-specific NEPA environmental document. The environmental document and other Ground Water Project documents will be available to the public for their review and comment. As a result of this process, the DOE believes the ground water that needs to be actively cleaned up will be and that contaminated ground water that is controlled through the use of institutional controls under a passive remediation strategy will not pose a threat to human health or the environment.

Comment 69. What is the cost of the proposed action for the entire project? The cost numbers in the draft PEIS do not seem right. The ranges expressed in the document are too broad, and therefore meaningless. The analysis for the cost figures should be made available during the public comment period for public review. (Halchita)

Response: The costs in the PEIS reflect a range of values based on the various types of strategies that could be applied under the proposed action. This range reflects the variability of site conditions, contaminants, future land use, size of plume, and other factors

that are evaluated when calculating the cost ranges of each compliance strategy. The total cost of the Ground Water Project as predicted in the fiscal year 1998 budget is $309 million. This sum includes a large contingency for out-of-scope activities associated with activity uncertainties. It reflects a budget estimate based on a strict budget planning strategy for this Project before stakeholder acceptance of the PEIS proposed action and publication of the Record of Decision. The amount encompasses a range of proposed strategies and alternatives in addition to contingency funds needed to meet unplanned occurrences in the execution of the Project. The sum is expected to change once the PEIS process is completed and more definitive strategies can be estimated for each UMTRA site. It should be noted that during the budget preparation process, the DOE encourages stakeholder involvement and shares budget data with the stakeholders during the March-through-June timeframe. Participation in this process provides the most current analysis of cost development for Project implementation.

Comment 70. The level of qualitative and quantitative analysis for determining cost effectiveness of the proposed action needs to be clarified. (Halchita)

Response: Qualitatively, the cost effectiveness of the proposed action is compared with the other alternatives in Section 4.4.15 of the PEIS. Section 4.4.15 was modified for clarity. A quantitative estimate of the cost-effectiveness of the proposed action would not be possible at this point because the final ground water compliance strategies at the UMTRA sites have not been determined. The costs can be highly variable, depending on factors such as the type of active ground water remediation that would take place at a given site, or how long institutional controls would have to be maintained. In general, the DOE believes that the proposed action would be more cost effective than the active remediation to background levels alternative. Although both would meet EPA standards, the proposed action would be less expensive because active remediation at all sites most likely would not be necessary. The proposed action would also be more cost-effective than the no action or passive remediation alternatives because although the latter two could be less expensive, the proposed action would more effectively meet EPA standards and protect human heath and the environment.

Comment 71. Baseline risk assessments are not baseline. They are an evaluation of existing data. Stakeholders need to be able to comment on final baseline risk assessments. Final risk assessments should be based on additional characterization data. (Halchita)

Response: Baseline risk assessments are available for review in local libraries and provided to UMTRA tribal representatives. As defined by the *Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual,* baseline risks are risks that might exist if no remediation or institutional controls were applied at a site. Additionally, as stated in Section B1.1 of the revised Appendix B to the PEIS, an UMTRA baseline risk assessment is baseline in that it describes preremediation ground water conditions at the site, with ground water quality only partially characterized.

Critical data gaps identified in the UMTRA risk assessments will be addressed in the site observational work plan for each site. For example, if the potential for adverse human

health and/or ecological risk is identified in the baseline risk assessment, and additional study is required to assess these risks, recommendations for further study will likely appear in the Site Observational Work Plan. The assessment of human health and/or ecological risk will be updated and revised as necessary based on the results from the additional data.

Stakeholders will have an opportunity to comment on the baseline risk assessments. Copies of the these documents are available for public review at libraries and reading rooms in UMTRA Project communities. News releases were used to publicize availability of the documents. In February 1994, 15 baseline risk assessments were released for public review. News releases of their availability were issued, and the documents were placed in libraries and reading rooms. A toll-free number was also publicized for individuals who wished to receive a copy of the documents. This number currently is (800) 399-5618.

Comment 72. What additional site characterization does Department of Energy plan on doing for the Navajo sites during the Ground Water Project? (Halchita)

Response: Specific characterization activities for each site will be based on the alternative chosen for conducting the Ground Water Project. Under the proposed action, active remediation to background levels, and passive remediation alternatives, site observational work plans will be formulated for each UMTRA site, providing additional site characterization data in the form of a site conceptual model. Examples of potential characterization activities, described in Section 2.8 of the PEIS, include monitor well installation and ground water sampling, soil sampling, and ground water and contaminant transport modeling. Under the no action alternative, additional site characterization data would not be collected.

Comment 73. How is moving the Ground Water Project to Grand Junction Projects Office cost effective? The Navajo Nation will lose the gains that have been made. (Halchita)

Response: DOE does not expect the Navajo Nation will lose gains they have made because the Project moved to the Grand Junction Projects Office. Over the long term, moving the Ground Water Project to Grand Junction will be beneficial because it is expected that long-term monitoring and/or institutional controls will be part of the long-term surveillance program which is managed out of the Grand Junction Projects Office.

Comment 74. Clarify the difference between no action and passive compliance alternatives. (Tuba City)

Response: Text was added to Section 2.4 in the final PEIS to further clarify the difference between these alternatives.

Comment 75. Consider population growth and changes in selection of alternative. (Tuba City)

Response: Consideration of population growth and changes are factored into the EPA standards. Compliance with the standards requires evaluation of current and projected future uses of ground water; population growth and changes are part of this evaluation. For example, natural flushing can be used only if ground water is not currently or projected to become a source for a public water supply system during the period of natural flushing. The application of supplemental standards requires assurances that current and projected uses of the affected ground water are preserved and requires that public health and the environment be protected now and in the future (Section 1.4.1). Finally, requirements for ground water monitoring would also provide protection of future populations. The proposed action alternative, because it would meet EPA standards at all sites, would include population factors in selecting a compliance strategy. Site-specific National Environmental Policy Act documentation would include more detailed analysis of demographic factors that could affect or be affected by implementing a ground water compliance strategy.

Comment 76. Provide an example of how supplemental standards or alternate concentration limits would be protective; explain supplemental standards and alternate concentration limits. (Tuba City)

Response: The regulations require that supplemental standards be applied only to contaminated ground water when a minimum of one of five other EPA regulation criteria is met (40 CFR §192.21(a)(b)(e)(f)(g)). These five criteria are:

a. Remedial action poses a clear and present risk of injury to workers or the public.

b. Remedial action would directly produce health and environmental harm that is clearly excessive compared to the health and environmental benefits.

e. There is no known remedial action.

f. Restoration of ground water quality is technically impractical from an engineering perspective.

g. The ground water is limited use, meaning that ground water is not a current or potential source of drinking water.

The regulations require that if supplemental standards are applied at a site, the DOE must apply any remedial action for the restoration of contaminated ground water that is required to ensure, at a minimum, protection of human health and the environment. In addition, if ground water meets the requirements of limited use and a supplemental standard is applied, current and reasonable projected uses of the affected ground water must be preserved (40 CFR §192.22(d)).

The regulations for applying alternate concentration limits (40 CFR §192.02(c)(3)(ii)) state that the DOE may apply an alternate concentration limit, if after considering remedial action to reach background levels, the DOE determines that the constituent will not pose a substantial present or potential hazard to human health and the environment as long as the alternate concentration limit is not exceeded.

In considering present or potential hazards to human health and the environment, the standards identify 10 factors that need to be considered for their potential adverse effects on ground water and 10 factors to be considered for their potential adverse effects on surface water. These include determining the characteristics of the aquifer, water quality, potential for human health risks, and potential to damage ecological and agricultural resources.

U.S. Nuclear Regulatory Commission concurrence is required before supplemental standards or alternate concentration limits can be applied.

Comment 77. Is the application of supplemental standards or alternate concentration limits made to the Nuclear Regulatory Commission? (Tuba City)

Response: Yes. UMTRCA states that the U.S. Nuclear Regulatory Commission will ensure that the management of the residual radioactive materials is carried out to conform with the EPA standards for UMTRA Project sites (40 CFR Part 192). Supplemental standards and alternate concentration limits are part of these standards.

Comment 78. Financial considerations could affect the choice of alternatives or strategies; will funding be available? (Tuba City)

Response: While the EPA standards anticipate that cost-effectiveness will be considered in selecting the compliance strategy, financial considerations would not result in the selection of a less costly but technically inappropriate compliance strategy. The DOE will request adequate funding to implement the most appropriate compliance strategy at each site. While no guarantees can be made on the amount of funding that Congress will appropriate, Project budget requests are based on the amount of funding required each fiscal year so over the life of the Project, compliance with the standards at each site will be met.

Comment 79. How is the time period for clean-up related to funding? (Tuba City)

Response: Currently the UMTRA Ground Water Project reflects a completion date in fiscal year 2014 based on minimal limitations to proposed budget requirements. These dates do not, however, include the completion of natural flushing where projection indicates the standards would not be met with this compliance strategy until after 2014. Under UMTRCA, the legislation authorizing the Project, DOE is allowed to proceed on this Project without time limitation; thus, as budget constraints are implemented at the federal level, there is potential for the cleanup time period to be extended.

Comment 80. How would changes in the Clean Water Act affect UMTRA Ground Water compliance? (Tuba City)

Response: The UMTRA ground water regulations in 40 CFR Part 192 are totally independent of the Clean Water Act regulations. The Clean Water Act is primarily concerned with preventing discharges, not cleaning up existing contamination, which is the focus of the UMTRA Ground Water Project. The DOE monitors changes to environmental acts and their implementing regulations. Only a major rewrite of the Clean Water Act that changes the current focus of the Act to deal with existing contamination could be expected to impact the UMTRA Ground Water Project. Such a change is not anticipated at this time.

Comment 81. The criteria for sole source aquifer (under the Clean Water Act) should be considered in UMTRA. (Tuba City)

Response: Sole source aquifers are considered under the Safe Drinking Water Act. The purpose of the Safe Drinking Water Act sole source aquifer protection program is to protect sole or principal drinking water sources from contamination that would create a significant hazard to public health. Under the program, no underground injection wells may be operated in such an aquifer without a permit. The UMTRA Ground Water Project is subject to these provisions.

UMTRA Project sites that have limited or sole-source water resources are Tuba City, Arizona, and Maybell, Colorado. In addition, a sole-source water resource criterion recently was added to the updated prioritization process.

Comment 82. Regarding drinking water standards, it is important to differentiate between water uses. Water standards may not accurately reflect actual water use (for example, drinking and livestock uses). (Tuba City)

Response: The DOE will consider actual water use when making site-specific decisions. Drinking water is just one use of ground water that the DOE evaluates in the baseline risk assessment. Other uses considered are bathing and agricultural uses, including crop irrigation and livestock watering. Other exposure pathways are also considered, including humans eating fish and livestock that could have come into contact with contaminated ground water. When analyzing site-specific impacts from the ground water compliance strategies, the DOE will also consider cultural and traditional uses of ground water.

Comment 83. An aquifer that is not sole source now, may be in the future; future need may require a different future use. (Tuba City)

Response: Independent of the aquifer classification, the DOE is required to meet the EPA ground water standards at the uppermost aquifer at all Title I former processing sites. Where appropriate, a sole source classification will be considered and discussed in the site-specific environmental documents. DOE will continue to monitor the uses of ground water at the UMTRA Project sites during the Ground Water Project. Therefore, the DOE will be aware if an aquifer is defined as sole source in the future.

Comment 84. There may be a need to revisit decisions. What opportunities would there be to re-evaluate choice of strategies with changing conditions (for example, population growth, climate, and drought). (Tuba City)

Response: It is agreed that it may become necessary to reevaluate the use of a particular ground water compliance strategy at a given site if the monitoring data or other information indicates the strategy may not be protective of human health or the environment as may occur with changing conditions. In most cases, ground water monitoring will take place at the sites and these data will be used to evaluate the effectiveness of a given strategy. For example, monitoring data and changing conditions at and near the site may indicate that natural flushing is not appropriate and that some other strategy such as active remediation may be required. Conversely, monitoring data may indicate ground water contamination has been reduced sufficiently by active remediation so that a passive remediation strategy may be applied.

Comment 85. Who will decide future water needs? (Tuba City)

Response: The PEIS does not discuss who will decide future water needs, and it is beyond the scope of this document to do so; the DOE will work with the appropriate agencies and stakeholders to determine future water needs during site-specific ground water compliance activities.

Comment 86. Flow rates and velocity must also be considered in a natural flushing scenario; to determine if natural flushing is appropriate. Natural flushing is not appropriate at the Navajo sites. (Tuba City)

Response: To evaluate natural flushing as a potential ground water compliance strategy at any site, the hydrogeologic and geochemical properties of the aquifer must be determined, and future migration of the contaminated ground water must be estimated. Ground water velocity (flow rate) is one of the hydrogeologic properties that would be evaluated and its determination is critical before natural flushing is implemented. No site-specific ground water compliance strategies have been selected at any UMTRA Project site.

Comment 87. Regarding prioritization for remediation, is there a priority for site remediation within the general prioritization categories identified in the PEIS? (Tuba City)

Response: At this time, there is no specific priority for site remediation within each general priority category. Prioritization is a dynamic process and will be revised and updated when necessary.

Comment 88. Would site characterization be completed at all Category 1 sites before starting site characterization at lower category sites? If site characterization is completed at lower category sites before it is completed at higher category sites, would remediation be completed at the lower category sites before the higher priority/category sites? (Tuba City)

Response: Characterization will continue to be completed across the category boundaries. The additional characterization is critical to validate conclusions reached during the initial site prioritization process. Remediation will generally follow along the lines of the site priorities. However, in an effort to balance budgets, program capabilities, and other resource considerations, some sites in lower categories may be completed ahead of the higher priority sites. Because finishing some lower priority sites may take a very limited amount of resources, these sites would not significantly impact efforts on the higher priority sites.

Comment 89. What happens if the Department of Energy runs out of funding? (Tuba City)

Response: The DOE receives annual appropriations based on budget requests from the President and negotiations on funding levels at the Congressional level. Thus DOE does not have a limited amount of funding that can run out. Budget cuts that reduce the amount of funding available in a fiscal year are possible. In these instances, work could be delayed to a subsequent fiscal year.

Comment 90. The importance of opportunities for participation by Northern Arizona State/Tribal Environmental Studies program in the ground water program should be stressed. (Tuba City)

Response: The DOE recognizes the importance of local participation in its Ground Water Project. For example, Navajo Community College students are participating in a ground water study at the Shiprock site; this study is being conducted by the University of New Mexico. In addition, Tuba City high school and junior college students are participated in the vegetation studies being conducted by the University of Arizona at the Tuba City site. The DOE will continue to support educational outreach opportunities.

Comment 91. There is confusion regarding the standards and the purpose of clean-up. Is the ultimate purpose of the program to return to background or to return to standards? How do other standards (tribal, state) influence clean-up? (Tuba City)

Response: The purpose of the Ground Water Project is to demonstrate that the EPA ground water standards have been met at each of the Title I former uranium processing sites. For constituents that are listed in the regulations but do not have UMTRA Project maximum concentration limits and those that are above maximum concentration limits in background waters, the EPA regulations set background as the standard.

Decisions regarding consistency with applicable tribal and state laws and regulations will be made by DOE in consultation with the tribes and states. These decisions will consider cases where an approved wellhead protection area, under the Safe Drinking Water Act, is associated with the site. A wellhead protection area is an area of land where there are restrictions on development so as to protect ground water supplies used for drinking water or other beneficial uses. DOE must comply with the provisions of that program, unless an exemption is granted by the President of the United States through the EPA. Contamination on the site that is not covered by UMTRCA (because it is not related to the processing operation) is not the responsibility of DOE but may be covered by other federal, tribal, or state programs. A discussion of this issue is presented in the EPA standards (60 FR 2854, 2856) and is in Appendix A to the PEIS.

Comment 92. Can background be an alternate concentration limit? (Tuba City)

Response: No. If the amount of a contaminant in ground water was at background, the standard would be met, and there would be no reason to apply to the U.S. Nuclear Regulatory Commission for an alternate concentration limit.

Comment 93. Regarding page 3-7 on the regulatory context: what if tribal standards are more stringent? Which would the Department of Energy use? This should be clarified in PEIS. (Tuba City)

Response: Decisions regarding consistency with applicable tribal and state laws and regulations will be made by DOE in consultation with the tribes and states. These decisions will consider cases where an approved wellhead protection area, under the Safe Drinking Water Act, is associated with the site. A wellhead protection area is an area of land where there are restrictions on development so as to protect ground water supplies used for drinking water or other beneficial uses. DOE must comply with the provisions of that program, unless an exemption is granted by the President of the United States through the EPA. Contamination on the site that is not covered by UMTRCA (because it is not related to the processing operation) is not the responsibility of DOE but may be covered by other federal, tribal, or state programs. A discussion of this issue is presented in the EPA standards (60 FR 2854, 2856) and is in Appendix A to the PEIS.

Comment 94. How would the Department of Energy address the question of compliance if there are no federal standards but there are tribal standards? (Tuba City)

Response: There are federal standards for the UMTRA Ground Water Project. The federal standards are included in the PEIS under Appendix A. They are 40 CFR Part 192 and

Groundwater Standards for Remedial Actions at Inactive Uranium Processing Sites, final rule (60 FR 2854, January 11, 1995). See answer to comment 93 for clarity on applicability of tribal standards. The DOE will review on a case-by-case basis whether or not to comply with standards not covered in the EPA standards.

Comment 95. How will the decision to close the Albuquerque office affect the project? How will the transfer of the Ground Water Project affect the program, for example, accessibility, moving forward on compliance, and tribal participation. (Tuba City)

Response: DOE will continue to respond to the needs and requests from all stakeholders, including the tribes, in a timely manner that is mindful of accessibility, compliance, and stakeholder/tribal participation. DOE and the Grand Junction Projects Office are committed to move forward, with tribal participation, in complying with EPA standards.

Comment 96. Indian tribes get short-changed when there are program changes for the economic benefit of the agency. Previous experience indicates a resulting loss of funding and communication. (Tuba City)

Response: The DOE will attempt to minimize the loss of funding. However, in the event of a funding reduction, DOE will strive to minimize any impact this might have on ground water cleanup on a programmatic and site-specific basis, and will continue to maintain effective communication with the public.

Comment 97. A group should stay in Albuquerque for the Ground Water Project to relate to the tribe. (Tuba City)

Response: The DOE, and Grand Junction Projects Office specifically, are committed to open and continual communication to help meet the public and project goals. We look forward to continuing the working relationship with the Navajo Nation.

Comment 98. We have established working relations with the site manager and this will be taken from us if the Ground Water Project moves to Grand Junction; we need continuity with the Department of Energy site manager. (Tuba City)

Response: The DOE, and Grand Junction Projects Office specifically, are committed to open and continual communication to help meet the public and project goals. We look forward to continuing the working relationship with the Navajo Nation.

Comment 99. The document needs to be culturally sensitive, that is, sensitivity to persons whose first language is not English; use more visual aids, clearer and simpler language. (Tuba City)

Response: The DOE has approved funding for a community involvement specialist who speaks Navajo to work as liaison between the DOE and the Navajo Nation. Additionally, the PEIS has been extensively reviewed and thoroughly edited to make sure it is clear and readable and technically correct.

Comment 100. Section 4.4.7 regarding Native American Resources, does not address Indian/tribal issues. Reference is made to the State Historic Preservation Officer but not to the comparable tribal officer. Tribal requirements and sensitivities need to be added. Use the term Cultural/Traditional Resources to encompass Native American resources (such as spiritual sites, and herb gathering areas). (Tuba City)

Response: Discussions regarding cultural resources were meant to encompass all such resources including historic, archaeological, and traditional Native American resources. As suggested, the title of the impact sections in the PEIS has been changed to "Cultural/Traditional Resources" for clarification. References to the appropriate tribal official have also been added, to Sections 4.2.1.7 and 4.2.2.7.

Comment 101. The Department of Energy should have better prepared the translators and have advance preparation and agreement on technical terms and coordination with local chapters. The Department of Energy needs to recognize different dialects and develop common agreement on terms for scientific information that can continue to be used. (Tuba City)

Response: Thank you for your comment. The DOE has approved funding for a community involvement specialist who speaks Navajo to work as liaison between the DOE and the Navajo Nation. In addition, the DOE will continue to work closely with the tribes and enhance its coordination for future public meetings.

Comment 102. What is Department of Energy's policy on environmental justice? Does the Department of Energy have a policy on environmental justice? Is this reflected in the PEIS or will it be in site-specific environmental assessments? An environmental justice discussion needs to be included in the PEIS. (Tuba City)

Response: Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations*, directs federal agencies to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations. Executive Order 12898 also directs the EPA administrator to convene an interagency Federal Working Group on Environmental Justice. The Working Group is directed to provide guidance to federal agencies on criteria for identifying disproportionately high and adverse human health or environmental effects on minority and low-income populations. The Working Group has not yet issued the guidance directed by Executive Order 12898. In coordination with the Working Group, the DOE is developing internal guidance on implementing the Executive Order. Because both the Working Group and the DOE are still in the process of developing guidance, the approach taken in this analysis may depart somewhat from the guidance that eventually is issued.

DOE has attempted in this PEIS, and will continue in subsequent tiered NEPA documents, to identify and to mitigate when so identified, any disproportionately high and adverse human health or environmental effects on minority and low-income populations resulting from decisions based on this PEIS. The activities required to complete the ground water project are highly localized and would not result in cumulative impacts to air quality, noise levels, visual resources, transportation systems, utilities and energy supplies, waste generation, and cultural resources. Further, the proposed action would result in human health, socioeconomic, and environmental impacts that would benefit any surrounding population. Therefore, the DOE does not anticipate any disproportionately high and adverse effect on minority and low-income populations to result from the implementation of this program. The DOE will reassess potential environmental justice issues in site-specific NEPA documents that will be tiered from this programmatic review.

Environmental justice (Executive Order 12898) discussions were added to the PEIS (Sections 1.4.4, 3.1.1.10, 4.2.1.12, 4.2.2.12, 4.2.3.12, 4.3.12, 4.4.12, and 4.5.8).

Comment 103. Page 3-9; strike first sentence. Tuba City is not sparsely populated. (Tuba City)

Response: This sentence has been revised to make it clear that the text is referring to the UMTRA Project site. The site is 6 air miles from Tuba City, which qualifies it as a rural site based on the criteria used in the PEIS.

Comment 104. Shading of maps (for example, 2-25, 2-26, 2-28, 2-29) could be misinterpreted. The implication is that one type of contamination is worse, for example, chemicals versus metals. It may not be accurate that one is more (or less) toxic. (Tuba City)

Response: The figures have been revised, where appropriate, to reduce the possibility of misinterpretations to the greatest extent possible. Because a variety of contaminants can contribute to the contamination of ground water and because Figures 2.4, 2.5, 2.6, and 2.7 are not site-specific, no specific ground water contaminants are represented. Only relative levels of contamination are represented. In these figures no reference is implied or made to the toxicity of specific ground water contaminants.

Comment 105. The area-capture zone (figure 2-8) is misleading. The terms are unclear and need to be clarified. The terms should be included in the glossary and included in the no flow boundary discussion. (Tuba City)

Response: The term "capture zone" refers to the area of an aquifer that contains ground water that will eventually be captured by the extraction wells. Figure 2.8 (Figure 2.7 in the final PEIS) has been revised for clarity. The term "capture zone" has been added to the glossary. A discussion of no-flow boundaries would be relevant to site-specific documents in which ground water flow model results are presented. An example of such a document would be a site observational work plan.

Comment 106. Include more information in the text to explain the terms. Technical terms should be discussed in simpler words. (Tuba City)

Response: Significant effort has been made in the final version of the PEIS to simplify and explain technical terms. The document has been reviewed and edited. Additional information to explain terms has been included for clarity. The glossary has also been reviewed and edited for consistency and clarity in definition of terms.

Comment 107. How and when is a decision to be made that site characterization is adequate to make a decision on ground water compliance at a site? Who makes that decision? Site-specific technical documents, their purpose, and the relationship to the Ground Water Project and to the PEIS need to be discussed in the PEIS. (Tuba City)

Response: Site characterization will be complete when enough information has been collected to propose a site-specific ground water compliance strategy that will be protective of human health and environment. The DOE will make the decision regarding the proposed ground water compliance strategy in consultation with the affected tribe, state, and/or public. Ultimately, the U.S. Nuclear Regulatory Commission, as the regulatory agency, decides whether sufficient site characterization is completed because it must approve the remedial action plan that is based on the site characterization. The relationship of other programmatic and site-specific ground water documents to the PEIS is discussed in Section 2.8.1. This section was revised to include an expanded discussion of site-specific Ground Water Project documents that will likely be prepared.

Comment 108. Will site-specific ground water data be presented in the environmental assessments? (Tuba City)

Response: A summary of the site-specific ground water data will be presented in the site-specific NEPA document. The more detailed data would not be included in the NEPA document although they may be attached in an appendix. These data are also likely to appear in the site-specific site observational work plan or the remedial action plan for a given site.

Comment 109. What happens to the contaminants when they are caught in a barrier? Who decides the disposal method for the contaminants? (Moenkopi Village)

Response: Contaminants are removed by either precipitation or sorption as the ground water passes through the permeable reactive barrier. Precipitation is a chemical process whereby a contaminant in solution (ground water) is converted to a solid in combination with other ground water constituents. Sorption is a process whereby a contaminant adheres to the barrier material through which the ground water passes. Contaminated materials will be disposed of in a manner consistent with the requirements of UMTRCA, DOE orders, and applicable federal, tribal, and state laws and regulations including Department of Transportation requirements.

Comment 110. Where does contaminated water naturally flush to? (Moenkopi Village)

Response: A ground water contaminant plume may naturally flush or discharge to a river. Some ground water contaminants may also be adsorbed onto the aquifer matrix through which the contaminated ground water passes. Adsorption occurs when contaminants chemically bond with minerals of the aquifer matrix.

Comment 111. Will the contaminants still be a hazard when natural flushing is used? (Moenkopi Village)

Response: During the time when natural flushing is occurring, the contaminants could be a hazard if the contaminated ground water is used improperly (such as for drinking water). However, before the DOE can implement natural flushing as an option, it is required to determine if its use would be protective of human health and the environment. In addition, viable institutional controls must be incorporated into this compliance strategy to prevent the inadvertent use of contaminated ground water. In addition, natural flushing cannot be used for a contaminated aquifer that is or is reasonably projected to become a public water supply.

Comment 112. The tailings in the Tuba City cell are moist. What will happen to this moisture? Right now the moisture from the tailings is moving towards Moenkopi Wash along with the contaminated ground water. (Moenkopi Village)

Response: A fraction of the moisture in the tailings has or will move downward into the ground water. This process is known as transient drainage. However, the flow rate from transient drainage occurs relatively quickly (DOE, 1995a). The volume of water that did or will enter the ground water system as transient drainage will be only a very small percentage of the total volume of contaminated ground water.

Encapsulation of the tailings into a disposal cell with a full-component cover should greatly reduce the seepage of constituents in the tailings into the underlying ground water.

Comment 113. Why does natural flushing occur after the options for supplemental standards and alternate concentration limits in the proposed action framework (page 2-3)? (Moenkopi Village)

Response: Moving from top to bottom of the proposed action framework (Figure 2.1, Volume I), the complexity and potential impacts of the ground water compliance strategies increase. It first considers no remediation, which includes supplemental standards and alternate concentration limits; this strategy would result in little environmental disturbance and human presence at a site. Natural flushing is considered after no remediation because this strategy has the potential to have greater environmental impact and human presence at a site as a result of ground water monitoring and institutional controls. In addition, the quality of the background ground water generally gets better as one moves through the framework from supplemental standards to natural flushing to active remediation. For example, if the contaminant plume is surrounded by poor ambient ground water, supplemental standards rather than natural flushing may be the logical choice for a ground water compliance strategy.

Comment 114. Will any of the alternatives or strategies effectively stop the contaminants from entering Moenkopi Wash? (Moenkopi Village)

Response: Contaminated ground water from the Tuba City site is not expected to reach Moenkopi Wash. This will be confirmed through ground water monitoring and characterization; results of this study will be used to study the plume at the Tuba City site. This information will be used with input from the tribes and the public to determine a strategy to meet the EPA standards for the contaminated ground water at the site..

Comment 115. Is there still a problem with airborne contaminants? (Moenkopi Village)

Response: Airborne contamination was caused by surface contamination at the UMTRA sites. This contaminated material has been or is being cleaned up and stabilized in disposal cells, resulting in the elimination of airborne contaminant levels above the EPA standards. The constituents in the contaminated ground water at the sites are dissolved in water and do not pose an airborne hazard.

Comment 116. How does the Department of Energy know if contaminants are caught in a barrier? (Moenkopi Village)

Response: The performance of a subsurface barrier can be monitored by the collection of ground water samples before the ground water enters the barrier and after the ground water exits the barrier. Such ground water samples can be collected through monitor wells. An analysis of the samples should indicate much lower concentrations of contaminants in ground water exiting the barrier compared to the contaminated ground water entering the barrier. This would demonstrate that a subsurface barrier is "catching" the contaminants and functioning properly.

Comment 117. There is a discoloration in the Wash near the bridge. Is this from the contaminated ground water? (Moenkopi Village)

Response: Contaminated ground water from the Tuba City site is not entering Moenkopi Wash, so it is not reasonably expected that the discoloration in the Wash is from the Tuba City site. Often, these are natural processes that can discolor the rock where ground water seeps occur. An example of such a process is the oxidation of common minerals present in the rock.

Comment 118. How deep is the contaminated plume? Explain the process of plume containment. (Moenkopi Village)

Response: Ground water samples from different depths and recent geophysical investigations indicate that the zone of ground water contamination at the Tuba City site ranges from 30 to 80 feet (9 to 24 meters) below the ground surface.

Plume containment may be employed as a means of isolating a zone of highly contaminated ground water so that it will not migrate downgradient. Contaminant plumes can be contained through the use of physical barriers or hydraulic barriers. Physical barriers consist of various types of subsurface walls placed around the zone of contamination. These ground water remediation technologies are discussed in more detail in the PEIS, Appendix C.

Comment 119. Human life and use of water should be the primary concerns. (Moenkopi Village)

Response: Agreed. The proposed action is a risk-based approach to implementing the Ground Water Project. Protection of human health and the environment is the driving force behind the determination of a site-specific ground water strategy.

Comment 120. The plume is moving faster than originally expected. (Moenkopi Village)

Response: The estimated ground water velocity for the Tuba City site presented in the PEIS is based on previously published reports and is consistent with current site investigations; current data indicate that ground water velocity at the Tuba City site is similar to previous estimates. The estimated ground water velocity at the Tuba City site will be revised, if necessary, on the basis of future site investigation.

Comment 121. The Hopi Tribe should have input into how things are done. (Moenkopi Village)

Response: Section 1.6 of the PEIS describes the process of public involvement and future opportunities to participate in the decision making process. In addition, as noted in Section 1.3.2 of the PEIS, Native American tribes have been identified as cooperating agencies in

this PEIS process. Cooperative agreements also outline responsibilities and commitments between the DOE and affected states and tribes. DOE is committed to ongoing public involvement in the Ground Water Project, including participation in site-specific NEPA documents that identify and analyze impacts of proposed ground water compliance strategies. These mechanisms will help ensure that the tribe has meaningful input into future decisions on the Ground Water Project.

Comment 122. The Department of Energy should bring whatever experts are needed to remediate the site and should collect whatever data is needed to remove the contamination before it reaches the Wash. (Moenkopi Village)

Response: The DOE acknowledges the importance of protecting Moenkopi Wash and has conducted extensive testing to determine the extent of the contamination at and near the Tuba City site as well as potential exposure to either humans or livestock. Our testing to date shows that there is no current risk of exposure. At present, the contamination in the ground water is located in the immediate vicinity of the former mill site. It is moving very slowly toward Moenkopi Wash. The DOE has monitored and continues to monitor the ground water to ensure that contamination is not moving into Moenkopi Wash. UMTRCA and the EPA ground water standards require DOE to implement strategies that will meet the regulations and protect public health and the environment. The DOE continues to seek opportunities for taking interim actions to protect human health and the environment. The DOE will use experts in a variety of disciplines during the Ground Water Project.

Comment 123. Moenkopi Village needs to be protected. The strategies do not appear to be protective. (Moenkopi Village)

Response: The DOE acknowledges the importance of protecting Moenkopi Village and has conducted extensive testing to determine the extent of the contamination at and near the Tuba City site as well as potential exposure to either humans or livestock. Our testing to date shows that there is no current risk of exposure. At present, the contamination in the ground water is located in the immediate vicinity of the former mill site. It is moving very slowly toward Moenkopi Wash. The DOE has monitored and continues to monitor the ground water to ensure that contamination is not moving into Moenkopi Wash. In all cases, the ground water compliance strategy will not be implemented unless it can be shown they are protective of human health and the environment. The protectiveness of a given strategy will be determined through consultation with the tribes and public, and verified through monitoring.

Comment 124. The PEIS needs to revisit the idea of Hopi tribal participation. The Hopi Tribe should participate fully in the decision making and should not be limited to just a concurring role. (Moenkopi Village)

Response: DOE intends to select compliance strategies and perform remedial actions with the consultation of the affected tribes, as required by UMTRCA. Section 1.3.2 of the PEIS had been revised to indicate that the Hopi Tribe is a cooperating agency in the PEIS;

Section 1.6 of the PEIS describes opportunities for public involvement in the future opportunities during site-specific decision making. New ground water cooperative agreements between the DOE and affected states and tribes will also outline the roles and responsibilities of the parties. The DOE is committed to ongoing participation of affected parties and recognizes the importance of this participation in making decisions that affect communities.

Comment 125. Have monitoring data been shared with the Hopi Tribe? (Moenkopi Village)

Response: Yes, ground water monitoring data are sent to the Hopi Tribe after being analyzed and validated by the DOE. Ground water sampling at the Tuba City site is scheduled to occur on a quarterly to annual basis depending on the monitor well.

Comment 126. Add to Section 1.3.2 of the PEIS: Hopi and Navajo Tribes are cooperating agencies. This is very important. (Moenkopi Village)

Response: A sentence has been added to the Section 1.3.2 that identifies the Navajo Nation and Hopi Tribe as cooperating agencies.

Comment 127. It is very important for the Hopi Tribe to concur on any determination involving alternate concentration limits (page 1-12). (Moenkopi Village)

Response: The application of alternate concentration limits would be submitted to the U.S. Nuclear Regulatory Commission and would appear in the draft and final remedial action plans. Affected states and tribes will have full participation and consultation, respectively, with the development of alternate concentration limits and ground water remedial action plans.

Comment 128. It sounds like the Department of Energy is leaning towards natural flushing. Natural flushing is not acceptable for the Tuba City site. (Moenkopi Village)

Response: A final decision regarding the ground water compliance strategy for the Tuba City site has not been made. Additional site characterization, impacts analysis, and tribal and public participation will be used to determine the final ground water compliance strategy at the Tuba City site.

Comment 129. The Project cannot meet the clean up schedules for corrective action identified in 40 CFR §192.04. It is suggested that a formal, legal opinion be developed about this issue. (Moenkopi Village)

Response: The need for corrective action, as identified in 40 CFR §192.04, would occur if ground water contamination exceeded concentration limits (established as part of the site-specific Surface Project water resource protection strategy) as a result of disposal cell

performance failure. If these limits were exceeded at a disposal cell's point of compliance as a result of a failure in cell performance, then DOE would implement a corrective action program as soon as is practical and, in no event, no later than 18 months after finding an exceedance. The need for corrective actions has not been identified at any of the UMTRA sites.

The 1988 amendment to UMTRCA gives the DOE the flexibility to perform ground water cleanup and compliance (Subpart B) without time limitation. One such compliance provision, natural flushing, allows up to 100 years for achieving compliance. The presence of residual ground water contamination beneath and downgradient of an UMTRA disposal cell does not constitute a scenario for formal corrective action.

Comment 130. The Department of Energy needs to consider first those sites with serious contamination problems. Urgent situations should be taken care of regardless of the PEIS schedule. (Moenkopi Village)

Response: DOE agrees with the need to take care of urgent situations. Baseline risk assessments have been completed at most sites, providing an assessment of the predominant risks to human health and the environment from the ground water conditions attributable to the processing activities. Based on these assessments and other factors, DOE has historically completed interim actions to protect human health and will continue to implement interim actions to mitigate urgent situations should such conditions be identified.

Comment 131. Define net gross alpha as used in the table on page SUM-6. Review the use of definitions in the glossary. More definitions of terms may be needed in the text. (Moenkopi Village)

Response: Net gross alpha is a radiological term for the alpha activity associated with all alpha-emitting radionuclides except uranium. Net gross alpha has been defined in the glossary. Glossary definitions have been reviewed to match the text, and new definitions have been added to text and glossary.

Comment 132. The PEIS states that the Monument Valley site has a wetland and that the Tuba City site does not (page SUM-7, table 3). Moenkopi Wash should be considered a wetland and identified in this table. (Moenkopi Village)

Response: It is agreed that there are wetlands along Moenkopi Wash. A site was said to have wetlands if wetlands were within the zone of influence of the site, such as being at or near the site or over or near the plume. The wash is about 7000 feet from the Tuba City site and not in the area of the plume and was not judged to be within the zone of influence of the site or the plume.

Comment 133. The parish alkali grass found in Moenkopi Wash should be recognized in the PEIS as an endangered species. (Moenkopi Village)

Response: Moenkopi Wash is not within the zone of influence of the Tuba city site and, therefore, endangered plants that occur along the wash were not considered. However, threatened and endangered species will be addressed in the site-specific NEPA document for the Tuba City site. This will include consultation with natural resources personnel from the Hopi Tribe and Navajo Nation and the U.S. Fish and Wildlife Service.

Comment 134. Define the abbreviation pCi used on page 2856 of the Federal Register, 60 FR 2856. (Moenkopi Village)

Response: The abbreviation pCi stands for picocurie. The picocurie is a unit of measurement of radioactivity and defines the number of transformations per unit of time. Transformation refers to one element changing into another element.

Comment 135. The terms used in the cooperative agreement and the PEIS need to be consistent. (Moenkopi Village)

Response: Terminology in the PEIS and Ground Water Project cooperative agreements will be consistent where appropriate.

Comment 136. Will there be additional opportunity for public input on the site-specific ground water environmental assessments and on other site-specific ground water documents? There should be. What will the environmental assessments address? (Moenkopi Village)

Response: Yes, the DOE will provide additional opportunities for public input in the site-specific NEPA documents, baseline risk assessments, site observational work plans, and ground water compliance action plans. The NEPA documents for the Ground Water Project will describe a proposed ground water compliance strategy for the specific site, describe the existing environment of the site area, and analyze the impacts associated with implementing the proposed ground water compliance strategy. The NEPA documents will focus on site-specific issues and impacts that have been broadly discussed in the PEIS.

Comment 137. It is important to the Hopi Tribe to continue to have input on all decisions affecting the Tuba City site. The Hopi Tribe is concerned that the PEIS will eliminate site-specific input. The PEIS should describe how future public input will be sought. (Moenkopi Village)

Response: The DOE recognizes the importance of input from the Hopi Tribe and will continue to work closely with the Hopi Tribe.

With regard to the PEIS and site-specific input, a site-specific National Environmental Policy Act document will be prepared for the Tuba City UMTRA site. As a cooperating agency, the Hopi Tribe will have active involvement in the National Environmental Policy Act process.

Comment 138. When will remediation or containment activities begin? (Moenkopi Village)

Response: Remediation activities will begin after the final ground water compliance strategy has been identified and analyzed in the site-specific environmental document and the U.S. Nuclear Regulatory Commission concurs on the ground water compliance strategy. Interim actions such as alternate water supplies are being considered or have been implemented at some sites.

Comment 139. Ground water extracted for remediation activities should be returned to the aquifer. The Department of Energy needs to be careful not to contribute to depletion of the aquifer. (Moenkopi Village)

Response: If active ground water remediation includes the extraction of ground water, the DOE will minimize, to the extent possible, the depletion of an aquifer. As described in Section 1.2.4 of the PEIS, Indian tribes and states will be consulted and requested to review and comment on ground water compliance strategies including those that may result in ground water extraction. In addition, remedial action plans will be prepared in consultation with the tribes and states. These plans will include arrangements for managing treated ground water if that is part of the ground water compliance strategy.

Comment 140. What will be done with radioactive material extracted from the contaminated plume? (Moenkopi Village)

Response: All contaminated materials including radioactive and nonradioactive material generated as a result of ground water remediation activities will be disposed of in a manner consistent with the requirements of UMTRCA, DOE orders, other federal regulations, and tribal and state regulations.

Comment 141. It is very important that all parties concerned work together. (Moenkopi Village)

Response: Thank you for your comment. The DOE agrees fully.

Comment 142. It is very important that the Department of Energy provide answers that are honest and straight forward. (Moenkopi Village)

Response: Thank you for your comment; the DOE agrees, and is committed to providing honest and straightforward information and continuing to provide opportunities to meet together to discuss issues regarding the UMTRA Project.

Comment 143. It is very important that the Department of Energy provide answers that are honest and straight forward. Water is precious to the Hopi people. Their welfare is critical. (Moenkopi Village)

Response: The DOE is committed to providing information and continuing to provide opportunities to meet together to discuss issues regarding the UMTRA Project. The DOE shares your concern and acknowledges the traditional values the tribe places on water resources. Chapter 4 of the PEIS discusses cultural/traditional resource impacts, including tribal traditional values related to water resources.

Comment 144. Will the Department of Energy use existing data for preparation of the environmental assessments or will further characterization be conducted? Will the Department of Energy conduct scoping prior to preparation of site-specific environmental assessments? (Gunnison)

Response: The DOE will use existing data and collect additional site characterization data while conducting the Ground Water Project at the Gunnison site. While the National Environmental Policy Act and its implementing regulations do not require public scoping for all NEPA documents, the DOE is committed to an ongoing public involvement process that includes opportunities for public input in developing all site-specific ground water environmental documentation. Section 1.6 of the PEIS identifies DOE plans for future public participation in the Ground Water Project. This will include public meetings and consultation with applicable agencies regarding site-specific issues and the impacts of implementing a proposed ground water compliance strategy.

Comment 145. It is good that the Department of Energy plans to have public meetings after developing the environmental assessments. In the past, the Department of Energy did not do that. (Gunnison)

Response: Thank you for your comment. The DOE recognizes the importance of involving the public in decisions that will affect them. Section 1.6 of the PEIS describes future opportunities for public participation in the Ground Water Project.

Comment 146. Why is natural flushing limited to 100 years? Does the 100 year limit have a scientific basis? (Gunnison)

Response: Natural flushing is limited to 100 years because it relates to EPA's approach to institutional controls for regulating radioactive waste disposal (60 FR 2854, 2862).

Comment 147. Will a cost benefit analysis be considered when making site-specific decisions? Specifically, will impacts from institutional controls on private property be taken into account? Valco has approximately 250 acres that could be affected. (Gunnison)

Response: The Ground Water Project will not conduct a cost-benefit analysis for site-specific decisions. However, it is the DOE's intent to apply the most cost-effective and publicly acceptable remedies available that are protective of human health and the environment and meet the EPA standards at each UMTRA site. In addition, all impacts of institutional controls that may be required for the successful application of a ground water compliance strategy will be addressed in the site-specific environmental documents.

Comment 148. Thorium is one of the contaminants at Gunnison. Why isn't thorium on the list of the Environmental Protection Agency standards for the UMTRA Project sites? (Gunnison)

Response: The EPA standards were written in response to the UMTRCA, which was responding to potential adverse health impacts from radon associated with uranium mill tailings. For the surface cleanup, thorium is being cleaned up in soils so that the decay of thorium into radium (over 1000 years) will not result in a radium concentration that exceeds the standards for radium (5 and 15 picocuries of activity per gram of soil). There is no Ground Water Project standard for thorium although background levels could be measured. In addition, thorium is extremely insoluble and immobile in most ground water.

Comment 149. Can supplemental standards be applied to thorium-contaminated areas? (Gunnison)

Response: The presence of thorium in ground water is very unlikely, due to the insolubility and immobility of thorium in ground water. Therefore, it is unlikely that supplemental standards would be needed. However, there is no regulatory reason why a thorium-contaminated area could not have supplemental standards applied, if one of the criteria for supplemental standards were met.

Comment 150. Who approves the thorium clean-up plan? (Gunnison)

Response: The U.S. Nuclear Regulatory Commission will approve both surface and ground water cleanup plans. The DOE will have received stakeholder input prior to presenting any cleanup plans to the U.S. Nuclear Regulatory Commission.

Comment 151. Table 2 in the Citizens' Summary shows that Gunnison has fewer elements than the other sites. What does this mean? How does this affect site-specific decisions? (Gunnison)

Response: Table 2 has been deleted from the summary. Table 3.3 of the final PEIS has been revised to incorporate the most current knowledge available on ground water contaminants at the sites. This table includes only elements that have a maximum concentration limit as defined by the EPA; net gross alpha, radium 226/228, and uranium exceed the maximum concentration limits at the Gunnison site. This table is provided to give the reader an indication of the contamination at the UMTRA Project sites and is not intended for use in determining site-specific ground water compliance strategies or decisions.

Comment 152. How are contaminants of concern that do not exceed the Environmental Protection Agency standards addressed in the PEIS, for example, iron, manganese, and thorium? They are not included in Table 2 of the Citizen's Summary. (Gunnison)

Response: All contaminants of concern, including iron, manganese, and thorium, are addressed in the site-specific baseline risk assessments where appropriate. It is not within the scope of the PEIS to provide a list of all site-specific contaminants of concern. The

PEIS provides a list of contaminants that exceed the maximum concentration limits at each site to provide general background information from the sites.

Comment 153. Are nitrates an issue at Gunnison? (Gunnison)

Response: No. Nitrate concentrations in the Gunnison site ground water are not above background levels nor do they exceed the EPA maximum concentration limit. For a list of ground water contaminants that exceed maximum concentration limits at the Gunnison site please refer to Table 3.3 and Section 3.2.5 of the PEIS. Other contaminants of concern are discussed in the site-specific baseline risk assessment.

Comment 154. What is the schedule for the Gunnison site? (Gunnison)

Response: The schedule for the Ground Water Project at the Gunnison site will begin with the preparation of the first version of the site observational work plan in 1997. Site characterization began in 1994 with the installation of monitor wells with data loggers and work is scheduled to begin on the site-specific NEPA documents in 5 years. Site characterization, the NEPA document, and the results of public participation will all be factored into the decision leading to the determination of the site-specific ground water compliance strategy.

Comment 155. What is the status of surface water and the surface cleanup? (Gunnison)

Response: Surface cleanup has been completed at the Gunnison site.

Comment 156. Do the monitoring wells have to be four to five feet high? They are a visual reminder of what we'd like to forget. (Gunnison)

Response: The DOE has made arrangements to have the monitor wells modified to a lower profile.

Comment 157. This is a project of great interest to the community. It has been a good project. (Gunnison)

Response: The DOE appreciates your comment and appreciates the interest the community has shown in DOE activities. Community involvement has made a significant contribution to the success of the Project.

Comment 158. The current Department of Energy site manager, Sharon Arp, and the State of Colorado representative, Wendy Naugle, have done a great job. (Gunnison)

Response: The DOE agrees and appreciates your comment.

Comment 159. The alternate water supply is working well. The County is looking at expanding it. Building in the areas have picked up dramatically. No one is drinking water they perceive to be contaminated. (Gunnison)

Response: The DOE appreciates your comment.

Comment 160. Which standards are the Department of Energy complying with on the Ground Water Project? The proposed or final standards? (Grand Junction)

Response: The DOE is complying with the final standards as of February 10, 1995, the day the January 11, 1995, final rule became effective.

Comment 161. What about other contaminants that are not addressed in the standards? (Grand Junction)

Response: The EPA ground water standards require that concentration limits must be determined for ground water constituents that are identified in the standards. If a site-related constituent exceeds background but is not listed in the standards it will generally not be identified for compliance as a hazardous constituent. However, the constituents that exceed background and are not in the standards may be evaluated on a case-by-case basis with tribal and state consultation.

Comment 162. Does a site-specific plan for Grand Junction exist? (Grand Junction)

Response: A site-specific plan for the Grand Junction site does not exist in the PEIS because this is a programmatic document. The site-specific ground water compliance strategy will be determined after completion of site characterization and of the impacts analysis in the site-specific NEPA document, and after input from the public. Such a strategy for the Grand Junction site is not expected to be determined for a few years.

Comment 163. What is the schedule for the Grand Junction environmental assessment? (Grand Junction)

Response: The tentative schedule for the start of the Grand Junction Ground Water Project NEPA document is 2001.

Comment 164. The Department of Energy will prepare site-specific environmental assessments and not environmental impact statements, is that correct? (Grand Junction)

Response: Under all of the alternatives except no action, NEPA documents will be prepared for most of the UMTRA Project sites under the Ground Water Project. The determination of an appropriate environmental document will be made after the completion of site characterization and the determination of a site-specific ground water compliance strategy.

Comment 165. What is the risk right now? Is there a clear and present danger? (Grand Junction)

Response: The DOE knows of no current risk from ground water contamination that poses a danger to human health and the environment. Ground water monitoring is being done to provide current information to the DOE so that, if conditions change, the DOE can take appropriate actions.

Comment 166. How will the alternatives address the fact that not all sites have the same contaminants? (Grand Junction)

Response: As indicated in Section 2.1, a number of ground water compliance strategies are available for use under the proposed action. This gives the proposed action the flexibility to address the varying degrees of contamination that occur at the UMTRA Project sites. In addition, the ground water compliance strategies are not specific to only one or just a few contaminants. For example, natural flushing can be applied to a number of constituents as long as the criteria necessary to apply natural flushing are met.

Under the active remediation to background levels alternative, most sites would undergo active ground water remediation regardless of the type of contamination. Under the passive remediation alternative, the no remediation and natural flushing strategies would be available. Under no action, ground water contamination would not be addressed.

Comment 167. Remedial action can get very expensive compared to the benefits. (Grand Junction)

Response: The EPA standards are in place to protect human health and the environment and meeting these standards is beneficial even though it can become quite costly. DOE is exploring alternatives to traditional ground water cleanup technologies to identify effective methods that would provide protection to human health and the environment, meet the standards, and save money. In addition, some UMTRA sites are potential candidates for supplemental standards and natural flushing. These compliance-driven, risk-based strategies have the potential to minimize costs.

Comment 168. Does water velocity affect the rate of ground water contamination? (Grand Junction)

Response: Ground water velocity is one aquifer property that affects the rate at which contaminants migrate once they enter the ground water system. Other hydrogeological and geochemical properties also can have significant effects on contaminant migration rates. If the hydrogeological and geochemical properties are conducive to contaminant migration, contaminant migration rates would increase with respect to ground water velocity.

Comment 169. How does the PEIS address unknown users of contaminated ground water? (Grand Junction)

Response: The PEIS does not address unknown users of the contaminated ground water. Use of the ground water at a particular site will be addressed in site-specific NEPA

documents. The DOE makes every attempt to be aware of users of the contaminated ground water. For example, during the preparation of site-specific baseline risk assessments, door-to-door canvassing of potential local users of the ground water occured at some sites.

Comment 170. Why did the clean at the point of use alternative fall out of the analysis? (Grand Junction)

Response: The clean at point of use alternative was considered and rejected as an alternative to be considered in the PEIS because it may not be protective of the environment and would not result in compliance with the EPA standards at all sites. An expanded discussion as to why this alternative was eliminated from further consideration was added to the PEIS in Section 2.6.3. However, nothing precludes DOE from completing interim actions or from including alternate water supplies as part of the compliance strategy.

Comment 171. The clean at the point of use alternative should be analyzed as an alternative in the PEIS. (Grand Junction)

Response: As explained in the response to the previous comment (170), this alternative was not analyzed in the PEIS for the reasons discussed in Section 2.6.3.

Comment 172. The clean at the point of use alternative could be considered in combination with the proposed action. (Grand Junction)

Response: Treatment at the point of use is part of the proposed action and all other alternatives except no action. That is, if ground water used by humans becomes contaminated or has the potential to become contaminated soon by the ground water plume, treatment at the point of use could take place under these alternatives as an interim action.

Comment 173. Institutional controls could eliminate some or all land use. A fence around the plume for 100 years "doesn't sound right." (Grand Junction)

Response: Institutional controls could eliminate some current or potential land uses while they are applied. The effectiveness of institutional controls must be verified and maintained over this entire period. Examples of acceptable measures include use restrictions enforceable by the administrative or judicial branches of government entities and measures with a high degree of permanence, such as federal or state ownership of the land containing the contaminated water. Institutional controls that are not adequate by themselves include measures such as health advisories, signs, posts, admonitions, or any other measures that require voluntary cooperation of private parties. However, these measures may be used to complement other enforceable institutional controls.

Comment 174. Socioeconomic impacts have not been considered in the PEIS. (Grand Junction)

Response: Discussions of socioeconomic impacts are included in a number of subsections in Section 4.0 of the PEIS as they relate to implementing the compliance strategies and alternatives. These subsections have been reviewed and revised to incorporate concerns expressed during the public comments period. In addition, the sections have been retitled "Social and Economic Resources."

Comment 175. Institutional controls are not clearly presented and are not presented in adequate depth in the PEIS. (Grand Junction)

Response: The PEIS attempts to clearly present the definition of institutional controls and their applicability to the Ground Water Project. The PEIS does not identify specific institutional controls for a particular site. That evaluation would be covered in a site-specific NEPA document. The EPA ground water standards discuss institutional controls for the UMTRA Ground Water Project. The standards are found in Appendix A of the PEIS. An expanded discussion on institutional controls has been added to Section 1.4.1 of the final PEIS.

Comment 176. Institutional controls could have major impacts and must be included in greater detail in the PEIS. (Grand Junction)

Response: See the answers to Questions 173 and 175. Efforts will be made to minimize the impacts of applying site-specific institutional controls to conditions that warrant control of access to contaminated ground water.

Comment 177. The PEIS does not disclose what the impacts of institutional controls are. (Grand Junction)

Response: Section 4.0 includes information on the potential impacts of institutional controls in relation to implementing the various compliance strategies.

Comment 178. Since ground water hydrology is not an exact science and therefore decisions about the institutional controls may be based on this inexact science. (Grand Junction)

Response: The DOE considers the uncertainties of ground water hydrology when characterizing and evaluating ground water conditions and when developing recommendations for the sites. When site-specific decisions about ground water compliance strategies and institutional controls are made, it will be with full awareness of the inherent limitations of the site characterization information and analysis.

Comment 179. Are there criteria established for what institutional controls are appropriate for different risks? (Grand Junction)

Response: The EPA Ground Water standards have some discussion of what constitutes a viable and enforceable institutional control (see Appendix A of the PEIS). The language can be found on page 2862 of 60 FR 2854. There are no specific criteria for institutional controls based on risks for the UMTRA Project. Rather, the EPA ground water standards require that institutional controls "effectively protect public health and the environment and satisfy beneficial uses of ground water." The regulations also require the use of institutional controls to have a "high degree of permanence," "be enforceable by the administrative or judicial branches of government entities," and "be verified for effectiveness and maintained over a period of time."

Comment 180. Who will decide what institutional controls will be used? (Grand Junction)

Response: The DOE will work with federal, tribal, state, or local government entities as appropriate in a joint decision-making process to identify effective and enforceable site-specific institutional controls.

Comment 181. Will the site-specific environmental assessment state what institutional controls are planned and what the impacts will be? (Grand Junction)

Response: Site-specific NEPA documents will identify the need for institutional controls based on the proposed ground water compliance strategy. If there is a need for institutional controls, the NEPA document would likely identify a range of controls or restrictions that could be applicable and evaluate the effectiveness and impacts of the implementation. Some of the factors to be considered include the following: the types of institutional controls that are available from the tribes, states, or local communities; beneficial uses of the uppermost aquifer; risk due to exposure to the contaminated ground water; the proposed compliance strategy; and land use and ownership.

Comment 182. Vicinity properties are only addressed in two sentences in the PEIS. (Grand Junction)

Response: The preamble to the final rule for the EPA ground water standards states that "only a few vicinity properties contain sufficient tailings to constitute a significant threat of ground water contamination" and concluded that "the detailed assessment and monitoring, followed by identification of listed constituents and ground water standards is *not* required at all vicinity properties. It is necessary only at those vicinity properties with a significant potential for ground water contamination, as determined by the DOE (with the concurrence of the U.S. Nuclear Regulatory Commission) using factors such as those in EPA's Resource Conservation and Recovery Act Facility Assessment Guidance document." Section 1.0 has been modified to provide more detail on DOE's approach to vicinity properties on the Ground Water Project.

Comment 183. Some vicinity properties had significant volumes of tailings materials. (Grand Junction)

Response: The following information has been added to Section 1.0 of the PEIS. DOE acknowledges that there have been some vicinity properties with substantial volumes of tailings materials. However, the volume of tailings is just one of the criteria for determining if the vicinity property would be a source of ground water contamination and fall within the Ground Water Project. Other factors include depth to ground water, soil and bedrock geochemistry, ground water recharge and discharge, background water geochemistry, climate, and the placement of the contaminated materials.

Comment 184. Has an analysis been done of whether there is an expected risk to ground water from a certain volume of tailings? (Grand Junction)

Response: An analysis of the expected risk to ground water from a certain volume of tailings, including tailings from vicinity properties, has not been conducted. Such an analysis would be difficult and may be of questionable value because of the variation in the chemical makeup of the tailings both between and within given tailings sites, the large variability of the rock and soil layers between the tailings and the ground water, and variations in weather patterns.

Comment 185. The Department of Energy should not assume vicinity properties will qualify for supplemental standards. The Department of Energy should not wait to evaluate vicinity properties. There might not be any money available. (Grand Junction)

Response: The DOE has not made the assumption that a vicinity property with ground water contamination will qualify for supplemental standards. Rather, DOE will address potential ground water contamination associated with vicinity properties on an as-needed basis. The DOE is not aware of any contamination affecting ground water resources as a result of a vicinity property. Section 1.0 has been modified to provide more information on DOE's approach to vicinity properties on the Ground Water Project.

Comment 186. Does the Department of Energy have any wells at vicinity properties? If not, why does the Department of Energy assume that ground water contamination from vicinity properties is negligible or non-existent? (Grand Junction)

Response: The DOE has not placed monitor wells at any vicinity properties to determine if the vicinity property material is causing ground water contamination with the exception of the Burrell, Pennsylvania, disposal cell. The DOE considers ground water contamination from vicinity properties a low potential because tailings were milled at processing sites, not at vicinity properties. The processing sites had a significant impact on ground water due to the use of chemicals, water discharge, and exposed saturated tailings. In most cases the tailings were exposed to the environment for many years before remediation. Vicinity properties did not have similar operating and exposure conditions, and therefore are not expected to have been a significant source of ground water contamination. Application of

these regulations to vicinity properties is discussed in the final rule of the EPA standards (60 FR 2854). See response to comment 182 for additional information regarding vicinity properties.

Comment 187. The Department of Energy should define "significant amount of tailings" after discussing quality and quantity of tailings with other project managers associated with the UMTRA Project (for example, project managers from the Department of Energy Grand Junction Project Office, Technical Assistance Contractor, Remedial Action Contractor, and Rust Geotech). (Grand Junction)

Response: The term "significant" can be defined from a volume and leachable source perspective. For tailings at a vicinity property to be determined to be significant, the volume must be large enough to potentially contribute enough chemical mass to adversely affect ground water. In addition, the leachate generation potential of the tailings must be of a magnitude to potentially adversely affect ground water. UMTRA Project managers from other projects will be consulted on defining vicinity property terminology on an as-needed basis.

Comment 188. Will institutional controls limit land use near the parks and future trails planned for the park? (Grand Junction)

Response: Specific institutional controls will be identified based on current and future beneficial uses of the uppermost aquifer, risks due to ground water contamination from processing activities, and the proposed ground water compliance strategy. The extent to which land uses adjacent to or near the former processing sites would be affected depends on ground water contamination and plume movement, and the potential that land uses would allow access to the ground water. These issues would be analyzed in site-specific NEPA documents if institutional controls are necessary as part of the proposed site-specific compliance strategy. Efforts will be made to minimize the impacts of applying site-specific institutional controls to conditions that warrant control of access to contaminated ground water.

Comment 189. Could utility trenches be dug in supplemental standards areas? (Grand Junction)

Response: Utility trenches could be dug in areas where supplemental standards have been applied as part of the Ground Water Project.

Comment 190. Alternative water systems should be considered for the 100 years that natural flushing would occur. (Grand Junction)

Response: The DOE will consider the use of alternate water systems in conjunction with institutional controls to prevent access to contaminated ground water where applicable.

Comment 191. The treat at point of use alternative should be left in the PEIS and analyzed as an alternative to be considered by the Department of Energy. (Grand Junction)

Response: Treat at point of use (clean at the point of use) alternative was not analyzed in the PEIS for a number of reasons, including that it may not be protective of the environment and may not meet the EPA standards at the sites. Section 2.6.3 was revised to include an expanded discussion as to why this alternative was not analyzed in the PEIS.

Comment 192. Future development may require that all new ground water users have their ground water treated at point of use. (Grand Junction)

Response: Treatment at the point of use is available for use for all of the alternatives except no action. The need for treatment at point of use will be determined on a case-by-case basis as a potential institutional control.

Comment 193. A fence around the plume at Grand Junction processing site would involve private property. On private property, the Department of Energy could not necessarily impose institutional controls. (Grand Junction)

Response: A ground water compliance strategy and associated institutional controls, if required, have not been developed for the Grand Junction site or any other UMTRA Project site. Site-specific institutional controls, when required to protect human health and the environment, will be developed in cooperation with tribal, state, and local governments on a case-by-case basis utilizing tribal, state, and/or local laws wherever applicable (see Section 1.4.1 of the PEIS).

Comment 194. Is there funding for the Ground Water Project now? Is there an act in Congress that will ensure that the Department of Energy will have money to pay for the Ground Water Project? Where is the money going to come from? (Grand Junction)

Response: Yes, Congress has appropriated budget each year since fiscal year 1991 for the Ground Water Project. Authority under UMTRCA provides congressional commitment to continue the Ground Water Project. DOE funding comes from congressional appropriations.

Comment 195. Congress thinks that the tailings are cleaned up. (Grand Junction)

Response: The UMTRCA authorized DOE to remediate the contamination associated with uranium milling at each of the designated processing sites. The surface contamination at each site was stabilized in a disposal cell. Encapsulating the tailings and other contaminated materials into an engineered disposal cell greatly reduces the potential for continued ground water contamination. The surface remedial action is presently required to be completed by September 30, 1996, with DOE requesting a 2-year extension to 1998. This is the portion which is referred to as the tailings cleanup. However, UMTRCA was amended in 1988 and in part authorizes DOE to take actions necessary to comply with EPA

ground water standards without time limitations. This portion of UMTRCA is responsible for the creation of the UMTRA Ground Water Project that is addressed in the PEIS. This project receives separate congressional appropriations, and the completions are tracked separately from the surface cleanup. Funding of the Ground Water Project began in 1991.

Comment 196. The Department of Energy needs to look at real risks and only pay to clean up those risks and nothing more. For instance if natural flushing could meet compliance in 25 years, why plan for 100 years of natural flushing? (Grand Junction)

Response: The DOE proposed action is a risk-based approach to cleaning up the ground water at the UMTRA sites. The ground water compliance strategy at a given site will be determined in part by the risks at that site. The EPA standards state that natural flushing must meet the standards within 100 years or less. Site characterization information will be used to predict how long natural flushing will take at a given site. Some sites have characteristics and contaminant conditions that would allow natural flushing to meet the standards in a shorter timeframe than 100 years.

Comment 197. Natural flushing is a good alternative. (Grand Junction)

Response: The DOE agrees that natural flushing is likely a good ground water compliance strategy for use at some UMTRA Project sites but site-specific decisions regarding its use have not been made.

Comment 198. Most taxpayers will support a smart use of money if it works and is important. (Grand Junction)

Response: Agreed, most taxpayers will support a smart use of money. The DOE will continue to conduct the Ground Water Project so as to be protective of human health and the environment and meet the EPA standards in the most cost-effective manner.

Comment 199. What are other types of active remediation technologies? (Grand Junction)

Response: Active ground water remediation methods involve the engineered alteration of ground water flow, quantity, or quality to achieve compliance with the EPA ground water standards. In Appendix C of the PEIS, several active ground water remediation methods are described. These include gradient manipulation, containment and control of ground water contaminant plumes, and extraction and treatment of ground water by various technologies. Other, less widely used methods to remediate ground water contamination would be considered on a site-specific basis, as needed.

Comment 200. Pump and treat is pumping money down a rat hole. (Grand Junction)

Response: In many cases, the ground water restoration technique of using "pump and treat" has historically not met the defined objectives. However, there are cases where pump and treat has proven reasonably effective for goals of contaminant mass reduction and/or containment of contaminated ground water. The UMTRA Team is open to considering all valid methods of ground water cleanup as potential alternatives to pump and treat.

Comment 201. Clean at point of use is ten times more cost-effective as active remediation (for example, pump and treat). (Grand Junction)

Response: From a purely cost perspective, "clean at point of use" is likely cheaper than active ground water remediation such as pump and treat. However, the EPA standards do not provide a regulatory provision for using "clean at point of use" for meeting the standards. Section 2.6.3 of the PEIS was expanded to further explain why the clean at the point of use alternative was eliminated from consideration in the PEIS. Also, the proposed action does provide the option of using passive ground water remediation strategies for meeting the standards that would typically be more cost-effective than active ground water remediation. In addition, treat at the point of use is an option that is available for use under all the alternatives except no action if the need arises.

Comment 202. How will comments be made part of the record? (Grand Junction)
Response: The comments received at the hearings, by mail, and from other sources along with the DOE response are in this comment/response document which is Volume II of the final PEIS.

Comment 203. Money will be harder to justify so the proposed plan at each site had better be effective. (Grand Junction)

Response: Agreed. The DOE will strive to implement effective ground water compliance strategies at each site based on site characterization data, risk assessments, and tribal, state, and public input.

Comment 204. Does the dollar amount for Falls City noted in the Annual Report to Stakeholders include cleanup or just administrative costs? Why are the costs for Monument Valley higher than those for Falls City when Falls City has more contamination? (Falls City)

Response: The Falls City, Texas, dollar value in the annual report to stakeholders includes costs for both ground water cleanup and administration. The costs for the Monument Valley site are higher than for the Falls City site because the contaminated aquifer beneath the Monument Valley site is a potential drinking water source while the contaminated aquifer beneath the Falls City site is not. However, the assumptions on which these costs estimates were based are preliminary and are part of the budget process that requires assumptions be made to request funds. However, no site-specific ground water compliance decisions have been made. After completion of the PEIS and the collection of site characterization data, a site-specific ground water compliance strategy can be proposed and better defined costs estimates will be available.

Comment 205. Is active remediation planned for Falls City? (Falls City)

Response: No ground water compliance decision has been made for the Falls City site. Characterization at the site was completed in 1995 and the data obtained from these studies along with input from the U.S. Nuclear Regulatory Commission, state of Texas, and interested public will be used in the determination of the compliance strategy. Once a ground water compliance strategy has been identified, the impacts of implementing this strategy will be analyzed in the site-specific NEPA document.

Comment 206. How many people are drinking ground water from the contaminated aquifer? It is possible that people without permanent housing might be consuming this ground water without anyone's knowledge. (Falls City)

Response: To the best of DOE's knowledge, no one is drinking contaminated ground water that results from the former processing activities.

Comment 207. Since the Three Oaks water supply system is available, will the Department of Energy put less emphasis on cleanup of the contaminated aquifer at Falls City? People are afraid to drill new wells because of the contamination. (Falls City)

Response: Even with the existence of the Three Oaks water supply, DOE's mission with the Ground Water Project is to protect human health and the environment and meet the EPA ground water standards.

People should contact the Texas Department of Health and the Texas Natural Resources Conservation Commission before drilling a new well near the former uranium processing site at Falls City, Texas.

Comment 208. Why is Falls City the only contaminated milling site in Texas being addressed by the Department of Energy? (Falls City)

Response: The UMTRA Project was created in response to the Uranium Mill Tailings Radiation Control Act (UMTRCA) of 1978. This act authorized the Secretary of Energy to designate abandoned uranium processing sites in 10 states that required remedial action. The Falls City site was the only site identified in Texas for cleanup under the Act.

Comment 209. How can other mines such as Zamsow, Lamprecht, Pownee, Exxon, and Smith be included in the Department of Energy's study? (Falls City)

Response: The DOE UMTRA Project was not authorized by Congress to study or clean up any site in Texas other than the abandoned Falls City uranium processing site.

Comment 210. I live within 2 to 3 miles of the site and I have never been canvassed for water use. Are my wells all right? Can additional data be provided? (Falls City)

Response: As part of a baseline risk assessment of ground water contamination at the Falls City, Texas, site, a ground water well records search and a field reconnaissance were conducted at and near the former uranium ore processing site in July-September 1990 and January 1994 (DOE, 1994c). Detailed examination of the well records and intensive field investigation within an approximately 2-mile radius of the site have revealed no present or historical users of the shallow Deweesville/Conquista aquifers. It is these two aquifers that have widespread tailings-related contamination. There is significantly less contamination in the lower Dilworth aquifer. No Dilworth aquifer wells are used as a drinking or domestic water supply within a 2-mile radius of the site. The baseline risk assessment described above is available at the Falls City, Texas, public library or from the National Technical Information Service.

National Technical Information Service
Department of Commerce
5285 Port Royal Road
Springfield, VA 22161
(703) 487-4650

TITLE: *Baseline Risk Assessment of Ground Water Contamination at the Uranium Mill Tailings Site Near Falls City, Texas*

Comment 211. Why is there no alternative for clean up to state standards? Was cleanup to state standards considered? Will the Department of Energy use Texas ground water standards which are higher than the Environmental Protection Agency's? (Falls City)

Response: Decisions regarding consistency with applicable tribal and state laws and regulations will be made by DOE in consultation with the tribes and states. These decisions will consider cases where an approved wellhead protection area, under the Safe

Drinking Water Act, is associated with the site. A wellhead protection area is an area of land where there are restrictions on development so as to protect ground water supplies used for drinking water or other beneficial uses. DOE must comply with the provisions of that program, unless an exemption is granted by the President of the United States through the EPA. Contamination on the site that is not covered by UMTRCA (because it is not related to the processing operation) is not the responsibility of DOE, but may be covered by other federal, tribal, or state programs. A discussion of this issue is presented in the EPA standards (60 FR 2854, 2856) and is in Appendix A to the PEIS. Cleanup to applicable tribal or state standards as an alternative was added to the PEIS (Section 2.6.5) under alternatives eliminated from further consideration.

Comment 212. Where are El Oso wells located? Is there communication of water between the Carrizo and other aquifers? (Falls City)

Response: The El Oso wells are located farther than 3 miles (4.8 kilometers) away from the Falls City site and are completed in the Carrizo aquifer that is more than 2000 feet (610 meters) below the Deweesville/Conquista aquifer. There is no ground water flow between those aquifers and, because of its depth below land surface and the several confining layers overlying the aquifer, the Carrizo aquifer is not affected by milling activities at the Falls City site.

Comment 213. We are concerned that in the future contamination will enter our wells from such occurrences as earthquakes. (Falls City)

Response: Earthquakes are not considered to be a concern at the Falls City site. The issue of earthquake effects was analyzed as part of the remedial design for the Surface Project. The following information was presented in the Falls City site remedial action plan document. Historical seismicity data for an area of 186 miles (300 kilometers) around the site indicates a stable region with relatively few earthquakes. No earthquakes of magnitude 3.0 or greater have been recorded within 40 miles (65 kilometers) of the site. The shallow faults that are fairly prominent in the site region are considered not capable of generating damaging earthquakes.

Comment 214. Abandoned wells may provide connection between shallow and deep aquifers. (Falls City)

Response: The DOE understands that improperly abandoned wells may provide connections between aquifers. Also, improperly abandoned exploratory boreholes from mining activities exist in the site area. Because they may provide a potential hydraulic interconnection between the Deweesville/Conquista aquifer and the Dilworth unit, the Dilworth unit is included as part of the uppermost aquifer at the Falls City site.

Residents near the site use ground water from the deeper Carrizo aquifer that is 2000 to 3000 feet (610 to 910 meters) below land surface. Because of its depth below land

surface and the confining layer overlying the aquifer, the Carrizo aquifer is not affected by mining and milling activities at the Falls City site.

Comment 215. Where did water in abandoned mines come from and does the Department of Energy know that contaminants are dumped in these mine pits? (Falls City)

Response: Yes, the DOE is aware that waste tailings and processing solutions from the Susquehanna-Western Incorporated milling operation were impounded in seven separate ponds, four of which had been open pit mines excavated into the ore-bearing sandstone. All tailings and contaminated materials have been consolidated and stabilized into a disposal cell in the location of former piles 1, 2, and 7.

Comment 216. Could some of this water in the mine pits come from shallow ground water? (Falls City)

Response: Yes, the most likely source of water in open mine pits is from rainfall, surficial runoff from the surrounding land surface, and in some limited cases, inflow of shallow ground water.

Comment 217. How are we going to control contamination if dumping is going on? (Falls City)

Response: The DOE is aware that hazardous materials have been disposed of at a site south of the Falls City site; this site is included in the State of Texas Superfund Registry of Hazardous Waste Facilities and thus, has been controlled by the state. However, it is believed that the material disposed of at this waste site or any other site in the area has not affected the ground water quality at or near the Falls City site.

Comment 218. Can the technology that created ground water during milling be used for creating water for arid locations? (Falls City)

Response: Uranium milling did not "create" ground water. Rather, the milling process transferred ground water from a deeper aquifer to a shallower aquifer. Water from a deep aquifer was used in the milling process, then discharged in a manner that caused it to infiltrate into the shallow subsurface.

Comment 219. Many of the mines in Texas have not been identified in the PEIS. The Department of Energy's decisions for Falls City will be setting cleanup precedence for other Texas mine sites. Falls City is the first cleanup of a mill processing site in Texas. (Falls City)

Response: DOE's remedial action at the Falls City, Texas, UMTRA Project site should not set a precedent for other Texas mine sites. The UMTRCA is a congressional act that

includes abandoned uranium mill tailings sites only and does not include abandoned mine sites in the state of Texas.

Comment 220. The public needs data and technical documents as they are produced. (Falls City)

Response: DOE provides current information and opportunities for the public to discuss site-specific issues during public meetings held in the site communities. Draft technical documents for the Ground Water Project, such as the baseline risk assessments, have been made available to applicable agencies and public libraries. In addition, the DOE plans to continue providing opportunities for public input in the site-specific NEPA documents for the Ground Water Project. These plans are discussed in Section 1.6 of the PEIS.

Comment 221. El Oso is from a different aquifer than the Carrizo aquifer. (Falls City)

Response: The El Oso well field is located over 3 miles (5 kilometers) from the site and the wells are completed in a deeper aquifer than the contaminated aquifers at the Falls City site.

Comment 222. Are there studies on ingesting contaminants noted in the final rule for ground water standards for the Falls City area? (Falls City)

Response: Not that we know of. However, toxicity profiles for all constituents of potential concern for the Falls City site are included in the baseline risk assessment for this site. This assessment is available at the Falls City, Texas, public library.

Comment 223. There is a concern that people may be using contaminated ground water or may want to use this ground water in the future. (Falls City)

Response: To the best of DOE's knowledge, water from the contaminant plume is not currently being used for human consumption or for agricultural purposes. The shallow ground water is of poor quality, and it is unlikely that domestic wells would tap into this ground water in the future. The DOE will continue to monitor the ground water at and near the site and hold public meetings to stay in communication with the local residents. The DOE has conducted fieldwork at the Falls City site, to further characterize the ground water at the site. Through this process, the public will remain informed regarding the extent and degree of ground water contamination at the site, thus greatly minimizing the probability of domestic use of the contaminated ground water in the future. If the public becomes aware of the potential for residents to be using contaminated ground water, please let the DOE know. The Grand Junction Projects Office can be reached at (970) 248-6000.

Comment 224. What is the geologic layer between the shallow and the deeper aquifers at Falls City? What prevents contamination of the Deweesville? I am concerned that strata

may not be able to protect the lower aquifer. It may have been broken down by contaminants that were dumped in the river. (Falls City)

Response: One of the geologic layers between the shallow and the deeper aquifers in the area of the Falls City site is known as the Manning Clay Formation. There is widespread tailings-related contamination in the Deweesville/Conquista aquifer and significantly less contamination in the underlying Dilworth aquifer. Residents near the site use ground water from the deeper Carrizo aquifer that is 2000 to 3000 feet (610 to 910 meters) below land surface. Because of its depth below land surface and the Manning Clay Formation overlying the aquifer, the Carrizo aquifer is not affected by milling activities at the Falls City site. No rivers in the site area have eroded downward into the Manning Clay.

Comment 225. It is important to study all possible concerns and scenarios. (Falls City)

Response: Yes, agreed. The process of determining a ground water compliance strategy at the UMTRA Project sites includes the collection and analysis of site characterization data, the determination of potential human health and ecological risks, compliance with EPA ground water standards, and working with the local officials and public as full partners.

Comment 226. What are treatment systems that the Department of Energy considers reasonable for cleaning contaminated water? (Falls City)

Response: In Appendix C of the PEIS, DOE describes several proven treatment technologies and selected innovative technologies for ground water remediation. These include physical treatment methods, such as filtration; chemical treatment methods, such as precipitation and ion exchange reactive barriers; and biological treatment methods, such as bioremediation. There are examples of engineered treatment technologies. Public input would be solicited for treatment technology alternatives if an active engineered ground water compliance strategy is proposed.

Comment 227. Has there been a health study for Falls City? Is a baseline health study important for the Falls City site? How can the public get the baseline risk assessment for Falls City? (Falls City)

Response: In 1987 and 1989, the Texas Department of Health examined cancer mortality and incidence of adverse reproductive outcomes among Karnes County residents in response to citizens concerns (Brender, 1987; 1989). Both of these epidemiological investigations revealed no statistically significant differences in cancer mortality and the incidence of congenital malformations among Karnes County residents compared to other Texas residents. Based on the studies, no health problems associated with potential exposure to uranium and associated contaminants from the Falls City site area were identified.

The baseline risk assessment and any revisions or supplements are an important part of the process used to determine site-specific ground water compliance strategies. The *Baseline Risk Assessment of Ground Water Contamination at the Uranium Mill Tailings Site Near Falls City, Texas* is available at the public library in Falls City; copies may also be purchased from the National Technical Information Service (see comment number 210 or the inside cover of this document for the address).

Comment 228. What are the affects of cattle drinking contaminated ground water and humans eating cattle? (Falls City)

Response: Use of the contaminated ground water for livestock watering was examined in the Falls City baseline risk assessment. This assessment indicates that constituent levels in the contaminated ground water from the Dilworth aquifer are lower than the applicable guidelines for livestock watering and would result in no adverse effects to livestock. Therefore, human health would not be adversely affected from eating beef or drinking milk from cattle that had consumed contaminated ground water from the Dilworth aquifer.

Comment 229. Were all flora and fauna examined in the baseline risk assessment? (Falls City)

Response: Limited flora and fauna samples were collected and analyzed during the screening level baseline ecological risk assessment for the Falls City site. Plant and fish samples were collected from a stock pond next to the site while plant samples were collected from Scared Dog Creek and Tordilla Creek near the site. Surface water and sediment samples were also collected from these bodies of water. These limited data indicate that aquatic life criteria are not exceeded in Tordilla Creek. Iron is above the criteria in Scared Dog Creek. Surface water quality in the ponds in the site area did not exceed the aquatic life criteria except for iron in the pond next to former pile 3. The concentrations of constituents in the sediment in these bodies of water did not exceed available sediment screening benchmarks. Fish tissue analysis indicated that concentrations of constituents are within the range of background reported in the literature. Concentrations of some constituents in the plants were above the background concentrations reported in the literature.

Comment 230. Where does data come from that is shown in the Annual Site Environmental Report? (Falls City)

Response: Data in the annual environmental report come from the Remedial Action Contractor for the Surface Project and the Technical Assistance Contractor for both projects. The Remedial Action Contractor provides radiological air and surface data at sites undergoing surface remediation. The Technical Assistance Contractor collects the ground water and surface data at all the sites.

Comment 231. How often are wells monitored and how is this done? (Falls City)

Response: The DOE monitor wells currently are sampled twice per year at the Falls City site. These samples are then sent to an analytical laboratory for analysis. This usually occurs in late summer and January. This schedule is identified in the site water sampling and analysis plan and is subject to change.

Comment 232. All people using the Three Oaks water supply system are actually using the Dilworth aquifer. (Falls City)

Response: This is incorrect. Residences within the Falls City site area use deeper ground water from the Carrizo Sandstone aquifer supplied by the Three Oaks Water Cooperative for domestic and potable purposes and for stock watering. This cooperative distributes water from a 2000-foot (610-meter)-deep well, approximately 10 miles (16 kilometers) northwest of the site.

Comment 233. What is the first good aquifer? (Falls City)

Response: The Carrizo Sandstone aquifer is the first "good" aquifer used for drinking water at the Falls City site.

Comment 234. How do people get information on wells and data? (Falls City)

Response: DOE provides current information and opportunities for the public to discuss site issues during public meetings held in the site communities. Site-specific data, including well data, can be obtained by contacting state health department, or the DOE Grand Junction Projects Office at (970) 248-6000.

Comment 235. The Department of Energy should look at all new technologies such as shallow water treatment and on-site treatment. (Falls City)

Response: If active ground water remediation is chosen as a compliance strategy at a particular site, the DOE will consider all relevant and practical technologies in ground water remediation design.

Comment 236. How did the Department of Energy arrive at the cost for the 24 sites? (Falls City)

Response: Cost estimates were made for each UMTRA site based on preliminary estimates of the work that might be performed at each site, allowing for an added contingency for unknowns. These estimates are preliminary and site-specific costs will be finalized after the Record of Decision of the PEIS is published, site characterization and risk analysis are

complete, public input is considered, a site-specific ground water compliance strategy is proposed, and a site-specific National Environmental Policy Act document is prepared.

Comment 237. Would the area northwest of the Riverton site be affected by contaminated ground water? (Riverton)

Response: A monitoring well was installed in 1995 northwest of the former processing site. In addition, an alternate water supply system is being provided to 19 residents near the site.

Comment 238. I have concerns about long term health impacts from consuming small amounts of contamination over many years. (Riverton)

Response: Low doses of some contaminants taken over a long period of time can result in health problems. At present, the contaminated ground water in the Riverton site plume is not being used for human consumption and, therefore, does not pose a human health risk.

Comment 239. How would flooding affect contaminated ground water? (Riverton)

Response: If flooding occurred, the floodwaters that infiltrate into the subsurface would tend to dilute the ground water contaminants.

Comment 240. Can flooding cause the ground water gradient to change in the surficial aquifer at the Riverton site? (Riverton)

Response: Ground water gradients would change temporarily during the flooding event. The ground water gradient toward the Little Wind River would decrease during flooding. However, gradients would return to normal conditions shortly after the flooding event.

Comment 241. Where are new wells to be placed? (Riverton)

Response: Twenty new wells were installed in the area of the Riverton site in 1995. Seven were monitor wells installed around the perimeter of the site to better determine background ground water quality. Ten tracer test and three aquifer test wells were installed for the purpose of testing the alluvial and semiconfined aquifer hydrogeologic characteristics.

Comment 242. Is there monitoring of airborne contaminants? (Riverton)

Response: Monitoring for airborne contaminants occurs during surface remediation at the sites. Monitoring for airborne contaminants during the Ground Water Project will not be required because all of the contaminants are in liquids.

Comment 243. How many monitor wells are in the northwest area of the Riverton site? There are a lot of homes in this area. We need to know if our wells are safe to drink. (Riverton)

Response: There are five monitor wells in the surficial aquifer along the railroad grade northwest of the Riverton site. A new well in the semiconfined aquifer was installed near the railroad right-of-way. In addition, another new monitor well was installed in the surficial aquifer due west of the site along Goes in Lodge Road. Ground water contamination occurs only in the surficial and semiconfined aquifer and has not been detected in aquifers that are used for domestic supplies.

Comment 244. Will the cone of depression from pumping tests draw contaminated ground water into our wells? (Riverton)

Response: Aquifer pumping tests were only conducted within the uppermost aquifer at the Riverton site. Domestic water supplies are obtained from a much deeper aquifer separated from the upper aquifers by geologic units that retard vertical ground water flow. These pumping tests should not affect ground water flow in aquifers used for domestic water supplies.

Comment 245. How deep are the monitor wells along the railroad? Will the Department of Energy test deeper than 20 feet? (Riverton)

Response: The monitor wells along the railroad grade northwest of the site are screened at depths from 20 to 25 feet (6 to 7.6 meters). One new monitor well has been installed at a depth of 50 feet (15 meters) to monitor the semiconfined aquifer in this area.

Comment 246. How can the Department of Energy protect wells from cross contamination? (Riverton)

Response: UMTRA Project ground water sampling personnel prevent cross contamination between monitor wells on UMTRA sites by diligent adherence to ground water sampling standard operating procedures. Such procedures include methods for decontaminating all sampling equipment that comes into contact with ground water and using disposable materials where appropriate. Furthermore, quality assurance and quality control samples are collected and evaluated during every sampling event to ensure the integrity of the ground water samples. During well installation, watertight casings are installed and grouted into the confining units between aquifers to prevent cross contamination. During aquifer tests, the duration and rate of pumping are monitored and altered, if necessary, to prevent cross contamination.

Comment 247. Can water samples be tested on-site? (Riverton)

Response: Certain constituents of ground water can be analyzed on the site, such as pH and alkalinity. However, analyses of ground water for concentrations of hazardous constituents must be conducted in certified laboratories consistent with UMTRA Project data quality objectives.

Comment 248. Does ground water surface at the wetland boundary? Is this ground water contaminated and is it a health risk? (Riverton)

Response: When the irrigation canals are not in use, some of the shallow contaminated ground water may discharge into the wetlands to the east and possibly to the south from the former uranium mill site. On the other hand, when the irrigation canals are in use, the water level in the wetlands may be high enough to recharge the shallow aquifer.

Based on limited sampling, no human health or ecological risks are associated with ground water possibly discharging into the wetlands, near the site. This sampling does indicate the potential for discharge of contaminated ground water and uptake by plants in the oxbow lake downgradient of the site.

Comment 249. Where does contaminated ground water go when it gets to the river? What happens to the contamination? (Riverton)

Response: Contaminated ground water seeps into the river. The flow in the river is many times greater than the amount of ground water seeping into the river and the river flow dilutes this contaminated ground water to undetectable levels.

Comment 250. Can the amount of ground water discharging to the river be quantified? (Riverton)

Response: The amount of ground water discharging into the Little Wind River at the Riverton site is estimated to be 0.2 cubic feet per second from the surficial aquifer and 0.1 cubic feet per second for the semiconfined aquifer along the approximately 1-mile (1.6-kilometer) stretch of the river where the plume discharges. For comparative purposes, the average flow in the Little Wind River based on 41 years of data is 579 cubic feet per second. The historical minimum flow in the river is 41 cubic feet per second.

Comment 251. No one will let children drink the water. Can the Department of Energy guarantee water is clean and safe to drink? (Riverton)

Response: The DOE routinely samples monitor wells and private wells in the vicinity of all the former Title I uranium processing sites. To the best of DOE's knowledge, no one is drinking the contaminated water. A tribal or state health department would be in the best position to evaluate water for cleanliness and safety.

Comment 252. Will there be a long term monitoring program with natural flushing? (Riverton)

Response: Yes, there will be long-term monitoring with natural flushing to demonstrate the continuing reduction of levels of contamination as modeled to ensure natural flushing is functioning as planned. Monitoring is an important part of natural flushing. As part of the process of determining if natural flushing is a feasible ground water compliance strategy at a given site, the DOE will conduct modeling to provide an estimate of how long it will take the ground water to naturally flush to the EPA standards. One aspect of ground water monitoring will be to determine if the natural flushing is working as expected.

Comment 253. Have soils been tested to see if natural flushing will work? (Riverton)

Response: Experiments were conducted at Sandia National Laboratories/New Mexico and the University of New Mexico on core samples taken from within the plume at the Riverton site. These experiments evaluated the mobility of contaminants within the soils, in part to determine if natural flushing is a viable ground water compliance strategy at the Riverton site. Based on the results of these experiments, natural flushing appears to be a viable ground water compliance strategy at the Riverton site.

Comment 254. What is the level of contamination with on-site wells? Is it as concentrated at the wetland area? (Riverton)

Response: The levels of contamination in the on-site wells appear in the Riverton baseline risk assessment, which is available at the Riverton Branch Library, Fremont County Public Library, and St. Stephens Mission. If the contaminated ground water were used for human consumption, constituents such as manganese, molybdenum, sulfate, and uranium could cause adverse health effects. However, the contaminated ground water is not being used for human consumption or other purposes and does not pose a health risk.

Surface water and sediments were collected in surface water bodies and wetlands in 1993 and the results appear in the Riverton baseline risk assessment. The analyses in this assessment showed that little if any site-related contamination is in these areas. An expanded sampling of the wetlands in the site area occurred in 1995 and results indicate that site-related contaminants occur in an oxbow lake southeast of the site. In addition, contaminated surface water and sediments were detected in a ditch leading from the Koch sulfur plant west of the site. The contamination in this ditch is not from the Riverton UMTRA site. No site-related contamination was detected in the Little Wind River.

Comment 255. Are sulfates a common contaminant in mill processing activities? Are there contaminants other than uranium? (Riverton)

Response: Sulfates are a common constituent at the UMTRA Project sites where sulfuric acid was used. Uranium, molybdenum, and sulfate from processing activities are also elevated in the ground water at the Riverton site.

Comment 256. People are scared for their children. (Riverton)

Response: The DOE shares your concern to protect public health and the environment. The DOE's proposed action analyzed in the PEIS uses risks to public health and the environment as the basis for making decisions regarding the appropriate way to comply with EPA ground water standards at each of the UMTRA sites. Future use of ground water is also part of the site-specific considerations for making compliance decisions.

Comment 257. Would a community water system be tied into an existing system or would the Department of Energy develop a new system? (Riverton)

Response: DOE has made a conditional commitment to fund a water system at the Riverton site to protect public health and safety for households which may be affected in the future by residual contamination from the site. The DOE is committed to protecting human health and the environment from contaminated ground water at Riverton and other UMTRA sites. This includes supplying an alternative water supply system if necessary.

Comment 258. Is the maximum concentration limit for uranium noted in the Environmental Protection Agency ground water standards applicable only to UMTRA? (Riverton)

Response: Yes, it is 30 picocuries per liter for combined uranium-234 and -238 which is equivalent to 0.044 milligrams per liter.

Comment 259. Has the Department of Energy studied radon at the site? (Riverton)

Response: DOE has studied radon in the ground water at the Riverton site. The results indicate that radon levels in the ground water are within the range for background levels for the state of Wyoming (Gonzales, 1988).

Comment 260. 39 million is lots of money. Is it necessary? (Written comment received at a hearing.)

Response: Thirty-nine million dollars is a lot of money. Under the PEIS proposed action, the DOE would spend only the amount of money necessary to protect human health and the environment and meet EPA standards at the Shiprock site and all other UMTRA Project sites. The proposed action would be less costly than the "active remediation to background levels" alternative because of the latter's reliance on more costly active ground water remediation methods. The proposed action may cost somewhat more than the passive remediation alternative, but the DOE prefers the proposed action because it would protect human health and the environment and meet the EPA standards at all sites, whereas the passive remediation alternative likely would not.

Comment 261. This PEIS is said to pertain to all UMTRA sites and talks about several alternatives including no strategy. But with reference to the Tuba City site, it has been determined already that the contamination level is high (underground). Therefore, at our site we should be presented with more aggressive strategies for elimination or containment of the contaminants. (Written comment received at a hearing.)

Response: Correct. The PEIS pertains to all UMTRA Project sites and talks about several alternatives. In addition, it has been determined that there is ground water contamination beneath the Tuba City site. A final decision regarding which alternative will be implemented has not been made. Following the publication of the final PEIS, the DOE will publish a Record of Decision (currently scheduled for the fall of 1996) in which one of the alternatives will become the DOE course of action for the Ground Water Project. Assuming DOE selects the proposed action, all ground water compliance strategies (described in Section 4.0 of the PEIS) would be available for consideration. At this preliminary stage in the Ground Water Project, there has been no final decision regarding the ground water compliance strategy at the Tuba City site or any other UMTRA Project site. A ground water compliance strategy that protects human health and the environment and meets EPA standards will be determined for all UMTRA Project sites, based on site characterization, risk assessment, impacts analysis, and public input.

Comment 262. No one, or nothing, is drinking contaminated ground water? (Written comment received at a hearing.)

Response: To the best of DOE's knowledge, no private wells have been completed in the contaminated ground water plume at the Tuba City site, and contaminated ground water is not discharging as surface water. Therefore, people, livestock, and wildlife are not drinking contaminated ground water. Project-wide, no people are drinking contaminated ground water from contaminated wells, and continued ground water monitoring and the use of institutional controls, where required, during the Ground Water Project will prevent human use of this water in the future. In addition, ground water compliance under the proposed action will result in the protection of other beneficial uses of the ground water and the aquatic and terrestrial biological resources in the area of the sites.

Comment 263. Ground water standards - if the state, or affected Indian Nation has higher standards, will the DOE follow? (Written comment received at a hearing.)

Response: Decisions regarding consistency with applicable tribal and state laws and regulations will be made by DOE in consultation with the tribes and states. These decisions will consider cases where an approved wellhead protection area, under the Safe Drinking Water Act, is associated with the site. A wellhead protection area is an area of land where there are restrictions on development so as to protect ground water supplies used for drinking water or other beneficial uses. DOE must comply with the provisions of that program, unless an exemption is granted by the President of the United States through the EPA. Contamination on the site that is not covered by UMTRCA (because it is not related to the processing operation) is not the responsibility of DOE, but may be covered by other federal, tribal, or state programs. A discussion of this issue is presented in the EPA standards (60 FR 2854, 2856) and is in Appendix A to the PEIS.

Comment 264. If a site has poor water quality, assuming EPA standards, yet is still being used as domestic source or livestock water, will the DOE still actively pump and treat? (Written comment received at a hearing.)

Response: The DOE will make site-specific decisions based on many considerations, including current use of the ground water and risks from that use. If site conditions are not protective of human health and the environment, the DOE will consider active ground water remediation.

Comment 265. No action and passive remediation similar but with control monitoring. (Written comment received at a hearing.)

Response: Under to no action alternative, there would be no more federally sponsored UMTRA Ground Water Project; the DOE would complete the cleanup of the surface contamination at the UMTRA Project sites and end the Ground Water Project. Under the passive remediation alternative, the DOE would conduct a ground water characterization program to determine the degree and extent of ground water contamination just as it would under the proposed action and the active remediation to background levels alternatives. However, in terms of ground water compliance, the DOE would be limited to one of the two strategies: natural flushing or no remediation. Active ground water cleanup methods could not be used with this alternative. The DOE would continue to monitor the ground water at the sites as required and institutional controls would be implemented when necessary to limit access to or use of contaminated ground water. The text of the PEIS was changed in Section 2.4 to further clarify the difference between the no action and passive remediation alternatives.

Comment 266. Future use of ground water must be considered. (Written comment received at a hearing.)

Response: Agreed. The future use of ground water is considered under all the alternatives except no action. For example, in the proposed action, natural flushing cannot be used as a ground water compliance strategy if the aquifer in question is currently or is projected to become a public water supply. Institutional controls could be used with passive or active ground water compliance strategies to prevent future human use of contaminated ground water. Under all the alternatives except no action, the DOE would be committed to protecting human health and the environment and ensuring that future use of the contaminated ground water does not occur until it is determined that this water no longer poses a threat to human health and the environment.

Comment 267. Our Program, Institute for Tribal Env. Professionals, would like very much to participate in the ground water remediation project. This ground water project can provide Native American students with a valuable state-of-the-art learning experience.

Please keep in contact with our office regarding any possibility for any type of cooperative agreements. (Written comment received at a hearing.)

Response: Thank you for your comment. The DOE has involved students in its project activities. Currently, a local college is participating in research and monitoring at the Shiprock site. The DOE will continue to make opportunities available, as appropriate, on the UMTRA Project.

Comment 268. Tuba City area needs to be singled out for this area as stated by residents and really given in that view and not to much of the full over view in order to receive a positive review by residents. (Written comment received at a hearing.)

Response: Agreed. Under all the alternatives except no action, the Tuba City site as well as the other UMTRA Project sites would have a site-specific ground water compliance strategy tailored to that particular site. This strategy would be formulated through site characterization and a site-specific risk assessment. Throughout this process, the affected tribes, states, and public will be kept informed and their input will be considered. Once a proposed ground water compliance strategy has been determined, the environmental impacts, if any, would be addressed in the site-specific environmental documents. The tribes and states will have an opportunity to review and comment on these documents.

Comment 269. PEIS has little site-specific information for the Hopi residents to gauge their exposure. Since the proposed alternative would enable DOE to tailor remediation to the most effective treatment for a particular site. Accordingly, the proposed alternative would be preferred if and only if the local residents were allowed to comment on the site-specific remediation method and its selection. The regional ground water model for the N-Aquifer developed by U.S. Geological Survey in Tucson reveals that, at the present and projected rate of pumping, the NTWF wells will be dewatered by the year 2011, and the Moenkopi wells will be dewatered by the year 2030. Obviously, the pump and treatment mitigation alternative could hasten the depletion of the aquifer unless the treated water is recharged or put to a beneficial use in lieu of ground water extraction. On the other hand, if left

untreated, public exposure to the contamination may result. (Written comment received at a hearing.)

Response: It is the intent of the DOE to involve the affected tribes and local residents in all aspects of the Ground Water Project at the Tuba City site, including the process of determining the appropriate ground water compliance strategy and commenting on the site-specific environmental document that would be prepared for the site.

Comment 270. The term "partnership" has been used repeatedly in these discussions. I would like to speak on behalf of the Navajo Nation Department of Justice as to what the term "partnership" means to the Navajo Nation.

By "partnership" the Navajo Nation expects, requires, and demands that the DOE, as a department within the Federal Government, respect the inherent sovereignty of the Navajo Nation, fulfill the Federal Government's long standing trust responsibility to Indian Nations, and work with the Navajo Nation on a Government-to-Government basis. (Written comment received at a hearing.)

Response: The DOE recognizes and respects the sovereignty of the Navajo Nation and has accepted the Navajo Nation as a cooperating agency in the preparation of the PEIS. Section 1.3.2 of the PEIS has been revised to reflect this relationship.

Comment 271. Studies other than water should be done such as plant life, water life - livestock and people. (Written comment received at a hearing.)

Response: As part of the Ground Water Project, a baseline risk assessment was prepared for the Tuba City site. This document assesses the potential risks to human health and the environment from the contaminated ground water at the site. It considers potential impacts to human health, livestock, crop irrigation, and plant and animal biological communities. The DOE is currently conducting a study in conjunction with the University of Arizona to determine the relationship between plant uptake of contaminants from the contaminated ground water at the Tuba City site and plant growth.

As stated in the PEIS, the DOE intends to protect human health and the environment in conducting the Ground Water Project. The baseline risk assessment, planned site characterization studies, site-specific impact analysis, and other activities are indicative of the DOE's intention.

Comment 272. Might it be possible to prepare an oral (taped) version of the draft PEIS summary - in Navajo - to broadcast locally (KNDN, KTNN radio) prior to July 17? (Thus inviting comments from individuals not at hearing and not fluent in English). Maybe this was done?

Oral presentation of the PEIS summary at Shiprock was clear and coherent. (Written comment received at a hearing.)

Response: Unfortunately, there was not adequate time to respond to this request and prepare a taped version of the PEIS in Navajo. The DOE did provide for an interpreter at the public meetings held at tribal sites. In addition, a Navajo language audio tape of the materials for the PEIS scoping meetings was produced and distributed to the Navajo Nation radio stations. These tapes do provide information on the PEIS, alternatives presented in the document, and on the Ground Water Project. These tapes are still available through the radio stations.

In addition, funding for a community involvement specialist who speaks Navajo has been authorized as requested by the Navajo Nation's Director, Division of Natural Resources, to assist in DOE's public participation with the Navajo Nation.

Comment 273. How are livestock effected by the slight contamination differences, those nearer to the UMTRA Project sites as opposed to animals further down river? Has there been any tests done? (Written comment received at a hearing.)

Response: Baseline risk assessments have been prepared for many UMTRA Project sites. One aspect of these assessments is to analyze the possible effects contaminated ground water may have on livestock both through drinking the contaminated water and eating contaminated forage. In some cases, the potential for negative effects on livestock from contaminated ground water has been noted. The baseline risk assessments for the Tuba City, Shiprock, and Monument Valley sites are available at local public libraries.

Comment 274. In the area of Shiprock town, how many local people employed in the testing of sites? (Written comment received at a hearing.)

Response: There are no residents of Shiprock employed by the DOE or the UMTRA Project Technical Assistance Contractor. Environmental samples are typically collected by employees of the UMTRA Project Technical Assistance Contractor, Jacobs Engineering Group Inc. These personnel are currently based out of the Albuquerque, New Mexico, office. Field activities conducted at the Shiprock site have occasionally required the services of the Shiprock office of the Navajo Engineering and Construction Authority. The Navajo Engineering and Construction Authority employees are residents of the Shiprock area. In addition, the Navajo UMTRA Program Office, which is funded by DOE, has a compliance officer on the site for all activities including testing and sampling.

However, students from the Navajo Community College in Shiprock, New Mexico have collected environmental samples at the Shiprock site and may soon begin collecting such samples at the Tuba City site.

Comment 275. Your hearing was well attended which is a first. . . . (Written comment received at a hearing.)

Response: The DOE was pleased with the large turnout at the Falls City public hearing. It is important to have as much information and input as possible from the public, particularly from those people who could affect or be affected by the Ground Water Project.

Comment 276. The PEIS seems to conform to the letter of the regulations regarding the procedure for a PEIS. (Hopi Tribe - Water Resource Program - Comment 1)

Response: Comment acknowledged.

Comment 277. It is not stated what the preferred alternative for Tuba City/Moenkopi might be. All of the sites are lumped into one PEIS, as permitted by regulation. Verbally, we were told at a previous meeting in Moenkopi that water would be pumped, treated, and wasted. I informed the DOE hydrologist that the USGS projections were for the ground water in the area to become dry by the year 2012, and that the wasting of the treated water, rather than recharging or reusing it could reduce the lifetime of water supply. To date, I have seen nothing to indicate what the eventual cleanup plan for the area might be. (Hopi Tribe - Water Resource Program - Comment 2)

Response: No final decisions have been made regarding the ground water compliance strategy for the Tuba City site. Under all the alternatives except no action, the ground water compliance strategy proposed for the site will be determined from site characterization studies, risk analysis, impact assessments, and consideration of input from the tribes and public. The impacts of using this proposed strategy will be assessed in the site-specific environmental document. During this process, all available information, including that from the U.S. Geological Survey and the Hopi Tribe, will be used.

Comment 278. I have not been kept abreast of the progress of the UMTRA project, not because the Mining Program is not communicating with me, but because the UMTRA meetings frequently conflict with meetings and activities of the LCR Adjudication. I need to meet with the mining people to acquire whatever recent information they have.

It seems that it would be appropriate for me to become more active in the UMTRA project immediately, as it seems that decisions are about to be made which require technical input. I would be happy to work with you and the Mining Program Staff to see that the Hopi technical expertise is brought to bear on the problem. (Hopi Tribe - Water Resource Program - Comment 3)

Response: It is important that the DOE receive input from all interested and affected parties: those with technical expertise can provide a very important role in providing information that will improve decision-making in the Ground Water Project. Advertisements and notices are prepared and widely distributed prior to public meetings to encourage broad participation. Information on the Project can be obtained through the Grand Junction Projects Office in Grand Junction, Colorado.

Comment 279. Hydro Geo Chem is about to release the report on its modeling of the N-Aquifer near Tuba City/Moenkopi related to questions over the impacts of the proposed San Juan Southern Paiute N-Aquifer irrigation well field they would like to drill and implement. I will keep in touch with that issue, since the results of the model could also reveal

sensitivities with respect to the UMTRA mitigation activities. (Hopi Tribe - Water Resource Program - Comment 4)

Response: The DOE would also like to remain informed regarding this project because, as the commentor points out, the results of the modeling could be of use to the UMTRA Project.

Comment 280. Comments made by the Tribe on the proposed EPA Rule are present in the final rule; we are precisely where we would have been had DOE moved forward in 1987 on the Proposed Rule and our comments. (Hopi Tribe - Comment 1)

Response: Comment acknowledged.

Comment 281. Acknowledgment of the "preferred alternative" approach does not constitute agreement by the Hopi Tribe with the specific implementation that DOE puts forward for the Tuba City Site. In particular, it does not constitute an implicit basis for concurrence by the Tribe in DOE-proposed remedial actions that may flow from a subsequent site-specific NEPA evaluation. The Hopi Tribe reserves all rights under UMTRCA to participate fully in the site-specific evaluations and to formulate its official position on concurrence with the Remedial Action Plan for ground water on the basis of site-specific factors and the best interests of the Hopi Tribe as a sovereign entity. (Hopi Tribe - Comment 2)

Response: The DOE agrees that acknowledgment of the "preferred alternative" approach does not constitute agreement by the Hopi Tribe with the specific implementation that the DOE puts forward for the Tuba City processing site. It is the intent of DOE to work closely with the Hopi Tribe and other affected partners during the Ground Water Project. DOE will make every reasonable effort to ensure all affected parties are consulted and issues will be resolved to meet areas of disagreement with positive and open communication.

Comment 282. The preferred alternative seems to propose that a "risk assessment" will be performed to develop the technical basis for remedial actions. However, 40 CFR 192.04 Corrective Action states:

> **"If the groundwater concentration limits established for disposal sites under provisions of 192.02(c) are found or projected to be exceeded, a corrective action program shall be placed in operation as soon as is practicable, and in no event later than eighteen (18) months after a finding exceedance. (Hopi Tribe - Comment 3)**

Response: Corrective action as identified in 40 CFR §192.04 (60 FR 2854) refers to the scenario when exceedances of ground water concentration limits established for the identified hazardous constituents as part of the surface remedial action plan's water resource protection strategy, are determined to be a performance failure associated with the disposal cell design criteria. If these limits were exceeded at the disposal cell's point of compliance as a result of cell performance failure, the DOE would implement a corrective action program as soon as is practicable, and in no event later than 18 months after finding an exceedance. To date, there have been no performance failures associated with the Surface Project disposal cells and, therefore, no corrective actions have been identified.

Comment 283. DOE acknowledges in the draft PEIS that they were obligated by the Proposed Rule since 1978 to institute corrective action but has not done so. Will the risk

assessment methodology as proposed meet the regulatory obligation to place in operation corrective action within eighteen months? DOE is obligated to explain its proposed schedule for action at the Tuba City Site and how that schedule and the "preferred alternative" will; meet the requirements of 40 CFR Part 192. (Hopi Tribe - Comment 4)

Response: The requirement for corrective action within 18 months of detecting an exceedance is in 40 CFR Part 192, Subpart A, which pertains specifically to the disposal cell design under the Surface Project. The Ground Water Project addresses contamination from processing site activities, not from engineering performance of the disposal cell. The DOE's proposed action is in response to ground water contamination from processing site activities. The Surface Project issues, including disposal cell performance and the schedule for corrective actions at Tuba City, fall outside the scope of the PEIS. The schedule for ground water activities will be presented to the community by the DOE through stakeholder interactions. The site-specific ground water compliance strategy for the Tuba City site will be analyzed in the site-specific NEPA document, which will be presented to the public for comment prior to DOE's decision on site-specific actions.

Comment 284. DOE mis-states that the site must be transferred to the Government (i.e., to DOE as the designated agency). UMTRCA requires that control of the "residual radioactive material" must go to the Government. UMTRCA does not require the Tribe to cede land (or any subsurface rights - e.g., water-associated with that land) to the Federal Government or any of its entities (such as DOE). DOE must either lease either the surface rights from the Tribe or arrange for a land transfer with another Federal Agency. (Hopi Tribe - Comment 5)

Response: UMTRCA does not require that the Indian tribes cede any lands to the United States. However, UMTRCA does require that the Indian tribes transfer custody of the disposal site on which the residual radioactive material has been encapsulated.

Comment 285. In the NEPA process, analysis of ground water quality standards for judgment of impact of the "human environment" are not restricted to RCRA hazardous constituents and their potential for impact to human health. In this regard the Hopi Tribe expects the site-specific NEPA evaluations to address all adverse impacts to beneficial use of water, which include the non-use (cultural, aesthetic, and religious) values of water to the Hopi People. Failure to do so would be a fatal flaw in the NEPA Process. (Hopi Tribe - Comment 6)

Response: The site-specific environmental document for the Tuba City site and all other UMTRA Project sites will address all pertinent impacts of a proposed ground water compliance strategy. The tribal, federal, and state agencies and interested public will have an opportunity to comment on the draft version of these documents. They will also have opportunities to comment on the scope of these documents while they are in the preparation phase. Regarding the cultural aspects of water, the PEIS acknowledges the religious significance of ground water to many Native Americans (see, for example, Section 4.2.1.7) and where religious significance is of concern, it will be addressed in the site-specific environmental document.

Comment 286. DOE mis-reads the EPA Rule that because institutional controls are permitted under the EPA Rule the Tribe must agree to establish and enforce administrative structures that permit institutional control. There is no such requirement in 40 CFR Part 192, nor in the RCRA regulations, nor is there any requirement that can be derived from UMTRCA. DOE funding would be required if the Tribe is to formulate and implement institutional controls at the site. But DOE has no standing to require that institutional controls be formulated and enforced. (Hopi Tribe - Comment 7)

Response: The DOE hopes to work cooperatively with the Hopi Tribe in developing and implementing appropriate institutional controls using tribal law, if possible. However, Section 109 of the UMTRCA (42 USC §7919) does give DOE broad authority to promulgate such rules as may be necessary to carry out the purposes of the Act. Further, Section 110 of UMTRCA (42 USC §7920) gives DOE the authority to enforce such rules. DOE would promulgate rules related to implementing and enforcing institutional controls only as a last resort.

Comment 287. DOE continues to suggest that Alternative Concentration Limits (ACL) may be appropriate at many sites. The Hopi Tribe's functional goal is preservation of beneficial uses of the ground water and this may be compatible with ACLs. However, the Tribe will remain skeptical about ACLs until specific proposals can be reviewed with respect to the Tribe's position on ground water quality and use. (Hopi Tribe - Comment 8)

Response: The goals of the Hopi Tribe and the DOE are similar in that the DOE is also committed to preserving the beneficial uses of ground water. The use of alternate concentration limits will require careful study on the part of the DOE and the preparation of a detailed application to be submitted to the U.S. Nuclear Regulatory Commission for their concurrence. To meet the EPA ground water standards, an alternate concentration limit must be shown to be protective of human health and the environment. In addition, the DOE would consult with the Hopi Tribe regarding the use of an alternate concentration limit.

Comment 288. "Natural Flushing" seems to be the "preferred alternative" selected by DOE for several sites. The term appears in several areas of discussion in the body of the PEIS which may be fine for the PEIS. However, "Natural Flushing" as a preferred alternative in the site-specific environmental assessment for the Tuba City Site will not be considered by the Tribe. Because of the amount of annual precipitation the local and recharge area receive and ground water movement, this alternative would not be viable. (Hopi Tribe - Comment 9)

Response: The DOE has not made any final decisions regarding the use of natural flushing as a ground water compliance strategy at the Tuba City site or any other site. Under all alternatives except no action, the proposed ground water compliance strategy, which would be analyzed in the Tuba City site-specific environmental document, would be determined through site characterization studies, risk assessments, and consultations with the Hopi Tribe and Navajo Nation. The DOE recognized that in certain hydrologic settings, natural flushing may achieve the EPA standards within the 100-year time frame while in

other hydrological settings it may not. Site characterization studies mentioned above would, among other things, be designed to determine if natural flushing can achieve the standards within 100 years.

Comment 289. Not only is the Tribe participating in the Groundwater Remediation Project through a Cooperative Agreement, the Tribe was granted "Cooperating Agency" status for the NEPA Process. (Hopi Tribe - Comment 10)

Response: Section 1.3.2. of the PEIS has been revised to identify the Hopi Tribe as a cooperating agency in the PEIS process.

Comment 290. The New Mexico Environment Department has reviewed the Programmatic Environmental Impact Statement for the Uranium Mill Tailings Remedial Action Ground Water Project. We agree with the Proposed Action, which considers protection of public health and the environment in determining the appropriate strategy to meet ground water protection standards. However, we believe that the application of supplemental standards at the Ambrosia Lake site may not be protective of the environment and/or future public health and that a remedy which includes remediation of ground water may be appropriate at this facility. Such a remedy would be consistent with remedies being conducted under state regulatory authority at sites adjacent to the Ambrosia Lake site. (New Mexico Environment Department - Comment 1)

Response: The determination of a specific ground water compliance strategy for the Ambrosia Lake site or any other UMTRA Project site will be determined based on future studies after the publication of the Record of Decision. For all the alternatives except no action, the ground water compliance strategy will be determined from site characterization studies, risk assessments, and public participation. This strategy will become the proposed action in the site-specific environmental document. Preliminary indications, as expressed in the first draft of the Ambrosia Lake Site Observational Work Plan, are that supplemental standards may be an appropriate ground water compliance strategy under the PEIS proposed action. However, this determination is only preliminary and will undergo further study as well as being subject to additional state and public review and comment.

Comment 291. Based on statements in the PEIS and conversations with DOE staff and their contractors, it appears that DOE has drawn conclusions regarding the potential for use of the aquifer in the vicinity of the Ambrosia Lake site. Page 3-21 of the PEIS describes the alluvial aquifer as follows: "The water bearing unit is of limited use because it cannot produce 150 gallons of water per day". If DOE believes this statement to be fact, as they have stated in conversations with New Mexico Environment Department staff, then they have already decided that the alluvial aquifer beneath the Ambrosia Lake facility meets the definition of a "Limited Use Aquifer" as defined in Section 192.11.e of the Ground Water Standards for Remedial Actions at Inactive Uranium Processing Sites. Based on that definition, DOE would only have one remedy choice for this site, the application of supplemental standards. This means that no ground water cleanup will take place and that contaminants may remain in ground water beneath the Ambrosia Lake site indefinitely. (New Mexico Environment Department - Comment 2)

Response: The text is Section 3.2.11 of the PEIS was revised to indicate that the contaminated ground water beneath the Ambrosia Lake site was considered limited use in terms of ground water protection for the Surface Project. No final decisions have been made regarding the ground water compliance strategy at the Ambrosia Lake site or any other UMTRA Project site under the Ground Water Project. DOE agrees that human health and the environment must be protected. This will be a part of the proposed ground water compliance strategy.

Comment 292. The New Mexico Environment Department does not believe that we have enough information to concur with the statement that the alluvial aquifer cannot produce 150 gallons per day and should therefore be classified as a "Limited Use Aquifer". The New Mexico Environment Department may not agree with the interpretation of the current test data and methods used to make that determination and request that supporting documents such as well logs and pump test data be provided for our review. Furthermore, in order to determine whether or not a Limited Use Aquifer classification is appropriate, we believe additional testing should be done, with input from New Mexico Environment Department technical staff. This testing should consider the rate and direction of movement of contaminated ground water, and should consider past and future plume movement to ensure that public health and the environment will not become threatened in the future. (New Mexico Environment Department - Comment 3)

Response: During the Surface Project, it was determined that the alluvial aquifer is "limited use." For the Ground Water Project, no final decisions have been made regarding the ground water compliance strategy for the Ambrosia Lake site or any other UMTRA Project site. These decisions will not be made until after the PEIS is finalized, all relevant ground water data have been collected, all risks are known, and input from the tribes, states, and public has been considered.

Comment 293. DOE has stated in meetings that they do not have to gain our concurrence on the selection of a subsurface remedy. They have answered that because we concurred with Subpart A for surface remediation, we incidentally concurred with the subsurface remedy. The New Mexico Environment Department does not agree with this reasoning and maintains that DOE must gain our concurrence for all remedies selected for the site, including the remedy for ground water contamination as discussed in 40 CFR Part 192, Subparts B and C of the Ground Water Standards for Remedial Actions at Inactive Uranium Processing Sites. (New Mexico Environment Department - Comment 4)

Response: The DOE will solicit the state's "full participation" in the selection and performance of ground water compliance. It is expected, and it is DOE's goal, that the states and the DOE will jointly agree in these decisions. However, the DOE has been directed by Congress not to allow the states to have a "concurrence" or "veto" authority over the remedial action program.

Section 108(a)(1) of the UMTRCA, Public Law 95-604, 42 USC §7918(a)(1), provides that "the State shall participate fully in the selection and performance of a remedial action for which it pays part of the cost." The legislative history of the UMTRCA is very clear that by using the term "full participation" in the legislation, Congress did not want the states to have a "concurrence" or "veto" authority:

> The committee rejected suggestions that this program be funded entirely by the Federal Government or that the share of the States be limited to less than 10 percent of those costs and, at the same time, provide all manner of State approvals or concurrences in the remedial action program. The committee is concerned about the precedent of such proposals and about their effect on the Federal budget.

> [T]he committee believes that the 90 percent maximum Federal share is more than generous... The committee also believes that since the bulk of the costs will be paid by the Nation's taxpayers, **the States should not have "concurrence" or "veto" authority over the remedial action program,** although the committee intends that the DOE clearly consult with the States. [Emphasis added].

H.R. Rep. No. 1480, Pt. 2., 95th Cong., 2d Sess. 33 (1978), *reprinted in* 1978 U.S. Code Cong. & Admin. News, 7460.

Comment 294. Conclusionary statements as to the status of aquifers below the UMTRA sites are inappropriate at this time with reference to the requirements of Subpart A, 40 CFR 192.01-192.02 (See attached testimony presented by NMED at the June 7, 1995 public hearing at Shiprock, New Mexico). (State of New Mexico - Groundwater Protection and Remediation Bureau - Comment 1)

Response: The text in Section 3.2.11 of the PEIS was revised to indicate that the contaminated ground water beneath the Ambrosia Lake site was considered limited use in terms of ground water protection for the Surface Project. No final decisions have been made regarding the ground water compliance strategy at the Ambrosia Lake site or any other UMTRA Project site under the Ground Water Project.

Comment 295. NMED is concerned that DOE has already concluded that the alluvial aquifer beneath the Ambrosia UMTRA site is of "limited use because it cannot produce 150 gallons per day". NMED is concerned with this statement for two reasons:

1. **DOE's conclusion that this aquifer qualifies as a supplemental standard aquifer due to limited use, i.e., produces less than 150 gallons per day on a sustained use bases, is formulated on a pump test on well 675 which pumped 0.35 gallons per minute for 12 hours (producing 252 gallons) before drawdown caused loss of suction. At a pumping rate of 0.35 gpm the required yield of 150 gpd could have been obtained in only 7 hours of continuous pumping. Information has not been presented to NMED with indicates that after a reasonable recharge period, this well would be able to pump 150 gallons each day on an intermittent basis. Further, pumping at a rate less than the 0.35 gpd used during the pump test may allow sustained pumping of 150 gpd. Before NMED can concur with DOE that the alluvial aquifer would qualify for supplemental standards, well 675 should be re-tested to provide the information described above.**

   Even if it can be proven that supplemental standards are appropriate at this site, institutional controls must be implemented to prevent the use of contaminated water in order to protect public health. (State of New Mexico - Groundwater Protection and Remediation Bureau - Comment 2)

Response: The text in Section 3.2.11 of the PEIS was revised to indicate that the contaminated ground water beneath the Ambrosia Lake site was considered limited use in terms of ground water protection for the Surface Project. No final decisions have been made regarding the ground water compliance strategy at the Ambrosia Lake site or any other UMTRA Project site under the Ground Water Project. DOE agrees that human health and the environment must be protected. This will be a part of the proposed ground water compliance strategy. DOE will consider retesting the well and will coordinate such decisions with state participation.

2. **Calculations of linear velocities in the alluvial aquifer by DOE and others (Thompson and Heggen, 1981), have ranged from 18 feet per year to 5,183 feet per year respectively. NMED is concerned that large quantities of highly contaminated alluvial ground water**

produced during the active life of the tailings pile and high rates of tailings dewatering discharged to the alluvial aquifer for several years after cessation of mill operations may have migrated off the UMTRA site. NMED believes that alluvial aquifer testing downgradient from the mill site is insufficient to allow an evaluation of the quality and yield of the portions of the alluvial aquifer which may have been impacted by Ambrosia Lake operations. (State of New Mexico - Groundwater Protection and Remediation Bureau - Comment 2)

Response: Ground water level measurements were taken between 1985 and 1995 from wells completed in the alluvial/weathered Mancos Shale unit. Many of these wells did not produce any ground water, indicating they are located outside the perimeter of the saturated portion of this unit. In addition, water levels in some of the wells along the margins of saturation have diminished to the point where they also no longer produce ground water. This indicates that the zone of saturation in the alluvial/Mancos Shale unit has decreased in areal extent and declined in thickness over the 10-year period of measurement.

Comment 296. NMED is also in disagreement with the PEIS in it's statement that "Ground water in aquifers below the Tres Hermanos-C unit does not appear to have been contaminated by seepage from the contaminated ground water units beneath the Ambrosia Lake site". Monitor well 678 located on the northeast edge of the tailings pile and completed in the Tres Hermanos-B, underlying the "C" unit, contains nitrate levels exceeding 3400 parts per million, sulfate levels of 6690 parts per million, and a total dissolved solids concentration of 15,300 parts per million. Ground water in the Dakota Sandstone beneath the Tres Hermanos Formation, collected from monitor well 680 located along the southwestern edge of the tailings pile, contains concentrations of sulfate at 2390 parts per million and a total dissolved solids concentration of 4140 parts per million. This well is listed as being an upgradient Dakota well. However, NMED believes that southwesterly flow of the alluvial ground water along the eroded, north dipping Tres Hermanos Formation is recharging the Tres Hermanos and is migrating downward to the Dakota Sandstone. (State of New Mexico - Groundwater Protection and Remediation Bureau - Comment 3)

Response: Stiff and Piper diagrams show that the ground water of the Tres Hermanos-B unit is a sodium-sulfate-type water. Plots of total dissolved solids with time show monitor well 678 has greater concentrations than other wells completed in the same unit. Well 678 also shows nitrate concentrations increasing from 500 milligrams per liter to 3500 milligrams per liter in the period between 1989 and 1993. Based on the information presented in these plots, DOE believes that well 678 appears to be two to three times as contaminated as the other wells. However, DOE believes that this increase in nitrate is not related to uranium processing at the Ambrosia Lake site because nitrate concentrations in monitor well 678 are much higher than average concentrations found in Ambrosia Lake site tailings pore fluids (approximately 1400 milligrams per liter). This interpretation of the data will be presented in the site observational work plan.

The discharge of water from the Quivira Mill to the outcrop of the Tres Hermanos-A Sandstone, Tres Hermanos-B Sandstone, and the Dakota Formation probably caused contamination of these units (Bostick, 1985).

Furthermore, the Tres Hermanos-B Sandstone is hydrologically isolated from the alluvium/ weathered Mancos Shale unit at the Ambrosia Lake site by 50 feet (15 meters) of contiguous Mancos Shale. The shale is of sufficiently low hydraulic conductivity to prevent the vertical migration of contaminants. A hydraulic conductivity of 4 (10^{-8}) centimeters per second was estimated in undisturbed Mancos Shale and is probably representative of the vertical hydraulic conductivity of the Mancos Shale aquitard that occurs between the Tres Hermanos-C and the Tres Hermanos-B Sandstones (Thomas and Heggen, 1981).

Comment 297. Based on the above, NMED strongly objects to the PEIS's conclusion that the alluvial aquifer is of limited use. NMED requests that DOE proceed with Subpart B of 40 CFR 192.11-192.12 and that NMED be included as an active participant in the "site specific" evaluation and testing of the ground water below and downgradient of the Ambrosia UMTRA site. This study should include at a minimum"

1. **Establish the chemical fingerprint of the alluvial ground water below and along the perimeter of the tailings pile by compiling "Stiff" diagrams using sulfate, chloride, TDS, and specific conductivity.**

2. **Retest well 675 as described above.**

3. **Sample alluvial ground water from wells south and southwest of the tailings pile and plot stiff diagrams for each well. Wells matching the stiff fingerprint of wells in and around the tailings pile should be tested for production capabilities using pump test methods described above. If sufficient alluvial wells are not present south of the tailings pile, new wells should be drilled on a "step-out" basis. (State of New Mexico - Groundwater Protection and Remediation Bureau - Comment 4)**

Response: The text of the PEIS in Section 3.2.11 was expanded to indicate that the limited use designation was for ground water protection under the Surface Project. No final decisions have been made regarding site-specific ground water compliance strategies at any of the UMTRA Project sites under the Ground Water Project. Under all the alternatives except no action, the DOE will conduct ground water characterization when required at the UMTRA Project sites so it can determine the appropriate site-specific ground water compliance strategies. As stated on numerous occasions in the PEIS, under the proposed action, these strategies would have to protect human health and the environment, and meet EPA standards. The DOE will actively solicit input from the affected tribes and states and local public during the process of determining site-specific ground water compliance strategies.

Comment 298. Ground water is a state-managed resource for which ONRT is trustee pursuant to state law [Natural Resources Trustee Act, 75-7-1 thru 5 NMSA 1978] and federal law [CERCLA, Section 107(d)]. Ground water is a scarce and a precious commodity of New Mexico. Even where local conditions cause ground water to exceed certain use-based standards on criteria, the resource still may be utilized by local residents if it is the best water available. ONRT seeks the best outcome for all ground water resources that are impacted by UMTRA Project sites in New Mexico. (State of New Mexico - Office of the Natural Resources Trustee - Comment 1)

Response: The DOE is in full agreement with Office of the Natural Resources trustee, in that it also seeks the best outcome for all ground water resources impacted by the UMTRA Project in New Mexico, and on all other tribal and state lands.

Comment 299. We have had preliminary discussions with DOE UMTRA Project staff concerning natural resource damage (NRD) liability, which applies to releases of hazardous substances pursuant to Section 107 of CERCLA. It is our position that CERCLA hazardous substances released from UMTRA Project sites into the environment are subject to NRD liability. Potential exemptions from liability have been reviewed and have been found not to apply. For example, Section 101(22) of CERCLA contains the definition of "release." in which "any release[s] of source, byproduct, or special nuclear material" addressed under Title I of UMTRCA is explicitly exempted form Section 104 of CERCLA or any other response action. While UMTRCA cleanups therefore may be exempt from some parts of CERCLA, the exemption makes no reference to Section 107 of CERCLA. Similarly, the term "response" [CERCLA 101(25)] makes no reference to Section 107 or to natural resource damage claims or actions. We therefore hold the position that UMTRA Project sites are not exempt from natural resource liabilities described in Section 107 of CERCLA.

Failure to restore polluted ground water at an UMTRA Project site could result in significant residual contamination remaining at the site and an extended period of lost or impaired use. The significance of these residual injuries and lost uses at specific sites is not well understood at this time, but they may be associated with natural resource damages of unknown magnitude. (State of New Mexico - Office of the Natural Resources Trustee - Comment 2)

Response: The former uranium processing sites designated by the Secretary of Energy pursuant to Section 102(a)(1) of the UMTRCA (42 USC §7912(a)(1)) are excluded from all of the provisions of Comprehensive Environmental Response, Compensation, and Liability Act, including natural resource damages, by their explicit exclusion from the definition of "release" under Section 101(22) of the Comprehensive Environmental Response, Compensation, and Liability Act (42 USC §9601(22)). There was no need for Congress to refer to these designated processing sites in the definition of "response" under Section 101(25) of the Comprehensive Environmental Response, Compensation, and Liability Act (42 USC §9601(25)), since there cannot be a response if there is no release. Likewise, there can be no natural resource damages if there is no release.

The legislative history of the UMTRCA is replete with references with statements that Congress did not recognize any federal responsibility or liability for the mill tailings. *See* H.R. Rep. No. 1480, Pt. 2, 95th Cong., 2d Sess. 29, 34, 37, and 42 (1978), *reprinted in* 1978 U.S. Code Cong. & Admin. News, 7450, 7456, 7461, 7464, and 7469. Congress undertook the remedial action program of these former processing sites based upon "compassion rather than legal responsibility." H.R. Rep. No. 1480, Pt. 2, 95th Cong., 2d Sess. 27 (1978) *reprinted in* 1978 U.S. Code Cong. & Admin. News, 7450, 7449.

Comment 300. The decision tree presented in the DPEIS (p. 2-3) provides for numerous compliance strategy outcomes other than active ground water remediation. If this decision tree is adopted as proposed, it is inevitable that active remediation will be undertaken at few UMTRA Project sites. It is unlikely that any given site will be able to jump all the hurdles placed in the path to an active ground water cleanup. Failure to clear any single hurdle will relegate a site to a "natural flushing" or "no remediation" alternative. (State of New Mexico - Office of the Natural Resources Trustee - Comment 3)

Response: The DOE's overriding consideration in the Ground Water Project is ensuring that site-specific ground water compliance strategies are protective of human health and the environment, and at the same time meet EPA standards. If a passive ground water compliance strategy (e.g., no remediation or natural flushing) can be shown to be protective of human health and not result in degradation of the environment and meet the standards, then it makes sense from risk and cost perspectives to use that strategy. Consistent with EPA standards, the use of a passive ground water compliance strategy would also need to be protective of other beneficial uses, such as for agricultural or industrial purposes. At this stage in the Ground Water Project, no site-specific decisions have been made regarding the proposed ground water compliance strategy at a given site. Such decisions will not be made until after the additional characterization data are collected. A site environmental document is prepared after input from the affected tribes and/or states and the local populace.

Comment 301. DOE's use of this decision tree needs to consider that some rural New Mexico residents use water from unproductive aquifers, or water that does not meet federal and state health standards, simply because it is the only water available. In these situation, supplemental standards or alternate concentration limits, in and of themselves, may not protect public health. DOE acknowledges that it cannot simply walk away form ground water contaminated by an UMTRA site because DOE must protect human health. Boxes 5, 6 and 9 in the decision tree seem to be crucial for these situations. The alluvial aquifer at New Mexico's Ambrosia Lake site might move through the tree via the following boxes: 1, 2, 4. 6, 8, 10, 11, 12; the result would be natural flushing with institutional controls. Institutional controls are essential in any no active remediation scenario to protect unsuspecting residents from using unsafe water. This site will not exit the tree at boxes 3 or 7 because simply leaving contaminants in the ground, even in an unproductive aquifer, poses an unacceptable health risk Another way to approach this situation may be to include institutional controls as part of the outcomes in boxes 3 and 7, as they are

including in boxes 12 and 17. (State of New Mexico - Office of the Natural Resources Trustee - Comment 4)

Response: The DOE's decision tree does in fact consider the scenario where rural residents use water from nondrinking water aquifers (unproductive aquifers). Such aquifers can have other beneficial use as a water resource. Past practices of residents using nondrinking water aquifers as a resource for watering livestock, watering gardens, and irrigating crops has been documented at some of the UMTRA sites. No such documentation has been made at the Ambrosia Lake, New Mexico, site because no one has ever used the uppermost aquifer for a beneficial use. Further, the probability of using the contaminated ground water as a future water resource is extremely remote. The uppermost aquifer was created by the milling operation and its volume is diminishing with time (DOE, 1995b).

Supplemental standards and alternate concentration limits can be protective of human health and the environment depending on their application. Selection of the natural flushing strategy appears to be inappropriate for the conditions at Ambrosia Lake. The natural flushing strategy, as defined in the EPA ground water standards, is applicable to potential drinking water aquifers not currently projected for use as a public water supply. The DOE will seek input from the state of New Mexico during the development of a site-specific ground water compliance strategy at the Ambrosia Lake site.

Comment 302. It is important to note that natural resource damage liabilities will pertain to all contaminated ground waters at the site even if DOE properly applies supplemental standards, alternate concentration limits, natural flushing, institutional controls, or any compliance strategy other than cleanup to pre-release conditions, as set forth in the NRDA regulations at 43 CFR 11. These liabilities notwithstanding, ONRT agrees that issues of water availability, natural water quality, and water use should be considered in any decision regarding active ground water remediation for a given aquifer. Active remediation may not be the best resolution of all such situations. (State of New Mexico - Office of the Natural Resources Trustee - Comment 5)

Response: The purpose of the Ground Water Project at the UMTRA Project sites is to meet the EPA standards in a way that protects human health and the environment. Under the proposed action, the ground water resources at the UMTRA Project sites would be cleaned up using a variety of strategies. These strategies can be used only if certain criteria are met as described in the PEIS. These criteria were established to protect human health and the environment and therefore, protect the users and uses of the ground water resource. In addition, as stated earlier, the DOE UMTRA Project sites are excluded from the definition of "release" under Section 101(22) of the Comprehensive Environmental Response, Compensation, and Liability Act. Therefore, DOE's UMTRA Project sites are not subject to the National Resource Damage Assessment regulations.

Comment 303. This outstanding loss could be addressed by reasonable means other than active remediation. For example, DOE could undertake a supplemental environmental project that enhances or protects ground water resources in the affected area. The exact

nature of the project would have to be determined on a site-by-site basis. Some examples might include: land use protection at ground water recharge area, inventory and plugging of wells that connect contaminated and uncontaminated aquifers, containment of contamination, artificial recharge, extension of water lines and educational projects; no doubt there are other possibilities. The size and scope of a given project generally should be commensurate with the loss incurred by the public due to the residual contamination. Usually this will be small relative to the cost of active remediation.

This approach can be incorporated into the DPEIS decision tree (p. 2-3) by amending boxes 3, 7, 12 and 17. Box 3 should be modified to read:

> **No site-specific ground water remediation. Implement supplemental ground water enhancement project.**

Box 7 should be modified to read:

> **No remediation required. Apply supplemental standards or alternate concentration limits. Implement supplemental ground water enhancement project.**

Box 12 should be modified to read:

> **Implement natural flushing plus supplemental ground water project or natural flushing with active remediation.**

Box 17 should be modified to read:

> **Apply supplemental standards based on technical impracticability and apply institutional controls where needed. Implement supplemental ground water enhancement project.**

Complementary changes would be useful in the text of the DPEIS, wherever the Proposed Action is described. It may be beneficial to include some discussion of NRD applicability in Section 1.4, Regulatory Compliance. A discussion of supplemental ground water enhancement projects might fit nicely within Section 2.8, Ground Water Characterization and Remediation Methods. (State of New Mexico - Office of the Natural Resources Trustee - Comment 6)

Response: As stated earlier, the DOE has no legal responsibility or authority to undertake supplemental environmental projects under the Comprehensive Environmental Response, Compensation, and Liability Act. The DOE is required to meet the EPA ground water standards and it must be shown that implementation of these standards are protective of human health and the environment.

Comment 304. At the 27 Jun 95 Falls City Ground Water Public Hearing, it was the position of the DOE that a public and environmental threat due to site operations ground water contamination does not exist. This is also stated in Section 3.2.17 of the DRAFT PEIS. However, in my view the DOE assessment is suspect because the level of contamination off-site has not been determined. This is evident by the information contained in the attached excerpts which state in part, "contamination from the...processing activities is still in ground water at the Falls City site...Contamination migration...maybe occurring but the extent...is not known because so few monitoring wells were placed in off-site locations (Figure 12-9)." Also, in addition to myself, I am aware of three other property owners on County Road 203 (east of FM 1344), all within three miles east and northeast of the site, who have not been asked to, nor had, tests performed on their domestic wells by any agency with the authority to judge their wells and the ground water they stem from, free from hazard. These domestic wells range from depths of 00 ft to 250 ft and could very well be affected by the current upper aquifer contamination since the ground water flows northeastward and southwestward (para 5, Section 3.2.17). Periodic seasonal backwash form the Scared Dog creeks occurs as well. It's likely there are other property owners in close proximity of the site that are in this situation. (For verification, the specific names and locations of the properties cited above can be obtained by contacting me. I have also given them a point of contact at DOE in Albuquerque NM since they all voiced keen interest in having their wells tested.) In summary, a quantifiable and viable ground water monitoring has never been employed for off-site locations in the vicinity of the UMTRA site. Therefore, the stated notion that a hazard does not exist to the public and the environment is dangerously premature and negligent. Recommend that a standard three to five mile radius around the site be established for public ground water monitoring purposes. All properties in this radius should have ground water sampled at various depths to determine the level of off-site contamination. Basically, this entire subject needs to be revisited before it can be incorporated into the PEIS. (David Rapstine - Comment 1)

Response: The DOE is always interested in identifying additional wells that may require sampling and has made a diligent effort to identify all potential affected wells. For example, as part of a baseline risk assessment of ground water contamination at the Falls City, Texas site (DOE, 1994c), a ground water well records search and field surveys of water use were conducted approximately within a 2-mile (3 kilometer) radius of the former uranium ore processing site in July-September 1990, and January 1994. The baseline risk assessment describing the results of these surveys will be available from the public library in Falls City.

Additional water use surveys were conducted within an extended area of up to about 3 miles (5 kilometers) downgradient of the site (i.e., northeast and south of the site in November 1994 and March 1995). These surveys revealed 15 additional private wells (most of them inactive), including nine wells within 3 miles (5 kilometers) northeast of the site. Ground water was sampled from the active wells and the inactive wells that were accessible and produced enough water to permit sampling. Chemical analysis of water samples revealed no site-related contamination. Well owners will be provided with results of the sampling from the Texas Department of Health.

Comment 305. Paragraph 6 of Section 3.2.17 of the draft PEIS states in part, "Tailing fluids have migrated into the uppermost aquifer...However, because the background water is of poor quality (uranium, gross alpha, radium), this water is of limited use for stock watering and is of no use for any other purpose. This position rationalizes that the upper aquifer ground water was never of any human use prior to contamination caused by site operations. Absent, however, is any form of data supporting or corroborating this bold declaration. I can personally certify otherwise--I have firsthand knowledge of farmers, ranchers, and their families using well water from the upper aquifer for many years and for numerous applications. And until legally restricted and mandated to the contrary, these wells can and should be available for use by the respective property owners as they see fit. Basically, the PEIS' comments regarding background water quality are interpreted by me (and probably by any reasonable person) as a position of expedience so that any type of issue regarding human use of the uppermost aquifer--past, present, or future, will not be able to be put on the table and addressed to the public's interest and satisfaction during any type of proceedings hereafter. Since the comments claiming the upper aquifer was never of any human use of value aren't supported by a documented factual basis, they shouldn't be allowed in the draft PEIS. Until data is provided which supports this specific narrative in the PEIS, the remarks should be amended to reflect that the background water quality in the uppermost aquifer was rendered useless for human use due to contamination from site operations as supported by the attached excerpts. (David Rapstine - Comment 2)

Response: As defined in the draft PEIS, the uppermost aquifer underlying the Falls City site consists of the saturated zones of the Deweesville Sandstone, Conquista Clay, and Dilworth Sandstone Members of the Whitsett Formation, which constitutes the upper part of the Jackson Group exposed in the Falls City site area.

Premining and premilling geochemical studies of the uranium ore deposits in Karnes County, where the former Falls City uranium processing site is located, revealed that the uranium ore deposits are principally in sediments of the Whitsett Formation of the Jackson Group (Weeks et al., 1974; Bunker and MacKallor, 1973; Eargle and Weeks, 1961). The most important uranium ore deposits are in the lower part of the Deweesville Sandstone Member; the uranium in the underlying Conquista Clay Member of the Whitsett Formation is generally of lower grade (Bunker and MacKallor, 1973). In 1955, the uranium ore deposits were discovered southwest, south, and northwest of the later uranium milling site and were mined during 1959 and 1960 (Bunker and MacKallor, 1973; Anders, 1962). These deposits are known as the Nuhn and Luckett deposits mined at the Falls City site, largest known uranium ore deposits discovered before 1970. The uranium ore deposits contain a great variety of uranium minerals, many of which are radioactive (Bunker and MacKallor, 1973). They include uranyl phosphates, arsenophosphates, silicates, phosphosilicates, molybdates, and vanadates. The samples taken for chemical analysis on the property at the south end of the Nuhn deposit showed considerable to slight enrichment in uranium, molybdenum, arsenic, vanadium, and lead.

The uranium ore deposits lie between the Fashing and Falls City faults, which have acted as barriers to the normal downdip movement of ground water (Bunker and MacKallor, 1973). The Falls City fault is north and northeast of the uranium ore deposits (and the former uranium milling site); the Fashing fault is south and southwest of the uranium deposits (Bunker and MacKallor, 1973). Both of these major faults have associated oil and

gas fields, which produce oil from the lower Willcox Group and the Carrizo Sand, respectively. Therefore, sulfur minerals are naturally widespread in the ground water in the site area.

As could be anticipated, background ground water from the uppermost aquifer (including Deweesville/Conquista Members and the Dilworth Member of the Whitsett Formation) contains widespread ambient chemical and radiological contamination resulting from naturally occurring conditions and from the effects of human activity not related to uranium milling operations.

Regional premining data for Karnes County indicate that the quality of ground water in several places (locations not identified) may be too saline for domestic use (Anders, 1962). The results of the ground water survey in Karnes County by Schafer (1937) revealed no users of the shallow ground water in the Falls City area. Water quality data associated with the surveyed wells indicate that many of the deeper wells produced water of poor quality with high levels of total dissolved solids, chloride, and sulfate (Schafer, 1937). Additionally, the recent water use surveys conducted in the Falls City site area (discussed in response to the previous comment) have not revealed any historical or present users of the shallow ground water beneath the Falls City site. Therefore, ground water in the uppermost aquifer beneath the former uranium milling site is historically of limited use as livestock water and is of no use for any other purpose. This is true because of the properties of this aquifer. For example, the physical limitations of this aquifer would preclude its use for industrial or irrigation purposes.

Comment 306. As indicated in the Draft PEIS, land and ground water use in and around the Falls City UMTRA site will likely be controlled in varying degrees depending on the course of action selected and a final, valid analysis made regarding extent of contamination around nearby off-site locations. Short and long-term restrictions and controls can include but are not limited to the following areas: Construction, agriculture, irrigation, ranching, and surface and ground water use. Obviously these restrictions can have a catastrophic economic impact on affected farmers, ranchers, and property owners due to decreasing property values, a limited, or entire cessation, of livestock and agricultural production, and soaring costs to secure dwindling alternate sources of water. Also, the absolute involuntary acquisition of land from current owners is an available option. While these things concern loss in terms of fiscal matters, it doesn't even begin to describe loss in human terms--the loss and suffering associated with having a person's entire way of life and livelihood uprooted and taken away from them. The PEIS matter-of-factly confirms and accepts that these are all possible unfortunate consequences which can result from the ground water project. In my opinion, this falls way short of the mark. It's insensitive, its uncaring--it's not enough. It's my recommendation the scope and content be expanded to address and therefore facilitate legal and financial recourse available to citizens who, through no fault of their own, now may be unduly affected by the actions and controls needed to remedy years of on and off-site contamination. With equity in mind, sensible criteria the key, and on a case-by-case basis, a program and policy should be developed to determine those people eligible for financial subsidy, free or low cost water, or outright free relocation, in order to mitigate confirmed instances of unjust severe financial losses caused by contamination or institutional controls. Some may argue that the PEIS isn't the proper

forum for addressing issues of financial liability. However, since nearby property owners, farmers, and ranchers are all vulnerable to significant financial loss and ruin--impacts resulting from compliance strategies, they are in fact relevant issues-- issues that are in the best interests of the public to have them incorporated into the document. It certainly can and, probably will, motivate and influence the alternative selected. (David Rapstine - Comment 3)

Response: The DOE will work with individual citizens who are impacted by the actions of the DOE at the former uranium processing site. See Section 1.4.1 of the PEIS for more detail regarding institutional controls.

Comment 307. Too many unanswered questions regarding validity of data -- i.e., no one is drinking water. (David Rapstine - Comment 4)

Response: All private well owners in the area that requested their wells be sampled and analyzed, including the private well owned by the commentor, were obliged by DOE. No reasonable request by a landowner for sampling and analyzing the water quality in their well was denied, regardless of the physical potential for the well to have been contaminated by activities that resulted from the former milling operations. The results from the sampling have been submitted to each landowner and the state of Texas. To summarize, the sampling analyses showed that no private well used for drinking is contaminated as a result of the former milling operation. Analyses are available for "validity" review.

Comment 308. The City of Rifle has two concerns about the ground water remediation in Rifle. One issue relates to the contaminated domestic wells in the area, and I previously I sent you a letter concerning DOE's *Private Well/Spring Position Paper, Rifle, Colorado*. (City of Rifle - Comment 1)

Response: Data collection analysis indicates that there are no contaminated domestic wells in the area. DOE acknowledges that a degree of uncertainty exists on determining the nature and extent of ground water. Therefore, DOE is actively exploring the option of an alternate water supply in the vicinity of the processing site.

Comment 309. The second issue concerns DOE's proposed action for the contaminated ground water. As I read the proposal, institutional controls would be used to protect human health and the environment in the event the decision tree called for natural flushing, natural flushing with active remediation, or when standards can not be met.

Our concern is that institutional controls could be quite serious, and would include private property. The controls can include fencing, land use restrictions, federal purchase of land, eliminating all uses, etc. (see Sections 4.2.2.6 & 5.2, DOE/EIS-0198). These controls could be in place for up to 100 years.

If the number of contaminants is any indication of the severity of contamination, the New Rifle site is of particular concern. This is the only UMTRA site in the country that has all of the hazardous constituents present (see Table 2, SUM-6, DOE/EIS-0198). The ground water plume at this site appears to be about one mile by one-half mile, and extends about 1/2 mile west of the site (see Private Well/Spring Position Paper, map figure 3.3). The possibility of having an area this size under strict institutional control for up to 100 years is of a great concern.

Based on past DOE actions, I have no doubt that the City of Rifle would be thoroughly consulted before any institutional controls would be implemented in our immediate planning area. Nevertheless, because both contaminated plumes are mostly outside our existing City limits, Rifle would not be in a position to reject onerous institutional controls and force more active remediation. Under the decision process, institutional controls will be the only option if active remediation is not judged to be effective. (City of Rifle - Comment 2)

Response: In the case where natural flushing is selected as the site-specific ground water compliance strategy under the proposed action, institutional controls would be required in most cases. For example, in the case where the contamination has moved under private property, an institutional control could be required to limit the use of the contaminated ground water for purposes such as household use.

Implementation of an institutional control would be considered with a graded approach methodology. That is, the minimum restriction necessary would be implemented to ensure continued protection of human health. For instance, an institutional control might limit use of contaminated ground water to irrigate crops, water gardens, water livestock or pets, or as an additive in manufacturing, while prohibiting the water for household use. Institutional

controls in this case could include a deed restriction or a requirement to hook up to a municipal water system.

The contaminant table in the PEIS does indicate that all of the hazardous constituents are present in the New Rifle, Colorado plume. However, this is somewhat misleading as to the severity of the problems. Even though the hazardous constituents identified in Table 3.3 have exceeded the maximum concentration limits in at least one well during all historical samplings, data taken from wells today indicate that only sulfate, total dissolved solids, chloride, sodium, nitrate, molybdenum, and uranium are found in sufficient concentrate quantities in ground water over an area large enough to be measured as exceeding the EPA standards in multiple wells.

Institutional controls, if any, will be selected in cooperation with the Indian tribes, states, and local governments.

Comment 310. It is our position that if the level of contamination is serious enough to warrant severe institutional controls in, or near, a municipality, active remediation should always be considered as part of the solution. If active remediation would significantly reduce the severity, area or duration of the institutional controls, it should then be included in the program. We ask that DOE modify the decision tree to include that provision. (City of Rifle - Comment 3)

Response: EPA expects the DOE to implement the most cost-effective strategy to meet the standards and be protective of human health. Such language is found in the EPA ground water standards (40 CFR Part 192). The proposed action as identified in the draft PEIS takes this goal into account in the decision tree logic.

The purpose of institutional controls is to protect public health or the environment during implementation of one or more ground water compliance strategies, including active remediation. The PEIS indicates that institutional controls can be used with active remediation to protect the public during ground water remediation (see Section 1.4.1 of the final PEIS). In addition, it is possible to combine active remediation and natural flushing as indicated in Box 13 of the proposed action framework (Figure 2.1). For example, active remediation could be used to clean up a "hot spot" of contamination and then natural flushing could be used with institutional controls, if necessary. In addition, as mentioned in Section 1.4.1, the restrictiveness of institutional controls could be reduced over time as ground water contamination is reduced over time. Active remediation is currently part of the decision tree so no modifications are necessary.

Comment 311. The City has been extremely pleased about the effectiveness and safety of the surface mill tailings remedial action project. The lack of problems with a project this large speaks well of all concerned. We are hopeful that any ground water remediation will be equally successful. (City of Rifle - Comment 4)

Response: The DOE appreciates the comment and is committed to maintaining its high standards on the Ground Water Project. The DOE looks forward to continuing its good relationship with its stakeholders.

Comment 312. At those sites/states in which EPA has not delegated authority to the state to administer the National Pollutant Discharge Elimination System permit, and active remediation is the selected remedy, a National Environmental Policy Act document may be required for the National Pollutant Discharge Elimination System process. If that is the case, the EPA would prepare National Environmental Policy Act documentation. Suggest that the EPA and DOE cooperate in preparing the documentation to eliminate or minimize duplication efforts. (David Tomsovic - USEPA- Comment 1)

Response: The DOE agrees that it is important to minimize duplication in preparing National Environmental Policy Act documentation. In the past on the Surface Project, the DOE worked with other agencies, such as the Bureau of Land Management, to prepare National Environmental Policy Act documentation that was compatible with other agency requirements. We anticipate continuing these cooperative efforts.

Comment 313. Suggest inclusion of a table that estimates the amount of contaminated ground water under each site. (David Tomsovic - USEPA- Comment 2)

Response: The DOE has recently completed an estimate of the amount of contaminated ground water beneath each of the sites. This information is included in the final PEIS in Table 3.1. These volumes represent estimates based mostly on ground water data and characterization from the UMTRA Surface Project. These estimates will be refined during the Ground Water Project as a result of site characterization studies.

Comment 314. The DPEIS was well written and did a good job of disclosing information necessary to select a programmatic alternative. It seems to be a sound approach to the problem given the limited intent of the DPEIS. The EPA does have several general concerns and a few specific comments about the DPEIS. (USEPA, Region VIII - Comment 1)

Response: Comment acknowledged.

Comment 315. One overriding general concern is the perception that most remediation efforts will focus on what is referred to in this document as passive remediation. Precipitation, adsorption, and ion exchange are all chemical/physical processes that will decrease the mass of contaminant present and transported in the ground water. None of these cause concern. However, a general reliance on flushing of contaminants from the aquifer does (dilution, dispersion, diffusion). The EPA would like to see more emphasis on removal of the mass contaminants than dilution and ground water transport away from processing sites. (USEPA, Region VIII - Comment 2)

Response: No decisions regarding site-specific ground water compliance strategies have been made and none will be made until all relevant site characterization data collection and analyses have been completed, all potential human and environmental risks have been identified, and input from the public and tribal and state agencies has been received. This will ensure that site-specific ground water compliance strategies, be they passive or active, will be protective of human health and the environment and meet EPA standards. Finally, the PEIS does not provide any site-specific ground water compliance strategies nor does it convey the perception that most ground water remediation will focus on passive ground water remediation strategies. With regard to natural flushing, natural processes such as precipitation, adsorption and ion exchange may assist in the natural flushing process as well as in dilution, dispersion, and diffusion.

Comment 316. Another general concern is the absence of reference to local land use authorities. The DPEIS recognizes potential contributions from other Federal, State, and Tribal entities but omits local governmental and quasi-governmental organizations. (USEPA, Region VIII - Comment 3)

Response: As part of the analysis of potential impacts of site-specific ground water remediation, the local land use authorities will be contacted. The PEIS was revised to indicate that local land use authorities have been and will continue to be consulted where appropriate, during the Ground Water Project (see Section 4.4.6 of the final PEIS).

Comment 317. There seems to be a significant reliance on previous site characterizations and the data derived from these efforts. Site characterization is the linchpin of remediation and must include the most complete and current data available. The EPA is not sure that adequate data is available today. Rather than characterization of a water table aquifer below a processing site, an understanding of the local aquifer system and its relationship to deeper ground waters as well as surface waters is of paramount importance. The

hydrologic character of the bedrock is also very important. (USEPA, Region VIII - Comment 4)

Response: Site characterization is ongoing and site-specific characterization activities will be completed in order to formulate an appropriate ground water compliance strategy for each site.

Comment 318. NPDES Permits and EPA's NEPA Compliance: The DPEIS (C-11) discusses various methods to dispose of contaminated ground water following treatment. One method is via discharge to surface waters. Page C-11 states that discharge rates and effluent quality would be regulated to meet National Pollutant Discharge Elimination System (NPDES) requirements, as required by the Clean Water Act. The Final EIS should note that in at least one State (Arizona) the USEPA may be required by the EPA's NEPA regulations (40 CFR Part 6) to prepare and circulate appropriate documentation under NEPA (Environmental Assessment or Environmental Impact Statement). The Department of Energy should work closely with the appropriate EPA regional office to determine whether the EPA has to prepare NEPA documentation for the new source NPDES discharge permit application, and if so, whether the DOE and EPA should work cooperatively to prepare a single NEPA document addressing both the DOE's ground water approach and the NPDES discharge. Additionally, we request that the DOE identify which UMTRA site or sites already have NPDES permits and, if feasible, which site or sites may be reasonably expected to require new source NPDES permits. For example, the UMTRA site with the largest amount of ground water contamination (Monument Valley, Arizona with .75 billion gallons) may well require surface discharges, since it may be impracticable to evaporate or inject such a large volume. (USEPA, Region VIII - Comment 5)

Response: Under all the alternatives except no action, the DOE will be preparing site-specific Ground Water Project environmental documents for the UMTRA Project sites. These documents will address the impacts associated with any discharges to surface water under the National Pollutant Discharge Elimination System, or state-equivalent permits. Where the EPA is the permitting authority, the DOE will share all pertinent environmental information with the EPA. When the EPA determines that additional documentation under the National Environmental Policy Act is required, the DOE will work closely with the EPA to avoid any unnecessary duplication of effort.

None of the UMTRA Project's current National Pollutant Discharge Elimination System or state-equivalent permits are expected to remain active under the Ground Water Project. Therefore, any permits required will be considered new source permits. It is not within the scope of the PEIS to discuss which sites will require National Pollutant Discharge Elimination System permits, since the final site-specific remedial action decisions have not been determined.

Comment 319. Volume of Contaminated Ground Water: It does not appear that there is a table in the DPEIS depicting the amount of contaminated ground water at each of the 23 sites (Lowman, Idaho shows no sign of ground water contamination, DPEIS, p. sum-5). We suggest that such a table be included in the Final PEIS. Alternatively, it may be easy to

incorporate data on the volume of contaminated ground water directly into Table 3.2 or Table 3.3. (USEPA, Region VIII - Comment 6)

Response: The estimated volume of contaminated ground water at the UMTRA Project sites was added to Table 3.1 of the PEIS.

Comment 320. The Hydrologic characterization discussion on Page 2-18 would be a good opportunity to establish a minimum standard for QA/QC including data quality and well construction. This would strengthen the reliance of referenced documents. (USEPA, Region VIII - Comment 7)

Response: The UMTRA Project *Quality Assurance Implementation Plan* and *Technical Approach to Ground Water Restoration* are described in Section 2.8.1. No additional detail is needed because the PEIS is not intended to be used for technical guidance nor for quality assurance/quality control guidance. The purpose of the PEIS is Project-wide planning and analysis of the potential impacts of four programmatic alternatives.

Comment 321. Geochemical Characterization, page 2-21: More detail is needed on appropriate selection of a background quality site. (USEPA, Region VIII - Comment 8)

Response: Additional detail regarding the determination of background ground water quality has been added to the revised Appendix B of the PEIS. A reference to Appendix B has been added to the PEIS text.

Comment 322. Geochemistry of aquifer matrix materials, page 2-23: Computer modeling could be of use here to predict chemical/physical process. (USEPA, Region VIII - Comment 9)

Response: Agreed. Text was expanded in "Geochemical Characterization Methods" regarding the use of geochemical models.

Comment 323. Ground Water Data in DOE's Site-Specific NEPA Documents: The EPA requests that the Final PEIS and Record of Decision contain a commitment that all future site-specific NEPA documents for the project include the full range of ground water data used by DOE in recommending a site-specific ground water decision. Including ground water data in the site-specific NEPA documents would enable the public and agencies to determine if the course of action recommended by the DOE is appropriate for each particular location. (USEPA, Region VIII - Comment 10)

Response: Section 1.3.1 was revised to indicate that all relevant ground water data would be included in the site-specific environmental documents so the public and agencies can determine whether the proposed ground water compliance strategy is appropriate. Detailed back up data would either be provided in an appendix to the site-specific environmental document or be referenced in another readily available site-specific document such as the

final site observational work plan or remedial action plan. The PEIS Record of Decision will also contain a commitment that the site-specific environmental documents will contain the full range of ground water data.

Comment 324. Pollution Prevention: The Council on Environmental Quality (CEQ) issued a guidance memorandum to Federal agencies concerning NEPA and pollution prevention in the January 29, 1993 Federal Register at pp. 6478-6481. This CEQ memorandum encouraged all Federal agencies to consider pollution prevention principles in their NEPA planning and decision-making and to incorporate such considerations in agency NEPA documents. It does not appear that the DPEIS reflects the CEQ's 1993 memorandum, although several project features may lend themselves to pollution prevention techniques. For example, will attempts be made to minimize or avoid construction and other land-disturbing actions in environmentally sensitive areas, and to use existing road alignments to reduce the amount of waste resulting from road construction activities? These and other pollution prevention techniques should be assessed by DOE as it undertakes site-specific activities. We recommend that the Final PEIS and Record of Decision include a commitment by DOE to adopt all reasonable, feasible pollution prevention measures in its site-specific actions. (USEPA, Region VIII - Comment 11)

Response: The DOE is committed to adopting all reasonable pollution prevention measures in its site-specific activities. A paragraph indicating this commitment was added at the end of Section 1.3.1 and the PEIS Record of Decision will also contain such a commitment.

Comment 325. Environmental Justice: The DPEIS does not appear to reflect the requirements of Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (Federal Register, February 16, 1994 at p. 7629). Site-specific EA's and EIS's for the UMTRA Ground Water Project should analyze the environmental effects of proposed ground water actions on minority and low-income communities. We suggest that the UMTRA project office refer to DOE's recent PEIS on Tritium Supply and Recycling for a useful approach to environmental justice issues. (USEPA, Region VIII - Comment 12)

Response: Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations*, directs federal agencies to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations. Executive Order 12898 also directs the EPA administrator to convene an interagency Federal Working Group on Environmental Justice. The Working Group is directed to provide guidance to federal agencies on criteria for identifying disproportionately high and adverse human health or environmental effects on minority and low-income populations. The Working Group has not yet issued the guidance directed by Executive Order 12898. In coordination with the Working Group, the DOE is developing internal guidance on implementing the Executive Order. Because both the Working Group and the DOE are still in the process of developing guidance, the approach taken in this analysis may depart somewhat from the guidance that eventually is issued.

DOE has attempted in this PEIS, and will continue in subsequent tiered NEPA documents, to identify and to mitigate when so identified, any disproportionately high and adverse human health or environmental effects on minority and low-income populations resulting from decisions based on this PEIS. The activities required to complete the ground water project are highly localized and would not result in cumulative impacts to air quality, noise levels, visual resources, transportation systems, utilities and energy supplies, waste generation, and cultural resources. Further, the proposed action would result in human health, socioeconomic, and environmental impacts that would benefit any surrounding population. Therefore, the DOE does not anticipate any disproportionately high and adverse effect on minority and low-income populations to result from the implementation of this program. The DOE will reassess potential environmental justice issues in site-specific NEPA documents that will be tiered from this programmatic review.

Environmental justice (Executive Order 12898) discussions were added to the PEIS (Sections 1.4.4, 3.1.1.10, 4.2.1.12, 4.2.2.12, 4.2.3.12, 4.3.12, 4.4.12, and 4.5.8).

Comment 326. The EPA agrees that the No Action alternative would not comply with EPA's ground water standards at most of the UMTRA project processing sites. The EPA also agrees that significant adverse impacts to human health and the environment could result under the no action alternative.

The passive remediation alternative would expose the public and environment to hazardous contaminants for a significant period. It would rely on flushing contaminants rather than removal. The EPA would have environmental objections should this become the selected alternative.

The preferred action (a hybrid alternative) appears to be acceptable in that it would institute a formula of no action, possible remediation or active remediation depending on the remediation needs and ground water uses of each particular site. (USEPA, Region VIII - Comment 13)

Response: Comment acknowledged. In addition, under the proposed action institutional controls could be implemented to prevent or greatly minimize the potential for human exposure to contaminated ground water.

Comment 327. Based upon the discussion in the DPEIS and the concerns and comments expressed above, the EPA is rating the preferred alternative EC-2 (Environmental Concerns - Insufficient Information). This means that the EPA review has identified environmental impacts that should be avoided to fully protect the environment and that the PDEIS does not contain sufficient information to fully assess environmental impacts that should be avoided to fully protect the environment. (USEPA, Region VIII - Comment 14)

Response: The DOE believes that all the environmental concerns identified by the EPA in a letter dated July 13, 1995, have been adequately addressed and that the PEIS contains sufficient information to fully assess the potential impacts.

Comment 328. Attached please find the comments generated by the State of Colorado regarding the above-referenced document. In general, we agree with the preferred alternative posed by the PEIS. The preferred alternative provides necessary flexibility in choosing site-specific remedies. We would like to stress that the focus of this PEIS, and any Environmental Assessment that will tier off of it, must be protection of human health and the environment. Any site-specific strategy developed through this process must be protective. (State of Colorado, Cover Letter - CDPHE - Comment 1)

Response: We agree with this comment, and state numerous times in the PEIS that the site-specific ground water compliance strategies would have to be shown to be protective of human health and the environment before they can be proposed and implemented.

Comment 329. Since this document is designed to simplify the site-specific NEPA process, we believe that all issues with project-wide implications should be addressed in this over-arching document. We have provided comments on some of the specific project-wide issues which we believe are not dealt with sufficiently in the PEIS. Our most serious concern is the lack of discussion regarding mitigative measures. We strongly believe that the document should contain proposed mitigative measures for all project-wide impacts. The most serious impact that will occur using the preferred alternative will be to private property owners. These impacts must be mitigated. Until this discussion is added to the PEIS, we feel that the requirements of NEPA have not been satisfied. (State of Colorado, Cover Letter - CDPHE - Comment 2)

Response: Mitigation is addressed in the impacts section of the PEIS (Section 4.0). For example, in 10 of the 15 resource categories in the "active ground water remediation methods impacts" (Section 4.2.1), mitigation measures are specifically mentioned or implied. The PEIS identifies areas where mitigation may be required; the site-specific mitigation measures will appear in the site-specific environmental documents prepared for the sites. For clarity, a paragraph was added to Section 4.0 of the final PEIS describing how mitigation is addressed in the PEIS.

Comment 330. Impacts of the proposed action and mitigative measures. The National Environmental Policy Act (NEPA) requires that all significant environmental impacts of an action be identified and mitigated. The PEIS should address all identified project-wide impacts, so that this discussion does not have to be recreated for each site-specific Environmental Assessment (EA). While the PEIS has identified some of the impacts that may occur, the discussion regarding mitigation is noticeably absent. We believe that the PEIS should contain a "laundry list" of possible mitigative measures that can be employed on a site-specific basis to mitigate the identified impacts. Then, during the EA stage for each site, the preferred mitigative measures for that site can be selected from the list.

We also believe that many of the impacts of the proposed action have been overlooked, or understated. We have provided some of the specific instances in our comments below. For example, impacts to private property owners, especially under the "passive restoration strategy" are significant and could potentially have legal ramifications for this project. DOE should provide a list of possible measures that can be used to address how the loss of use

of private property, especially water rights, will be mitigated. In addition, the impacts of raising the water table, or conversely the impacts of drawing down the water table under the "active remediation strategy" are not addressed. Possible mitigative measures for these impacts should also be listed. (State of Colorado, Jeff Deckler- CDPHE - Comment 1)

Response: The PEIS does address mitigation under each resource category heading in Section 4.0, where appropriate (see response to Comment 329 for more details on this topic). A paragraph was added to the end of Section 4.0 to clarify how mitigation is addressed in the PEIS. The DOE believes that, while a "laundry list" of mitigation measures may be of interest, its utility in the PEIS, especially with respect to tiering off to site-specific documents, would be limited since the PEIS does not select site-specific compliance strategies. Additionally, it would be difficult to list all potential mitigative measures because many are specifically tailored to specific impacts resulting from potential implementation of compliance strategies at a site. In addition, the determination of an impact-specific mitigation measure is derived from the impact; whether or not this mitigative measure is provided in a list in the PEIS would have little or no bearing on its being chosen as a mitigative measure.

Private property ownership rights, particularly water rights, may be impacted if it is necessary to acquire such rights as an institutional control. However, the DOE plans to rely on the acquisition of property rights only as a last resort. Site-specific institutional controls will be developed in conjunction with state, tribal, and local governments on a case-by-case basis using tribal, state, or local laws wherever feasible.

The potential impacts of water drawdown as a result of ground water extraction on wetlands was mentioned in the draft PEIS in Section 4.2.1.5.

Comment 331. Contaminants to be addressed. There appears to be a discrepancy between the contaminants that are being addressed under the PEIS and those addressed by the site-specific risk assessments. For example, the Gunnison, CO risk assessment identifies iron and manganese as the contaminants causing the highest degree of risk. However, it appears that these contaminants will not be addressed under the ground water program since they are not listed in the EPA standards. If DOE does not plan to remediate these "unlisted" contaminants, then this is an impact of the project that must be addressed as part of the PEIS. In addition, ground water monitoring has identified radionuclide daughter products (i.e., Lead-210) in groundwater at some of the mill sites. This contamination is obviously from the mill processing activities, yet it appears that it will not be addressed under the ground water program. The position of the State of Colorado is that any constituent posing a hazard to human health or the environment, (whether specifically listed in the EPA standards or not) that has originated from uranium processing activities, must be addressed by the ground water project. The PEIS should clarify the proposed approach that DOE plans to take regarding "unlisted" ground water contaminants. (State of Colorado, Jeff Deckler- CDPHE - Comment 2)

Response: The Secretary of Energy was directed by Congress to perform remedial action at designated processing sites in accordance with the general standards prescribed by the EPA administrator (42 USC §7908(a)(1)). If EPA chose not to list certain ground water

contaminants that originated from the uranium milling activities, the DOE is not responsible for remediating these contaminants. However, the DOE will consider the need to screen for nonlisted constituents on a case-by-case basis. For example, the DOE does sample for iron, manganese, and sulfate because these constituents have been measured in concentrations exceeding background and lead-210, polonium-210, and thorium-230 because they are residual decay products of uranium.

There is no discrepancy between the contaminants that would be addressed by the Ground Water Project as implemented by the proposed action and those addressed in the site-specific risk assessments; these risk assessments are an integral part of the Ground Water Project under the proposed action. As stated on many occasions in the PEIS, one of the major considerations when proposing a site-specific ground water compliance strategy under the proposed action would be to ensure that it is protective of human health and the environment. The purpose of the site-specific risk assessments is to determine potential human health and environmental risks and this will be factored into the site-specific decisions regarding the ground water compliance strategy.

DOE will also consider risks associated with contaminants of concern as part of the cumulative impacts analysis in the site-specific NEPA document.

Comment 332. Ground Water standards. The PEIS should address the approach that will be used and the commensurate impacts that will occur when the UMTRA ground water standards are different from the Safe Drinking Water Act maximum contaminant levels. For example, the proposed EPA drinking water standard for uranium is 0.020 mg/l, while the UMTRA ground water standard for uranium is 0.044 mg/l. If a ground water source is to be used for a future water supply, and DOE remediates to 0.044 mg/L, an impact would occur in that further treatment, down to the 0.020 mg/l level would be required before the aquifer could be used for drinking water supply. The PEIS should also address how changes in the drinking water standards will impact the project. In addition, the PEIS does not discuss how specific state or tribal standards will be used in the ground water project. This discussion should be added, and any impacts due to the differences in standards should be addressed. (State of Colorado, Jeff Deckler- CDPHE - Comment 3)

Response: The approach that will be used for (total) uranium-234 and -238 compliance under the UMTRA Ground Water Project will be based on 0.044 milligrams per liter. No commensurate impacts are anticipated and therefore commensurate impacts will not be analyzed.

It is true that the proposed EPA drinking water standard for uranium is equal to 0.020 milligrams per liter, while the UMTRA ground water standard is 0.044 milligram per liter. Drinking water standards and ground water protection/cleanup standards are fundamentally different. Nonetheless, should the subject aquifer be projected for use as a drinking water resource, the uranium standard of 0.044 milligrams per liter is protective of human health and the environment. As summarized in the preamble to the final rule of the EPA Ground Water Standards (60 FR 2854), the EPA has concluded that 30 picocuries per liter (the equivalent to 0.044 milligrams per liter, where secular equilibrium exists) provides an adequate margin of safety against both carcinogenic and toxic effects of uranium.

However, should the maximum concentration limits for drinking water, as finally promulgated, provide a level of health protection different from that provided by the limit set in the ground water standards, the EPA will reconsider the limit at that time.

Section 1.4.1 of the PEIS acknowledges that the EPA has reserved the right to modify the ground water standards in the future should the need, based on changes to the drinking water standards, become apparent.

Decisions regarding consistency with applicable tribal and state laws and regulations will be made by DOE in consultation with the tribes and states. These decisions will consider cases where an approved wellhead protection area, under the Safe Drinking Water Act, is associated with the site. A wellhead protection area is an area of land where there are restrictions on development so as to protect ground water supplies used for drinking water or other beneficial uses. DOE must comply with the provisions of that program, unless an exemption is granted by the President of the United States through the EPA. Contamination on the site that is not covered by UMTRCA (because it is not related to the processing operation) is not the responsibility of DOE, but may be covered by other applicable federal, tribal, or state programs. A discussion of this issue is presented in the EPA standards (60 FR 2854, 2856) and is in Appendix A to the PEIS.

Comment 333. Ground water contamination on vicinity properties. The State of Colorado has frequently stated our position that the ground water project must address ground water contamination that may have occurred on vicinity properties. We believe that sufficient data exists to indicate that ground water contamination has occurred on vicinity properties (Bendix study of Lincoln Park). However, the PEIS does not address this issue. The PEIS needs to discuss the proposed method for addressing ground water contamination at VPs, any impacts that this method will have, and the proposed mitigative measures for those impacts. It should also note that since source material is being left in place, all portions of the proposed alternative (i.e., natural flushing) may not apply. In addition, the PEIS does not acknowledge the fact that vicinity property deposits may impact the ability to determine background concentrations at some mill sites (see specific comments regarding the Grand Junction and Rifle sites below). (State of Colorado, Jeff Deckler- CDPHE - Comment 4)

Response: The EPA determined in the January 11, 1995, preamble to the final rule (40 CFR Part 192) that "only a few vicinity properties contain sufficient tailings to constitute a significant threat of ground water contamination" and concluded that "the detailed assessment and monitoring, followed by identification of listed constituents and ground water standards is *not* required at all vicinity properties. It is necessary only at those vicinity properties with a significant potential for ground water contamination, as determined by the DOE (with the concurrence of the U.S. Nuclear Regulatory Commission)." The PEIS now includes this information in Section 1.0.

The DOE acknowledges that there have been some vicinity properties with significant volumes of tailings materials. A "significant" volume of tailings would be defined from a volume and leachable source perspective. For the amount of tailings at a vicinity property to be significant, the volume must be large enough to potentially contribute enough

chemical mass to adversely affect ground water. In addition, the leachate generation potential of the tailings must be of a magnitude to potentially adversely affect ground water.

The DOE has not placed monitor wells at any vicinity properties with the exception of the Burrell, Pennsylvania, disposal cell. The DOE considers vicinity properties to have a low potential to create ground water contamination because tailings were milled at processing sites. The processing sites had a significant impact on ground water due to the use of chemicals, water discharge, and exposed saturated tailings. In most cases, the tailings were exposed to the environment for many years before remediation. Vicinity properties did not have similar operating and exposure conditions, and therefore are not expected to have been a significant source of contamination.

However, tailings volume is just one of the criteria for determining if a vicinity property would be a source of ground water contamination and fall within the Ground Water Project. Other factors include depth to ground water; soil and bedrock type; geochemistry; ground water recharge and discharge; background water quality; climate; and condition of the vicinity property. The Grand Junction, Colorado, site observational work plan will provide a detailed discussion of the regional water quality in the Grand Valley. If it is determined that a vicinity property has a significant potential to result in ground water contamination, the DOE will implement a characterization plan.

Comment 334. Data uncertainties. The document does not address impacts associated with the uncertainty of the ground water analysis. The sensitivity of various remedies to the accuracy of the site characterization should be considered in the selection process. For example, the sensitivity of natural flushing to flow velocity may be such that for sites where we are unsure of this parameter, natural flushing would not be considered as reliable and might not be chosen. (State of Colorado, Jeff Deckler- CDPHE - Comment 5)

Response: A ground water compliance strategy for a particular site will be selected only after adequate hydrogeological and geochemical characterization is completed. Hydrogeological and geochemical characterization activities will reduce uncertainties to the extent practical to ensure a compliance strategy is selected that will be protective of human health and the environment. The beginning of Section 2.8, Ground Water Characterization and Remediation Methods, was expanded to clarify this.

Comment 335. Alternate water systems. The use of alternate water systems as a complete remedy has been discarded because EPA standards would not be met. However, such a system may provide an excellent institutional control to be used in conjunction with natural flushing. The PEIS should specifically mention alternate water systems, as well as other specific institutional controls which might be considered. The impacts and mitigation of these impacts should also be included. (State of Colorado, Jeff Deckler- CDPHE - Comment 6)

Response: DOE considers the use of alternate water supply systems with enforceable ground water restrictions a viable institutional control where there is a threat to public

health and safety as a result of ground water contamination from a processing site. This option was added to Section 1.4.1 as an example of another institutional control DOE could consider. Any proposed institutional controls would require concurrence of the U.S. Nuclear Regulatory Commission. Specific institutional controls will be developed in conjunction with tribal, state, and local governments on a case-by-case basis using tribal, state, or local laws wherever feasible.

Comment 336. Point of Compliance (POC). Since the PEIS is designed to be an over-arching document, and Point of Compliance is a project-wide issue, we believe that the definition of POC merits discussion in the document. (State of Colorado, Jeff Deckler- CDPHE - Comment 7)

Response: The DOE agrees that the point of compliance should be discussed in the PEIS. A discussion of point of compliance was added under the discussion of Subpart B in Section 1.4.1 of the PEIS and the definition was revised in the glossary.

Comment 337. Passive remediation strategy. We are concerned about the fact that there does not appear to be any consideration of the costs of mitigating potential impacts in deciding to use the passive remediation strategy. We believe that it is highly likely that there will be sites were passive remediation is technically feasible, however, overriding factors, like private property ownership rights will preclude the use of this option, as mitigating the impacts may become more costly than the active remediation strategy. The decision-making process needs to include the costs of mitigation in determining the best strategy under the proposed option. (State of Colorado, Jeff Deckler- CDPHE - Comment 8)

Response: Private property ownership rights, particularly water rights, may be impacted if it is necessary to acquire such rights as an institutional control. However, the DOE plans to rely on the acquisition of such property rights only as a last resort. Site-specific institutional controls will be developed in conjunction with tribal, state, and local governments on a case-by-case basis using tribal, state, or local laws wherever feasible.

Comment 338. Page SUM-6, Table 2 and Page 3-5, Table 3.3. This table lists constituents exceeding the maximum concentration limits (MCLs) at each mill site. The list of constituents for most of the Colorado sites has been changed from those listed in site-specific surface Remedial Action Plans (RAPs). For example, the Gunnison, CO RAP lists 10 hazardous constituents exceeding the MCLs, however, this table shows only 2 constituents exceeding MCLs. The tables in the PEIS should be consistent with the approved surface RAPs. Any changes that have occurred in the site-specific interpretation of ground water data should be noted and described in the site-specific NEPA documents rather than the PEIS. (State of Colorado, Jeff Deckler- CDPHE - Comment 9)

Response: The lists of constituents that exceed maximum concentration limits by site in Table 3.3 are based on the most up-to-date information available from the sties. Therefore, they may not be consistent with older Surface Project documents. The constituents listed

for the Gunnison site (net gross alpha, radium-226 and -228, and uranium) were based on exceedance of the maximum concentration limit at least twice since 1990. The other constituents listed in the Surface Project remedial action plan as exceeding the maximum concentration limits were either no longer detected in the ground water or had maximum concentrations below the maximum concentration limits. The information in Table 3.3 in the main body of the text provides a list of constituents that exceed the maximum concentration limits. This table was not intended to list all constituents that exceed background or to provide the basis for risk assessments. It is recognized that ground water characteristics at the UMTRA sites are dynamic and that over time the list of constituents that exceed the maximum concentrations limits may change.

Comment 339. Page SUM-8. Given the varying success of active treatment systems such as "pump and treat", the document should acknowledge that standards might not be met even with this aggressive approach. (State of Colorado, Jeff Deckler- CDPHE - Comment 10)

Response: One of the intentions of the PEIS is to provide examples of typical active remediation options so the public can relate to the variety of options which could be implemented. A critical evaluation of the effectiveness of various options would be site-specific and out of scope of this document. A recommended active compliance strategy will be designed to meet the standards in a reasonable amount of time. Section 2.1 of the PEIS describes the proposed action which indicates that if active remediation will not result in meeting the EPA ground water standards, supplemental standards based on technical impracticability of remediation may be used.

Comment 340. Page 1-16. It is unclear how active treatment and natural flushing can be combined. We suggest adding an example to describe the combination of these two strategies. (State of Colorado, Jeff Deckler- CDPHE - Comment 11)

Response: A general example of how active remediation and natural flushing could be combined is provided in Section 2.1 of the PEIS.

Comment 341. Page 2-2. The decision-making process shows that the application of supplemental standards is the first choice after no action, followed by ACLs. We would like DOE to reexamine this logic. The goal of ground water remediation should be to meet MCLs, as the first approach, if possible. Therefore, natural flushing and active treatment should be looked at as the means to achieve these standards. However, if the impacts or costs of these options were significant, then supplemental standards, and lastly ACLs would be considered to justify not meeting the MCLs in a given situation. (State of Colorado, Jeff Deckler- CDPHE - Comment 12)

Response: The EPA standards indicate that the DOE considers meeting the standards in the following order 1) background, 2) maximum concentration limits, and 3) alternate concentration limits. The standards also say that supplemental standards can be used in place of meeting the above standards. The DOE recognizes this and, of course, will apply

supplemental standards only if it can be shown to be protective of human health and the environment and meet other criteria as stipulated in the standards.

The proposed action is a risk-based approach to meeting EPA ground water standards and the emphasis is on protecting human health and the environment and secondarily on cost. The DOE believes that if site characterization data and a site risk assessment show EPA standards can be met and public health and the environment protected with passive ground water compliance strategies such as natural flushing or no remediation, then that would be the most cost-effective approach to take. Of course, the affected tribes, states, public, and other stakeholders would have input regarding the determination of the final proposed ground water compliance strategy at a given site. For this reason, the DOE believes the decision-making process as presented in the PEIS for the proposed action is the most cost-effective and logical approach to meet the EPA standards.

Comment 342. Page 2-5. Section 2.3 2nd paragraph. The meaning of the statement "or fall within the EPA ground water standards" is unclear. Please clarify. (State of Colorado, Jeff Deckler- CDPHE - Comment 13)

Response: The referenced sentence was modified by removing the word "or fall within."

Comment 343. Page 2-7. This discussion understates the short term impacts. Drilling in some areas of contaminated ground water, for example, the Dos Rios subdivision in Gunnison, CO will have definable short term impacts to the homeowners in the area. Again, we recommend that possible mitigative measures be mentioned for these impacts. (State of Colorado, Jeff Deckler- CDPHE - Comment 14)

Response: As determined in Section 4.0 and summarized in Section 2.5 of the PEIS, the DOE believes that the most potential short-term impacts associated with site characterization, monitoring, and the construction and operation of ground water remediation facilities will be minor (see Sections 4.1 and 4.2.1). However, it is acknowledged that these activities (particularly the construction and operation of ground water remediation facilities) could have detrimental impacts on such resources as land use, water rights, biological systems, and cultural resources. The magnitude of these detrimental impacts, if any, will be determined and analyzed in the site-specific environmental document and appropriate mitigation measures will be presented.

Comment 344. Page 2-7. This discussion understates the long term impacts. The discussion should include the impacts due to infrastructure (pumping wells, treatment plants) remaining in place over an extended period of time. In addition, there will be impacts from the monitor wells remaining in place over long periods of time. A private property may change ownership many times over the course of the "remedial period", DOE should explain how long-term access to private property will be maintained. There will also be long term impacts from institutional controls which are not discussed in this document. These impacts, which include access restrictions, building restrictions, ground water use restrictions and property devaluation should be included in the document and possible

mitigative measures should be presented for each impact identified. (State of Colorado, Jeff Deckler- CDPHE - Comment 15)

Response: Under all the alternatives except no action, monitor wells will be in place for extended periods of time and, for sites undergoing active ground water remediation, facilities such as treatment plants could also be in existence for extended periods of time. The PEIS has been revised to indicate that monitor wells have the potential to result in a visual impact to nearby residents and that the DOE will work with the local residents to mitigate these impacts if necessary (see Sections 4.2.1.9, 4.2.2.9, and 4.2.3.9). The potential impacts of construction and operation of active ground water remediation facilities, including potential visual impacts, are addressed in Sections 4.2.1.1 through 4.2.1.15 of the PEIS. At this stage in the Ground Water Project, only general programmatic potential impacts can be assessed because no site-specific ground water compliance strategies have been determined. Potential site-specific impacts from ground water remediation structures remaining in place for extended periods of time would be addressed in the site-specific environmental documents.

Private property ownership rights, particularly water rights, may be impacted if it is necessary to acquire such rights as an institutional control. However, the DOE plans to rely on the acquisition of property rights only as a last resort and, in addition, will seek the full cooperation of the property owner. Site-specific institutional controls will be developed in conjunction with tribal, state, and local governments on a case-by-case basis using tribal, state, or local laws wherever feasible. The potential impacts of site-specific institutional controls, if required, will be analyzed in the site-specific environmental documents.

Comment 345. Page 2-13. The discussion regarding exposure pathways is very confusing and unclear. We recommend rewriting this section. It may be helpful to begin the discussion with the last paragraph, followed by the discussion of how the exposure pathways are determined. (State of Colorado, Jeff Deckler- CDPHE - Comment 16)

Response: The section on human health and ecological risk assessment has been revised and Appendix B has been updated.

Comment 346. Page 2-14. Section 2.7.3 seems out of context, because in most cases site prioritization occurred before the risk assessments were completed. Thus, we think that it would make more sense to have the discussion of prioritization before the section regarding risk assessment. (State of Colorado, Jeff Deckler- CDPHE - Comment 17)

Response: The DOE agrees with this comment and has placed the prioritization section before the risk section.

Comment 347. Page 2-15. Section 2.8. This section should discuss any contaminants resulting from milling operations that have been detected in ground water at the processing, rather than only those which exceed MCLs. (State of Colorado, Jeff Deckler- CDPHE - Comment 18)

Response: The purpose of Section 2.8 is to describe ground water characterization and remediation methods. Listing all the ground water contaminants at UMTRA Project sites is not within the scope of this section. The constituents that exceed the maximum concentration limits are listed by site in Table 3.3. The purpose of this table is to give the reader a sense of the contamination in the ground water at UMTRA Project sites, not to provide a complete list of constituents that exceed background at all of the sites. Detailed lists of analytes and their concentrations are included in the baseline risk assessments and site observational work plans. These documents are available to the public.

Comment 348. Page 2-17. Use of the observational method is discussed in Section 2.8.1. As we have mentioned in previous discussions, this creates potential funding difficulties on the part of the state, since there is never a complete plan of action or defined cost (rather, there are costs associated with each iteration). This is an impact that should be addressed. (State of Colorado, Jeff Deckler- CDPHE - Comment 19)

Response: The purpose of using the observational method on the Ground Water Project is to determine site-specific ground water compliance strategies in the most cost-effective manner. Under all alternatives except no action, this observational method would be used to prepare the site observational work plans, to determine a viable ground water compliance strategy. Typically, a preliminary ground water compliance strategy based on available data would be proposed in the first version of the site observational work plan. The plan would also identify data gaps that need to be filled to determine whether the proposed strategy is viable, and identify potential deviations from the proposed ground water compliance strategy based on the variability and uncertainty of those data gaps. The plan would also consider contingency plans for the potential deviations from the proposed ground water compliance strategy. Observations made during the site characterization to fill the data gaps would indicate whether the preliminary ground water compliance strategy is appropriate. Through this process, a proposed ground water compliance strategy would be formulated and the impacts of this strategy would be analyzed in the site-specific environmental document. After completion of this and other site-specific Ground Water Project documents, a final ground water compliance strategy would be proposed in a remedial action plan. The DOE would most likely incur all the costs leading up to determination of the final strategy and, of course, would remain in communication with the affected tribe or state and public during this process. It is DOE's belief that using the observational method would minimize changes in the proposed ground water compliance strategy as well as costs and would have a minimal impact on state funding because such funding would likely only be required to implement the final ground water compliance strategy.

Comment 349. Page 2-21. There is an implication in Section 2.8.1.2 that determinations will be made of contaminant concentrations in the unsaturated zone. How will this occur?

What impacts will occur as a result of this testing? How will the data be interpreted? How will this information alter the ultimate decision for a site? Please clarify the intent of this section. (State of Colorado, Jeff Deckler- CDPHE - Comment 20)

Response: Contaminated soils that resulted from the tailings seepage and former uranium milling activities have been addressed under the UMTRA Surface Project. The Ground Water Project will also evaluate the potential for contaminated soils to act as a continued source term to the uppermost aquifer. Should a continued source term be identified, the Ground Water Project will take action to mitigate the impact.

Comment 350. Figure 2-5 could be enhanced by showing a monitor well. (State of Colorado, Jeff Deckler- CDPHE - Comment 21)

Response: Agreed. Monitor wells were added to Figure 2.5.

Comment 351. Page 2-27. As an initial comment, the State of Colorado is unlikely to favor contaminant isolation as a site specific remediation technology. We do not believe that this approach satisfies the intent of the EPA standards. (State of Colorado, Jeff Deckler- CDPHE - Comment 22)

Response: Under all the alternatives except no action, a ground water compliance strategy will be formulated after site-specific risk assessments and detailed site investigations. A ground water compliance strategy will be formulated with the participation of tribes, states, and the U.S. Nuclear Regulatory Commission. The use of a method such as contaminant isolation must protect human health and the environment, comply with EPA standards, and withstand the scrutiny of tribal, state, and/or public review.

Comment 352. Page 2-30. State and federal regulations should be mentioned in the discussion of waste management methods. Residual Radioactive Material (RRM) should be added to the list of wastes which may be generated. (State of Colorado, Jeff Deckler- CDPHE - Comment 23)

Response: The discussion of waste management practices (Section 2.9) was expanded. Section 2.9 states, "All these materials have the potential of being contaminated with constituents typical of uranium mill processing" and being considered residual radioactive material.

Section 2.9 does indicate that waste material generated by the Ground Water Project will be managed in accordance with requirements of the UMTRCA, the DOE, EPA, and the appropriate tribe and state regulations. The level of detail regarding waste management practices in the draft PEIS is considered sufficient. However, the DOE has prepared a report entitled *Technical Approach for the Management of UMTRA Ground Water Investigation-Derived Wastes* (DOE, 1994d) and a reference to this document was added to Section 2.9. In addition, text was added that indicates that the DOE will consider waste management on a site-by-site basis in the site-specific environmental documents.

Comment 353. Page 2-31. There is discussion of disposing contaminated soils and sludges at an open UMTRA cell. Given the timing of the ground water program, the only open cell (assuming a "post-UMTRA" tailings management plan is implemented) will be the Cheney cell in Grand Junction. However, current plans allow for a maximum of 15,000 yards of non-Colorado UMTRA material to be disposed of in this cell. Since active systems can produce significant quantities of sludge, the document should consider alternate disposal locations with adequate capacity. (State of Colorado, Jeff Deckler- CDPHE - Comment 24)

Response: DOE acknowledges the potential that ground water remediation may produce more waste than the Cheney disposal cell can accept and that given the long-term nature of the Ground Water Project, an UMTRA Project disposal cell may not be available to receive waste. That is why the PEIS states a number of times in Section 2.9 that waste that could not be accommodated in an UMTRA Project disposal cell would be disposed of in a licensed facility. Given that ground water remediation may not occur at the UMTRA Project sites for a few years, it would be premature to provide specific alternate disposal site locations in the PEIS. The text in Section 2.9 was revised to indicate that waste management and regulation will be considered on a site-by-site basis, where required, in the site-specific environmental documents.

Comment 354. Page 2-32. Section 2.10. In order to clarify that the budgetary process has not predetermined any site-specific decisions, the last sentence of the first paragraph should be rewritten to state "These assumptions are for budgetary reasons only and in no way indicate that site-specific ground water compliance strategy decisions have been made prior to completion of the PEIS or site specific NEPA documents." This comment also applies to Page 3-7. (State of Colorado, Jeff Deckler- CDPHE - Comment 25)

Response: The suggested change was made to the PEIS.

Comment 355. Page 3-4. Grand Junction and Rifle should be considered urban sites, since the mills are located in the towns. (State of Colorado, Jeff Deckler- CDPHE - Comment 26)

Response: Table 3.2 indicated that the Grand Junction site is an urban site. Rifle was categorized as suburban because both the New Rifle and Old Rifle sites are located on the edge of town.

Comment 356. Page 3-10. The Durango site surface has been revegetated by the Project and supports a healthy stand of vegetation. It is not "highly disturbed with limited vegetation". Also, the discussion on ground water usage should include the planned Animas-La Plata project, which will have its intake in the Animas River on the southern portion of the mill site. (State of Colorado, Jeff Deckler- CDPHE - Comment 27)

Response: The text in Section 3.2.3 was corrected to indicate that the Durango site has a healthy stand of vegetation.

The fact that the Animas-La Plata project will have its intake in the river on the southern portion of the mill site was added to the end of the last paragraph in Section 3.2.3.

Comment 357. Page 3-11. The Grand Junction site is owned by the state. Also, the discussion of ground water quality should note the possibility of vicinity properties impacting the "background" wells, and acknowledge the uncertainty of background at this particular site. (State of Colorado, Jeff Deckler- CDPHE - Comment 28)

Response: The text was corrected to indicate that the Grand Junction site is owned by the state. In an initial screening study, it was determined that tailings at some vicinity properties at the Grand Junction site are in contact with the shallow alluvial aquifer (Cahn et al, 1988). The potential does exist for tailings to affect water quality from the UMTRA Project background wells because vicinity properties are near these wells. DOE acknowledges that there is some uncertainty regarding background ground water quality at the Grand Junction site. A sentence to this effect was added to the PEIS in Section 3.2.4.

Comment 358. Page 3-13. The Gunnison site is owned by the state. Also, the discussion of the water system needs to be updated to indicate completion. (State of Colorado, Jeff Deckler- CDPHE - Comment 29)

Response: The two suggested changes were made to the text in Section 3.2.5.

Comment 359. Page 3-14. Since DOE and CDPHE are currently discussing the appropriate cleanup in Johnson Wash and Lay Creek, it is premature to state that most of this contamination will not be cleaned up. Also, the statement on page 3-15 that there is no ground water contamination is misleading as there are wells drilled at the site that produce contaminated water from below the ground surface. This statement is also inconsistent with tables 2 and 3.3 which show several contaminants exceeding the MCLs at this site. It would be accurate to state that the contamination has not traveled beyond the site boundary. (State of Colorado, Jeff Deckler- CDPHE - Comment 30)

Response: The sentence stating that most of the contaminated material along Johnson Wash and Lay Creek was revised.

The text for the Maybell site does indicate that contaminants from the processing site have entered the aquifer beneath the site. This statement was revised to indicate that the contamination has not traveled beyond the site boundary as suggested.

Comment 360. Section 3.2. Site Descriptions. Site descriptions should all use the same units of measurement for commonly discussed parameters. For example, the discussion regarding the ground water flow velocity at Maybell, CO site uses feet per day, while the

Old Rifle site is listed in units of feet per year. (State of Colorado, Jeff Deckler- CDPHE - Comment 31)

Response: Agreed. The ground water velocities were changed to consistent units in this section.

Comment 361. Page 3-17. The discussion of the Rifle site ground water indicates that Colorado River stage impacts the alluvial flow regime, which is to be expected. However, in the Rifle Private Well/Spring Position paper, it is stated that the hydraulic gradient is constant regardless of the river stage. These documents should be consistent, and data should be provided to the state to support whichever conclusion is correct (we have asked for this data in our comments on the position paper). Also, the discussion of ground water quality should note the possibility of vicinity properties impacting the "background" wells, and acknowledge the uncertainty of background at this particular site. (State of Colorado, Jeff Deckler- CDPHE - Comment 32)

Response: The Rifle private well/spring position paper states that "data indicate a relatively constant horizontal hydraulic gradient toward the southwest in the immediate vicinity of the New Rifle tailings regardless of the stage of the Colorado River." This statement is not meant to imply that there is no impact on the ground water flow regime in the alluvium near the Colorado River. In fact, Section 3.5 of the position paper states, "Seasonal fluctuations in the Colorado River stage may locally recharge the alluvium during periods of high stage."

The second issue has been addressed in the paper, "Response to CDPHE Comments Regarding the Private Well/Spring Position Paper, Rifle, Colorado, Site, August 1995." Ground water quality results obtained from locations upgradient of the processing sites and any vicinity properties are statistically indistinguishable from water quality obtained from private wells and springs located downgradient from the vicinity properties. Also, it is unlikely that vicinity property deposits near the Rifle sites are large enough to provide a significant source of contaminants. Therefore, there is extremely low potential that the downgradient locations have been impacted. The DOE's position is that the alluvial aquifer and Wasatch Formation background locations used in the recent Rifle baseline risk assessment accurately estimate background ground water quality in the vicinity of the Rifle sites.

Comment 362. Page 4-9. Section 4.1 needs to address potential impacts in developed area, i.e. the Dos Rios Subdivision, in Gunnison, CO. If passive remediation is chosen as the strategy for the Gunnison site, many long-term impacts will occur. For example, monitor wells will remain in place for an extended period of time, potentially for 100 years in the middle of a residential area. Other impacts would include access restrictions, use restrictions, and decreased property values. (State of Colorado, Jeff Deckler- CDPHE - Comment 33)

Response: A paragraph was added to the impacts analysis in Sections 4.2.1.9, 4.2.2.9, and 4.2.3.9 to indicate monitor wells may have a negative visual impact. It was also stated that the DOE would work with the local population to reduce these impacts by such methods as flush-mounting monitor wells or providing landscaping. Potential impacts of institutional controls on land access and use and on property values was added to the PEIS in Sections 4.2.2.6 and 4.2.2.11.

Comment 363. In Table 4.3, impacts to visual resources could occur in the long-term as well, and should be included. (State of Colorado, Jeff Deckler- CDPHE - Comment 34)

Response: Table 4.3 lists the potential impacts from site characterization that represent relatively short-term impacts. The text of the PEIS (Sections 4.2.1.9, 4.2.2.9, and 4.2.3.9) was revised to indicate there is potential for visual impacts from monitor wells and that the DOE will work with local landowners to mitigate this impact through such procedures as having flush-mounted wells or landscaping.

Comment 364. Page 4-8. Section 4.2.1.3. Construction of ground water remediation facilities may also require storm water permits, which should be mentioned. (State of Colorado, Jeff Deckler- CDPHE - Comment 35)

Response: Suggested addition was made to the text of the PEIS.

Comment 365. Page 4-8. In Section 4.2.1.4 impacts of raising the water table, impacts of drawdown on surface water, and impacts to water rights are not addressed. Possible mitigative measures for these impacts should also be listed. (State of Colorado, Jeff Deckler- CDPHE - Comment 36)

Response: The impacts mentioned in this comment were either addressed in the draft PEIS or were added to the final PEIS based on another comment. Sections 4.2.1.11, 4.2.2.11, and 4.4.11 were expanded to include a discussion of potential impacts to water rights. A list of potential mitigative measures was not added to the PEIS because mitigation is a site-specific issue. The PEIS does discuss mitigation in general terms and a paragraph was added to the document explaining how mitigation is addressed in the PEIS.

Comment 366. Page 4-11, Page 4-23, and Page 4-32. There are visual impacts from monitor wells, particularly in developed areas which should be addressed in the document. Experience has shown that homeowners do not like to have monitor wells as part of their landscaping. DOE needs to address the mitigative measures of flush-mounting monitor wells or providing landscaping to hide the wells. (State of Colorado, Jeff Deckler- CDPHE - Comment 37)

Response: Sections 4.2.1.9, 4.2.2.9, and 4.2.3.9 were revised to indicate there is potential for visual impacts from monitor wells and that the DOE will work with concerned local landowners to mitigate these impacts.

Comment 367. Page 4-25, Table 4.4. Footnote "a", should read "qualify". In addition, this table uses the term "temporary" in relation to reduction in property value. What time period is meant by temporary? (State of Colorado, Jeff Deckler- CDPHE - Comment 38)

Response: The correction to footnote "a" of Table 4.4 was made. Also, the word "temporary" was removed from this table.

Comment 368. Page 4-33. The potential impacts to water rights should be discussed, and mitigative measures proposed. (State of Colorado, Jeff Deckler- CDPHE - Comment 39)

Response: Paragraphs addressing the potential impacts to water rights were added to the text (Sections 4.2.1.11, 4.2.2.11, and 4.4.11).

Comment 369. Page 4-35, Table 4.5. We disagree that the proposed action has little or no impact on property value. If passive restoration is chosen as the remediation strategy, property values could be decreased significantly for an extended period of time. Since both active and passive remediation are strategies within the proposed action, it is unclear how the impacts for these options can be described differently. (State of Colorado, Jeff Deckler- CDPHE - Comment 40)

Response: Table 4.5 represents the potential impacts of the alternatives relative to the other alternatives and is not intended to analyze actual impacts. As shown in Table 4.5, the proposed action is predicted to have little or no impact on land use as a result of the contaminated ground water when it is compared to the other alternatives. The rationale behind this prediction is given in Section 4.4.6. Based on another comment, Table 4.5 was revised and the comparison of potential impacts of the alternatives of land use has been clarified.

Comment 370. Wyoming has two sites involved in the subject "Uranium Mill Tailings Remedial Action Ground Water Project". The "Riverton Site" is located approximately two (2) miles southwest of Riverton, Wyoming and the "Spook Site" is located approximately forty-eight (48) miles northeast of Casper, Wyoming in Converse County. The "Riverton Site" has the potential for both surface and ground water contamination. The "Spook Site" probably has contaminated ground water only because there are no perennial streams in the area receiving ground water inflows. Also, the ground water quality of the "Spook Site" is closely associated with the ore body so it is difficult to tell background ground water quality from that quality created by infiltration of water from the tailings.

The only comments that the State Engineer's Office has are as follow. First, depending upon the type of remediation method utilized, permits to appropriate water may be required. This is particularly true if some sort of flushing-withdrawal-treatment-reinjection system is utilized. Some quantity of water will be "lost" in such a system and will require additional "make-up" water. (State of Wyoming - State Engineer - Comment 1)

Response: The DOE understands the importance of working with state and local permitting requirements. The site-specific work plans and the NEPA documents will state which permits are necessary and how they will be complied with.

Comment 371. Secondly, if a more passive remediation method is utilized, i.e., natural flushing, the State Engineer's Office should be made aware of the magnitude, composition, direction of movement, etc. of any contaminate plume so that prospective applicants for permits to beneficially utilize ground water near the contaminated areas can be advised of ground water conditions in the area. (State of Wyoming - State Engineer - Comment 2)

Response: The DOE appreciates the willingness of the state engineer's office to disseminate information to potentially affected ground water users. Site-specific remedial action plans and site observational work plans will be sent to the tribes and states for review when appropriate. If any reports lack information that the state engineer's offices require, the information will be included in the final document, or through other means.

Comment 372. Our comments pertain principally to the participation of Indian Tribes (Tribes) as cooperating agencies as described in 40 CFR 1508.5 of the National Environmental Policy Act of 1969, as amended (NEPA). We believe it is clear that Tribes merit this role because tribal lands are governed by a sovereign Tribal government whose local concerns and issues must be addressed during the remedial selection process. Similarly, States, although not sovereign governments, should participate as cooperating agencies. We recommend the designation of Tribes and States as cooperating agencies be mentioned in Section 1.3.2, "Cooperating Agencies". (Bureau of Indian Affairs - General Comment - A)

Response: The DOE has extended cooperating agency status to the Navajo Nation and Hopi Tribe for the PEIS; language to this effect was added to Section 1.3.2 of the PEIS. In addition, other revisions were made to Section 1.3.2 to more accurately reflect the roles of the tribes, states, public, and federal agencies.

Comment 373. The Draft PEIS for the UMTRA Ground Water Project is a well written document. Although this document is not site specific, the document was reviewed in a manner to determine its possible impact to the remediation of ground water at the Tuba City UMTRA Ground Water Project. Through the review of this document and our familiarity with the Tuba City UMTRA Site in Coconino County, Arizona, we believe that "Active Ground Water Remediation" as identified in Box 16 on page 2 - 3 of the subject document should be the proposed action at this site. As a result, we would expect that proposed remedial options will encompass innovative and creative ways to remediate the ground water with emphasis towards the mitigation of radioactive particles in the ground water. (Bureau of Indian Affairs - General Comment - B)

Response: At this time, no final decisions have been reached regarding the ground water compliance strategy at Tuba City, Arizona, or at any other UMTRA Project site. The DOE will conduct the Ground Water Project using the most cost-effective means to protect human health and the environment from contaminated ground water while still meeting the EPA standards. In addition, DOE will investigate the possibilities of using innovative and new technologies on the Ground Water Project. The determination of the site-specific ground water compliance strategy will be the result of site characterization studies and consultation with the affected tribes and public.

Comment 374. In addition to the treatment of existing contaminated ground water at the Tuba City UMTRA Site, we believe a collection and/or treatment system should be established to treat contaminants in the vadose zone under the site in order to prevent additional migration of contaminants into the ground water. Also, we believe efforts should be made to prevent contamination of additional ground water. (Bureau of Indian Affairs - General Comment - C)

Response: As indicated previously, no final decisions have been made regarding site-specific ground water compliance strategies at Tuba City, Arizona, or at any other UMTRA Project site. The Ground Water Project will also evaluate the potential for contaminated

soils to act as a continued source term to the uppermost aquifer. Should a continued source term be identified, the Ground Water Project will take action to mitigate the impact.

Comment 375. We support the concept of site specific UMTRA Ground Water Project NEPA documents for analyzing impacts and determining the most effective and economical ground water compliance strategy in accordance with 40 CFR Part 192 requirements. We recommend that the PEIS also address Executive Order 12898 concerning the issue of "Environmental Justice" in minority and low income populations. In evaluating the proposed actions and alternatives, the Department of Energy (DOE) should identify and evaluate any anticipated effects, direct or indirect, to these communities. (Bureau of Indian Affairs - General Comment - D)

Response: Additional information and more detailed analysis for environmental justice impacts has been included in the PEIS and will also be addressed in Ground Water Project site-specific NEPA documents.

Comment 376. Regarding the Tuba City UMTRA Site, we would expect DOE, as the lead agency, to schedule, coordinate and communicate the status of remedial option processes on a consistent basis with both the Hopi Tribe and the Navajo Nation. (Bureau of Indian Affairs - General Comment - E)

Response: The DOE is committed to ongoing communication with and participation of groups that could affect or be affected by ground water compliance actions at UMTRA Project sites. This participation is very important in identifying site-specific issues, and in obtaining site-specific information that can contribute to decision making.

Comment 377. 1. <u>Section 1.3.2, "Cooperating agencies", Page 1 - 10: Paragraph Two, First Sentence</u>: Delete this sentence, and replace with: "DOE, will participate as the lead agency for the PEIS, while U.S. Nuclear Regulatory Commission, and affected stakeholders to include Tribes and States will participate as cooperating agencies."

2. <u>Section 1.3.2, "Cooperating agencies", Page 1 - 10: Paragraph Two, Second Sentence through Last Sentence:</u> This information should be moved to a new paragraph which would be the third paragraph of the section. After this paragraph, a new paragraph should be added discussing Tribes and States:

> **"Tribes and States, are governments which have jurisdiction over lands that have been impacted and are thus stakeholders, and also have government to government relationships with other Federal agencies with natural resource trust responsibilities. Consequently, these governments meet the legal jurisdiction criteria for participation as cooperating agencies consistent with Council of Environmental Quality implementation regulations (40 CFR §1501.6). For the Ground Water Project PEIS, the affected States and Tribes, provide consultation for sections of the PEIS which discuss local issues for which these governments have special expertise. These topics**

would include such areas as Tribal and State governmental policies, water resources, land use, and cultural issues." (Bureau of Indian Affairs - A)

Response: Language was added to Section 1.3.2 indicating that the Navajo Nation and Hopi Tribe are cooperating agencies in the PEIS. The DOE will consult with the affected tribes and states on a regular basis regarding the Ground Water Project. This would include, but not necessarily be limited to, consideration of tribal and state policies, water resources, land use, and cultural issues. In addition, these and other issues will be analyzed in the site-specific environmental document that would address the impacts of the proposed site-specific ground water compliance strategies.

Comment 378. Section 1.4.1, "EPA Standards", Page 1 - 12, First Paragraph, Second Sentence: Delete the phrase "...NRC concurs..." and replace with "...NRC, applicable Tribes and States concur....". (Bureau of Indian Affairs - B)

Response: Section 108(a)(1) of the UMTRCA (42 USC §7918(a)(1)), specifies the roles of the respective parties in the selection and performance of remedial action:

> The State shall **participate fully** in the selection and performance or remedial action for which it pays part of the cost. Such remedial action shall be selected and performed with the **concurrence** of the [U.S. Nuclear Regulatory] Commission and in **consultation**, as appropriate, with the Indian tribe and the Secretary of the Interior [emphasis added].

Comment 379. Chapter 9.0, "GLOSSARY", Page 9 - 1: We recommend that definitions in this glossary be consistent with terms to be included in the planned ground water cooperative agreement with the Hopi and Navajo Tribes and DOE. (Bureau of Indian Affairs - C)

Response: The definitions of terms in the PEIS glossary will be consistent with the definitions that will be used in the Ground Water Project cooperative agreements with the Hopi Tribe and Navajo Nation, as well as the affected states, where appropriate.

Comment 380. Chapter 12.0, "AGENCIES CONSULTED DURING THE PREPARATION OF THIS STATEMENT": Page 12 - 1: Was the U.S. Fish and Wildlife service, the U.S. Corps of Engineers, and the Environmental Protection Agency consulted during the preparation of the PEIS? If so, these agencies should be listed. (Bureau of Indian Affairs - D)

Response: None of these agencies were consulted during the preparation of the PEIS. Consultation with the Fish and Wildlife Service, Department of the Interior, took place during the Surface Project and it is anticipated that such consultation will take place during the Ground Water Project. The U.S. Army Corps of Engineers was contacted on numerous occasions regarding wetlands issues during the Surface Project and will likely be involved in the Ground Water Project with regard to wetlands. The DOE has been in communication with the EPA during the process of finalizing the UMTRA Project ground water standards.

The DOE expects to have a continuing dialogue with the EPA during the Ground Water Project.

Comment 381. 1. Chapter 13.0, "AGENCIES, ORGANIZATIONS, AND PERSONS RECEIVING COPIES OF THE PEIS": Page 13 - 1: Add the Phoenix and Flagstaff, Arizona Public Libraries to your list of organizations.

2. Chapter 13.0, "AGENCIES, ORGANIZATIONS, AND PERSONS RECEIVING COPIES OF THE PEIS": Page 13 - 2: Replace "Office and Environment Project Review" with "Office of Environmental Policy and Compliance"

3. Chapter 13.0, "AGENCIES, ORGANIZATIONS, AND PERSONS RECEIVING COPIES OF THE PEIS": Page 13 - 3: Replace "Gallup Area Office" with "Navajo Area Office". (Bureau of Indian Affairs - E)

Response: The suggested changes were made to the PEIS.

Comment 382. The Draft PEIS fails to inform decisionmakers and the public of reasonable alternatives that would avoid or minimize adverse impacts of the proposed groundwater remediation program. See, 40 CFR §1502.1. This failing is principally attributable to the PEIS's failure to (1) rigorously explore and objectively evaluate all reasonable program alternatives and (2) present this evaluation in a comparative form. See, 40 CFR §1502.14. Because of these failures, the "heart" of the draft PEIS is largely missing, and the document cannot serve its action - forcing purpose. See, 40 CFR §§1502.1 and 1502 - 14. (Concord Oil Company - 1.)

Response: During the preliminary stages of the PEIS preparation process before publication of the Notice of Intent, alternatives that were considered for inclusion in the PEIS received considerable attention. Meetings were held with experts from various disciplines both within and outside the DOE to determine reasonable alternatives. Following the publication of the Notice of Intent as stated in the PEIS (Section 1.6), 19 public scoping meetings were held in 16 communities between November 18, 1992, and April 15, 1993, to receive public input regarding the alternatives that should be assessed in the PEIS. The DOE also solicited comments on alternatives during the hearings on the draft PEIS. Therefore, the DOE has rigorously explored and evaluated all reasonable alternatives. In addition, the potential impacts of the alternatives are compared in Sections 2.5 and 4.4 of the PEIS.

Comment 383. The Draft PEIS does not consider the reasonable alternative of according different remediation frameworks to "wet" and "dry" sites. DOE has historically characterized the Cannonsburg and Falls City sites as "wet" sites (37 and 30 inches rainfall annually, respectively); the Lowman, Idaho, site (27 inches rainfall annually) might reasonably be added to the "wet" category. Draft PEIS, Table 3 - 2. Given the many uncertainties attending the risk assessment science that underlies DOE's proposed action, and given the lack of attention paid by the proposed action to contamination in the unsaturated (vadose) zone, one might reasonably accord to "wet" sites more stringent cleanup standards than one accords other sites. (Concord Oil Company - 1.a.)

Response: The "reasonable alternative" of having a different remediation framework for "wet" and "dry" sites could actually be considered part of the proposed action. That is, a site-specific ground water compliance strategy under the proposed action would not be proposed until all site characterization and risk data and input from the public have been received. The amount of annual precipitation along with many other factors will be considered during the process leading up to proposing a site-specific ground water compliance strategy under the proposed action. Based on its narrow focus, the "wet/dry reasonable alternative" is not inclusive enough to be considered a programmatic alternative.

Comment 384. The Draft PEIS does not consider the reasonable alternative of according different remediation frameworks to sites in areas that are seismically active or that are in areas with high potential for inter - aquifer communication. (Concord Oil Company - 1.b.)

Response: The "reasonable alternative" of having different remediation frameworks for sites that are seismically active or sites that have a high potential for interaquifer

communication actually represent factors that would be analyzed, during the site characterization phase of the Ground Water Project. These factors and many others will be considered during the formulation of the site-specific ground water compliance strategy under the proposed action. Based on their narrow focus, these two "alternatives" are not inclusive enough to be considered programmatic alternatives.

Comment 385. The Draft PEIS does not consider the reasonable alternative of according different remediation frameworks to sites at which background water conditions are particularly difficult to determine. (Concord Oil Company - 1.c.)

Response: The "reasonable alternative" of having a different remediation framework for sites where the background water quality is "particularly difficult to determine" is part of the proposed action and all other alternatives analyzed in the PEIS except no action. The determination of background water quality is an important component in the formulation of site-specific ground water compliance strategies and every effort will be made to determine the concentrations of this important parameter. Conducting the Ground Water Project based on the degree of difficulty of determining background water quality is not considered inclusive enough to serve as a programmatic approach. That is, there are factors such as the potential for risks to human health and the environment, and hydrogeologic factors that need to be considered. Cleanup of contaminated ground water to background is analyzed in the active remediation to background levels alternative.

Comment 386. The Draft PEIS does not consider the reasonable alternative of requiring site groundwater cleanup to meet the standards of the state in which the site is located. EPA has determined that groundwater cleanup "consistency" between the federal and state programs should be determined by DOE in consultation with the states. 60 Fed. Reg. 2856 (January 11, 1995). The Draft PEIS itself (p. 2 - 13) commits the DOE to reliance on the various state criteria for determining toxicity to aquatic life, so a desire for uniformity across all UMTRCA sites would not seem to justify disregarding out of hand state cleanup standards. In Texas, at least, there are numerous safeguards that attend cleanup under state standards (generally, see §43.90 (f) (3), Tex. R. Control Rad.) that are missing under the UMTRCA Title I standards. For example, there are 52 more groundwater contaminants that must be considered under the Texas state standards (based on 10 CFR 40, App. A, Criterion 13) than under the federal standard (based on 40 CFR §192, App. I). (Concord Oil Company - 1.d.)

Response: DOE will make decisions regarding consistency with applicable tribal and state laws and regulations in consultation with the tribes and states. These decisions will consider cases where an approved wellhead protection area, under the Safe Drinking Water Act, is associated with the site. A wellhead protection area is an area of land where there are restrictions on development so as to protect ground water supplies used for drinking water or other beneficial uses. DOE must comply with the provisions of that program, unless an exemption is granted by the President of the United States through the EPA. Contamination on the site that is not covered by UMTRCA (because it is not related to the processing operation) is not the responsibility of DOE, but may be covered by other federal,

tribal, or state programs. A discussion of this issue is presented in the EPA standards (60 FR 2854, 2856) and is in Appendix A to the PEIS.

In general, the DOE will not screen for any potential contaminants that are not listed in Tables A and 1, and Appendix I of the Ground Water Standards (60 FR 2854). Exceptions to this are iron, manganese, and sulfate because these constituents have been measured in concentrations exceeding background and lead-210, polonium-210, and thorium-230 because they are residual decay products of uranium. The DOE will consider the need to screen for additional nonlisted constituents on a case-by-case basis. The DOE would need technical justifications to screen additional nonlisted constituents.

The DOE agrees that meeting applicable tribal or state standards may be a reasonable alternative to consider in the PEIS. However, this alternative was rejected from further consideration for the reasons provided in the new Section 2.6.5 of the PEIS.

Comment 387. The Draft PEIS also fails to lay a credible foundation for analyses of the various alternatives offered or that should have been offered, principally because the Draft PEIS does not discuss in any depth - - and, sometimes, not at all - - the reasonably foreseeable indirect effects of the proposed action and the conflicts between the proposed action and the objectives of the states or smaller locales in which the groundwater sites are located. See, 40 CFR §1502.16. (Concord Oil Company - 2)

Response: The indirect effects of the proposed action and other alternatives are discussed in the PEIS. The actual discussion of indirect effects appears in the section that describes the potential impacts of the ground water compliance strategies (Section 4.2) and no action (Section 4.3). The direct and indirect impacts of the compliance strategies are not repeated in Section 4.4, which compares the alternatives, because all alternatives except no action would use all or some of the compliance strategies. For example, site-related ground water contamination has the potential of entering the environment. Sections 4.2.1.5, 4.2.2.5, and 4.2.3.5 indicate that a risk assessment would be prepared to determine the effects, if any, of such a circumstance. These risk assessments consider both direct and indirect effects on the environment. Other categories where both the direct and indirect effects are considered are human health, surface water, land use, and socioeconomics.

The DOE has made and will continue to make every effort to communicate with the affected public at each of the UMTRA Project sites. Within the PEIS process, this includes holding public scoping meetings, hearings, orientation meetings, and media briefings. The DOE has held numerous public meetings not associated with the PEIS and plans to continue its public participation policy during the remainder of the Ground Water Project. The DOE's commitment to meaningful public participation will go a long way toward solving most "conflicts" that may arise between the DOE, tribes, states, and local governments.

Comment 388. The Draft PEIS does not consider the impacts of the various alternatives it analyzed on the values of surrounding properties. Had it done so, there would have been additional information available to decisionmakers on the relative costs to state and local

governments of each of the alternatives. Analyses of the relative dependence on property taxes of state and local governments where the sites are located would have provided decisionmakers with information on which to decide, for example, that the active remediation alternative should always be implemented in certain states or that supplemental concentration limits should not be approved in certain states. (Concord Oil Company - 2.a.)

Response: The PEIS analyzes the potential impacts of the ground water compliance strategies on land use and values, especially as they pertain to the use of institutional controls. The PEIS acknowledges that the use of institutional controls could have short-term and long-term effects on land values. The PEIS also indicates that use of the no action alternative has potential negative impacts on land use and socioeconomic values (Sections 4.3.6 and 4.3.11). However, given that the PEIS is a programmatic document and final decisions have not been made regarding site-specific ground water compliance strategies, the PEIS cannot and should not provide a quantitative analysis of impacts of the alternatives on the values of surrounding properties. Even if the information requested in this comment were available, it would not be appropriate to stipulate that certain ground water compliance strategies must be applied based on the "relative dependence on property taxes of state and local governments."

Comment 389. The Draft PEIS did not analyze the various alternatives it considered or should have considered would be likely to affect the development of state cleanup standards at uranium mill tailings facilities not subject to UMTRCA Title I. Basically, by setting a low federal floor for cleanup standards, DOE encourages relaxation of state standards and this, in turn, leads to amplified environmental and health harm, because of the number of sites under state jurisdiction and because of the relatively fewer resources available to state regulators. (Concord Oil Company - 2.b.)

Response: The DOE is committed to administering the UMTRA Ground Water Project in an environmentally sound manner. As stated on numerous occasions in the PEIS, this includes applying ground water compliance strategies that are protective of human health and the environment and that meet EPA standards. The DOE sees no indication that the EPA standards have encouraged the lowering of state standards and disagrees with this comment.

Comment 390. The Draft PEIS is not clearly written. It is imprecise in its use of terms or does not define its terms, with the result that the Draft PEIS is not calculated to be readily understood by the relevant decisionmakers or the public. See, 40 CFR §1502.8. (Concord Oil Company - 3.)

Response: Comments received on the draft PEIS have resulted in some clarifications and the inclusion of additional detail, as appropriate. The glossary defines terms used in the PEIS. It has been reviewed, cross checked with the text, and clarified.

Comment 391. The Draft PEIS (p. 1 - 11) acknowledges that the EPA's final UMTRCA groundwater cleanup standards (generally, 40 CFR §192) have only recently been established. The Draft EIS acknowledges that DOE was required to comply with the proposed EPA standards, until final standards were promulgated. The Draft PEIS, then, states, "for this reason, the planning of the Ground Water Project was done under the proposed standards." It is unclear whether the PEIS, certainly a component of the Ground Water Project, utilized the proposed or the final EPA standards. The former is certainly a reasonable reading of the text. If that reading is correct, it is incumbent on DOE to justify reliance on outdated standards (now that the final standards are available); if that reading is incorrect, the text should be modified to remove the ambiguity. (Concord Oil Company - 3 - a.)

Response: The Ground Water Project and the PEIS were planned prior to the promulgation of the final standards. However, the April 1995 draft PEIS that was released for public comment was revised to incorporate the final standards published on January 11, 1995. The draft PEIS reflects the final ground water standards. Section 1.4.1 has been revised to reflect the same information.

Comment 392. The Draft PEIS (pp. 1 - 10 through 1 - 14) correctly explains the EPA's hierarchy of UMTRCA site groundwater cleanup standards. Under 40 CFR §192.12(c), groundwater must be "cleaned" to:

i. **background conditions or "maximum concentration limits", whichever values are less stringent, or**

ii. **if maximum concentration limits have not been set for a contaminant or if other special circumstances exist, alternate concentration limits, or**

iii. **for "limited use" groundwater, to "supplemental standards," which are the least stringent of all.**

EPA requires supplemental standards come as close "as reasonable achievable" to meeting the background/MCL or alternative concentration limits. 40 CFR §192.22(a). DOE's proposed action assumes that "limited use" groundwater need not be remediated, if environmental and human health risks are acceptable. See, Draft PEIS, p. 2 - 2 and Figure 2.1. The Draft PEIS does not explain how DOE has determined the unremediated values of contaminants at sites underlain by limited use groundwater come as close as reasonably achievable to the background/MCL or alternative concentration level values. (Frankly, it strains credulity to believe this is uniformly true.) If, as seems probable, that determination has not really been made, the proposed action should be modified to bring it into compliance with 40 CFR §192.22(a) (i.e., so it does not assume an outcome that legally must be reached by analysis), and the Draft PEIS should describe in detail the manner by which the required determination is to be made. (Concord Oil Company - 3.b.)

Response: The proposed action assumes that an aquifer qualifies for supplemental standards based on limited use ground water (box 4 of Figure 2.1), and then asks whether this ground water compliance strategy would be protective of human health and the

environment (box 5 of Figure 2.1). Section 2.1 indicates that the first step in determining whether supplemental standards based on limited use ground water is an appropriate strategy is to determine whether EPA standards are met. The reader is referred to Section 1.4.1, which discusses supplemental standards. Under the heading "Subpart C, Implementation," in Section 1.4.1, the factors that need to be met to qualify an aquifer for supplemental standards based on limited use ground water are given. To qualify, it must be shown that ground water is not a current or potential source of drinking water because 1) total dissolved solids exceed 10,000 milligrams per liter; or 2) widespread ambient contamination that is not due to the UMTRA Project site cannot be cleaned up using treatment methods reasonably available to public water systems; or 3) the aquifer yields less than 150 gallons per day. In addition, the DOE has not made any final site-specific determinations regarding the application of supplemental standards based on limited use ground water for ground water cleanup at any UMTRA Project sites. The determination regarding the applicability of limited use supplemental standards will take place after site characterization is complete, all the risks are known, and public input has been considered.

Comment 393. The "limited use groundwater" determination may only be made if the groundwater in question can not be a potential source of drinking water because of high solids, low flow, or background (i.e., not due to uranium mining and processing) contamination that can not be cleaned up using reasonable public water system technologies. 40 CFR §192.11(e). The Draft EIS does not, but should, explain for decisionmakers and the public:

i. **how DOE will determine what will be the technologies future public water systems would reasonably employ to clean water, especially, water that is deficient as to only the contaminants found in a site's background water (e.g. high uranium or radium); (Concord Oil Company - 3.c.)**

Response: A detailed analysis addressing the technical and economic viability of treating ground water from the uppermost aquifer is presented in the Falls City site remedial action plan water resources protection strategy (DOE, 1992). In determination of "limited use ground water," the UMTRA regulations do not specify that future public water systems should be analyzed. However, all viable, technologies currently used for public water supplies in Texas were analyzed. In general, the DOE will analyze all viable technologies, where appropriate, during the Ground Water Project.

ii. **over what period of time DOE will investigate a groundwater's potential for drinking water use (i.e., will DOE consider the water's potential for use only in the 20 - year or 50 - year future, or will DOE consider more distant times when general water scarcity is likely to make some currently uneconomical water economically viable?); (Concord Oil Company - 3.c.)**

Response: In the determination of "limited use ground water," the UMTRA regulations do not specify a future time period for considering the potential use of

ground water. Under the proposed action, the DOE would make decisions based on current technology and site characterization data.

iii. **how DOE will evaluate the reasonableness of groundwater blending (.i.e., mixing with higher quality water), in particular, as a current or potential technology by which limited use groundwater might be made drinkable; and, perhaps most importantly, (Concord Oil Company - 3.c.)**

Response: The PEIS is not designed to provide scientific and engineering guidance for conducting investigations that lead to site-specific ground water compliance strategies. Those analyses will be presented in appropriate site-specific documents such as ground water remedial action plans.

iv. **how DOE will determine that groundwater contaminants do not result from mining or processing activities (e.g., if DOE plans to rely on ratios of various elements or isotopes found "naturally" in groundwater, what exactly are those ratios, or, if DOE plans to rely on "updip" groundwater samples to determine background conditions, what will DOE do at sites where there are no "updip" samples to be had?). (Concord Oil Company - 3.c.)**

Response: The PEIS is not designed to provide scientific and engineering guidance for conducting investigations that lead to site-specific ground water compliance strategies. Those analyses will be presented in appropriate site-specific documents such as ground water remedial action plans.

Comment 394. EPA's supplemental standards may only be relied upon, in the instance of limited use groundwater, if a particular supplemental standard ensures reasonably projected future uses (not just drinking water uses) of the groundwater are preserved. 40 CFR §192.22(d). The Draft PEIS does not, but should, explain for decisionmakers and the public:

i. **how DOE has determined that just leaving the limited use ground waters in their polluted states will uniformly result in ensuring reasonable future uses of the waters are protected;**

ii. **how DOE will determine the reasonable future uses of groundwater (e.g., by what methods will DOE determine costs of alternative purification technologies, or by what methods will DOE project an area's agricultural or industrial trends?) and**

iii. **over what period of time will DOE attempt to make these use projections. (Concord Oil Company - 3.d.)**

Response: The DOE agrees that, as stated in Section 1.4.1 of the PEIS, the application of supplemental standards based on the limited use criteria must be protective of current and projected future uses of the ground water. The procedures used to determine whether

supplemental standards based on limited use would be protective of current and future uses of ground water and be protective of human health and the environment will vary from site to site. In general, the applicability of supplemental standards based on limited use will be determined after site characterization is complete, all risks are known, and public input has been considered. Site-specific decisions regarding the applicability of supplemental standards based on limited use or any other ground water compliance strategy have not been made and will not be made until after the Record of Decision of the PEIS is published.

Comment 395. The Draft PEIS apparently contemplates use of a risk assessment methodology other than that used in the RCRA program, that is, other than the methodology set out in Risk Assessment Guidance for Superfund, Volume II (EPA, 1989a, EPA/540/1 - 89/001). The decision should be justified to use instead the methodology more or less described at Draft PEIS pages 2 - 10 through 2 - 15, Appendix B, and Human Health Risk Assessment Methodology for UMTRCA Groundwater Project (Jacobs Engineering, Nov. 1994). This explanation is particularly in order, in that UMTRCA standards are generally required to be consistent with the RCRA standards. 42 CFR §7918(a). It may be that the risk assessment methodology described in the Draft PEIS is superior to that used under RCRA, but the Draft PEIS certainly does not explain that fact to decisionmakers or the public.

The risk assessment methodology to be used is not as clearly described in the Draft PEIS as it should be. In particular, the deficiencies of risk assessment "science," which science, after all, underlies any claim that DOE's preferred alternative (i.e., the proposed action) is rational, need to be fairly presented to the decisionmakers and the public. That the science has numerous deficiencies does not necessarily militate against DOE's preferred alternative, but it is unreasonable of DOE not to lay the facts of the deficiencies before the decisionmakers and public. (Concord Oil Company - 3.e.)

Response: The UMTRA Project sites risk assessment methodology follows the basic framework outlined by the EPA for evaluating hazardous waste sites to assess potential health and environmental impacts (EPA, 1989a). This framework is incorporated in the methodology developed to evaluate current human health risk at UMTRA Project sites and to estimate risks from potential future use of contaminated ground water or surface water near the former uranium processing sites. This methodology uses Monte Carlo simulations to assess human health exposure to inorganic contaminants by drinking water ingestion. Other potential exposure pathways (such as dermal contact with ground water while bathing, human consumption of meat or garden produce) are evaluated using standard EPA deterministic approaches. Recent EPA investigations indicate that probabilistic and deterministic calculations are consistent. The EPA considers Monte Carlo simulations useful in implementing new risk assessment guidance. An expanded explanation of the risk assessment methodology used on the UMTRA Project appears in Appendix B of the PEIS.

The DOE agrees that the EPA ground water standards are generally required to be consistent with RCRA standards. The UMTRA Ground Water Project's application of site-specific baseline risk assessments and implementation of the preferred alternative in no way abrogates the requirements of meeting the EPA standards, which are mostly

prescriptive. An exception to prescriptive standards, such as maximum concentration limits, are supplemental standards that are based on distinct technical criteria but documented by a narrative position.

The baseline risk assessment for the Falls City, Texas, UMTRA site is available to the public at the Falls City public library.

Comment 396. At a more specific level, at least the following questions about the risk assessments proposed by DOE should be answered:

how will risks posed by contaminants in the unsaturated zones above aquifers be addressed; (Concord Oil Company - 3.e.i.)

Response: Contaminated soils that resulted from the tailings seepage and former uranium milling activities have been addressed under the UMTRA Surface Project. The Ground Water Project will also evaluate the potential for contaminated soils to act as a continued source term to the uppermost aquifer. Should a continued source term be identified, the Ground Water Project will take action to mitigate the impact.

Comment 397. will contaminant species be eliminated from toxicity review based only on human health implications, or will the implications of these species for wildlife, particularly livestock, be considered, also; (Concord Oil Company - 3.e.ii.)

Response: Because ecological effects on livestock differ from the effects on human health, the complete list of contaminants of potential concern (ground water constituents elevated above background levels) is considered for the ecological, livestock, and agricultural resources risk assessment. This information appears in Section B2.8 of the revised Appendix B in the PEIS.

Comment 398. how will it be determined (for purposes of exposure assessment) what the reasonable future land uses in an area are and how long a future time will be considered in determining reasonable future uses; (Concord Oil Company - 3.e.iii.)

Response: Determination of possible alternative future land uses is based on available information and professional judgment. To determine historical, present and possible future land uses, the following information sources are evaluated, as available: likelihood that activities associated with current land use will be different under an alternate future use; city or county projections of future land use; U.S. Bureau of the Census projections; and established trends in the general area and the area immediately surrounding the site. Because residential land use is most often associated with the greatest exposure, it is generally the most conservative choice to make when deciding what type of alternate land use may occur in the future.

An expanded discussion of this appears in Section B2.3 (Site Description) of the revised Appendix B in the PEIS.

Comment 399. why was it determined that only the existing biological community would be considered in the evaluation of the impacts of contaminants on non - humans (see, Appendix B - **8 - - this would seem to be inconsistent with the requirement of 40 CFR §192.22(d) that supplemental standards ensure projected uses also are protected); (Concord Oil Company - 3.e.iv.)**

Response: The word "existing" has been deleted.

Comment 400. will toxicological data on populations potentially to be exposed to the contaminants consider differences between the sensitivities of the U.S. population as a whole and the sensitivities of the particular sub - sets of the population (i.e., American Indian and Mexican - American) that are most likely to be exposed to the contaminants; (Concord Oil Company - 3.e.v.)

Response: Some individuals and/or subpopulations could be more vulnerable to potential exposures than the general population. These sensitive populations could include infants, children, the elderly, or people with existing illness, such as diabetics. Another sensitive subpopulation could include individuals with preexisting occupational exposures and/or those with certain dietary habits (when normal dietary intake of certain contaminants is already higher than national averages due to living in high mineralization areas). These differences are all considered in the UMTRA Project risk assessments, wherever possible. The potential health risks of the sensitive groups of human population are evaluated qualitatively in the risk assessment, if relevant. See Appendix B of the PEIS for an expanded discussion of this topic.

Comment 401. on what basis was it decided the risk assessments will not consider the air-borne exposure pathway; (Concord Oil Company - 3.e.vi.)

Response: Exposure through the inhalation route is not evaluated because UMTRA Project ground water contaminants are primarily nonvolatile contaminants (i.e., metals, nitrate, and sulfate). Although inhalation of mists could result from showers or irrigation, this risk is considered negligible compared to water ingestion. However, further evaluation of this exposure route may be warranted under some conditions. Similarly, irrigation could cause contaminant buildup in soil that may be of concern in some exposure scenarios.

The above information appears in Section B2.5 (Exposure Assessment) of the revised Appendix B of the PEIS.

Comment 402. by what objective means will it be determined that there are sufficient groundwater data to support the use of probabilistic curves, rather than expected values or uniform distributions, to describe contaminant concentrations; (Concord Oil Company - 3.e.vii.)

Response: The probability distributions for ground water concentrations of a site contaminant are used in UMTRA Project baseline risk assessments to describe naturally

occurring temporal variation in ground water quality accessed by one or more wells at a site. The methodology is based on the principle that natural variation will always exist, even if site-specific data are inadequate to characterize the statistical pattern of variation associated with a particular well and contaminant. Therefore, the use of probabilistic curves for risk evaluation is not dictated by the amount of data available at the site.

In practice, theoretical probability distributions for risk simulation are selected using a combination of data analysis and professional judgment. Experience with water quality data shows that concentration distributions are typically unimodal (one peak), not uniform.

For UMTRA Project risk assessments, the expected value of the probability distribution is set equal to the observed mean of the water quality data. This is because a) the ground water concentration value is multiplied by other factors (ingestion rate [x], exposure frequency [y]) and divided by body weight (z) to compute average daily intake of ground water; and b) these other factors are assumed to be distributed in the population independent of the amount of contamination in the ground water. It follows that the expected value of the average daily intake distribution reflects the actual mean of the water quality data regardless of which theoretical distribution is selected to model the contaminant distribution in ground water. Mathematically:

If: Concentration (C) is statistically independent of factors X, Y, and Z, and Average Daily Intake (ADI) = C*X*Y/Z,

Then: Expected value of ADI = (Expected value of C)*(Expected value of X*Y/Z).

In this sense, a probabilistic risk simulation includes as a subset the result that would have been obtained if expected values instead of distributions had been used to calculate ADI.

In addition to equating the theoretical mean to the observed mean, on the UMTRA Project we also equate the theoretical standard deviation to the observed standard deviation of the data. Data are also examined for evidence of symmetry/skewness that may suggest an appropriate distributional shape (e.g., normal, lognormal, exponential). Provided the theoretical distribution is centered over the data (the mean) reflects the observed variation in the data (the standard deviation), and has an appropriate amount of skewness, the risk outcome can be expected to be relatively robust to the particular theoretical distribution selected to model ground water contaminant concentrations.

The methodology used for distribution selection is described in Section B2.5 of the revised Appendix B.

Comment 403. will probabilistic curves be used to represent possible contaminant intakes by both humans and livestock, and will these curves be adjusted to well - reflect reality in the generally hot regions in which the UMTRCA sites are found; (Concord Oil Company - 3.e.viii.)

Response: Curves/graphs representing probability intake distribution are generated to estimate human potential exposure from drinking water ingestion. If human exposure

pathways by consumption of meat or milk from livestock that have consumed contaminated ground water are considered for the site, these pathways will be evaluated using the EPA's standard deterministic approach.

Daily drinking water intake distributions, by age group, are based on the U.S. Department of Agriculture data collected during a 1977-1978 nationwide food consumption survey. This is a large geographically and seasonally balanced survey of a representative sample of the United States population. In this study, daily total drinking water (tap water) intake rates for adults (ages 20-64) ranged from approximately 0.15 to 3.78 liters per day with a mean intake rate of 1.37 liters per day. Total tap water intake for children (ages 1-10) ranged from approximately 0.06 to 1.95 with a mean intake rate of 0.74 liters per day. This is also one of the key studies used by the EPA in selecting recommended drinking water consumption rates for general population exposure assessments. The mean and upper-percentile estimates reported in these studies appear to be relatively consistent. These consumption rates represent reasonable maximum exposures and, therefore, are considered protective of all regions of the country. However, some site-specific ingestion rates might vary somewhat from those estimated based on the national surveys.

It is true that ingestion rates for drinking water vary among different regions of the country. Unfortunately, these data are typically not available and EPA generally uses national estimates to evaluate risks. This is still considered protective in all regions of the country because the national estimates are for reasonable maximum exposures; thus, they are still more conservative than typical ingestion rates found in high consumption regions. This approach is not inconsistent with the response to Comment 400 because the estimation of risks to sensitive subpopulations may require exposure factors that are higher than conservative national averages.

The above information appears in Section B2.5 (Exposure Assessment) of the revised Appendix B of the PEIS.

Comment 404. Appendix B suggests, but does not actually say, the toxicity assessment components of risk assessments will consider the non - carcinogenic (as well as the carcinogenic) implications of contaminants - are both implications to be evaluated in the risk assessments; (Concord Oil Company - 3.e.ix.)

Response: The toxicity assessment components of risk assessment consider and evaluate both noncarcinogenic and carcinogenic adverse health effects. This information appears in Sections B2.5 (Exposure Assessment) and B2.7 (Human Health Risk Evaluation) of the revised Appendix B of the PEIS.

Comment 405. given that it is generally recognized that toxic levels for many trace elements are only slightly higher than normal intake levels, how will risks of intake of trace elements, in particular, be evaluated (again, given the particular population sets found near UMTRCA sites and given the climate peculiarities [i.e., heat] at some of those sites); (Concord Oil Company - 3.e.x.)

Response: The screening process of contaminants of potential concern for human health appears in Section B2.4 (Extent of Contamination) in the revised Appendix B. This section provides a detailed discussion of the screening process of all the ground water constituents, including trace elements, based on nutritional and dietary criteria. Site-specific information on normal dietary intake levels is addressed qualitatively, if available.

Comment 406. how does DOE justify its apparent decision to utilize EPA's chemical - induced cancer risk curve in assessing the cancer risk posed to humans by chemical contaminants, since the risk of cancer is cumulative with exposure (note EPA's radiation - induced cancer curve), but EPA's chemical - induced cancer curve assumes a constant average daily intake; (Concord Oil Company - 3.e.xi.)

Response: Although carcinogenic risk from chemical (nonradionuclide) carcinogens is considered cumulative over a lifetime, the exposure for chemical carcinogens is calculated in milligrams per kilogram per day. This is because EPA-derived cancer slope factors (risk per kilogram per day) for chemical carcinogens correlate estimated daily intakes averaged over a lifetime (measured in milligrams per kilogram per day) to incremental cancer risk.

Risk from radioactive contaminants in the ground water depends on total exposure over time rather than on average daily exposure. Therefore, exposure to carcinogenic radionuclides is quantified as total exposure to radioactivity throughout an individual's exposure duration.

The above information is included in Section B2.5 (Exposure Assessment) of the revised Appendix B of the PEIS.

Comment 407. the Jacobs Engineering Human Health Risk Assessment **document cited earlier indicates (p. 11) DOE's risk assessments will be based, in part, on late 1970s national body weight data; how will DOE determine its UMTRCA site risk assessments may reasonably rely on this foundation, given the particular population subsets and climates found near UMTRCA sites; (Concord Oil Company - 3.e.xii.)**

Response: Use of distributions based on national data requires an assumption that the distributions of body weight in the vicinity of an UMTRA Project site are comparable to those for the nation as a whole. In the absence of site-specific data, this assumption is probably reasonable for body weight factor.

The above information appears in Section B2.5 (Exposure Assessment) of the revised Appendix B of the PEIS.

Comment 408. will DOE's risk assessments consider the likelihood that an individual who is in the future hypothesized to be exposed to contaminants through a groundwater pathway may have had abnormal prior occupational exposure (e.g., from work in the uranium industry) to the same contaminant; and (Concord Oil Company - 3.e.xiii)

Response: Specific sensitivities of human subpopulations to contaminants of potential concern (such as those resulting from previous occupational exposure or associated with site-specific dietary intakes) are addressed qualitatively, if information is available.

The above information appears in Section B2.5 (Exposure Assessment) of the revised Appendix B of the PEIS.

Comment 409. are the variable values chosen from the probability distribution curves during the Monte Carlo simulations that produce the risk outputs themselves interdependent (e.g., if a high value for meat consumption is selected during a simulation run, is a high value for water consumption also more likely than a low value to be selected)? (Concord Oil Company - 3.e.xiv.)

Response: The probabilistic approach to risk evaluation employed at UMTRA Project sites has been developed only for drinking water pathways. Input variables associated with this pathway are assumed to be statistically independent within each age category because realistic correlation matrices for body weight, water ingestion rates, and exposure frequency were not available at the time the risk assessment methodology was developed. Furthermore, correlations between these variables are expected to be small, such that their inclusion would not alter risk-based decisions at the site.

Exposure pathways other than the drinking water pathway are evaluated using point estimates for input variables, as prescribed in the EPA risk assessment guidance document (EPA, 1989a, Volume I). The EPA approach does not allow for statistical dependencies between variables either within the same pathway (e.g., water ingestion rate and body weight for the drinking water pathway) or different pathways (e.g., meat ingestion rate and water ingestion rate).

Some variable dependencies act together to increase risk, while others tend to cancel out and decrease risk, so their net impact to overall risk cannot be determined. However, it remains our belief that the UMTRA Project methodology adequately characterizes the most significant risks to humans posed by the contaminated ground water.

Comment 410. Finally, the Draft PEIS's description of conditions at the Falls City site, the only site about which Concord Oil has any sophisticated understanding, omits important facts and contains errors that should be corrected. Presumably, the Draft PEIS's inclusion of site - specific information is intended to afford decisionmakers and the public some opportunity to evaluate the reasonableness of the alternatives DOE proposed or should have proposed. To serve that function, all the site descriptions need to be accurate and inclusive of important details.

Regarding the Falls City site:

it is incorrect to state the surface cleanup was completed in June 1994; NRC has not concurred in the surface cleanup to date, and DOE has not even completed its vicinity property surveys at Falls City; (Concord Oil Company - 4.)

Response: The text was revised to indicate that the Falls City site disposal cell was completed in June 1994. The DOE is conducting an inclusion survey for one vicinity property; it has not been determined if this property will qualify for inclusion.

Comment 411. it should be explained that the Falls City site is immediately east of a state Superfund site ("Butler Ranch") at which hazardous materials were illegally dumped, and that the Falls City site itself is characterized by unexplained high levels of thorium contamination. (Concord Oil Company - 4.b.)

Response: There is no connection between the contaminated material at the "Butler Ranch" Superfund site and the Falls City UMTRA Project site so reference to this site was not added to the PEIS. A study at the old tailings piles 4 and 5 indicated that thorium-230 levels were within the range of values found in background mineralized and lignite sediments and therefore no further studies or activities were required.

Comment 412. it should be made explicit that what the Draft PEIS characterizes as a "low - yield" upper aquifer is, nonetheless, an aquifer that yields more than EPA has determined to be the threshold for "limited use groundwater" designation; (Concord Oil Company-4-c.)

Response: In Section 3.2.17 of the PEIS it states that the aquifers yield small amounts of water (1 to 2 gallons per minute). No claim is made that on this basis these aquifers should be classified as "limited use."

Comment 413. it should be explained that the lower aquifer at Falls City may be interconnected with the upper aquifer both by geologic pathways and by the numerous wells and boreholes in the area; the observation of apparent mining - related contamination at two points in the lower aquifer should be mentioned; (Concord Oil Company - 4.d.)

Response: Both the upper and lower aquifers at the Falls City site are considered to be the uppermost aquifer because of the interconnection potential. Section 3.2.17 of the PEIS states, "These aquifers have the potential to be interconnected and together are considered to be the uppermost aquifer."

Section 3.2.17 of the PEIS states that tailings fluids have migrated into the uppermost aquifer; as a result the concentrations of molybdenum and uranium that are above background are attributable to the processing site.

Comment 414. that the Falls City area is one of historic seismic activity should be explained; (Concord Oil Company - 4.e.)

Response: Earthquakes are not considered a concern at the Falls City site. The issue of earthquake effects was analyzed as part of the remedial design for the Surface Project. The following information was presented in the Falls City site remedial action plan document (DOE, 1992).

"The historical seismicity within 186 miles (300 kilometers) of the site indicates a stable, relatively aseismic region. No tectonic earthquakes of magnitude 3.0 or greater have been recorded within 40 miles (65 kilometers) of the site. The shallow faults that are fairly prominent in the site region are considered nontectonic and are not capable of generating damaging earthquakes."

Because this issue was investigated for the Surface Project and because it was concluded that earthquakes are not a significant threat at the site, a summary of this analysis was not presented in the PEIS.

Comment 415. the statement that there is no indication of groundwater discharge to surface streams should be tempered to reflect that there are seeps to surface streams on the site and adjoining properties that may provide pathways for upper aquifer contamination of surface waters; (Concord Oil Company - 4.f.)

Response: Based on information from the latest site observational work plan for the Falls City site (June 1995), the referenced statement in Section 3.2.17, 5th paragraph, of the PEIS was changed to indicate that shallow ground water may discharge into intermittent streams at the site from ephemeral seeps.

Comment 416. the Draft PEIS's statement that groundwater in the upper aquifer can not be treated by methods currently employed by public water systems in the region should be reworded to make the relevant statement, which is DOE's analysis of whether the contamination could be cleaned up by methods that are or in the relevant future could be used by public water systems, whether in the region or elsewhere; (Concord Oil Company - 4.g.)

Response: The fact that this statement is based on a previous DOE analysis will be indicated by adding a reference to this analysis at the end of this sentence. The reference will be to the following document:

DOE, 1992. *Remedial Action Plan and Site Design for Stabilization of the Inactive Uranium Mill Tailings Site at Falls City, Texas*, UMTRA-DOE/AL-050520.0000, September 1992, UMTRA Project Office, Albuquerque Operations Office, Albuquerque, New Mexico.

Comment 417. The draft PEIS comments that the water in the upper aquifer is of limited use for livestock and is of no other use (now or in the future, presumably) and, that, therefore, its contaminants pose no threat to human health or the environment (again, now or in the future, presumably) should be deleted; this language states as factual conclusions (DOE's) hypotheses that are still to be proven by data collection and risk analyses. (Concord Oil Company - 4.h.)

Response: Based on the conclusions of the baseline risk assessment conducted at the Falls City site (DOE, 1994c), the referenced statement in Section 3.2.17, last paragraph, has been modified to indicate that human health is not at risk from direct ground water use because the Deweesville/Conquista ground water is currently not used by area residents.

Comment 418. The proper cleanup of contaminated groundwater at the UMTRA sites located on the Navajo Nation is of paramount importance to the Navajo people. The Navajo Nation expects that these comments will be given due consideration.

The document appears to have been constructed to justify the selection of the Proposed Action Strategy, with emphasis on natural flushing, as the preferred alternative. On page 2.1, four alternatives are listed but only the last one, Passive Remediation, with flushings/no remediation, is analyzed. Why not analyze active remediation or institutional controls only? The approach taken by DOE appears to be slanted toward a desired end result. (Navajo Nation - 1.)

Response: The DOE acknowledges that the proposed action is its preferred alternative; the DOE also believes that all alternatives were treated equally in the PEIS. The DOE disagrees with this comment; all alternatives are analyzed in Sections 2.1 through 2.4. In addition, the preferred alternative does not emphasize natural flushing. It is just one of three ground water compliance strategies that are available for use under the proposed action. The choice of a site-specific ground water compliance strategy will be made after all necessary site characterization data have been collected and analyzed, all existing and potential risks and impacts are known, and input from the tribes, states, and public have been considered.

Comment 419. Cited references are difficult to comprehend without some knowledge of how they apply. For example, in Section 2.8.1, the Draft PEIS cites the existence of three UMTRA project documents as evidence that DOE's technical approach for the groundwater program is consistent with UMTRA regulations. However, without having previously reviewed these documents, it is very difficult for a reviewer to comment on the adequacy of the approach proposed in the Draft PEIS. (Navajo Nation - 2.)

Response: The DOE acknowledges your comment and appreciates the increased burden of review inherent in referencing other documents. The National Environmental Policy Act encourages incorporating information by reference (40 CFR §1500.4; 1502.21). As required by NEPA (40 CFR §1502.21A), the documents cited specifically in your comment are briefly described in Section 2.8.1, and their relationship to the Ground Water Program and PEIS indicated. These documents are available from the DOE Environmental Restoration Division in Albuquerque. In addition, applicable tribal and state governments have received copies of these reports and representatives of tribes and states participated in developing the Technical Approach to Ground Water Restoration (DOE, 1994e) document during ground water technical working group meetings from 1992 to 1994.

Comment 420. One of the important contaminant pathways that can threaten human health on the Navajo Nation is via animal consumption. This threat is ignored in the discussion of human health risk assessment in Section 2 and in the discussion of environmental impact on human health in Section 4. This is not a matter that should be relegated to coverage in some later site specific documents. The threat to human health via animal consumption probably extends to many of the 24 sites covered by the Draft PEIS. (Navajo Nation - 3.)

Response: The potential human exposure pathway via consumption of meat or milk from livestock that have consumed the affected ground water is evaluated in the UMTRA Project risk assessments, if this pathway is likely to be completed.

Human exposure pathways typically evaluated in the UMTRA Project risk assessments include, but are not limited to, the following:

- Drinking water ingestion.
- Dermal contact with ground water while bathing.
- Consumption of garden produce irrigated with ground water.
- Consumption of meat and milk from livestock that have consumed ground water.

The above information appears in Section B2.5 (Exposure Assessment) of the revised Appendix B of the PEIS.

Comment 421. DOE's reliance on natural flushing as a remedy seems to assume that there is no other beneficial use for water other than to use it as a flushing medium. Water is becoming increasingly sought after to meet the growing needs on the Navajo Nation, for a domestic water supply, for stock water, for commercial use (e.g., laundries) and for industrial use (e.g., cooling water, water to inject into oil producing formations, water to make steam for injection or for food and other processing, etc.) For some commercial and industrial uses, it does not matter that the water is of poor quality; impurities can be reduced or removed. The water itself has significant value, which can only increase as demand increases in the future. If this sort of value was evaluated, the attraction of natural flushing would diminish.

It is a matter of concern of the Navajo Nation that present approvals and/or acquiescence by the Navajo Nation to DOE flushing plans may later be deemed to be dedications of water to the flushing usage for as long as 100 years. Such a prior water-use right could act to hamstring development on the Navajo Nation 20, 50 or 80 years from now. In such circumstances, it would be far better to deal with contaminants presently with a low-water-use alternative and preserve the scarce water resource for more beneficial future usages. (Navajo Nation - 4.)

Response: DOE is aware of the value of ground water and its potential uses. In presenting natural flushing as a possible ground water compliance strategy, it is not intended to disregard any beneficial uses of ground water. The natural flushing compliance strategy does not diminish the amount of ground water within an aquifer. Rather, the natural flow of ground water from upgradient of the site is allowed to flow through the site subsurface to produce the natural flushing process. Under this scenario, water resources will increase in value as the contaminant concentrations decrease. It should also be emphasized that, according to EPA standards, before natural flushing can be implemented, ground water must not currently be, or be projected to become, a public water supply system during the period of the natural flushing (Section 1.4.1).

Comment 422. Another characteristic of uranium mill tailings that should have been addressed more thoroughly is the widespread soil contamination above the water table at the location of the tailings piles. This oversight is probably the result of the separation of the DOE responsibilities into a Surface Project and a Ground Water Project. Neither Project focuses adequately on the problem soils that exist below the surface and above the ground water.

These sites are very different from the typical urban ground water contamination sites where, for instance, a leaky underground storage tank might contaminate soil over a small area. At the mill tailings sites, the soil is contaminated over tens of acres and through unsaturated zone depths of 10 to over 60 feet.

This widespread residual soil contamination will not be addressed by the groundwater remediation program. Seepage through this soil will act as a continuous source of contamination to groundwater (particularly at sites like Tuba City where active seepage from the consolidating, restructured tailings piles is clearly taking place). Without eliminating this source of contamination, any groundwater clean-up will be prolonged and ineffectual.

The Draft PEIS makes only a minimal reference to the problem and remedial techniques for contaminated soil, with the exception of isolation, are virtually not discussed. This is a serious matter which needs attention. (Navajo Nation - 5.)

Response: Contaminated soils that resulted from the tailings seepage and former uranium milling activities have been addressed under the UMTRA Surface Project. The Ground Water Project will also evaluate the potential for contaminated soils to act as a continued source term to the uppermost aquifer. Should a continued source term be identified, the Ground Water Project will take action to mitigate the impact.

Comment 423. Another missing evaluation relates to the geochemistry of contaminants specific to mill tailings sites. These toxic items (uranium, nitrate, sulfate and various metals) are treated in a very cursory and sometimes misleading manner. In order to understand the processes affecting the migration of these contaminants, their susceptibility to natural flushing or pump and treat remediation, or how they could be treated chemically or biologically in situ, it is necessary to have at least a basic understanding of the geochemistry involved so that informed decisions can be made. The Draft PEIS needs to address the geochemistry of the pertinent contaminants to explain the applicable geochemical processes and appropriate remedial approaches. (Navajo Nation - 6.)

Response: Geochemical characterization of ground water and aquifer matrix material is discussed in Section 2.8.1.2 of the PEIS. The PEIS proposes a programmatic approach for ground water compliance to be used for all UMTRA sites. The PEIS is not a decision document for site-specific ground water compliance strategies. The geochemistry of each hazardous constituent and the geochemistry of aquifer matrix material are site-specific, complex, and beyond the scope of this document. Site-specific geochemical information will be obtained through additional site characterization activities and presented in site

observational work plan, baseline risk assessment, and ground water remedial action plan documents, which are site-specific.

Comment 424. In the decision tree, Figure 2.1, there is no recognition that it may be reasonable and appropriate to pursue cleanup of groundwater to levels higher than an established Alternate Concentration Limit, even to the background level. The final EPA regulation, Section III, under Cost, states "Further, once the basic criteria for establishing ACLs set forth in... have been satisfied, if a higher level of protection is reasonably achievable, this should be carried out." Thus, EPA considers ACLs to be a point of departure for determining the appropriate cleanup level. Perhaps this guidance applies to MCLs also. In any event, the decision tree does not recognize this alternative action. It should be so amended. (Navajo Nation - 7.)

Response: The DOE disagrees with this comment because Figure 2.1 does recognize that standards "higher" than alternate concentration limits will likely be used to meet EPA ground water cleanup standards. For example, boxes 10, 11, and 12 mention attaining background concentrations or maximum concentration limits to meet EPA standards. In addition, the text of the PEIS mentions on numerous occasions that the DOE will meet the standards in any of four ways, including meeting background levels or maximum concentration limits.

Comment 425. The risk assessment methodology proposed in the Draft PEIS deviates significantly from the standard EPA approach and the deviation needs to be justified. Specifically, the Draft PEIS approach does not include Reasonable Maximum Exposure (RME) estimates and has no provision for characterizing the non - carcinogenic risks of chemical mixtures (i.e., it does not use the hazard index method).

The is not in conformance with EPA's Final Rule. In Section II of that rule (summary of Background Information), EPA states "UMTRCA requires that the standards established under Title I provide protection that is consistent, to the maximum extent practicable, with the requirements of RCRA". Since risk assessment is a key component in the development of UMTRCA standards, this would imply that UMTRA risk assessment methodology should be consistent with a RCRA approach, such as that presented in the RCRA Facility Investigation Guidance. EPA's final Corrective Action Plan directive provides an additional list of guidance documents to be utilized for human and ecological risk assessment, including Risk Assessment Guidance for Superfund (RAGS, Volumes I and II). It should be noted that these guidance documents support the use of hazard index methodology for human health risk assessment as well as RME - style calculations.

The claim is made that DOE's proposed risk assessment methodology will be easier for decision makers and the public to understand. (ABSTRACT, Human Health Risk Assessment Methodology for the UMTRA Ground Water Project, Nov. 1994). The Navajo Nation submits that the ease of communication is not, in itself, a sufficient reason for deviating from standard and accepted assessment techniques. Secondly, the Navajo Nation is not persuaded that the Monte Carlo simulations included in the Draft PEIS methodology are all that easy to understand. (Navajo Nation - 8.)

Response: The UMTRA Project sites risk assessment methodology follows the basic framework outlined by the EPA for evaluating hazardous waste sites to assess potential health and environmental impacts (EPA, 1989a). This framework is incorporated in the methodology developed to evaluate current human health risk at UMTRA Project sites and to estimate risks from potential future use of contaminated ground water or surface water near the former uranium processing sites. This methodology uses Monte Carlo simulations to assess human health exposure to inorganic contaminants by drinking water ingestion. The Monte Carlo simulations were only used when sufficient data were available. Other potential exposure pathways (such as dermal contact with ground water while bathing, human consumption of meat or garden produce) are evaluated using standard EPA deterministic approaches. Recent EPA investigations indicate that probabilistic and deterministic calculations are consistent. The EPA considers Monte Carlo simulations useful in implementing new risk assessment guidance (Smith, 1994).

Where sufficient data exist, concentration probability distributions are used to describe ground water contaminant concentrations in the plume area. A probability distribution provides a range of concentrations over the exposure period that may reasonably occur in ground water from the most contaminated portion of the site. Therefore, concentration probability distributions represent a reasonable maximum exposure estimate as defined by the EPA in the supplemental risk assessment guidance to Superfund (EPA, 1992).

Where site-specific contaminant characterization is insufficient, standard Superfund reasonable maximum exposure point concentrations are used.

It is our understanding that the toxicity assessment is one of the weakest aspects of the widely used standard EPA risk assessment methodology. The UMTRA Project methodology is designed to strengthen this part of the assessment. In the standard method, the noncarcinogenic evaluation results in the calculation of a hazard quotient, which is the ratio of estimated intake into the reference dose or acceptable intake. This quotient is of limited use because, when the ratio exceeds 1, the quotient conveys no information regarding the type or severity of potential adverse effects. Consequently, the hazard quotient/index approach provides numbers that have little meaning to the public and to decision makers.

Potential interactions between components of site-specific chemical mixtures are addressed qualitatively, as discussed in Sections B2.4, B2.6, and B2.7 of the revised Appendix B of the PEIS.

Comment 426. The document is not well organized and is difficult to read and understand. Regarding organization, figures in Section 4 are referred to in Section 2 and there is considerable referencing of text from section to section and to outside references. As to readability and comprehensibility, the draft PEIS uses terms such as "passive remediation" which nonetheless includes an action such as the imposition of institutional controls. Also, it defines "no remediation" as one of the elements of "passive remediation" (e.g., in Section 2.4). Some thought should be devoted to making these terms mean what they say. Also, general location maps for the individual sites would be extremely helpful for the reader in evaluating this document. (Navajo Nation - 9.)

Response: Comments received on the draft PEIS have resulted in some clarifications and inclusion of additional detail as appropriate. The entire PEIS has been revised and edited to ensure that it is clear, readable, and technically correct. The organization of the PEIS reflects the recommended format in the regulations, implementing the National Environmental Policy Act of 1969 (40 CFR §1502.10). This act encourages use of references to incorporate information (40 CFR Part 1504 and §1502.21). The PEIS uses the term "passive remediation" to differentiate this alternative from the National Environmental Policy Act-required "no action" alternative; this alternative recognizes that the passive remediation could include actions undertaken at the sites, such as the implementation of institutional controls. "No remediation" is a strategy that is included in the passive remediation alternative and the proposed action. The definitions of alternatives and strategies has been reviewed and clarified. Inclusion of general maps was considered in preparing the draft PEIS; however, it was decided that, because the PEIS did not focus on site-specific issues and site location maps did not add information that would aid in evaluating the programmatic issues, including site maps would unduly emphasize the specific UMTRA Project sites.

Comment 427. Section 1.2.4 of the Draft Programmatic Environmental Impact Statement For The Uranium Mill Tailings Remedial action Ground Water Project addresses the role of Indian Nations in the Department of Energy's (DOE) Ground Water Project. Section 1.2.4 states that the "involvement of ...Indian tribes in the UMTRA [Ground Water] Project is defined through individual cooperative agreements."

The Navajo Nation disagrees with the DOE's statement that the Navajo Nation's involvement in the UMTRA Ground Water Project is defined by the Cooperative Agreement entered into by the Navajo Nation and the DOE. In limiting the Navajo Nation's involvement in the UMTRA Ground Water Project to the terms and conditions of the cooperative agreement entered into between the Navajo Nation and the DOE, the DOE is failing to take into account the following: (Navajo Nation - Legal Concerns on the Draft PEIS)

Response: The cooperative agreement between the DOE and the Navajo Nation, combined with the "consultative" role of Indian tribes as described in Section 108 of the UMTRCA (42 USC §7918) form the basis of DOE's relationship with the Navajo Nation in the UMTRA Program.

Comment 428. The Federal Government, and the DOE as a department within the Federal Government, has a Trust Responsibility to Indian Nations. (Navajo Nation - 1. Legal Concerns on the Draft PEIS)

The Federal Government's Trust Responsibility to Indian nations arises from Indian treaties, Federal Statutes, Executive Orders, legal decisions, and the historical relations between the United States and Indian Nations. In a broad sense, the Trust Responsibility derives from the United States' unique legal and political relationship with Indian Nations. In a narrow sense, the trust responsibility defines the precise legal obligations owed to Indian Nations by the Federal Government in managing the property and resources of Indian Nations. The Trust Responsibility imposes on the Federal Government, and the DOE as a department within the Federal Government, the duty to remain loyal to, and advance the interests of, Indian Nations, F. Cohen, Handbook of Federal Indian Law, p. 227, (1982ed.).

Response: The DOE recognizes that, as a federal agency, it has a fiduciary duty to act in the best interests of the Navajo Nation under the United States' trust responsibility with Indian nations, as acknowledged in DOE's American Indian Policy.

Comment 429. The Federal Government, and the DOE as a department within the Federal Government, owes a Fiduciary Duty to Indian Nations.

The Trust Responsibility imposes on the Federal Government a Fiduciary Duty of the most exacting standards when dealing with Indian nations and peoples. The United States Supreme Court has determined that the Federal Government, pursuant to its Fiduciary Duty, owes to Indian nations "moral obligations of the highest responsibility and trust," Seminole Nation v. United States, 316 U.S. 286, 287, (1942), and is "bound by every

moral and equitable consideration to discharge its Trust Responsibility with good faith and fairness," United States v. Payne, 264 U.S. 446, 448 (1924). (Navajo Nation - 2. Legal Concerns on the Draft PEIS)

Response: The cooperative agreement between the DOE and the Navajo Nation, combined with the "consultative" role of Indian tribes as described in Section 108 of the UMTRCA (42 USC §7918) form the basis of DOE's relationship with the Navajo Nation in the UMTRA Program. However, the DOE recognizes that, as a federal agency, it has a fiduciary duty to act in the best interests of the Navajo Nation under the United States' trust responsibility with Indian nations, as acknowledged in DOE's American Indian Policy.

Comment 430. President Clinton's Pronouncement of Government - to - Government Relations with Indian Nations.

On April 29, 1994, President Clinton reaffirmed the United States' unique relationship with Indian Nations and issued a memorandum to all executive departments and agencies of the Federal Government titled Government - to - Government Relations with Native American Tribal Governments. This document requires that in all activities relating to the resources and rights of Indian nations, the Executive Branch of the Federal Government must:

A. Operate within a Government - to - Government relationship with Indian nations.
B. Consult, to the greatest extent practicable and permitted by law, with Tribal Governments before taking actions that affect Indian Nations.
C. Assess the impact of agency activities on Tribal trust resources and assure that Tribal interests are considered before the activities are undertaken.
D. Remove all procedural impediments to working directly with Tribal Governments on activities that affect trust property or governmental rights of Indian Nations.
E. Work cooperatively with other Federal Agencies to accomplish these goals established by the President of the United States. (Navajo Nation - 3. Legal Concerns on the Draft PEIS)

Response: The DOE acknowledges Presidents Clinton's memorandum on April 29, 1994, entitled *Government to Government Relations with Native American Tribal Governments*, and will operate within the spirit of the memorandum goals to the fullest extent possible.

Comment 431. Secretary of the Interior Babbitt's Order regarding Department of the Interior Responsibilities for Indian Trust Resources.

Secretary of the Interior Babbitt, on November 8, 1993, issued Secretarial Order No. 3175 titled Departmental Responsibilities for Indian Trust Resources. This Order requires that whenever an action is taken by the Department of the Interior that affects Indian trust resources:

A. All anticipated effects on Indian trust resources must be explicitly addressed in the planning, decision and operational documents that are prepared for a project.

B. All actions taken by the Department of the Interior must be consistent with the Trust Responsibility owed to Indian Nations.
C. Bureaus and offices of the Department of the Interior are required to consult with the Indian Nation with jurisdiction over the resources that the proposed action by the Department of the Interior may effect.
D. All consultations with Indian Nations are to be open and candid so that Indian Nations may evaluate for themselves the potential impact the proposed Department of the Interior actions may have on their resources. (Navajo Nation - 4. Legal Concerns on the Draft PEIS)

Response: The DOE recognizes that, as a federal agency, it has fiduciary duty to act in the best interests of the Navajo Nation under the United States' trust responsibility with Indian nations, as acknowledged in the DOE's American Indian Policy.

Comment 432. The DOE's American Indian Policy.

The DOE's American Indian Policy outlines the principals to be followed by The DOE in its interactions with federally recognized Indian Nations. Included within these principals are the following:

A. The DOE recognizes Tribal Governments as sovereign entities with primary authority and responsibility for Indian country. In keeping with the principle of American Indian self - government, the Department will view Tribal Governments as the appropriate non - Federal parties for making decisions affecting Indian country, its energy resources and environments, and the health and welfare of its populace. The DOE will recognize the right of each Tribe to set its own priorities and goals in developing and managing its energy resources.
B. In keeping with the trust relationship, the DOE will consult with Tribal governments regarding the impact of DOE activities on the energy, environment and natural resources of Indian Tribes when carrying out its responsibilities.
C. The DOE will take a proactive approach to solicit input from Tribal governments on departmental policies and issues. The Department will encourage Tribal Governments and their members to participate fully in the national and regional dialogues concerning departmental programs and issues.
D. DOE recognizes that there may be regulatory, statutory and/or procedural impediments which limit or restrict DOE's ability to work effectively and consistently with Tribes. In keeping with this policy, the DOE will seek to remove any such impediments. Additionally, the DOE will, to the maximum extent permitted by law, apply existing statutory, regulatory and procedural requirements in a manner that furthers the goals of this policy.
E. DOE will seek and promote cooperation with other agencies that have related responsibilities. In many areas of concern to DOE, cooperation and mutual consideration among neighboring governments (Federal, State, Tribal and Local) is essential. Accordingly, the DOE will encourage early communication and cooperation among all governmental parties.

In conclusion, the Navajo nation finds the Draft Programmatic Environmental Impact Statement For The Uranium Mill Tailings Remedial Action Ground Water Project inadequate due to its failure to recognize the Federal Trust Responsibility to Indian Nations, the fiduciary duty owed by the Federal Government to Indian Nations, President Clinton's Pronouncement to work with Indian Nations on a Government - to - Government basis, Secretary Babbitt's Order, and the DOE's American Indian Policy.

The Federal Trust Responsibility to Indian Nations, the Fiduciary Duty owed by the Federal Government to Indian nations, President Clinton's Pronouncement, Secretary Babbitt's Order, and the DOE's American Indian Policy operate separately and independent of the cooperative agreement entered into between the Navajo Nation and the DOE. In light of the Federal Trust Responsibility to Indian Nations, the Fiduciary Duty owed by the Federal Government to Indian Nations, President Clinton's Pronouncement, Secretary Babbitt's Order, and the DOE's American Indian Policy, the cooperative agreement entered into between the Navajo Nation and the DOE does not and can not define the Navajo Nation's involvement in the UMTRA Ground Water Project.

The Navajo Nation requests that the DOE specifically acknowledge, and integrate into all decision making, the Federal Government's Trust Responsibility to Indian nations, the Fiduciary Duty owed by the Federal Government to Indian Nations, the DOE's commitment to work with Indian nations on a Government - to - Government basis and abide by President Clinton's Pronouncement, Secretary Babbitt's Order, and the DOE's American Indian Policy when addressing the Uranium Mill Tailings Remedial Action Ground Water Project on the Navajo Nation. (Navajo Nation - 5. Legal Concerns on the Draft PEIS)

Response: The UMTRCA specifies a primary role for federal rather than state or tribal agencies. The DOE recognizes that, as a federal agency, it has a fiduciary duty to act in the best interests of the Navajo Nation under the United States' trust responsibility with Indian nations, as acknowledged in the DOE's American Indian Policy.

Comment 433. SUM - 3; Table 1. The distinction between strategies is vague. No groundwater remediation at sites meeting maximum concentration limits is a "no action" strategy. There is no action regardless of whether or not the site characterization activities are performed. Characterization is not remediation and so there is "no action". (Navajo Nation - Specific Comment - 1.)

Response: No action, as described in the PEIS, is an alternative the DOE is required to assess. Under this alternative, the Ground Water Project would end and site characterization, remediation, and monitoring would not take place. The distinction between these alternatives has been further defined in the PEIS in the second paragraph of Section 2.4.

Comment 434. SUM - 4; First Full Paragraph. The "step - by - step" approach described here considers the no remediation strategy first. However, Table 1 (on page SUM - 3) addresses the active remediation strategy first. This is inconsistent and misleading as to what is considered to be the most important strategy. (Navajo Nation - Specific Comment - 2.)

Response: The information in this section is a summary of the text of the PEIS and the strategies are discussed in the order they are discussed in the text. No strategy is considered more important than another strategy. The choice of a site-specific ground water compliance strategy would be based on the characteristics at the site, the potential risks at the site, and input from the public and affected tribes and states.

Comment 435. SUM - 4; Last Paragraph. Why is no remediation considered as part of the passive remediation compliance alternative? (Navajo Nation - Specific Comment - 3.)

Response: Under the passive remediation alternative, no active ground water remediation would take place. However, strategies that do not involve active ground water cleanup could be used. These include both the natural flushing and the no remediation strategies.

Comment 436. SUM - 5; Fourth Paragraph. The paragraph reads "All of the alternatives except the no action alternative involve the implementation of one or more of three strategies." This is misleading. Of the three strategies discussed, only one can be implemented, i.e., active remediation. Neither natural flushing nor the no ground water remediation strategy can be implemented; these seem to fall under the "no action" strategy. (Navajo Nation - Specific Comment - 4.)

Response: The PEIS considers ground water compliance strategies and alternatives. The strategies are ways to meet EPA standards; they consist of active ground water remediation, natural flushing, and no remediation. No remediation would take place at sites that have no ground water contamination above EPA standards or at sites that qualify for alternate concentration limits or supplemental standards. Although there would be no active ground water cleanup if the natural flushing or no remediation ground water compliance strategies are used at a given site, activities such as site characterization and

monitoring would take place. Therefore, the use or implementation of all these strategies involves activities on the ground at the sites as well as the completion of reports and applications. As described in Section 2.0 of the PEIS, all or some of these ground water compliance strategies are available for use under the proposed action, active remediation to background levels, and passive remediation alternatives. However, as described below, these strategies are not available for use under the no action alternative.

The comment refers to the "no action strategy." No action is actually an alternative and if it were implemented, the Ground Water Project would come to an end and there would be no site characterization, ground water cleanup, or monitoring. In other words, under the no action alternative, none of the three ground water compliance strategies as described above would be available for use. Therefore, the natural flushing and no remediation strategies as used in the PEIS are not the same as no action as used in the PEIS.

Comment 437. SUM - 5; Impacts Assessment. The use of "+/ - " to assess impacts is confusing. The "+" means high potential for a negative impact. This is confusing to the lay person. It would be better to express the impacts as high, medium and low. (Navajo Nation - Specific Comment - 5.)

Response: Tables 3 and 4.5 and associated text have been revised. The "+," "-," and "0" notations used to indicate the relative severity of impacts among alternatives were replaced with "high," "medium," and "low," as suggested.

Comment 438. SUM - 9; Table 4. The ranking is confusing. The title of the table should clearly state that this is a comparison of negative environmental consequences. In addition, it is confusing to have economic benefits ranked, in reverse, in the same table. (Navajo Nation - Specific Comment - 6.)

Response: The title was changed in Tables 3 and 4.5 as suggested and social and economic resources impacts are summarized in terms of potential negative impacts rather than positive impacts.

Comment 439. 1 - 2; Third and Fourth Paragraphs. The Draft PEIS states that "This document analyzes potential impacts of the alternatives, including the proposed action, which is DOE's preferred alternative." This statement is unclear, and tends to overstate the information provided in the Draft PEIS. That is, the potential impacts of the alternatives cannot be property addressed without completion of site characterization, monitoring, and the baseline health risk assessment for each UMTRA site. At this phase of the evaluation process, the exact "action" required is still undecided. (Navajo Nation - Specific Comment - 7.)

Response: It is agreed that the determination of the actual impacts that occur at a site during ground water remediation cannot be determined until site characterization and risk assessment have been completed and a ground water compliance strategy proposed. That is why the PEIS provides only an analysis of potential impacts of the ground water

strategies. In addition, the comparison of alternatives is limited to comparing potential impacts of the alternatives relative to the other alternatives (see Section 4.4 for more on the methodology used to compare alternatives).

Comment 440. 1 - 7; Section 1.2.4. First Sentence. Please revise the first sentence to read, "The UMTRA requires that the states *and tribes* participate fully....." This section states the "Indian tribes are not responsible for paying any of the remedial action costs." Yet Section 1.4.1. states the "Indian tribes...will take the lead role in implementing and enforcing the institutional controls." The Navajo Nation's resources are not sufficient to erect fences, devote time to guarding structure, or conduct monitoring of sites. Since administrative controls are a part of the remedial action, and DOE is required to fund such activities on Indian lands, then DOE should fund administrative controls. (Navajo Nation - Specific Comment - 8.)

Response: Section 108(a)(1) of the UMTRCA (42 USC §7918(a)(1)) specifies the roles of the respective parties in the selection and performance of remedial action:

> The State shall **participate fully** in the selection and performance of remedial action for which it pays part of the cost. Such remedial action shall be selected and performed with the **concurrence** of the [U.S. Nuclear Regulatory] Commission and in **consultation**, as appropriate, with the Indian tribe and the Secretary of the Interior **[emphasis added]**.

The DOE will work with the appropriate governmental entities towards identifying and implementing appropriate institutional controls.

Comment 441. 1 - 8; First Full Paragraph, lines 7 - 9. This statement may not be true because the Surface Project does not appear to be in compliance at the Tuba City site. After moving and stabilizing the tailings in the "engineered disposal cell" (which is not underlain with a liner), the tailings are undergoing transient drainage which is predicted to last approximately 120 years as the tailings consolidate under their own weight. This is adding additional contaminated water to the aquifer. Section IV.A of the Final Rule (EPA, January, 11, 1995) states that, it there is excess moisture in the tailings, "it will normally be necessary to use a liner or equivalent to assure that groundwater will not be contaminated while the moisture level in the tailings adjusts to its long - term equilibrium value." The tailings will continue to contaminate the groundwater at this site for a long period of time because of the way they were disposed of and will postpone any final solution of the groundwater contamination problems far into the future. (Navajo Nation - Specific Comment - 9.)

Response: It is expected that only a fraction of the moisture in the tailings will eventually move downward into the ground water. This process is known as transient drainage. However, the flow rate from transient drainage decays exponentially, with the bulk of the flow occurring relatively quickly (DOE, 1995a). The volume of water that will enter the ground water system as transient drainage will be only a very small percentage of the total volume of contaminated ground water.

Fieldwork under the Surface Project has started at the Tuba City site to install extraction wells that will be used to remove contaminated transient drainage moving away from the cell.

Comment 442. 1 - 10; Section 1.4. There is no mention of the role of tribal laws and regulations in the UMTRA ground water project process. While the involvement of the tribes in the UMTRA Project through Cooperative Agreements is noted in Section 1.2.4, this does not include any discussion of tribal jurisdiction over certain activities which DOE might undertake at UMTRA sites. This section should include a statement that DOE's activities at the UMTRA sites located on tribal lands are also subject to tribal laws and regulation by tribal agencies. (Navajo Nation - Specific Comment - 10.)

Response: The following information is provided in Section 1.4.6 of the PEIS. DOE shall follow all applicable tribal laws and regulations in performing ground water compliance activities on Indian lands. In the event of conflicting applications of federal, state, and tribal law, the subject activity will be carried out pursuant to the following order of priority in application: 1) federal, 2) tribal, and 3) state.

Decisions regarding consistency with applicable tribal and state laws and regulations will be made by DOE in consultation with the tribes and states. These decisions will consider cases where an approved wellhead protection area, under the Safe Drinking Water Act, is associated with the site. A wellhead protection area is an area of land where there are restrictions on development so as to protect ground water supplies used for drinking water or other beneficial uses. DOE must comply with the provisions of that program, unless an exemption is granted by the President of the United States through the EPA. Contamination on the site that is not covered by UMTRCA (because it is not related to the processing operation) is not the responsibility of DOE, but may be covered by other federal, tribal, or state programs. A discussion of this issue is presented in the EPA standards (60 FR 2854, 2856) and is in an appendix to the PEIS.

Comment 443. 1 - 10; Section 1.4.1. How will ACLs be established for constituents like SO4, TDS, Cl, Fe, NH4 and pH? What standards will NRC use to determine that human health and the environment will not be adversely affected? (Navajo Nation - Specific Comment - 11.)

Response: The U.S. Nuclear Regulatory Commission has not yet provided the DOE with the guidance to apply for alternate concentration limits. The U.S. Nuclear Regulatory Commission released a draft final staff technical position on alternative concentration limits for Title II uranium mills, in February 1994, but has not yet provided the DOE with guidance for Title I sites. The DOE cannot speculate about what the U.S. Nuclear Regulatory Commission will require for an alternate concentration limit application. Further guidance will be provided to the tribes and states as it becomes available.

Comment 444. 1 - 11; Last Full Sub - Paragraph, lines 3 - 7 from the bottom. In the list of potential contaminants of concern, only inorganic chemical constituents are shown.

Organic solvents were used as part of the extraction process at some of the processing sites but do not appear to have been analyzed in the ground water samples. Since the geochemistry of organic contaminants can vary greatly from that of inorganics and because organics are often toxic at very low concentrations, their presence needs to be determined before a remediation plan can be established and before a risk assessment can be performed. (Navajo Nation - Specific Comment - 12.)

Response: The DOE is currently sampling for organic contaminants. This evaluation will take place at sites with a history of organic chemical use.

Comment 445. 1 - 11; Last Sub - Paragraph (and first three lines on 1 - 12). An addition needs to be made indicating that in the development of alternative concentration limits "that human health and the environment would not be adversely affected" <u>if the remediated water is used as a drinking water supply.</u> This language is in the regulations (EPA), 1995) but was omitted here. (Navajo Nation - Specific Comment - 13.)

Response: The development of alternate concentration limits requires the consideration of over 20 criteria described in 40 CFR §192.02(c)(3)(ii)(B)(1)(i-x) and §(2)(i-x). The preamble provides other guidance, including that in cases where the ground water is not classified as limited use, any alternate concentration limit should be determined under the assumption that ground water may be used for drinking purposes.

The DOE did not want to single out any specific criteria for the PEIS summary of the regulations. The DOE intends to evaluate whether the application of alternate concentration limits would adversely affect human health or the environment regardless of whether or not the water is used, or intended to be used, as a drinking water supply. In addition, the effects of drinking remediated water will be addressed in subsequent site-specific analyses.

Comment 446. 1 - 12; First Full Paragraph, Last Statement. How will "quantity of water" be determined? (Navajo Nation - Specific Comment - 14.)

Response: The quantity of water that can be produced by an aquifer per day will be determined during the site characterization phase of the Ground Water Project. Aquifer tests, mathematical modeling, and other methods will be used to determine the yield of aquifers.

Comment 447. 1 - 12; First Bullet. Before the natural flushing alternative is selected, DOE should consider the volume and concentration of tailings covered. The concentration amounts would affect the loading rate (producing leachate) as time progresses. The concentration could also be affected by other factors such as seasonal, recharge, and the decline in source strength. In light of these factors, how will DOE determine the short - long term rates regarding whether the 100 years clean - up period can be obtained? (Navajo Nation - Specific Comment - 15.)

Response: DOE understands that the effects of transient drainage must be considered if natural flushing is evaluated as a potential ground water compliance strategy at the Tuba City site. There are many site-specific factors which must be evaluated in order to establish a ground water compliance strategy at any given site. Future site-specific characterization activities to determine the feasibility of natural flushing will be presented in site observational work plan and remedial action plan documents. The short- and long-term rate of cleanup using natural flushing will be determined through modeling and monitoring.

Comment 448. 1 - 12; Third Bullet. Does public drinking water also include livestock and agriculture uses? "Public drinking water" is not defined in the Glossary. (Navajo Nation - Specific Comment - 16.)

Response: The text has been clarified to state that the ground water is not currently or is not projected to become a source for a public water system. A public water system is defined in 40 CFR §125.58 as a "system for the provision to the public of piped water for human consumption, if such system has at least fifteen (15) service connections or regularly serves at least twenty-five (25) individuals. This term includes: 1) any collection, treatment, storage, and distribution facilities under the control of the operator of the system and used primarily in connection with the system; and 2) any collection of pretreatment storage facilities not under the control of the operator of the system which are used primarily in connection with the system." The glossary of the PEIS has been revised to include the definition of public water system.

Comment 449. 1 - 13; "Supplemental Standards". The discussion of supplemental standards and limited use ground water does not make clear some important points within the Final Rule (40 CFR Part 192). Supplemental standards, as defined at 60 FR 2861 (third column), may be granted if "Groundwater at the site is of limited use (§192.11(e)) in the absence of contamination from residual radioactive materials..." Limited use is meant to be equivalent to Class III ground water except that "for the purpose of qualifying for supplemental standards, human - induced conditions exclude contributions from residual radioactive materials". This point is not made clear in the document. (Navajo Nation - Specific Comment - 17.)

Response: The section has been rewritten to clarify the criteria for supplemental standards. The new version states that ground water would be evaluated as limited use in the absence of contamination from residual radioactive materials and that widespread, ambient contamination caused by human-induced conditions excludes contributions from residual radioactive materials.

Comment 450. 1 - 13; Second Bullet. If supplemental standards are chosen, based on this point, the reasons must be compelling There will be the possibility that the contaminated groundwater could be the only drinking water source in the future. (Navajo Nation - Specific Comment - 18.)

Response: The DOE agrees.

Comment 451. 1 - 13; Third Bullet. Cost should not be a reason for not cleaning up the ground water to background level, MCLs or ACLs. The potential for a "clear present or future hazard" requires a subjective judgment. Also the phrase, "at a vicinity site" has been left out. The conditions from the Final Rule for 40 CFR 192.21 and 192.22 should be included verbatim to remove any possibility of misinterpretation. (Navajo Nation - Specific Comment - 19.)

Response: Cost is not the primary factor that DOE considers with regard to ground water compliance. Meeting the standards and protecting human health are the primary factors considered when developing site-specific ground water compliance strategies. The descriptions of the conditions for applying supplemental standards have been rewritten to more closely repeat the language of the regulations.

Comment 452. 1 - 13; Sixth Bullet. At what point would ground water be deemed "limited use"? Before milling activities? After milling activities? (Navajo Nation - Specific Comment - 20.)

Response: Limited use refers to background ground water quality unaffected by milling activities.

Comment 453. 1 - 13; Last Bullet. The significance of this statement is unclear. All the other six conditions listed above would result in the setting of a supplemental standard which is higher than the current regulatory standard. But this statement would appear to require a lower standard if radiation were high. Does this imply a standard lower than the 15 pCi/L gross - alpha standard? or is the statement there to include gross - beta activity, for which no standard is given? Some clarification is needed. (Navajo Nation - Specific Comment - 21.)

Response: The statement does not include gross-beta activity. Since no beta progeny have half-lives of more than a few days, it is unlikely that the risks from gross beta would justify application of a supplemental standard. This criteria for the use of supplemental standards would likely not be used on the UMTRA Ground Water Project because it does not apply.

Comment 454. 1 - 14; First Full Paragraph. Implementation of institutional controls as restrictive mechanisms, such as the rightful inhabitants of the land being restricted from their land, is unacceptable to the Navajo Nation under the no action strategy and under the no remediation strategy. (Navajo Nation - Specific Comment - 22.)

Response: The no action alternative (what we assume is meant in the comment by "no action strategy") would not use institutional controls because, under this alternative, there would be no Ground Water Project. The no remediation strategy would require use of institutional controls in certain cases for supplemental standards or alternate concentration limits to protect human health and the environment. However, to be most effective, institutional controls must meet the needs of those affected by them. Therefore, the DOE

will not propose any institutional controls until it has conversed with all affected stakeholders concerning the appropriateness, effectiveness, and administration of the institutional controls.

Comment 455. 1-19; Next to Last Paragraph. It is not clear what the Record of decision ("ROD") applies to. Does The ROD only apply to the programmatic approach (most likely to the Proposed Action)? Will there be individual RODs for each of the sites on what specific actions will be taken there? Issuing of the ROD is a very important step in the regulatory process: prior to the ROD there is a lot of opportunity for public input, while after the ROD public input is more difficult. (Navajo Nation - Specific Comment - 23.)

Response: The text has been clarified and now states that the Record of Decision will announce the decision DOE has made regarding how to programmatically conduct the Ground Water Project. National Environmental Policy Act documentation will be prepared for all site-specific decisions; however, only site-specific environmental impact statements would result in a Record of Decision.

The DOE intends to solicit public comment on all site-specific compliance decisions regardless of what National Environmental Policy Act documentation is prepared.

Comment 456. 2 - ; "Alternatives". The four alternatives listed in the Draft PEIS are really only reflective of three alternatives. That is, 1) No Action, and 2) Remediation - Active, and 3) Remediation - Passive. The additional alternative considers remediation to background levels of the constituents of concern in ground water, however, this is truly an element of alternative 2) above. It may be more time - and cost - effective to group active remediation to ANY level, i.e., background, maximum Concentration Limits (MCLs), or Alternate Concentration Limits (ACLs) as a single alternative. (Navajo Nation - Specific Comment - 24.)

Response: The suggestion is to have an alternative that would use active ground water remediation to background, maximum concentration limits, or alternate concentration limits rather than the active remediation to background levels alternative that currently exists in the PEIS. DOE's rationale for proposing the active remediation to background levels alternative is that uranium processing at UMTRA Project sites resulted in the contamination of ground water which, in most cases, was not contaminated before uranium ore processing began. Furthermore, this ground water needs to be cleaned up to preoperational levels and not to standards set by the EPA. The DOE believes the rational for including the active remediation to background levels alternative in the PEIS is valid and the alternative was left in the PEIS.

The Navajo Nation suggestion is to use active remediation to meet background, maximum concentration limits, or alternate concentration limits are options that are currently available under the proposed action. The proposed action has the flexibility to rely on active ground water remediation to meet EPA standards as well as use passive ground water compliance strategies such as natural flushing or no remediation.

Comment 457. 2 - 2; Last Paragraph. In reference to supplemental standards, a description of the application of supplemental standards is discussed in Section 1.4.1 but a description of how elevated the standards can be above the background, MCL or ACL is missing. This matter needs to be addressed. Also, the paragraph is confusing; a rewrite is indicated. (Navajo Nation - Specific Comment - 25.)

Response: The following information has been added to the paragraph. "The use of supplemental standards will be determined on a site-by-site basis and the DOE will abide by the EPA ground water standards when proposing the use of supplemental standards. All proposed supplemental standards would require U.S. Nuclear Regulatory Commission concurrence."

Comment 458. 2 - 2; Figure 2.1. The decision tree is obviously cost - based, and is designed to avoid active remediation where possible. It also is in contradiction with the Final Rule, which requires that supplemental standards can be used only "after thorough investigation and consideration of all reasonable restoration alternatives" (emphasis added). By introducing the decision point for supplemental standards so early in the decision tree, such thorough investigation and consideration may be bypassed. (Navajo Nation - Specific Comment - 26A.)

Response: The DOE has determined that if ground water compliance strategies that are less disruptive to the environment than active remediation (such as supplemental standards or natural flushing) can be used to meet the standards and be protective of human health and the environment, their use may be warranted. The actual determination of a site-specific ground water compliance strategy is not cost-based; it is based on a process that includes consideration of site characterization data, risk assessments, and consultations with the tribes, states, and public. As this process proceeds and ground water conditions and risks become clear, DOE, in consultation with the stakeholders, will adjust the ground water compliance strategy as necessary. The DOE agrees that the use of supplemental standards will not be proposed until "after thorough investigation and consideration of all reasonable restoration alternatives."

Comment 459. The decision - making methodology as illustrated by Figure 2 - 1 is lacking some critical elements. As described, the methodology lacks a mechanism for critical assessment of compliance strategy effectiveness, and for modifying compliance strategies at a specific site based on monitoring. This is illustrated where the outcome boxes with the various compliance strategies (Boxes 3, 7, 12, 16, and 17) are essentially "dead - ends". This begs the question of what will happen if a particular compliance strategy is chosen and implemented at a site. Will DOE choose not use the data gathered during characterization and monitoring to modify or change compliance strategies? (Navajo Nation - Specific Comment - 26B.)

Response: Once a ground water remediation strategy is put into place, a monitoring program usually is implemented to determine whether the ground water is being cleaned up as predicted and human health and the environment are being protected. During the development of a ground water compliance strategy for a given site, the limitations and

conditions under which the strategy may fail will be determined and presented in the site-specific NEPA document and other Ground Water Project documents. These documents will be made available to the public for review and comment and to ensure that the public is aware of the potential limitations and failures of a specific ground water compliance strategy before it is used. The public will always be kept informed during the ground water cleanup phase, including having access to the ground water monitoring data. If the chosen strategy is shown not to work as planned and not protect human health and the environment, a new ground water compliance strategy may have to be used. The local residents would have be apprised of any problems with the chosen compliance strategy and the DOE would seek input from the public during the development of a new ground water compliance strategy. Figure 2.1 has been changed and now states that the compliance strategy will be reevaluated if conditions change or if monitoring indicates that EPA standards will not be met.

Comment 460. The decision tree should include a decision point between Box 2 and Box 3 in which a risk assessment is carried out to determine the potential health risks of the chemical mixtures present in ground water. (Navajo Nation - Specific Comment - 26C.)

Response: The DOE does not believe that a risk assessment is necessary if the ground water contamination is not present in excess of maximum concentration limits or background levels.

Comment 461. An implication of the flow chart is that the supplemental standards in Box 8 will be greater than the supplemental standards in Box 4. This indicates that Box 9 will yield a NO option since the human health and environmental risks will not change from their Box 4 levels. (Navajo Nation - Specific Comment - 26D.)

Response: The commentor is correct in that if ground water qualifies for limited use supplemental standards (yes for box 4) but is not protective of human health and the environment (no for box 5), then supplemental standards based on excessive environmental harm (yes for box 8) will also not apply because box 9 will likely be no. However, the ground water may not qualify for supplemental standards based on limited use (no for box 4), but may qualify based on excessive environmental harm (yes for box 8) and be protective of human health and the environment (yes for box 9). Supplemental standards based on limited use and excessive environmental harm cannot be compared because they are two distinct criteria. Therefore, supplemental standards for one criterion cannot be greater than the other criterion.

Comment 462. In Boxes 10 - 14, the remediation alternative is conditioned on whether institutional controls can be established and effected. The Navajo Nation cannot say that tribal administrative and judicial controls can be extended and be maintained in full force for 100 years. The Navajo Nation must have some guarantee that if natural flushing is truly an alternative to be considered, then proper institutional controls will be maintained and funded by the DOE. (Navajo Nation - Specific Comment - 26E.)

Response: The DOE will not propose any institutional controls until it has conversed with all affected stakeholders concerning the appropriateness, effectiveness, and administration of the institutional controls. The DOE will address the administration of institutional controls, including the maintenance and funding, in the site-specific NEPA document.

Comment 463. In Boxes 10, 13, 15, "attain" does not appear to be properly used. The descriptions do not clearly indicate a distinction when MCLs are exceeded. (Navajo Nation - Specific Comment - 26F.)

Response: The word "attain" was replaced with "result in compliance with."

Comment 464. 2 - 5; Section 2.3, First Sentence. Restoring to background levels or to "levels as close to background as possible" should be defined perhaps via parameter values. (Navajo Nation - Specific Comment - 27.)

Response: The restoration of ground water to background levels is limited by the technologies available, and in some cases it is impossible. If complete restoration would not be possible, the DOE would attempt to reduce the levels of contamination to as near background as possible.

Given the number of variables at each site, including quantities and types of contaminants, local geohydrology, and the ability of available technologies to clean up the ground water, it is not possible to set programmatic parameters to this alternative.

Comment 465. 2 - 5; Second Paragraph. The basis for stating that the "...no action alternative would not comply with the EPA ground water standards at the UMTRA Project processing sites, ..." is not provided. If the no action alternative is applied to a few sites where contamination"... does not exceed background levels or MCLs or where supplemental standards... would apply", it may also be applied if the results of the baseline health risk assessment indicate that the residual contamination in ground water at ACLs does not pose a significant impact to human health or the environment. This alternative should not be eliminated from further consideration until the results of site characterization, monitoring, or the baseline risk assessments are completed for <u>each</u> of the 24 sites. (Navajo Nation - Specific Comment - 28.)

Response: The concept of no action as it is used under NEPA can be confusing. If the no action alternative were implemented, there would be no Ground Water Project and, therefore, no additional site characterization, monitoring, or baseline risk assessments. It is acknowledged that under the no action alternative, the one UMTRA Project site with no ground water contamination (Lowman, Idaho) or sites that may qualify for supplemental standards would meet the EPA standards whether or not there is a Ground Water Project. However, at this stage in the Ground Water Project, it is not clear which sites will meet the supplemental standards and this will not be determined until adequate site characterization data have been collected and evaluated. If the no action alternative were implemented, these data would not be collected and the determination of which sites will meet the

supplemental standards would not have been made. Therefore, except for the possible exception of the Lowman, Idaho, site, if no action were implemented, it is not known whether EPA standards would be met at UMTRA Project sites.

The wording of the last paragraph in Section 2.2 under no action has been revised to reflect these data.

Comment 466. 2 - 5; Last Full Paragraph. The language in the second sentence is not clear as to what the "may not be used" means. Does this mean it is forbidden to use active ground water remediation at limited use areas? That could be quite a mistake if the limited use aquifer discharges into a current or potential drinking water supply, i.e., Tuba City. The limited use aquifer may need to be cleaned up with active remediation to prevent the spread of contamination. Would there be a need for long term monitoring to document that water quality remains at background levels? What happens to the site if ground water quality deteriorates after the site is deemed remediated? (Navajo Nation - Specific Comment - 29.)

Response: The term "may not be used" has been replaced with "likely would not be used" to clarify the sentence. The determination regarding the use of monitoring for sites that qualify for supplemental standards based on limited use would be determined on a site by site basis. If monitoring did take place and conditions that were not consistent with limited use ground water were to arise, the DOE may reassess the use of this ground water compliance strategy. However, the probability of the ground water compliance strategy, based on limited use ground water, failing is considered remote because of the poor water quality and the yield conditions that exist in these areas. In addition, if a limited use aquifer is directly connected to a drinking water aquifer the combined aquifer would be classified as a drinking water aquifer. It may be possible that long term monitoring would be needed to document that water quality remains at background levels. This will be decided on a case-by-case basis. If ground quality at a site deteriorates as a result of UMTRA site contamination after the site is deemed remediated DOE would have to take corrective action.

Comment 467. 2 - 5; Last paragraph. This paragraph illustrates an opinionated tendency throughout Section 2.3. It is stated that Active Remediation to background Levels will mean that "a higher level of ground - disturbing activities would occur..." This depends on whether the treatment technology were used in situ or not. Most ground water remediation technologies require little excavation after well construction. Also, the description of floodplains is unclear. Floodplains throughout this country are heavily developed and populated at great expense to the government (e.g., flooding of the Mississippi River in 1994). Additionally, the statement that more ground water treatment, waste sludge and water would be generated under this strategy implies that under the proposed action, less treatment would be required, i.e., it assumes that supplemental standards or ACLs will be acceptable. (Navajo Nation - Specific Comment - 30.)

Response: It is agreed that some ground water remediation methods may not require much ground disturbance activity. However, it is assumed that active ground water remediation

methods will likely result in more ground disturbance than passive methods such as natural flushing or no remediation. As indicated in Table 3.2, 22 of the sites are near surface water bodies and many of the sites are in river floodplains. Although many of the nation's floodplains are heavily developed (including the Colorado River floodplain at the Grand Junction, Colorado, site), most of the UMTRA Project sites are within floodplains in sparsely to very sparsely populated areas. The DOE will make every attempt not to disturb the floodplains at the UMTRA Project sites; however, if the active remediation to background levels alternative were implemented, remedial action activities would take place in the floodplain at some of the sites such as Shiprock, New Mexico, and Slick Rock and Naturita, Colorado. The comparison of alternatives section states that the proposed action would probably generate less waste than the active remediation to background levels alternative because the proposed action could use passive ground water remediation compliance strategies, which would likely result in the production of less waste. The number of sites that would qualify for passive ground water remediation under the proposed action is not known, but this comparison assumes that some of the sites would qualify for these strategies.

Comment 468. 2 - 6 ; First Full Paragraph. Using "risk - based analyses" to determine which strategy to use could be detrimental should long term monitoring indicate the spread of contamination. During this process, would alternative water sources and supplies be provided? (Navajo Nation - Specific Comment - 31.)

Response: Under the passive remediation alternative, most ground water monitoring would take place to determine various ground water plume characteristics, including potential spread. If the plume were determined to threaten drinking water supplies or other uses, the use of an alternate water source, which is an option under this alternative, would be considered.

Comment 469. 2 - 7; Third Full Paragraph. In contrast to the statement on page 2 - 5 about ground disturbances due to active remediation activities, impacts are described here as non - existent or minimal. Of course, well construction will result in greater disturbances than the no - action strategy, but is it significant? Also, the continuing attempt to compare the relative character of strategies is difficult for the reader to sort out. (Navajo Nation - Specific Comment - 32.)

Response: Section 2.5 summarizes the comparison of alternatives that appears in Section 4.4. For this programmatic document, the potential impacts of one alternative are compared to the potential impacts of the other alternative because the actual site-specific impacts are not known. In addition, even though the PEIS predicts that many of the potential short-term impacts will be minor, it is still true that the active remediation to background levels alternative would have more construction and operation-type impacts because of its reliance on active ground water remediation methods.

Comment 470. 2 - 8; Last Paragraph. It is stated that the proposed action is the most cost effective in the long - run. This assumes that there is no litigation resulting from the

use of supplemental standards, alternate concentration standards, appropriation of waste for flushing, and that institutional controls are maintained for 100 years. (Navajo Nation - Specific Comment - 33.)

Response: The cost estimate for the proposed action did not include expenses due to litigation, if any, that may take place. Under the proposed action, the DOE is committed to meeting the EPA standards in a manner that is protective of human health and the environment. In addition, DOE is working closely with the tribes, states, and local residents to resolve issues of concern.

Comment 471. 2 - 9; Section 2.6.3, Second Sentence. If DOE chooses to drill a new well through the contaminated groundwater to an uncontaminated source, cross - contamination could result during drilling or pumping. Tapping into uncontaminated ground water resources must be qualified. (Navajo Nation - Specific Comment - 34.)

Response: To clarify for the reader, Section 2.6 discusses several ground water compliance alternatives that were eliminated from analysis. Section 2.6.3 discusses the alternative of providing clean water at the point of use. This alternative was eliminated because it would not have been in compliance with EPA ground water standards. However in cases where wells would have to be installed through zones of contamination there are standard operating procedures and well construction techniques that DOE employs to prevent cross contamination of aquifers.

Comment 472. 2 - 9; "Provide clean water at the point of use". Eliminating this activity at this point is unreasonable. While it should not be the complete solution to a ground water contamination problem, it is an approach that can be used in conjunction with remedial actions during the period of clean - up. Supplementing the water supply does not mean that DOE would not have to clean up a site. Supplemental water might even be necessary to carry out the favored flushing programs, where the water supply is inadequate to do all the long - term flushing plus provide for other essential uses. (Navajo Nation - Specific Comment - 35.)

Response: The DOE agrees that the treatment of contaminated water at the point of use is an approach that can and will, if necessary, be used under all alternatives except no action. Section 2.6.3 has been expanded and acknowledges that alternate water supplies may be required during the course of the Ground Water Project.

Comment 473. 2 - 10; Section 2.7.1. The risk assessment determines if ground water contamination at the processing sites has the potential to adversely affect public health or the environment. Was true baseline environmental data collected prior to commencing surface remediation projects? Did the surface remediation projects result in impacts to subsurface material during disposal of liquid and radiation wastes? (Navajo Nation - Specific Comment - 36.)

Response: Baseline data were collected in many areas during the UMTRA Surface Project (such as background surface and ground water data and background radiological data). In general, liquid waste was not disposed of in Surface Project disposal cells. In addition, the Surface Project is having a positive long-term impact on subsurface material, including ground water, because the source of contamination was either removed from the site or was disposed of on the site in a cell designed to inhibit infiltration, which will limit the movement of contaminants into the underlying soil and ground water.

Comment 474. 2 - 10; Second Bullet. The statement "Evaluate potential public health and environmental risks at the sites and determine need for an alternative water supply" is used as direction for site prioritization, but is in contradiction to Section 2.6.3. See previous comment. (Navajo Nation - Specific Comment - 37.)

Response: Section 2.6.3 was revised and more detail was given as to why this alternative was not considered further in the PEIS. In addition, it is stated that the use of alternate water supplies is an option available for all alternatives except no action. This revision has eliminated the contradiction identified by the commentor.

Comment 475. 2 - 11; Line 1. This statement needs to be clarified to indicate that only compliance strategies will be evaluated in the Risk assessment. Specific remediation plans should be analyzed in a document similar to the Feasibility Study used at Superfund sites. (Navajo Nation - Specific Comment - 38.)

Response: The text does not state that the risk assessment will evaluate the strategy, but that the risk assessment will be used on the Ground Water Project to help determine the strategy. Specific remediation plans will be evaluated in the site observational work plan, the site-specific environmental document, and remedial action plan.

Comment 476. 2 - 11; First Paragraph Under Bullets. The first sentence should indicate that the Proposed Action and the Active Remediation to Background Levels alternatives are health and environmental risk - based approaches. (Navajo Nation - Specific Comment - 39.)

Response: Implementation of the active remediation to background levels alternative would result in the formulation of site-specific ground water compliance strategies that would be protective of human health and the environment. However, this alternative is not considered a health and environmental risk-based approach because, as indicated in Section 2.3, the driving force behind this alternative is to clean ground water to background levels no matter what the potential risks are to human health and the environment. Sites that would qualify for no remediation or natural flushing under the proposed action, based in part on human health and environmental risk assessments, would require active ground water remediation under the active remediation to background levels alternative.

Comment 477. 2 - 11; Third Paragraph Under Bullets. The risk assessment should not be completed while there are still major data gaps. For example, the plume needs to be characterized and the presence of toxic organics needs to be clearly determined. The use of the "Baseline Risk Assessment" in the selection of compliance strategies should not occur until after site characterization is completed and the Draft Base Line Risk Assessment is completed. (Navajo Nation - Specific Comment - 40.)

Response: Baseline risk assessments were performed prior to further site characterization to identify immediate threats to public health and the environment, if any, and to identify data gaps that may need to be filled to determine an appropriate site-specific ground water compliance strategy.

Critical data gaps will be resolved in site observational work plans. Upon completion of site characterization as identified in the site observational work plans, a ground water compliance strategy would be proposed in a site-specific environmental document. For these documents, risks will be updated, if necessary, as a result of this additional site-characterization data.

Comment 478. 2 - 11; Last Paragraph, Second Sentence. The example given about ACLs being applied when natural attenuation would reduce contaminants to acceptable concentrations before reaching an exposure point appears to contradict the language of the Final Rule (EPA, 1995) which states that ground water being evaluated should be considered a drinking source (Sec. VI.B). This latter statement is a conservative but reasonable approach in that, once remediation has been completed, a water supply well could be installed in the area of the former plume. It is not possible to predict exposure point locations in the future, and so the exposure point must be assumed to be in the plume area, not along a point some distance away where attenuation could occur along the flowpath. (Navajo Nation - Specific Comment - 41A.)

Response: Section 2.7.1 of the draft (Section 2.7.2 of the Final PEIS) has been rewritten and language about alternate concentration limits and natural attenuation has been removed.

Comment 479. Also, if the risk assessments show that ACLs are not applicable for contaminant characterization, would the background limit be applied as an ACL? Would this be considered as a "supplemental" concentration limit, and would NRC have to concur with this system, process, or procedure? (Navajo Nation - Specific Comment - 41B.)

Response: The EPA standards can be attained by meeting background levels, maximum concentration limits, alternate concentration limits, or supplemental standards. If a risk assessment shows that an alternate concentration limit is not protective of human health and/or the environment, the standards would have to be met by some other means such as meeting background levels or maximum concentration limits. Alternate concentration limits and background are two distinct ways to meet the EPA standards and background cannot be an alternate concentration limit. If supplemental standards or alternate concentration limits are prepared, the NRC's concurrence is required.

Comment 480. 2 - 12; Section 2.7.2, Second Paragraph. Apparently previous ground water data to determine surface water quality will not be used. Does this mean that all historical ground water data will be used only for ecological risk assessment? Some rivers may be hydraulically connected to an unconfined aquifer. If you eliminate previous ground water data, all data related to the unconfined aquifer would not be considered and valuable information would be ignored. (Navajo Nation - Specific Comment - 42.)

Response: The second paragraph of Section 2.7.2 stated, "Existing ground water quality data plus limited surface water data and sediment quality data are used in UMTRA Project ecological risk assessments." Nothing in the text indicated or implied that any ground water data will be excluded from consideration. An expanded discussion of the UMTRA Project ecological risk assessment appears in the revised Appendix B of the PEIS.

Comment 481. 2 - 13; Last Paragraph. Are the referred background levels data taken from local or regional sources where possible, or is the data regional and taken from a reference source? Are comparisons of the data to background made on the basis of statistical analyses, or direct, untreated, numerical comparisons? This information should be stated in this paragraph. (Navajo Nation - Specific Comment - 43.)

Response: Background data are from areas local to the site. Statistical analyses are used for comparison of on-site data to background data. Appendix B, Risk Assessment Methodology, has been revised and includes an expanded discussion regarding the determination of background ground water quality on the UMTRA Project site.

Comment 482. 2 - 13; Last Paragraph, Fifth Sentence. It should not be assumed that "state" is inclusive of "tribes"; therefore, the sentence should read: "When available, state *and tribal* criteria..." The term "tribal" should be added, when appropriate, throughout the paragraph and the rest of the document as well. (Navajo Nation - Specific Comment - 44.)

Response: In the final PEIS the summary of ecological risk assessment methodology has been combined with the human health section (Section 2.7.2). The reference to state criteria in the final PEIS has been removed. However, when the DOE conducts ecological risk assessments on tribal lands, tribal surface water criteria will be used, when available.

Comment 483. 2 - 14; Section 2.7.3. It is unclear whether the criteria used for site prioritization have equal weight in the evaluation process. That is, there is no distinction given to weighting of health risk (population or individual), ecological risk or risk timing.

Due to the unique religious and cultural value of water to the Navajo people, as well as the overwhelming dependence of the Navajo Nation on ground water sources for present and future supplies, ground water restoration at the Navajo sites must remain a high priority for DOE. Any future versions of the priority scoring system must continue to consider the unique values place on ground water by the Navajo Nation. DOE's trust responsibility to the Navajo nation must be considered as DOE prioritizes remediation activity. (Navajo Nation - Specific Comment - 45.)

Response: The prioritization system developed for the UMTRA Ground Water Project is based on the DOE's Environmental Restoration Priority System, which used multiattribute utility analysis to prioritize sites. This system is described in detail elsewhere (DOE, 1991). The site prioritization system did rank and weight the criteria to determine site priorities. Section 2.7.3 of the draft PEIS (Section 2.7.1 in the final PEIS) was revised to provide more detail regarding the Ground Water Project prioritization system. The Ground Water Project prioritization system is to be revised in 1996.

The DOE recognizes the unique value water resources have for Native American peoples. Section 4.0 of the PEIS discussed cultural/traditional resource impacts, including tribal traditional values related to water sources. Section 2.7.1 on site prioritization describes a ranking that was conducted to provide the DOE with a preliminary indication of the site sequence for conducting ground water compliance actions. That prioritization did consider public and policy issues, including Native American cultural issues, and was reviewed by Indian tribes as well as the states. These issues will continue to be considered in future ground water decision-making. In addition, the DOE has taken into consideration its trust responsibility to Native American tribes as it prioritizes remediation activity of the designated processing sites, and will continue to do so.

Comment 484. 2 - 15; Section 2.8. This section on characterization and remediation has almost no discussion of residual soil contamination which most likely will act as a continued source of contaminants to ground water. Seepage from the uranium mill tailings has contaminated the soil from the surface down tens of feet to the water table over areas of tens of acres at the tailing sites. It will greatly prolong the ground water remediation project if these soil contaminants are not dealt with. Methods for characterizing the vertical and lateral extent of deep soil contaminants need to be discussed. Techniques used in remediating or isolating soil contaminants need to be present and evaluated. (Navajo Nation - Specific Comment - 46.)

Response: In Section 2.8.1.2, it states that "the distribution of hazardous constituents . . . would be defined on the site . . . . This information would be used to predict contaminant migration for each site . . . ." Geochemical characterization methods are discussed later in Section 2.8.1.2.

Comment 485. 2 - 15; Section 2.8, Second Sentence. The statement ". . . to obtain data to perform risk assessments to evaluate . . ." implies that new data will be secured. Is it fair to assume that relevant historical data will not be used? If not, then the statement should be written more clear and reflect that relevant historical data will be used. (Navajo Nation - Specific Comment - 47.)

Response: The statement has been reworded as follows: ". . . to obtain additional data which will be used together with historical data in evaluating . . . ."

Comment 486. 2 - 17; First Paragraph. This paragraph describes the use of the observational method to plan and collect site characterization data and devise a remediation

plan, noting the economy of that approach. Under this approach, decisions would be made based on the "most probable conditions" of the site. Such an approach connotes the application of personal judgment about what is most probable at the site. These judgments, informed as they may be, cannot be substituted for or override the conclusions arising from risk assessment procedures that are designed to establish reasonable maximum exposure limits to protect human health and the environment. (Navajo Nation - Specific Comment - 48.)

Response: The observational method is an approach to site characterization. Use of the observational method will not "override" conclusions of risk assessment investigations.

Comment 487. 2 - 17; Last Paragraph. Not included in the brief description of hydrogeologic characterization is a determination of discharge areas including springs, seeps, and subsurface flow. Please cite guidance used. (Navajo Nation - Specific Comment - 49.)

Response: Section 2.8.1.1 states that hydrogeologic characterization would include a determination of ground water recharge and discharge areas that may influence human health and the environment. Furthermore, it states that ground water discharge areas would include surface water bodies and water supply wells. The guidance used is cited in Section 2.8.1.

Comment 488. 2 - 18; Second Full Paragraph from Bottom. Ground water modeling is inadequately defined and explained in this section. There is no description of the likely source from which ground water models(s) may be selected, e.g., *U.S. EPA, Selection Criteria for Mathematical Models Used in Exposure Assessment: Ground Water Models EPA 600/8 - 88/075, May, 1988. U.S. EPA, Superfund exposure Assessment Manual. EPA/540/1 - 88/001, April, 1988.* Additional information is needed to clarify the requirements of using an approved and verified ground water model. (Navajo Nation - Specific Comment - 50.)

Response: There are a variety of models from a variety of sources that may be used to aid in characterization of contaminant movement at UMTRA sites. Descriptions of potential models that may be employed however, are beyond the scope of the PEIS. The PEIS is not a technical guidance document for site characterization. Descriptions of models used for site characterization will be presented in site-specific site observational work plans and ground water remedial action plans.

Comment 489. 2 - 21; Section 2.8.1.2. This section on geochemical characterization needs to be broadened in its scope, particularly with the addition of specifics about geochemistry affecting the fate and transport of contaminants of uranium mill tailings. The text is presently too generic and does not address the specific geochemical processes of concern at these sites. If the PEIS is to serve as a planning guide, then the necessary <u>basic</u> information needs to be presented in the document.

The discussion on the use of background is not clear. There is no description of whether background concentration data are taken from local or regional sources, or if published literature is the source of background information. (Navajo Nation - Specific Comment - 51.)

Response: In Section 2.8.1 of the PEIS, the text is intended to be generic. Discussion of site-specific geochemical processes at UMTRA sites is beyond the scope of the PEIS. The PEIS is not a technical guidance document for site characterization. Site-specific geochemical processes, investigation methodologies, and geochemical data will be presented in site-specific site observational work plans and ground water remedial action plans.

It is stated in the second paragraph of Section 2.8.1.2 under "Ground Water Quality" of the PEIS that background water quality is determined from hydrologically upgradient locations or adjacent areas that have not been affected by uranium processing activities. The determination of background ground water concentrations are largely determined from sampling conducted as part of the Surface and Ground Water Projects.

Comment 490. 2 - 21; Section 2.8.1.2., First Sentence. Not only does the characterization need to address the definition of contaminants related to uranium processing and their interaction with aquifer materials, but also to address both the natural and the impacted pore water geochemistry. (Navajo Nation - Specific Comment - 52.)

Response: The PEIS reflects this consideration. Please refer to the third paragraph of Section 2.8.1.2 under "Ground Water Quality" of the PEIS, that states that the distribution of hazardous constituents in the *unsaturated zone*, ground water, and surface water would be defined on the site and downgradient from the processing sites.

Comment 491. 2 - 21; First Bullet. Determination of the quality of the contaminated and uncontaminated water should not be restricted to just the contaminants of concern but should include all chemical parameters and constituents which affect a contaminant's mobility. These would include parameters such as ionic strength, redox potential, organic carbon content and concentration of ions which form complexes with metals and radionuclides. (Navajo Nation - Specific Comment - 53.)

Response: The third bullet (formerly the first bullet) in paragraph two of Section 2.8.1.2 states that the scope of geochemical characterization would include a determination of the contaminated and uncontaminated ground water quality. To characterize ground water quality, the DOE samples for many parameters other than hazardous constituents.

Comment 492. 2 - 23; First Paragraph, First Sentence. Redox reactions needs to be added to the list of geochemical mechanisms and to Table 2.1. Almost all the contaminants of concern are sensitive to redox conditions (in conjunction with pH). Metals may be sensitive because they themselves have multiple oxidation states or because they form insoluble precipitates with reduced species such as sulfides. Uranium is very sensitive to redox conditions, being generally quite mobile under oxidizing conditions but

essentially immobile under reducing concerns. Nitrates and sulfates, two primary contaminants of concern, can potentially be removed under reducing conditions. The redox chemistry of the contaminants of concern needs to be discussed, with respect to their mobility, their response to natural flushing or to pump and treat remediation, their response to in situ remediation, and their susceptibility to ex situ treatment processes. Shallow water at most of the sites appears to have oxidizing conditions. Use of in situ remediation approaches, such as biological immobilization with sulfur reducing bacteria as is proposed for the Tuba City site, would require altering the redox conditions over a large volume of porous medium. While the process may work well as a laboratory bench scale, is it feasible to create a large scale reducing environment? What happens when remediation is completed and the pore waters revert to oxidizing conditions? The foundation for understanding the basic geochemical processes needs to be laid in this section. Geochemical specifics with respect to possible remediation alternatives should be discussed in the remediation Section (2.8.2.) (Navajo Nation - Specific Comment - 54.)

Response: The PEIS is a Project-wide document. This document analyzes potential impacts of four programmatic alternatives. The alternatives do not address site-specific ground water compliance strategies. The PEIS is a planning document that provides a framework for conducting the Ground Water Project. The PEIS is not a technical guidance document for site-specific characterization activities. Discussions of site-specific geochemical conditions, geochemical processes, effects of potential remediation technologies on geochemical conditions, and efficacy of potential remediation technologies are beyond the scope of the PEIS. Such information and analyses will be presented in site-specific documents such as site observational work plans and ground water remedial action plans.

Comment 493. 2-24; "Natural Flushing". The feasibility of natural flushing as a restoration technique must be carefully evaluated before it is proposed for any site. This is particularly true of the three Navajo sites where the tailings have been stabilized in-place (Mexican Hat, Tuba City and Shiprock), as the stabilized tailings will remain as a potential source of continuing or renewed contamination. A thorough assessment must be made to determine the risk that physical and/or biological processes could compromise the integrity of the disposal cell over the 1000-year design lifetime, as part of the assessment of natural flushing as a restoration alternative at these sites. (Navajo Nation - Specific Comment - 55A.)

Response: The DOE agrees and intends to carefully evaluate any potential site-specific ground water compliance strategy. As indicated in the PEIS, risk assessments and detailed site investigations will take place in order to select a ground water compliance strategy for an UMTRA site.

Comment 494. The 100-year criterion for ground water cleanup by natural flushing is unacceptably long. Any reduction of available land and water resources, particularly for at least 100 years, will create significant socioeconomic impacts. Also, neither the DOE nor the Navajo Nation can guarantee the effectiveness of institutional controls at the Navajo sites for 100 years. (Navajo Nation - Specific Comment - 55B.)

Response: The 100-year requirements of institutional controls is the maximum amount of time the EPA has allowed for natural flushing to meet the standards. The duration of natural flushing at a specific site will be determined after site characterization and risk assessments are complete and input from the tribes, states, and public has been considered. It is possible that the actual site-specific natural flushing period may be less than 100 years. The DOE will implement in cooperation with the tribes, states, local land use authorities, and affected public, the best possible institutional controls, and will make necessary adjustments to the institutional controls, if necessary, in the future. The site-specific NEPA documents will propose site-specific institutional controls and will also analyze the impacts of those measures. In addition, the logic diagram was modified to indicate that the ground water compliance strategy will be modified if conditions change or monitoring indicates the EPA's standards are not being met.

Comment 495. Determination that natural flushing will meet the proposed 100-year criterion for cleanup to acceptable levels (whether MCLs, ACLs, or supplemental standards) at any site must not preclude assessment by DOE for the potential for renewed contamination beyond 100 years, nor the possibility that DOE may need to implement an engineered restoration technique if the integrity of a disposal cell is compromised and renewed contamination does occur. An assessment would also need to be made of the potential for contamination of other aquifers within the 100 - year period, whether through natural or induced leakage from contaminated aquifer(s). This is of particular concern at the Monument Valley site, where the presence of an alluvium - filled paleochannel provides a potential conduit for contaminant migration from the contaminated surficial aquifer into the underlying uncontaminated De Chelly Sandstone aquifer. (Navajo Nation - Specific Comment - 55C.)

Response: The long-term integrity of a disposal cell is monitored under the Surface Project through the implementation of a site-specific Long Term Surveillance and Maintenance Program. For the Ground Water Project, the formulation of a ground water compliance strategy will take into account horizontal and vertical ground water flow and any potential impacts to uncontaminated aquifers.

Comment 496. 2 - 24; Last Paragraph. The suggestion that gradient manipulation leading to dilution is an acceptable remediation method is inappropriate. The use of dilution to treat wastes is the last alternative that should be considered. Dilution ratios may change seasonally and over the long term as a function of water consumption (e.g., increased population) and climate (e.g., drought versus wet season) change. Contaminate transport into major rivers (3 - 3; Paragraph 4) should be avoided in that the cumulative discharge from multiple sites of a contaminant results in an increased loading that can lead to concentrations greater than acceptable limits. (Navajo Nation - Specific Comment - 56.)

Response: It is the intention of this sentence to state that gradient manipulation may be employed as a means to accelerate the process of natural flushing. The text in Section 2.8.2 was changed for the sake of clarity.

Comment 497. 2 - 25; Figure 2.5. The figure is misleading. It appears that the contaminant is disappearing in place when in fact dilution, attenuation and transport via the river result in contaminant redistribution. (Navajo Nation - Specific Comment - 57.)

Response: Figure 2.5 was not intended to show contaminants "disappearing." This figure was modified to show attenuation and ground water contamination that is below EPA standards.

Comment 498. 2 - 27; "Contaminant isolation". If this method is employed for ground water remediation, there is no indication of whether there will be some overlap with the Surface Project work that will either be underway or completed. If the Ground Water and Surface Projects have similar elements related to remedial measures, there may be considerable cost and time savings to both projects if information is shared. (Navajo Nation - Specific Comment - 58.)

Response: The DOE agrees and information is shared between the two projects.

Comment 499. 2 - 29; Figure 2.8. While it is understood that visual aids help the reader grasp the concepts discussed, the figures in this Part of the Draft PEIS seem to minimize the effects of nitrates. In this figure, nitrates are considered "least contamination" while uranium is considered "most contamination". This minimizes that hazardous nature of nitrates when it should be made clear that nitrates can be much more hazardous than uranium. Some discussion is needed regarding the possibility of extraction wells causing elongation of contaminant plumes; and "Capture Zone" should be defined in the Glossary. (Navajo Nation - Specific Comment - 59.)

Response: Figure 2.8 (Figure 2.7 in the final PEIS) did not distinguish between specific ground water contaminants in depicting levels of contamination. However, this figure was revised for clarity. As long as extraction wells are designed and located properly they will not cause elongation of a contaminant plume. The term "capture zone" was added to the glossary.

Comment 500. 2 - 30; "Waste management Methods". There may also be some overlap between the Ground Water and Surface Projects that can be used to develop cost and time efficient remediation strategies not included in this section. In addition, it is indicated in this section that wastes may be extracted from ground water for disposal purposes. Some of the wastes may contain compounds for which no regulatory limits exist, and ACLs must be generated. If this were the case, what would the basis for the ACLs be? Health risk, environmental risk, or other supplemental criteria? (Navajo Nation - Specific Comment - 60.)

Response: DOE will strive to minimize any waste stream associated with ground water activities. Any waste material generated will be disposed of in a manner consistent with federal, tribal, and state laws and regulations. Alternate concentration limits refer to

ground water compliance standards and do not apply to waste generated during the Ground Water Project.

Comment 501. 2 - 31; Third Bullet. Because of the probability that purge water will be contaminated, it should be treated prior to being disposed of. (Navajo Nation - Specific Comment - 61.)

Response: As stated in Section 2.9, purge water is analyzed to determine the proper disposal method.

Comment 502. 2 - 31; Last Paragraph, Second Sentence. U.S. EPA should be included since they are "directed to establish standards for the remediation and disposal of contaminated material from inactive uranium processing sites (see Section 1.2.3.) (Navajo Nation - Specific Comment - 62.)

Response: Agreed. The sentence has been revised.

Comment 503. 3 - 3; Last Paragraph. Ground water contaminants that exceed the background levels and that do not have an MCL should be addressed at a minimum. (Navajo Nation - Specific Comment - 63.)

Response: The purpose of Section 3.1.1.4 was to provide a general picture regarding ground water contamination at the UMTRA sites. A complete listing of all constituents that exceed background would be beyond the scope of the PEIS. The text has been revised in Section 3.1.1.4 to state that the baseline risk assessments and site observational work plans provide a complete list of all UMTRA site related constituents above background.

Comment 504. 3 - 4; "Shiprock, NM". What sources were used to designate Shiprock as "suburban"? How DOE designates each site should be defined in the Glossary. (Navajo Nation - Specific Comment - 64.)

Response: The Shiprock site was identified as suburban because the site is located on the edge of the regional population center. Proximity to communities, population of adjacent communities, and the regional population context were considered in designating sites as urban, suburban, or rural. Selection 3.1.1.9 has been expanded.

Comment 505. 3 - 6; "Cultural resources". This section states that many sites fall within or near "boundaries" of cultural interest to Native Americans. Please specify the sites and are they included as cultural resource concerns? See also comment #91. (Navajo Nation - Specific Comment - 65.)

Response: This sentence has been clarified in Section 3.1.1.7 and now reads: "Many UMTRA Project sites fall within or near boundaries of tribal lands. Cultural resource investigations conducted primarily for the UMTRA Surface Project, have identified cultural resources at two of the sites associated with tribal lands (Monument Valley, Arizona, and Riverton, Wyoming). Other resources of cultural interest to Native Americans may occur on other sites located on tribal lands (such as Tuba City, Arizona; Shiprock, New Mexico; Mexican Hat, Utah) or lands associated with historic Indian occupation. More detailed information on cultural resources will be included in site-specific Ground Water Project environmental documents. Additional cultural resource investigations, will be conducted, if required, prior to any site disturbing activities associated with ground water compliance actions."

Comment 506. 3 - 7; Section 3.1.2.2, last statement. Specify "...applicable *tribal and state* environmental regulations." (Navajo Nation - Specific Comment - 66.)

Response: The term "applicable environmental regulations" may in some instances include tribal and state regulations.

Comment 507. 3 - 8; Section 3.2.1, Last Sentence of last Full Paragraph. On what basis is the statement that there are "no known threatened or endangered species at or near the site". Please make reference to the survey and the date it was performed. (Navajo Nation - Specific Comment - 67A.)

Response: This statement is based on information in the Monument Valley environmental assessment for surface cleanup at the Monument Valley site and a citation to this document was added to the referenced sentence. In addition, threatened and endangered species consultation will be updated during the preparation of the Monument Valley site-specific ground water remediation NEPA document.

Comment 508. The final Rule (60 FR 2855) notes that the Monument Valley site has the estimated largest amount of ground water contamination (.75 billion gallons). While this is noted on page SUM - 5, it should also be noted in the site description of the Monument Valley site. (Navajo Nation - Specific Comment - 67B.)

Response: The estimated amount of contaminated ground water at each UMTRA Project site has been added to Table 3.1 of the PEIS and noted in the site descriptions in Section 3.2.

Comment 509. 3 - 9; First Full paragraph. "Confining aquifer" is not used throughout the document, but is defined in the Glossary. This would be a good place to use confining aquifer to describe the Shinarump Member and the De Chelly Sandstones. (Navajo Nation - Specific Comment - 68.)

Response: The text was changed to describe the De Chelly Sandstone as a confined aquifer.

Comment 510. 3 - 9; Second Full Paragraphs. It is stated that the "elevated concentrations" in the Shinarump and De Chelly aquifers at the Monument Valley site "would be the result of pumping process water during the former milling operations". However, no reference is cited by which this conclusion can be either confirmed or denied. The statement is unclear (the precise mechanism by which "pumping of process water" during milling operations caused elevated levels to occur in these aquifers is not described), and infers that through its characterization work to date, DOE has definitively concluded that contamination of these aquifers has not occurred from the tailings. This statement is misleading, and should be either deleted or replaced with a general statement that the reason for these elevated concentrations is unknown at this time and needs to be further investigated. (Navajo Nation - Specific Comment - 69.)

Response: For the sake of clarity, the reference to the influence of the process water pumping was deleted. In this paragraph, it was not intended to imply that contamination did not originate with the tailings. Since the Shinarump and De Chelly have upward vertical flow gradients, the only way tailings-related contamination could move downward is from a temporary reversal of the vertical gradients. This could only occur if the Shinarump and De Chelly piezometric surfaces were lowered by ground water extraction.

Comment 511. 3 - 9; Third Full Paragraph. Which ground water source do the residents use for drinking water, livestock and agriculture? Throughout the document, nothing is written about water as a resource and how the local ground water sources are being used. (Navajo Nation - Specific Comment - 70.)

Response: In the first sentence of this paragraph it is stated that two domestic wells are completed in the alluvial aquifer just south and upgradient of the site. The second sentence was modified to indicate that the artesian water used by the residents comes from the De Chelly Sandstone.

Comment 512. 3 - 9; Last Paragraph. Tuba City is not "sparsely populated". Using DOE's population figure of 7300 for Tuba City, the area should be designated a suburban community. Belfield, a city with a population of 881 (see last sentence on page 3 - 22 and Table 3.2), is considered to be a suburban community. Therefore, Tuba City, with a population approximately 8.5 times greater than Belfield should also be designated a suburban community. (Navajo Nation - Specific Comment - 71.)

Response: The sentence stating that the Tuba City site is sparsely populated refers to the Tuba City UMTRA Project site. The text has been revised to clarify this.

Comment 513. 3 - 10; Second Full Paragraph. The Navajo Sandstone aquifer should be described as a "confining aquifer". See Comment #68. (Navajo Nation - Specific Comment - 72.)

Response: The DOE refers to the Navajo Sandstone aquifer as a confining aquifer as a result of descriptions provided in the following documents. The 1983 U.S. Geological

Survey Water-Supply Paper 2201 states that the Navajo Sandstone aquifer is exposed at the surface in about 1400 square miles near the boundaries of the 5400 square-mile Black Mesa study area (page 24) (USGS, 1983). This coincides with the location of the Tuba City site. It has also been established that the N-aquifer is unconfined in the Tuba City site area by the DOE in the Surface Project remedial action plan (DOE, 1989).

Comment 514. 3 - 10; Second Full Paragraph. Which ground water source do the residents use for drinking water, livestock and agriculture? Throughout the document, nothing is written about water as a resource and how the local ground water sources are being used. Also, water uses from Moenkopi Wash occur downgradient of the plume; this should be included in the last sentence. (Navajo Nation - Specific Comment - 73.)

Response: The last paragraph of Section 3.2.1 states, "Water use in the area is from springs near Moenkopi Wash and from the wash itself. These use areas are all greater than 1 mile from the Tuba City site." The text was modified to indicate that the Moenkopi Wash is downgradient of the site.

Comment 515. 3 - 12; Third Full Paragraph. Groundwater velocity is estimated at "0.2 to 5.0 ft... per day". We assume this is an error as other sections use the measure, "feet per year". Whether or not this is an error, consistent measures should be used to not confuse the reader. (Navajo Nation - Specific Comment - 74.)

Response: Ground water velocities have been changed to consistent units.

Comment 516. 3 - 21; "Shiprock, New Mexico". Which ground water source do the residents use for drinking water, livestock and agriculture? Throughout the document, nothing is written about water as a resource and how the local ground water sources are being used. (Navajo Nation - Specific Comment - 75.)

Response: The PEIS was expanded to indicate that the residents of Shiprock, New Mexico, use the public water supply system of Shiprock and this system obtains its water from the San Juan River.

Comment 517. 3 - 22; Last Full Paragraph. For purposes of accurate characterization, background ground water quality for the alluvial terrace should be defined on the SOUTH side of the San Juan River, not the north side. (Navajo Nation - Specific Comment - 76.)

Response: The definition of background ground water quality on the terrace has been a low priority because the thin alluvial deposits on top of the Mancos Shale are not a source of water in the area. The critical aquifer to define the background ground water quality is the alluvium within the floodplain. This is done on the north side of the river because the alluvium in the floodplain is inaccessible upgradient of the site on the south side of the river.

Comment 518. 3 - 30; "Mexican Hat, Utah". Which ground water source do the residents use for drinking water, livestock and agriculture? Throughout the document, nothing is written about water as a resource and how the local ground water sources are being used. (Navajo Nation - Specific Comment - 77A.)

Response: The last paragraph of Section 3.2.19 states that there are no records of past or current users of the ground water from the two formations in the Mexican Hat site area. It is further stated in the section that domestic water for Halchita is supplied by a treatment facility that obtains water from the San Juan River. The Mexican Hat water supply is from a converted oil exploration well and the San Juan River.

Comment 519. There is no discussion that the Mexican Hat site is actually located in Halchita and is adjacent to the Halchita community. A description of Halchita should be included in this section, i.e., population, distances between Halchita and Mexican Hat, and that a "scenic highway" runs by both towns. (Navajo Nation - Specific Comment - 77B.)

Response: The text in Section 3.2.19 has been modified to reflect the proximity of the village of Halchita to the Mexican Hat site.

Comment 520. 3 - 30; Third Full Paragraph, Last Sentence. On what information is this statement decided? It seems irresponsible and unprofessional to write off ground water that is discharging into the San Juan River as "not adversely affecting water quality". DOE is thereby minimizing additional harm such discharges may cause. See also Comment #101. (Navajo Nation - Specific Comment - 78.)

Response: Sampling results upriver and downriver from the discharge area demonstrate no appreciable change in water quality. In addition, the volume of river water is significantly greater than the volume of discharge water. For more information about the surface water sampling at the Mexican Hat site see the site-specific remedial action plan, which was cited several times in Section 3.2.19 (DOE, 1993). More information can also be found in the response to comment 40 in this document.

Comment 521. 3 - 30; Last Paragraph. The discussion about the Honaker Trail Formation and the Halgaito Shale is confusing. Which is "unconfining" and which is "confining"? (Navajo Nation - Specific Comment - 79.)

Response: An aquifer is a geologic unit that can store and transmit water at rates fast enough to supply reasonable amounts to wells or springs. A confining layer is a geologic unit having little or no intrinsic permeability. This is a somewhat arbitrary limit and depends on local conditions. Aquifers can be close to the land surface, with continuous layers of material of high intrinsic permeability extending from the land surface to the base of the aquifer. Such an aquifer is called a water table or unconfined aquifer. Some aquifers, called confined or artesian aquifers, are overlain by confining layers. Confining layers are low-permeability geologic units that can or sometimes cannot transmit water.

In the case of the Mexican Hat site, the Honaker Trail aquifer is a confined or leaky confined aquifer and the Halgaito Shale forms the overlying confining layer.

Comment 522. 4 - 1; Section 4.0, Footnote c. The footnote is misleading as it is written; it implies that the contaminated water could equal the MCLs and still comply with cleanup standards. It would read easier as "sites that *do not exceed* maximum concentration limits...." (Navajo Nation - Specific Comment - 80.)

Response: This footnote refers only to the active remediation to background levels alternative and thus no change in the footnote was made.

Comment 523. 4 - 2; Last Paragraph. This paragraph does not include ground water as a resource and the potential impacts of the ground water as a resource, i.e., its current uses and potential future uses. (Navajo Nation - Specific Comment - 81.)

Response: The list of categories for which potential impacts were analyzed includes ground water. The impacts analysis in subsequent sections include the considerations of ground water as a resource.

Comment 524. 4 - 7; Second Paragraph. The application of nutrient rich ground water to land does not necessarily result in remediation. Biotreatment via denitrification is a widely used, cost effective method of removing nitrate from water and should be considered as a treatment alternative. (Navajo Nation - Specific Comment - 82.)

Response: This section discusses how human health would be protected when ground water remediation generates contaminated ground water or sludge. Land application was presented as an example. No statement was made that implied land application is suitable for all contaminated ground water. A discussion of bioremediation (including denitrification) is presented in Appendix C.

Comment 525. 4 - 8; Last Paragraph. Include "tribes" in the last sentence since the Navajo Nation is currently applying for treatment as a state with regard to NPDES. (Navajo Nation - Specific Comment - 83.)

Response: The sentence has been revised to state that National Pollutant Discharge Elimination System permits would be required at some sites.

Comment 526. 4 - 9; Second Paragraph. This paragraph indicates that high nitrate water will be treated prior to land disposal, whereas on page 4 - 7, second paragraph (noted above), no pretreatment is described. This needs clarification. (Navajo Nation - Specific Comment - 84.)

Response: Section 4.2.1.1 states that water would be treated prior to land application if it contained high levels of undesirable constituents, such as heavy metals.

Comment 527. 4 - 9; Last Paragraph. Considerable potential impacts on sensitive habitats are described, yet the summary of impacts on page 4 - 6, Table 4 - 3, does not reflect this. It is unclear how a short - term duration of remediation was determined. Pump and treat, in situ and other ground water treatment methodologies often take years to achieve desired goals. (Navajo Nation - Specific Comment - 85.)

Response: Table 4.3 refers to the potential impacts of site characterization and monitoring activities, while Section 4.2.1.5 analyzes the potential impacts of active ground water remediation strategies; these potential impacts are summarized in Table 4.4.

It is acknowledged that some active ground water remediation methods could take years to complete. However, in relation to the maximum 100-year natural flushing period or the long-term impacts of not remediating the ground water under no action, active ground water remediation is relatively short-term.

Comment 528. 4 - 11; Fifth Paragraph. Addition of fences, gates, signs and other institutional controls will likely affect visual resources and should be addressed. For instance, the Mexican Hat site is located less than a mile off a "scenic highway" from scenic Monument Valley north to scenic southeastern Utah. (Navajo Nation - Specific Comment - 86.)

Response: Agreed. An assessment of potential impacts of institutional controls has been added to Sections 4.2.2.6 and 4.2.2.11 of the PEIS.

Comment 529. 4 - 14; Third Full Paragraph. Costs provided in this paragraph indicate that considerably more information has been assimilated than has been provided in the Draft PEIS. This information was collected for the site specific determinations that were to follow acceptance of the programmatic approach. This information should be made available for review. (Navajo Nation - Specific Comment - 87.)

Response: Information used to estimate Ground Water Project costs is in the UMTRA Project Document Control Center in Albuquerque, New Mexico, and is available for review upon request to DOE.

Comment 530. 4 - 16; Lines 1 - 10. Completion of a risk assessment on surface water contamination as a result of natural flushing is not acceptable. Further distribution of contaminants into other water sources should be avoided. Use of natural flushing, which is not a treatment process, should be carefully evaluated to preclude undesirable secondary results. (Navajo Nation - Specific Comment - 88.)

Response: The DOE agrees that the use of natural flushing should be carefully evaluated before it is proposed as a site-specific ground water compliance strategy. It is also agreed that further contamination of water resources should be avoided. Under natural flushing and other ground water compliance strategies, the DOE will monitor the ground water at the sites to determine whether the strategies are working as planned. If monitoring indicates the ground water compliance strategy is not working as planned, its use will be reassessed. Monitoring may also indicate that previously uncontaminated water resources (surface and/or ground water) have become contaminated, which may mean that a risk assessment will have to be prepared.

Comment 531. 4 - 16; Section 4.2.2.4. The expansion of institutional controls to mitigate expansion of a ground water plume resulting from natural flushing may not be feasible at the three (3) sites located in cities, seven (7) sites at the edge of towns or cities and most likely at some of the rural or remote settings. Use of natural flushing should be critically reviewed and evaluated. (Navajo Nation - Specific Comment - 89.)

Response: The DOE agrees that the use of natural flushing will need to be critically reviewed and evaluated on a site-by-site basis.

Comment 532. 4 - 16 and 4 - 17; Last Paragraph of Section 4.2.2.5. This paragraph contradicts itself. The release of contaminated water is first stated as having a remote impact, however later in the paragraph, the release of contaminated water is said to increase as the natural flushing period increases, a period of 100 years. (Navajo Nation - Specific Comment - 90.)

Response: The text was revised to clarify its meaning.

Comment 533. 4 - 17; Section 4.2.2.7. All referenced cultural resource investigations are at least five years old. The Navajo Nation Archaeology Department and the Navajo Historic Preservation Department should be contacted to confirm whether these findings are still valid. The threatened and endangered species investigations are also out of date. The Navajo Fish and Wildlife Heritage Program has recently added species to its threatened and endangered species listing and should be consulted for an update. See also comment #65. (Navajo Nation - Specific Comment - 91.)

Response: Section 4.2.2.7 generally identifies the types of impacts that could affect cultural resources at any of the UMTRA Project sites and does not specifically reference cultural resource studies that have been conducted. Previous cultural resource investigations were primarily conducted for the UMTRA Surface Project, but have been ongoing if there are site-disturbing activities planned at any of the sites. For example, cultural resource studies recently were conducted at sites (e.g., Tuba City, Arizona) where ground water monitoring wells are to be installed. Cultural resource studies would be conducted prior to initiating activities associated with implementing ground water compliance strategies that could disturb these resources. Consultation with appropriate tribal and state agencies is an integral part of any cultural resource investigation.

Threatened and endangered species surveys and consultation with federal, tribal, and state agencies have been and will continue to be conducted at the UMTRA Project sites during the Surface Project. Similar studies and/or consultation will take place under the Ground Water Project.

Comment 534. 4 - 17; Last Paragraph. Here the DOE asserts no significant impact on cultural resources, however, there is no evidence that DOE has made any comprehensive investigation to back up this allegation, particularly with respect to Indian lands. In the second paragraph, it is alleged that "remediation... by natural flushing would have a positive impact"; and the "Impacts to this Native American cultural resource would be reduced as natural flushing progressed." By emphasizing natural flushing, this paragraph implies that ground water cleanup by other methods, i.e., active remediation, would not have a positive impact, therefore, the statements are misleading. It is clearly preferable to have the water cleaned up immediately with some positive remediation program. (Navajo Nation - Specific Comment - 92.)

Response: During the Ground Water Project, the DOE will conduct investigations for cultural resources before any ground disturbance activities take place. The referenced paragraph is about the potential impacts of natural flushing on cultural resources. The potential impacts of active ground water remediation methods on cultural resources is provided in Section 4.2.1.7.

Comment 535. 4 - 18; Fifth Paragraph. Economic losses associated with the loss of land use for 100 years due to implementation of institutional controls cannot be evaluated. The potential for continued loss of land over time if, or when, the plume extends beyond its current boundaries will result in increased economic losses. The loss of Indian trust land has particular significance in terms of the federal trust responsibility. Each acre of trust land was dedicated by the United States for the perpetual, exclusive use and enjoyment of Indian occupants, considering their ancestral ties to that acreage. It is not acceptable in these circumstances for the United States to simply put a fence around tracts of trust land and in effect say, "you can't have this land after all, we are changing our minds about the trust land designation". Nor would it be acceptable for the government to force Indians to leave trust land and relocate them to some distant place without ancestral and community ties. (Navajo Nation - Specific Comment - 93.)

Response: Any institutional controls will require significant coordination and consultation with the tribal government if involvement of tribal lands is impacted. The DOE has done its best to work with the Navajo Nation in all of its remediation activities on tribal land, and will continue to do so.

Comment 536. 4 - 19; Section 4.2.2.14. Cost provided in this paragraph indicate that considerably more information has been assimilated than has been provided in the Draft PEIS. This information was collected for the site specific determinations that were to follow acceptance of the programmatic approach. This information should be made available for review. (Navajo Nation - Specific Comment - 94A.)

Response: The PEIS does not provide the text of all technical and financial resources used to write the document. However, the DOE makes every effort to provide documentation on the project available to stakeholders for review. For many documents, a formal review process is conducted that aggressively solicits input from tribes, states, and other parties affected by the DOE's decisions on the UMTRA Project. Requests for access to any site-specific or programmatic information should be made to the DOE site manager or project manager.

Comment 537. Of particular interest is whether or not there is any cost associated with the disruption of residents' lives and land usage by the institutional (fencing off of land) controls and the long - term dedication of some of the area's available water resources to the flushing function. In this latter category are costs for the use of water under Navajo Nation laws and regulations. (Navajo Nation - Specific Comment - 94B.)

Response: The DOE does not anticipate that there will be any significant disruption of residents' lives and land usage by the use of any institutional controls on Navajo land. However, your point is well taken and analysis of all associated costs to implement a strategy must ultimately be considered.

Comment 538. The costs cited are $14 to $24 million per site for natural flushing. In Section 4.2.1.14, costs are said to be $86 to $162 million per site for active remediation to background levels. There is no indication whether the lower cost is decisive in any way for the preference toward natural flushing. This should be disclosed in light of the EPA Final Rule observation that"...Congress provided no authority that protection of ground water at each site should be limited by cost/benefit consideration" (Federal Register page 2858, third column). (Navajo Nation - Specific Comment - 94C.)

Response: The lower cost of natural flushing versus active ground water remediation will not be taken into account during the process of identifying site-specific ground water compliance strategies. The principal factor considered by DOE when determining site-specific ground water compliance strategies is to assure that this strategy will be protective of human health and the environment.

Comment 539. 4 - 19; Last Paragraph. It should be noted that water bearing units of 150 gallons per day are sufficient for a family in a remote or rural area, such as the Navajo Reservation. Cleanup of water for use in such circumstances should definitely be considered. (Navajo Nation - Specific Comment - 95A.)

Response: The text has been revised to clarify that site-specific and user-specific uses will be considered fully when making site-specific decisions.

Comment 540. The consideration of the 150 gallon per day criterion is much too superficial in the paragraph. The reader is left with the impression that the 150 gallon figure is a rock - solid, inflexible figure that will allow DOE to ignore areas where small

water quantities are normal and essential. That impression is wrong and must be corrected. (Navajo Nation - Specific Comment - 95B.)

Response: Although the DOE must comply with EPA standards, the DOE will consider site-specific conditions when deciding whether supplemental standards based on limited use apply.

Comment 541. The 150 gallon limitation is new, having been adopted in the 1995 Final Rule by adding subparagraph (e) to Section 192.11: (e) "Limited use groundwater means groundwater that is not a current or potential source of drinking water because (3) the quantity of water reasonably available for sustained continuous use is less than 150 gallons per day. The parameters for determining the quantity of water reasonably available shall be determined by the Secretary with the concurrence of the Commission." Note that the Nuclear Regulatory Commission must be involved in the decision to set water quantity limitations, presumably in a separate proceeding beyond the scope of the procedures contemplated in the Draft PEIS. (Navajo Nation - Specific Comment - 95C.)

Response: The 150-gallon limitation was included as a criterion for Class III ground water in the 1987 proposed rule. The 1995 standards included this limitation as a criterion for limited use ground water. Because the U.S. Nuclear Regulatory Commission is the regulator that will enforce EPA standards on DOE UMTRA Project sites, it will be involved in all site-specific decisions.

Comment 542. Also, the writers of the Draft PEIS should note the EPA discussion of how treatment/remediation may be handled in areas of short water supply (Federal Register page 2861, columns two and three). There is clearly a lot of discretionary choices available to DOE planners and there should be adequate and full consultation with residents and tribal governments on this matter. On this point, the EPA's description of an appropriate procedure is noteworthy: "Restoration of groundwater may be carried out by removal, wherein the contaminated water is removed from the aquifer, treated, and either disposed of, used, or re - injected into the aquifer, and in situ, through the addition of chemical or biological agents to fix, reduce, or eliminate the contamination in place." (Federal Register, page 2862, third column). (Navajo Nation - Specific Comment - 95D.)

Response: The DOE has every intention of providing tribal, and state governments as well as local residents, opportunity for input into site-specific decisions. For example, the DOE is committed to holding public meetings prior to finalizing site-specific NEPA documents. The DOE does not plan to automatically apply supplemental standards to all sites with wells that produce less than 150 gallons per day.

Comment 543. 4 - 20; Lines 1 - 5. The implication that only three of the seven criteria for applying supplemental standards would be used is out of place. This statement belongs in Section 1.4.1. on page 1 - 13. Justification for this statement is not provided. (Navajo Nation - Specific Comment - 96.)

Response: The discussion of the supplemental standards in Section 1.4.1 has been revised to state which of the eight criteria would most likely be appropriate for the Ground Water Project.

Comment 544. 4 - 20; First Full Paragraph. A new term, "concentration levels" is introduced in the discussion of supplemental standards. This is not to be confused with the term "alternate concentration limits". The term is not included in the glossary. (Navajo Nation - Specific Comment - 97.)

Response: The term "concentration levels" has been replaced with "amount of contamination in the ground water at the site."

Comment 545. 4-20; Fourth Full Paragraph. The inclusion of the no remediation alternative in the active remediation strategy does not make sense. (Navajo Nation - Specific Comment - 98.)

Response: The use of the no remediation ground water compliance strategy under the active remediation to background levels alternative would be very limited. For example, no active ground water remediation would be required at sites with no ground water contamination, or at sites where the ambient ground water quality is poor and water cleaned up from active ground water remediation would be recontaminated from the surrounding ambient ground water.

Comment 546. 4-21, First Paragraph. This paragraph indicates that if alternate concentration limits were applied, a risk assessment would have to be conducted. On page 4-20, second full paragraph, it was assumed that a risk assessment would be performed. It is not clear whether or not a risk assessment would be required prior to the use of alternate concentration limits. This need clarification.

Response: A risk assessment would be prepared to demonstrate that the use of an alternate concentration limit is protective of human health and the environment. The text in Section 4.2.3 of the final PEIS was revised to clarify this relationship.

Comment 547. 4-21; Last Paragraph. This paragraph is unclear and needs clarification. It states that the impact of applying supplemental standards "would have little or no impact on ground water . . . " then in the same sentence states " . . . could affect less contaminated" water. (Navajo Nation - Specific Comment - 100.)

Response: DOE agrees that Section 4.2.3.4 was confusing. The paragraph has been revised.

Comment 548. 4-25; Table 4.4. The table does not reflect the text. In addition, short term impacts are given the same weight as long term impacts (e.g., dust emissions). As a

result, the impacts related to active ground water remediation are over stated and those related to natural flushing are under stated. The severity of the impact is also not addressed. Use of numbers (i.e., 1 is "low", 2 is "moderate", 3 is "high") could be used to provide a numerical assessment of impact. For example, the indication that an impact to human health due to the ingestion of contaminated water resources under the active ground water remediation strategy is unfounded and not referred to in the text in this section. Page 4-30, paragraph 3 however, states that this strategy would have the least potential for an impact. Numerical ranks would make the distinctions between alternatives clear. The usefulness of the table is limited in its current format. Several other examples follow:

There is an indication that an impact to human health due to accidents should be included in the natural flushing and no remediation strategies. Accidents could occur during the risk assessment, water management and monitoring phases of each strategy. Impacts due to surface water contamination from waste water in the active ground water remediation are not founded. In fact, the statement pertaining to impacts from waste management for all the strategies state the same conclusion: "No potential negative impacts on human health and the environment...are expected". The table needs to be corrected so that the texts and table summary are in agreement.

Also, there are other sources of exposure to impacted water resources not included in this table, such as inhalation and dermal exposure. Even though their relative contribution to overall risk may be lower than the risk posed due to water ingestion, they should be considered as part of the potential risk picture posed by the sites. (Navajo Nation - Specific Comment - 101.)

Response: Table 4.4 was carefully compared to the text in Section 4.2 and some changes have been made. It is agreed that the table gives equal weight to all impacts; the reader is referred to each subsection in Sections 4.2.1, 4.2.2, and 4.2.3 for a general discussion of the magnitude of the impact of the ground water compliance strategies on the resources analyzed. In the comparison of alternatives section (Section 4.4), the relative magnitude of the impacts is discussed and the more minor, short-term impacts are separated from the more significant long-term impacts. In addition, a ranking system is used to distinguish low, moderate, and high potential negative impacts of the alternatives in Table 4.5. Therefore, the recommended ranking system for Table 4.4 is not necessary and was not incorporated into the PEIS.

The purpose of Table 4.4 is to provide a summary of the potential impacts of the ground water compliance strategies that will be useful when the site-specific environmental documents are prepared. Even though a potential impact such as natural flushing on visual resources may be minor, this impact should be addressed in the site-specific document.

It is agreed that there is a potential for accidents under the natural flushing and no remediation ground water compliance strategies. However, the potential for such accidents is highest during the site characterization phase and the potential impacts of site characterization are addressed in Section 4.1 of the PEIS. As indicated in Section 4.2.1.3, the potential impacts of wastewater on surface water bodies is remote. However, this potential impact would need to be addressed in the site-specific environmental documents.

It is agreed that there are other sources of human exposure to impacted water resources. The first heading under "human health" in Table 4.4 has been changed from "ingestion" to "exposure to contaminated water resources."

Comment 549. 4 - 28; Section 4.4. The comparison of alternative is marred by the lack of agreement in the text in Sections 4.2 and 4.3, which were used to provide the assumptions used in the comparative analysis. These subjective comparisons may or may not be valid. Weighting impacts to human health equivalent to visual impacts or noise impacts, particularly given that the latter are expected to be short term whereas the former would be long term, is unacceptable. The use of " + " and " - " and "0" is confusing: a " + " means a high potential for negative impact to human health and a high potential for positive impacts to economic benefits. In addition, the use of " - " does not mean that there is a low potential for negative impact but rather that the impact is lower than one of the other alternatives. In other words, a " - " indication could still result in unacceptable impacts to human health and the environment. This misleading and confusing comparative technique needs to be more accurately presented. Use of the descriptive terms such as high, low, moderate, and absent may be of more value. (Navajo Nation - Specific Comment - 102.)

Response: As suggested, the ranking system used in Table 4 in the summary and Table 4.5 in the text was changed; the "-" is now "low," the " + " is now "high," and the "0" is now "moderate."

Comment 550. 4 - 35; Table 4.5. This table is a comparison of long term impacts associated with each alternative. The table shows that relatively high negative impacts (as indicated by the " + ") would be associated with the active remediation to background levels alternative. Page 4.9, paragraph 1 however, states the "In the long term, active ground water remediation would eventually eliminate this source of contaminated water entering the environment."

Cultural resources are separated into surface and ground water in the text. According to the text (Section 4.2), the only alternative resulting in a positive effect on ground water cultural resources is the active remediation of background levels alternative. Surface impacts associated with this alternative are no worse than that associated with natural flushing, which may take up to 100 years to remediate ground water cultural resources. The passive remediation alternatives do not treat the ground water which is considered "a cultural resource of significance to many Native Americans" (page 4 - 17, paragraph 4). The coding of this environmental factor needs to be re - evaluated.

The text for waste management impacts is exactly the same for all alternatives. It is unclear how the coding of the environmental factor was made. This needs to be clarified. (Navajo Nation - Specific Comment - 103.)

Response: The impacts given a "high" rating for the active remediation to background levels in relation to the other alternatives are for potential land disturbance impacts on ecological resources and cultural resources and the production of waste materials. The

"high" rating is in relation to the other alternatives only and does not imply that these impacts will actually be high once site-specific ground water remediation begins. The justifications for these ratings are given in Sections 4.4.5, 4.4.7, and 4.4.14. The ratings given these potential impacts are not contradictory to the assumption that active ground water remediation will eventually result in the elimination of contaminated ground water entering the environment.

Section 4.4.7 addresses the potential impacts of the alternatives on cultural/traditional resources that may occur from ground disturbance activities. An additional paragraph has been added to address the potential impacts the alternatives may have on ground water when it is considered a cultural resource.

The coding in the waste management section was based on the preceding text in Section 4.4.14, which indicates that those alternatives that use active ground water remediation (active remediation to background levels and the proposed action) would have a greater potential to produce waste than the passive remediation or no action alternatives.

Comment 551. 4 - 38; Section 4.5.1. It is a gross overestimation to state that the UMTRA sites may have a positive impact on human health or the environment. This terminology carries the connotation that removal of mill tailings may result in a positive impact. A more fair statement is that removal of mill tailings removes the source of continued adverse impact. The "positive" statement implies that remediation will improve site conditions to a level that exceeds the original condition of the site, which may not be the case. (Navajo Nation - Specific Comment - 104.)

Response: The DOE believes that surface and ground water remediation under the UMTRA Project represent positive impacts in terms of minimizing contaminants that have the potential to pose risks to human health and the environment.

Comment 552. 4 - 38; Fourth Paragraph. The implementation of the active remediation to background levels alternative would <u>not</u> have a "similar positive cumulative impact" on surface water as the proposed action; it would have a <u>greater</u> positive impact. This is because the proposed action may allow the use of supplemental standards, ACLs, and natural flushing - - all of which allow for higher level of contaminates to remain in groundwater. (Navajo Nation - Specific Comment - 105.)

Response: Passive ground water compliance strategies such as supplemental standards, alternate concentration limits, or natural flushing would not be used under the proposed action unless it has been shown that these strategies are protective of human health and the environment. Part of the analysis to determine whether these strategies are protective would involve an assessment of the impacts on surface water bodies. If it were determined that negative impacts to surface water bodies may result from these strategies, they may not be used. Therefore, the proposed action and the active remediation to background levels alternative would have similar positive cumulative impacts on surface water bodies.

Comment 553. 4 - 39; Third Full Paragraph. The implementation of the active remediation to background levels alternative would not have a "similar positive cumulative impact" on surface water as the proposed action; it would have a greater positive impact. This is because the proposed action may allow the use of supplemental standards, ACLs, and natural flushing - - all of which allow for higher level of contaminates to remain in groundwater. (Navajo Nation - Specific Comment - 106.)

Response: Same response as response to Comment 552 above.

Comment 554. 7 - 1; Section 7.0. Some of the materials identified as "irrevertibly" lost such as wood, and metal during implementation of the proposed action could, in fact, be recycled at the termination of the Ground Water project. If this option has been reviewed, and eliminated from further consideration, reasons for such elimination should be stated in this section. (Navajo Nation - Specific Comment - 107.)

Response: The DOE will recycle all materials it can after the completion of site-specific remedial action.

Comment 555. 9 - 3; "Hydraulic Barrier" Definition. The definition is difficult to understand. Perhaps it can be re - written: "The area where ground water flow is not leaving or entering the capture zone which is caused by pumping ground water from wells". (Navajo Nation - Specific Comment - 108.)

Response: The definition of hydraulic barrier in the PEIS was revised.

Comment 556. 12 - 1; Section 12.0 All tribes should be listed separated from states as independent governmental bodies. The four Navajo Nation sites should not be listed as, for instance, "Tuba City, Arizona" but "Tuba City, Navajo Nation (AZ)". State boundaries within tribal lands are artificial geographic constructs, since the tribes are sovereign nations. (Navajo Nation - Specific Comment - 109.)

Response: The recommended change has been made.

Comment 557. 13 - 1; Section 13.0 The Navajo Nation Environmental Protection Agency ("Navajo Nation EPA") should be listed as a separate agency receiving copies of the PEIS. The Navajo Nation EPA is the Navajo Nation's environmental authority and is separate from the Division of Natural Resources. (Navajo Nation - Specific Comment - 110.)

Response: Thank you for your clarification. The Navajo Nation Environmental Protection Agency has been added to the list in Section 13.0.

Comment 558. B - 1; Section 1.0. The citation listed as "EPA, 1989" refers to the guidance document entitled *Risk Assessment Guidance for Superfund,* Volume II, which is

the ecological guidance document. This document is not a guidance for human health evaluation. Guidance for human health evaluations is more likely to be found in the U.S. EPA's *Risk Assessment Guidance for Superfund (RAGS), Volume I. Human Health Evaluation Manual (Part A). Interim Final.* EPA/540/1 - 89/002. This should be cited in this section and in Section 8.0 (References). If DOE intends to use alternative methods and guidance, it should be so stated in this section. (Navajo Nation - Specific Comment - 111.)

Response: The correct reference appears in the revised Appendix B of the PEIS.

Comment 559. B - 2; Section 2.0. This section does not indicate if background is determined locally, regionally, or if it is based on published literature. There is no indication as to whether there is any statistical treatment of background, or if evaluation of site - specific data will be made by direct numerical comparison to background data. There is no detail indicating how the exposure point concentration term will be developed, e.g., will the U.S. EPA's *Supplemental Guidance to RAGS; Calculating the Concentration Term* (May 1992) be used? (Navajo Nation - Specific Comment - 112.)

Response: Appendix B of the PEIS has been revised to provide detailed information on the process of selecting site-specific background water quality and the determination of contaminant concentrations for the UMTRA Project sites (see response to comment Navajo Nation - Specific Comment 8).

Comment 560. B - 3; Section 3.0. Figure B.1 does not indicate that inhalation is a pathway that should be considered in the risk assessment. The presence of radon gas in the ground water may result in a complete inhalation pathway through domestic ground water use. Even if the latter is secondary that of ingestion, it should still be addressed since risks across all potential pathways are additive.

Surface water is not addressed by the pathway analysis. That is, surface water that may have been impacted directly by ground water, or indirectly, exist at sites such as Rifle, CO; Shiprock, NM, Green River, UT, Mexican Hat, UT, and Salt Lake City, UT. The potential to contact impacted surface water may arise from ingestion, inhalation, dermal exposure during recreational activities, or from consumption of fish. Even if these pathways are secondary to that of ground water ingestion, they should still be addressed because risks are additive. (Navajo Nation - Specific Comment - 113.)

Response: Exposure through inhalation route is not evaluated because the primary UMTRA Project ground water contaminants evaluated are nonvolatile contaminants (e.g., metals, nitrate, and sulfate).

Radon concentration distributions were investigated at some UMTRA Project sites such as Gunnison, Colorado (DOE, 1994f) and Riverton, Wyoming (Gonzales, 1988). Because most, if not all, UMTRA Project sites are in the highly uranium mineralized regions, the observed ground water concentrations (activity) of radon were within the range of background for the area (no measurable increase in radon concentrations from the mill site). Therefore, the associated health risk of potential increases in indoor radon concentrations

from domestic water usage are not expected to be increased by the ground water plumes at UMTRA Project sites. Radon activity will be evaluated on a site-specific basis.

Ground water serves only as a medium whereby radon, if present, enters the home through the water system and is released to the indoor air (Hurlburt, 1989; Cothern, 1987). Radon gas escapes when water (no longer under pressure) is drawn from the tap. Therefore, ingestion of drinking water is generally considered harmless because most radon escapes at the water outlet, leaving only minimal amounts in the water itself. Similarly, radon gas would pose no harm in the open air, where dilution dramatically reduces its concentration.

Potential surface water pathways are addressed in the baseline risk assessments. The risk assessment methodology is in the revised Appendix B of the PEIS.

Comment 561. B - 6; Section 4.0. If toxicity data is not available from the Integrated Risk Information System, or from the Health Effects Assessment Summary Tables, are there other sources of toxicity data that are approved for use at these sites? If not, does DOE propose to generate toxicity data for the anticipated compounds, and those that may not have been identified in the currently available data sets?

How will DOE account for chemical interactions? Will DOE use a data base of information as MIXTOX? Current risk assessment methods do not allow for quantification of effects such as synergism or antagonism between compounds, however, qualitative statements regarding possible compound interaction may be made. Such statements may not be limited to additivity and antagonism. If this is the intent, it should be stated in this section.

The majority of the compounds listed in earlier sections of the Draft PEIS identify compounds that may have deleterious impacts on human health and the environment following chronic (long-term) exposure. Because all the site characterization and monitoring data for each site are not completed, there may be other compounds detected onsite that can have acute (short-term) impacts, if present in sufficient concentrations. The Draft PEIS does not address the potential for acute impacts to be evaluated. If they are not expected, and there is sufficient technical data to support that contention, it should be stated in this section. (Navajo Nation - Specific Comment - 114.)

Response: The primary sources of toxicity information are the Integrated Risk Information System and the Health Effects Assessment Summary Tables. These sources are supplemented by the Agency for Toxic Substances and Disease Registry toxicological profiles, the handbook on the toxicology of metals, and other relevant literature (Friberg et al., 1986). These sources of information are discussed in Section B2.6, Toxicity Assessment, of the revised Appendix B of the PEIS.

Risks are combined across exposure pathways and multiple contaminants; potential interactions between particular components of the site-specific chemical mixtures are characterized qualitatively. MIXTOX and other relevant literature sources were used to discuss possible chemical interactions between components of site-specific complex mixtures in the toxicity assessment section of the baseline risk assessments.

Both long- and short-term adverse health effects are evaluated in the risk assessments. A discussion of this topic is presented in Section B2.7, Human Health Risk Evaluation, of the revised Appendix B of the PEIS.

Comment 562. B - 7; Section 5.0. It is unreasonable to assume that many of the constituents detected at an UMTRA site have nutritional essentially. It may be likely that, for example, selenium has some nutritional value, but this is certainly not true for other compounds such as arsenic, uranium, radon, cadmium, lead or barium. It is misleading to state that "...many of the compounds associated with mill tailings are beneficial to health," and as such this type of statement should not appear.

For each UMTRA site is likely that risk characterization will be based on multiple exposures to multiple compounds. The overall impact to human health will be defined using carcinogenic risk probabilities, and noncarcinogenic hazard ratios. The distinct definitions should be provided in the section along with a definition of the comparative criteria that will be used to determine the point of departure for risk management decision - making. Will the criteria listed in 40 CFR Part 192, Section III, be used as ranges for acceptable risk?

It is unclear as to whether risk ranges will be set up for comparison based on the outcome of the probability curves generated as part of the Exposure Assessment. No information is provided with respect to the uncertainty analysis component of the risk assessment process. (Navajo Nation - Specific Comment - 115.)

Response: Some of the constituents at UMTRA Project sites are essential nutrients while others are clearly not. Methods used to determine contaminants of potential concern at the UMTRA Project sites appear in the revised Appendix B of the PEIS.

Concerning how overall impacts to human health are evaluated for carcinogenic and noncarcinogenic chemicals for UMTRA Project sites, please refer to Section B2.7, Human Health Risk Evaluation, of the revised Appendix B of the PEIS for the discussion of how potential adverse health effects are evaluated.

The comparative criteria that will be used to determine the point of departure for risk management decision-making are presented in the final rule of the ground water standards for remedial actions at inactive uranium processing sites (Appendix A of the PEIS). These criteria include maximum concentration limits, alternate concentration limits, and background concentrations.

Refer to Section B2.7, Human Health Risk Evaluation, of the revised Appendix B of the PEIS for a discussion of how toxic effect ranges are used to evaluate the risks when compared to the probability curves.

Refer to the revised Section B2.7, Human Health Risk Evaluation, of Appendix B of the PEIS for the discussion of how uncertainty analysis is incorporated into the risk assessments.

Comment 563. B - 8; First Paragraph. The second sentence states: "Currently the EPA has no guidance for quantifying potential impacts to ecological receptors but has developed a qualitative approach..." This is wrong. In 1993, the EPA published the Wildlife exposure factors handbook (Volumes I and II). These documents present guidelines and data for carrying out a qualitative analysis. (Navajo Nation - Specific Comment - 116.)

Response: *The Wildlife Exposure Factors Handbook* (Volumes I and II) provides guidance that instructs how to perform a quantitative ecological risk assessment. It provides information on various factors used to assess exposure to wildlife. The risk assessment guidance for Superfund (EPA, 1989b), is the guidance document that is used on the UMTRA Project to evaluate the ecological environment. A description of the qualitative approach to performing screening level ecological risk assessments appears in the revised Appendix B of the PEIS.

Comment 564. B - 8; Last Paragraph. It is unclear if the experimental approach described in this paragraph will be implemented. Experimentation of this type should be performed in a controlled environment and not on land with animals used by the local population, as indicated. (Navajo Nation - Specific Comment - 117.)

Response: This paragraph does not present an experimental approach. It describes a potential future pathway for contaminated ground water to reach livestock if, at some future date, a well was placed in the plume by, say, a local landowner, for the purpose of providing water for livestock. This section has been revised in the Appendix B of the PEIS.

Comment 565. B - 9; Section 7.0. It is not usual to place risk mitigation measures in the risk assessment documentation. This information is typically found in a Feasibility Study phase or Corrective Measures Study, because the results of the risk assessment become one of the criteria for selecting the appropriate remedial strategy If the intent is to identify risk mitigation measures in the risk assessment, in an effort to wrap the human health and ecological evaluations, and the EIS process into a single document, this should be stated. (Navajo Nation - Specific Comment - 118.)

Response: The UMTRA baseline risk assessments are meant to address potential immediate risks. The intent of the risk mitigation section in the baseline risk assessment, therefore, is to present relevant information in determining how to address immediate risks.

Comment 566. C - 1; Introduction. It is recommended that additional treatment technologies described in the following references be evaluated:

EPA (U.S. Environmental Protection Agency), 1994. *Ground - Water Treatment Technology Resource Guide.* EPA/542 - B - 94 - 009, Office of Solid Waste and Emergency Response. Technology Innovation Office, Washington, D.C.

EPA (U.S. Environmental Protection Agency), 1990. Assessment Technologies for the Remediation of Radioactively Contaminated Superfund Sites. EPA/540/2 - 90/001. Office

of Solid Waste and Emergency Response, Office of Radiation Programs, Washington, D.C. (Navajo Nation - Specific Comment - 119.)

Response: This recommendation has been noted. If active ground water treatment is chosen for a compliance strategy at a particular site, the DOE will consider all viable alternatives.

Comment 567. C - 2; Lines 20 - 23. For sites where heavily contaminated soil remains in the unsaturated zone or where seepage from disposal cells continues to occur, it could be unlikely that natural flushing could solve the ground water contamination problem while additional contaminants are being continuously added.

A second comment on this section is that care must be taken when using rivers as ultimate disposal zones ("points of groundwater discharge into surface bodies"). Some metals from tailings leachate (for instance, mercury) can become concentrated in the sediment and in aquatic plants growing on that sediment and can then bioconcentrate up the food chain. (Navajo Nation - Specific Comment - 120.)

Response: Contaminant sources, pathways, and receptors will be considered when evaluating a site for natural flushing. The Ground Water Project will also evaluate the potential for contaminated soils to act as a continued source term to the uppermost aquifer. Should a continued source term be identified, the Ground Water Project will take action to mitigate the impact.

In the evaluation of any ground water compliance strategy, risk assessments would be completed to ensure that human health and the environment are protected. The risk assessment methodology is described in Appendix B of the PEIS.

Comment 568. C - 2, Last Paragraph. Solute transport models are very strongly influenced by the assumptions made about their input parameters. Dispersivity, which controls the magnitude of dilution from mixing, is difficult to quantify. For it and other model parameters, conservative assumptions need to be made to ensure a margin of safety with uncertainties. (Navajo Nation - Specific Comment - 121.)

Response: Standard numerical modeling practices generally require the use of conservative estimates of parameters that have a significant level of uncertainty. It is also standard practice to conduct sensitivity analyses on all input parameters that have a significant level of uncertainty. This ensures solute transport model quality.

Comment 569. C - 4, Section 3.1.1. During the use of infiltration trenches or other water application techniques during gradient manipulation, the possibility of flushing soil contaminants out of the zone above the initial water table needs to be taken into account. For instance, if well oxygenated water were introduced, an enhanced removal of reduced species by oxidation could occur. This flushing may be either desirable or undesirable, but its possibility should not be ignored. (Navajo Nation - Specific Comment - 122.)

Response: Comment noted. As described in Section 2.8.1.2, geochemical characterization efforts would be essential in developing ground water compliance strategies.

Comment 570. C - 6, Lines 3 - 4. The "contaminant isolation" to reduce a contaminant source from entering the groundwater is not the same thing as the "waste isolation" approaches discussed at the bottom of the page. Those waste isolation approaches refer to ground water, and there is no discussion of contaminant isolation techniques applicable to sources above the ground water except for capping and surface control. If there are other applicable containment isolation technologies to prevent ground water contamination, then those need to be discussed here.

At what type of sites would the surface water control method be used? Would this apply only to those sites where the tailings were removed for disposal elsewhere? Would these measures be used over a shallow plume? (Navajo Nation - Specific Comment - 123.)

Response: Appendix C is not meant to be all encompassing. It's purpose is to give examples of remediation technologies. When ground water compliance strategies are formulated, all viable methods and technologies will be reviewed.

The conditions under which surface control methods could be used would have to be evaluated on a site-specific basis.

Comment 571. C - 11; "Disposal of contaminated groundwater". Under the reinjection option, would UIC permits be required? From which agency would such permits be obtained? (Navajo Nation - Specific Comment - 124.)

Response: If reinjection is used in a ground water compliance strategy, all necessary permitting would be completed and all applicable federal, tribal, and state regulations would be followed.

Comment 572. C - 11; "Evaporation". The listing of evaporation methods should include the possible use of mist evaporation systems, which will allow treatment of higher water volumes and allow for much smaller evaporation ponds. (Navajo Nation - Specific Comment - 125.)

Response: Appendix C discusses numerous variations of all technologies. These examples presented in Appendix C are not meant to be all encompassing. In the development of a ground water compliance strategy the DOE is not limited to the technologies that appear in this Appendix.

Comment 573. C - 12; Section 3.2.3. It needs to be acknowledged here that it is not possible to destroy radionuclides in the treatment process, rather it is only possible to move them from one medium or place to another. Also, this entire section is much too generic.

How do these treatment technologies relate to the identified contaminants of concern (i.e., how viable are they)? (Navajo Nation - Specific Comment - 126.)

Response: It is not stated that radionuclides are destroyed. The text states that contaminants can be *removed* from ground water by various methods.

This appendix is generic because the PEIS is not a site-specific document. The viability of remediation technologies for particular sites will be discussed in site-specific documents such as ground water remedial action plans.

Comment 574. C - 12; Section 3.2.3, Lines 6 - 10. Oxygen gas is not a byproduct of denitrification, rather the oxygen in the nitrate goes to bicarbonate ion. (Navajo Nation - Specific Comment - 127.)

Response: The text was modified for clarity.

Comment 575. C - 14; Oxidation/reduction. This subsection discusses how to create oxidizing conditions, however, the shallow contaminated aquifers are generally well - oxidized. A more pertinent discussion would be about how to create reducing conditions, since most of the contaminants of concern are more likely to be treatable under those conditions. (Navajo Nation - Specific Comment - 128.)

Response: Reduction scenarios are discussed in the biological treatment methods paragraph.

Comment 576. C - 16; Lines 7 - 8 From Bottom. How bioremediation might be used at UMTRA sites needs to be expanded upon, particularly since it is a possible proposed approach at the Tuba City site. What processes would mobilize contaminants? Which would mobilize them? How would the proper environmental condition be created (particularly for anaerobic bioremediation proposed at Tuba City)? What would happen to the insoluble reduced species when oxidizing conditions returned after the termination of remediation? Wouldn't they oxidize and become mobile once more? (Navajo Nation - Specific Comment - 129.)

Response: The PEIS is not a site-specific document. The viability of remediation technologies for particular sites will be discussed in site-specific documents such as ground water remedial action plans.

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LETTERS FROM COMMENTORS

Comments for the PEIS

39 million is lots of money. Does it mean you

Comments for the PEIS

The PEIS is said to pertain to all UMTRA sites ~~but with~~ and talks about several alternatives including no strategy. But with reference to the Tuba City site, it has been determined already that the contamination level is high (underground). Therefore, at our site we should be presented with more aggressive strategies for elimination or containment of the contaminants.

Comments for the PEIS

Noone, or nothing, is drinking contaminated groundwater?

Groundwater standards - if the state, or affected Indian Nation has higher standards, will the DOE follow?

If a site has poor water quality, ~~tey~~ assuming EPA standards, yet is still being used as domestic source or livestock water, will the DOE still actively pump & treat

NO Action & Passive Remediation similar but w/ monitoring control

Future use of groundwater must be considered.

Comments for the PEIS

Our Program, Institute for Tribal Env. Professionals, would like very much to participate in the ground water remediation project. This ground water project can provide Native American students with a valuable state-of-the art learning experience.

Please keep in contact with our office regarding any possibility for any type of cooperative arrangements.

Thank You, Sincerely

Eunice Teo
(520) 523-1478

Comments for the PEIS

Tulsa City Area needs to be singled out for this area as stated by residents and really given in that view and not to much of the full over view in order to receive a positive review by residents.

WC-12

Comments for the PEIS

PEIS has little site-specific information for the Hopi residents to gage their exposure. Since the proposed alternative would enable DOE to tailor remediation to the most effective treatment for a particular site. Accordingly, the proposed alternative would be prefered if and only if the local residents were allowed to comment on the site-specific remediation method and its selection. The regional groundwater model for the N-Aquifer developed by US Geological Survey in Tucson reveals that, at the present and projected rate of pumping, the NTUA wells will be dewatered by the year 2011, and the Moenkopi wells will be dewatered by the year 2030. Obviously, the pump and treatment mitigation alternative could hasten the depletion of the aquifer unless the treated water is recharged or put to a beneficial use in lieu of groundwater extraction. On the other hand, if left untreated, public exposure to the contamination may result.

Ron Morgan, Hopi Hydrologist

Comments for the PEIS

Comment by William Johnson, STAFF ATTORNEY, Navajo Nation Department of Justice.

The term "partnership" has been used repeatedly in these discussions. I would like to speak on behalf of the Navajo Nation Department of Justice as to what the term "partnership" means to the Navajo Nation.

By "partnership" the Navajo Nation expects, requires, and demands that the D.O.E., as a department within the Federal Government, respect the inherent sovereignty of the Navajo Nation, fulfill the Federal Government's long standing trust responsibility to Indian Nations, and work with the Navajo Nation on a Government-to-Government basis.

WC-15

Comments for the PEIS

Studies other than water should be done such as plant life; water life - livestock & people.

Comments for the PEIS

Might it be possible to prepare an oral (taped) version of the draft PEIS summary - in Navajo - to broadcast locally (KNDN, KTNN radio) prior to July 17? (Thus inviting comments from individuals not at hearing and not fluent in English).
- maybe this was done?

Oral presentation of the PEIS summary at Shiprock was clear and coherent.

WC-17

Comments for the PEIS

1. How are livestock effected by the slight contamination differences, those nearer to the UMTRA Projects sites as opposed to animals further down river — Has there been any tests done?

2. In the area of Slickrock town, how many local people employed in the testing of sites?

Draft Programmatic Environmental Impact Statement Hearing Survey

Thank you for attending the hearing for the draft Programmatic Environmental Impact Statement for the UMTRA Ground Water Project. Please share your opinions with us about the hearing so that we can improve public participation on the UMTRA Project.

1. How did you learn about the hearing? (check all that apply)

☐	radio announcement	☐	tv announcement	☐	newspaper advertisement
☐	newspaper article	☐	mail	☒	word of mouth
☐	Federal Register notice	☐	other_____		

2. Did you receive adequate notice of the hearing? yes ☐ no ☒

3. Was the hearing convenient for you to attend? yes ☒ no ☐

4. If no, how could we have made the timing and/or location of the hearing more convenient?

---

5. Did you represent a group or organization? yes ☐ no ☑

Which group?_____

6. Have you ever attended a DOE hearing before? yes ☐ no ☑

7. Do you feel you were provided with enough information to comment on the draft PEIS?
yes ☐ no ☑ Too many unanswered questions regarding validity of data -- i.e.; no one is drinking water

8. Do you believe the format provided adequate opportunity to express your views?
yes ☒ no ☐

9. Did the hearing

☐ fulfill expectations?	☑ fulfill some expectations?
☐ fulfill none of your expectations?	☐ no opinion; you had no expectations?

If you would like to receive future mailings about the PEIS for the UMTRA Ground Water Project, please fill in your name and address below and check the documents and/or announcements you would like to receive. If you would like a site manager to contact you, check the appropriate box.

Name DAVID RAPSTINE

Address 1102 Feather Ridge Floresville Tx 78114
(street) (city) (state) (zip)

☒	Implementation Plan	☐	Site Manager Call
☒	Final PEIS	☐	News Release
☒	Record of Decision		

Please leave with PEIS hearing personnel

WC-31

Comments for the PEIS

Your Hearing was well attended which is a first

The only comment I have is that ANY meeting you have around here is You all give TOO much time to a fellow named Jeff Libby which he thinks he knows everything and is doing this to better his knowledge just to be heard. I've known this guy for ages and all he is is mad for talking and a lot of us don't want him here

Thanks

Bonnie A. Sklars

WC-33

THE HOPI TRIBE

Water Resources Program
P. O. Box 123
Kykotsmovi, AZ 86039
(520) 734-9307

May 15, 1995

MEMORANDUM

TO: Arnold Taylor, Manager, Department of Natural Resources

FROM: Ron Morgan, Water Rights Hydrologist RPM

SUBJ: Review of UMTRA PEIS

1.) The PEIS seems to conform to the letter of the regulations regarding the procedure for a PEIS.

2.) It is not stated what the preferred alternative for Tuba City/Moenkopi might be. All of the sites are lumped into one PEIS, as permitted by regulation. Verbally, we were told at a previous meeting in Moenkopi that water would be pumped, treated, and wasted. I informed the DOE hydrologist that the USGS projections were for the groundwater in the area to become dry by the year 2012, and that the wasting of the treated water, rather than recharging or reusing it could reduce the lifetime of the water supply. To date, I have seen nothing to indicate what the eventual cleanup plan for the area might be.

3.) I have not been kept abreast of the progress of the UMTRA project, not because the Mining Program is not communicating with me, but because the UMTRA meetings frequently conflict with meetings and activities of the LCR Adjudication. I need to meet with the mining people to acquire whatever recent information they have.

4.) It seems that it would be appropriate for me to become more active in the UMTRA project immediately, as it seems that decisions are about to be made which require technical input. I would be happy to work with you and the Mining Program Staff to see that the Hopi technical expertise is brought to bear on the problem.

5.) Hydro Geo Chem is about to release the report on its modeling of the N-Aquifer near Tuba City/Moenkopi related to questions over the impacts of the proposed San Juan Southern Paiute N-Aquifer irrigation well field they would like to drill and implement. I will keep in touch with that issue, since the results of the model could also reveal sensitivities with respect to the UMTRA mitigation activities.

WC-19

THE HOPI TRIBE

Ferrell H. Secakuku
CHAIRMAN

Wayne Taylor Jr.
VICE-CHAIRMAN

June 13, 1995

Mr. Richard Sena, Acting Manager
Earth Restoration Division
Department of Energy
Albuquerque Operations Office
P.O. Box 5400
Albuquerque, New Mexico 87185-5400

Dear Mr. Sena:

The Hopi Tribe is pleased to provide comments to the Programmatic Environmental Impact Statement (PEIS).

This letter sets out the Tribes's comments and concerns .

□1. Comments made by the Tribe on the proposed EPA Rule are present in the final rule . □□□we are precisely where vve would have been had DOE moved forward in 1987 on the □□□Proposed Rule and our comments.

□2.□Acknowledgement of the "preferred alternative" approach does not constitute agreement by □□□the Hopi Tribe with the specific implementation that the DOE puts forward for the Tuba City □□□Site. In particular, it does not constitute an implicit basis for concurrence by the Tribe in □□□DOE -proposed remedial actions that may flow from a subsequent site-specific NEPA □□□evaluation. The Hopi Tribe reserves all rights under UMTRCA to participate fully in the □□□site-specific evaluations and to formaulate its official position on concurrence with the □□□Remedial Action Plan for groundwater on the basis of site-specific factors and the best □□□interests of the Hopi Tribe as a sovereign entity.

□3.□The preferred alternative seems to propose that a "risk assessment" will be performed to □□□develop the technical basis for remedial actions. However, 40 CFR 192. 04 Corrective □□□Action states :

> "If the groundwater concentration limits established for disposal sited under provisions of 192.02(c) are found or projected to be exceeded, a corrective action program shall be placed in operation as soon as is practicable, **and in no event later than eighteen (18) months after a finding of exceedance.**

□□□DOE acknowledges in the draft PEIS that they were obligated by the Proposed Rule since □□□1978 to institute corrective action but has not done so. Will the risk assessment □□□methodology as proposed meet the regulatory obligation to place in operation corrective □□□action within eighteen months? DOE is obligated to explain its proposed schedule for

P.O. BOX 123 — KYKOTSMOVI, ARIZONA — 86039 — (602) 734-2441

WC-22

□□□action at the Tuba City Site and how that schedule and the "preferred alternative" will; meet □□□the requirements of 40 CFR Part 192.

□4.□DOE mis-states that the site must be transferred to the Government (ie. , to DOE as the □□□designated agency). UMTRCA requires that control of the "residual radioactive material" □□□must go to the Government. UMTRCA does not require the Tribe to cede land (or any □□□subsurface rights - e.g., water- associated with that land) to the Federal Government or any □□□of its entities (such as DOE). DOE must either lease either the surface rights from the □□□Tribe or arrange for a land transfer with another Federal Agency.

□5.□In the NEPA process , analysis of ground water quality standards for judgment of impact on the "human environment " are not restricted to RCRA hazardous constituents and their potential for impact to human health. In this regard the Hopi Tribe expects the site-specific NEPA evaluations to address all adverse impacts to beneficial use of water, which include the non-use (cultural, aesthetic, and religious) values of water to the Hopi People. Failure to do so would be a fatal flaw in the NEPA Process.

□6.□DOE mis-reads the EPA Rule that because institutional controls are permitted under the □□□EPA Rule , the Tribe must agree to establish and enforce administrative structures that □□□permit institutional control. There is no such requirement in 40 CFR Part 192 , nor in the □□□RCRA regulations, nor is there any requirement that can be derived from UMTRCA. DOE □□□funding would be required if the Tribe is to formulate and implement institutional controls at □□□the site. But DOE has no standing to require that institutional controls be formulated and □□□enforced.

□□□DOE continues to suggest that Alternative Concentration Limits (ACL) may be appropriate □□□at many sites. The Hopi Tribe's functional goal is preservation of beneficial uses of the □□□groundwater and this may be compatible with ACLs. However, the Tribe will remain □□□skeptical about ACLs until specific proposals can be reviewed with respect to the Tribe's □□□position on groundwater quality and use.

□7.□"Natural Flushing" seem to be the "preferred alternative" selected by DOE for several □□□sites. The term appears in several areas of discussion in the body of the PEIS which may □□□be fine for the PEI S. However, "Natural Flushing" as a preferred alternative in the site-□□□specific environmental assessment for the Tuba City Site will not be considered by the □□□Tribe. Because of the amount of annual precipitation the local and recharge area recieve □□□and groundwater movement, this alternative would not be viable.

□8.□Not only is the Tribe participating in the Groundwater Remediation Project through a □□□Cooperative Agreement, the Tribe was granted "Cooperating Agency" status for the NEPA □□□Process.

This concludes the comments and thank you providing the Hopi Tribe this opportunity to comment on the draft PEIS.

Sincerely:

Norman Honie

Norman Honie, Jr., Director
Office of Mining & Mineral Resources

cc: DNR
Office of the Chairman

WC-23

TESTIMONY OF RICHARD OHRBOM
ON BEHALF OF THE NEW MEXICO ENVIRONMENT DEPARTMENT
REGARDING THE "PROGRAMMATIC ENVIRONMENTAL
IMPACT STATEMENT FOR THE URANIUM MILL TAILINGS
REMEDIAL ACTION GROUND WATER PROJECT"
Shiprock, New Mexico
June 7, 1995

My name is Richard Ohrbom and I represent the New Mexico Environment Department. My testimony today is a synopsis of the New Mexico Environment Department's comments on the PEIS. Additional written comments will be sent directly to DOE.

The New Mexico Environment Department has reviewed the Programmatic Environmental Impact Statement for the Uranium Mill Tailings Remedial Action Ground Water Project. We agree with the Proposed Action, which considers protection of public health and the environment in determining the appropriate strategy to meet ground water protection standards. However, we believe that the application of supplemental standards at the Ambrosia Lake site may not be protective of the environment and/or future public health and that a remedy which includes remediation of ground water may be appropriate at this facility. Such a remedy would be consistent with remedies being conducted under state regulatory authority at sites adjacent to the Ambrosia Lake site.

Based on statements in the PEIS and conversations with DOE staff and their contractors, it appears that DOE has drawn conclusions regarding the potential for use of the aquifer in the vicinity of the Ambrosia Lake site. Page 3-21 of the PEIS describes the alluvial aquifer as follows: "The water bearing unit is of limited use because it cannot produce 150 gallons of water per day". If DOE believes this statement to be fact, as they have stated in conversations with New Mexico Environment Department staff, then they have already decided that the alluvial aquifer beneath the Ambrosia Lake facility meets the definition of a "Limited Use Aquifer" as defined in section 192.11.e of the Ground Water Standards for Remedial Actions at Inactive Uranium Processing Sites. Based on that definition, DOE would only have one remedy choice for this site, the application of supplemental standards. This means that no ground water cleanup will take place and that contaminants may remain in ground water beneath the Ambrosia Lake site indefinitely.

The New Mexico Environment Department does not believe that we have enough information to concur with the statement that the alluvial aquifer cannot produce 150 gallons per day and should therefore be classified as a "Limited Use Aquifer". The New Mexico Environment Department may not agree with the interpretation of the current test data and methods used to make that determination and request that supporting documents such as well logs and pump test data be provided for our review. Furthermore, in order to determine whether or not a Limited Use Aquifer classification is appropriate, we believe additional testing should be done, with input from New

Mexico Environment Department technical staff. This testing should consider the rate and direction of movement of contaminated ground water, and should consider past and future plume movement to ensure that public health and the environment will not become threatened in the future.

DOE has stated in meetings that they do not have to gain our concurrence on the selection of a subsurface remedy. They have asserted that because we concurred with Subpart A for surface remediation, we incidentally concurred with the subsurface remedy. The New Mexico Environment Department does not agree with this reasoning and maintains that DOE must gain our concurrence for all remedies selected for the site, including the remedy for ground water contamination as discussed in 40 CFR Part 192, Subparts B and C of the Ground Water Standards for Remedial Actions at Inactive Uranium Processing Sites.

Thank you for considering the New Mexico Environment Department's comments.

State of New Mexico
ENVIRONMENT DEPARTMENT
Ground Water Protection and Remediation Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502
(505) 827-2918 phone
(505) 827-2965 fax

GARY E. JOHNSON
GOVERNOR

MARK E. WEIDLER
SECRETARY

EDGAR T. THORNTON, III
DEPUTY SECRETARY

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Post-it® Fax Note 7671	Date 7/17	# of pages ▶ 6
To UMTRA Project	From Richard Ohrbom	
Co./Dept. Team DOE	Co. Comm'd Water Sec	
Phone #	Phone # 827-0219	
Fax # 845.4023	Fax # 827-2965	

July 17, 1995

Rich Sena, Manager
UMTRA Team
Environmental Restoration Management Office
U.S. Department of Energy
2155 Louisiana NE, Suite 4000
Albuquerque, NM 87110

Re: PEIS Draft, Uranium Mill tailings Remedial Action Ground Water Project, April 1995

Dear Mr. Sena:

The New Mexico Environment Department (NMED) has reviewed the above referenced report and respectfully submits the following comments and concerns relating to the Ambrosia Lake UMTRA site.

Conclusionary statements as to the status of aquifers below the UMTRA sites are inappropriate at this time with reference to the requirements of Subpart A, 40 CFR 192.01-192.02 (See attached testimony presented by NMED at the June 7, 1995 public hearing at Shiprock, New Mexico).

NMED is concerned that DOE has already concluded that the alluvial aquifer beneath the Ambrosia UMTRA site is of "limited use because it cannot produce 150 gallons per day". NMED is concerned with this statement for two reasons:

1. DOE's conclusion that this aquifer qualifies as a supplemental standard aquifer due to limited use, i.e. produces less than 150 gallons per day on a sustained use bases, is formulated on a pump test of well 675 which pumped 0.35 gallons per minute for 12 hours (producing 252 gallons) before drawdown

WC-48

caused loss of suction. At a pumping rate of 0.35 gpm the required yield of 150 gpd could have been obtained in only 7 hours of continuous pumping. Information has not been presented to NMED which indicates that after a reasonable recharge period, this well would be able to pump 150 gallons each day on an intermittent basis. Further, pumping at a rate less than the 0.35 gpd used during the pump test may allow sustained pumping of 150 gpd. Before NMED can concur with DOE that the alluvial aquifer would qualify for supplemental standards, well 675 should be re-tested to provide the information described above.

Even if it can be proven that supplemental standards are appropriate at this site, institutional controls must be implemented to prevent the use of contaminated water in order to protect public health.

2. Calculations of linear velocities in the alluvial aquifer by DOE and others (Thompson and Heggen, 1981), have ranged from 18 feet per year to 5,183 feet per year respectively. NMED is concerned that large quantities of highly contaminated alluvial ground water produced during the active life of the tailings pile and high rates of tailings dewatering discharged to the alluvial aquifer for several years after cessation of mill operations may have migrated off the UMTRA site. NMED believes that alluvial aquifer testing downgradient from the mill site is insufficient to allow an evaluation of the quality and yield of the portions of the alluvial aquifer which may have been impacted by Ambrosia Lake operations.

NMED is also in disagreement with the PEIS in it's statement that "Ground water in aquifers below the Tres Hermanos-C unit does not appear to have been contaminated by seepage from the contaminated ground water units beneath the Ambrosia Lake site". Monitor well 678 located on the northeast edge of the tailings pile and completed in the Tres Hermanos-B, underlying the "C" unit, contains nitrate levels exceeding 3400 parts per million, sulfate levels of 6690 parts per million, and a total dissolved solids concentration of 15,300 parts per million. Ground water in the Dakota Sandstone beneath the Tres Hermanos Formation , collected from monitor well 680 located along the southwestern edge of the tailings pile, contains concentrations of sulfate at 2390 parts per million and a total dissolved solids concentration of 4140 parts per million. This well is listed as being an upgradient Dakota well. However, NMED believes that southwesterly flow of the

alluvial ground water along the eroded, north dipping Tres Hermanos Formation is recharging the Tres Hermanos and is migrating downward to the Dakota Sandstone.

Based on the above, NMED strongly objects to the PEIS's conclusion that the alluvial aquifer is of limited use. NMED requests that DOE proceed with Subpart B of 40 CFR 192.11-192.12 and that NMED be included as an active participant in the "site specific" evaluation and testing of the ground water below and downgradient of the Ambrosia UMTRA site. This study should include at a minimum:

1. Establish the chemical fingerprint of the alluvial ground water below and along the perimeter of the tailings pile by compiling "Stiff" diagrams using sulfate, chloride, TDS, and specific conductivity.

2. Retest well 675 as described above.

3. Sample alluvial ground water from wells south and southwest of the tailings pile and plot stiff diagrams for each well. Wells matching the stiff fingerprint of wells in and around the tailings pile should be tested for production capabilities using pump test methods described above. If sufficient alluvial wells are not present south of the tailings pile, new wells should be drilled on a "step-out" basis.

Further, NMED concurs with the comments submitted by the New Mexico Office of the Natural Resources Trustee, dated July 17, 1995, submitted under separate cover.

Please contact Richard Ohrbom of the Ground Water Section at 505-827-0219 to coordinate meetings between DOE and NMED to discuss planning and execution of Subpart B for the Ambrosia Lake UMTRA site.

Sincerely,

Marcy Leavitt, Chief
Ground Water Protection and Remediation Bureau

ML/RO/ro

Enclosure: NMED Testimony

WC-50

cc: Ed Kelly, Director, NMED WWMD
Benito Garcia, Chief, HRMB
Dale Doremus, Program Manager, GWS
Tracy Hughes, General Counsel, OGC
Steven J. Cary, Deputy Director, ONRT

WC-51

FROM: David Rapstine
1102 Feather Ridge
Floresville TX 78114
(210) 216-7459 (home)
(210) 671-3707 (work)

TO: US Dept of Energy
UMTRA Project
2155 Louisiana Blvd NE, Suite 4,000
Albuquerque NM 87110

REF: UMTRA Ground Water Hearing & Draft PEIS
Falls City TX, 27 Jun 95

The following issues are submitted in modifying the scope and content of the PEIS for the UMTRA Ground Water Project at the Falls City TX site:

Issue 1: At the 27 Jun 95 Falls City Ground Water Public Hearing, it was the position of the DOE that a public and environmental threat due to site operations ground water contamination does not exist. This is also stated in section 3.2.17 of the DRAFT PEIS. However, in my view the DOE assessment is suspect because the level of contamination off-site has not been determined. This is evident by the information contained in the attached excerpts which state in part, "contamination from the...processing activities is still in ground water at the Falls City site....Contamination migration...may be occurring but the extent...is not known because so few monitoring wells were placed in off-site locations (Figure 12-9)." Also, in addition to myself, I am aware of three other property owners on County Road 203 (east of FM 1344), all within three miles east and northeast of the site, who have not been asked to, nor had, tests performed on their domestic wells by any agency with the authority to judge their wells and the groundwater they stem from, free from hazard. These domestic wells range from depths of 00 ft to 250 ft and could very well be affected by the current upper aquifer contamination since the groundwater flows northeastward and southwestward (para 5, section 3.2.17). Periodic, seasonal backwash from the Scared Dog creeks occurs as well. It's likely there are other property owners in close proximity of the site that are in this situation. (For verification, the specific names and locations of the properties cited above can be obtained by contacting me. I have also given them a point of contact at DOE in Albuquerque NM since they all voiced keen interest in having their wells tested.) In summary, a quantifiable and viable ground water monitoring has never been employed for off-site locations in the vicinity of the UMTRA site. Therefore, the stated notion that a hazard does not exist to the public and the environment is dangerously premature and negligent. Recommend that a standard three to five mile radius around the site be established for public ground water monitoring purposes. All properties in this radius should have ground water sampled at various depths to determine the level of off-site contamination. Basically, this entire subject needs to be revisited before it can be incorporated into the PEIS.

Issue 2: Paragraph 6 of section 3.2.17 of the draft PEIS states in part, "Tailing fluids have migrated into the uppermost aquifer....However, because the background water is of poor quality (uranium, gross alpha, radium), this water is of limited use for stock watering and is of no use for any other purpose. This position rationalizes that the upper aquifer ground water was never of any human use prior to contamination caused by site operations. Absent, however, is any form of data supporting or corroborating this bold declaration. I can personally certify otherwise--I have firsthand knowledge of farmers, ranchers, and their families using well water from the upper aquifer for many years and for numerous applications. And until legally restricted and mandated to the contrary, these wells can and should be available for use by the

respective property owners as they see fit. Basically, the PEIS' comments regarding background water quality are interpreted by me (and probably by any reasonable person) as a position of expedience so that any type of issue regarding human use of the uppermost aquifer--past, present, or future, will not be able to be put on the table and addressed to the public's interest and satisfaction during any type of proceedings hereafter. Since the comments claiming the upper aquifer was never of any human use of value aren't supported by a documented factual basis, they shouldn't be allowed in the draft PEIS. Until data is provided which supports this specific narrative in the PEIS, the remarks should be amended to reflect that the background water quality in the uppermost aquifer was rendered useless for human use due to contamination from site operations as supported by the attached excerpts.

Issue 3: As indicated in the Draft PEIS, land and ground water use in and around the Falls City UMTRA site will likely be controlled in varying degrees depending on the course of action selected and a final, valid analysis made regarding extent of contamination around nearby off-site locations. Short and long-term restrictions and controls can include but are not limited to the following areas: construction, agriculture, irrigation, ranching, and surface and ground water use. Obviously these restrictions can have a catastrophic economic impact on affected farmers, ranchers, and property owners due to decreasing property values, a limit, or entire cessation, of livestock and agricultural production, and soaring costs to secure dwindling alternate sources of water. Also, the absolute involuntary acquisition of land from current owners is an available option. While these things concern loss in terms of fiscal matters, it doesn't even begin to describe loss in human terms--the loss and suffering associated with having a person's entire way of life and livelihood uprooted and taken away from them. The PEIS matter-of-factly confirms and accepts that these are all possible unfortunate consequences which can result from the ground water project. In my opinion, this falls way short of the mark. It's insensitive, it's uncaring--it's not enough. It's my recommendation the scope and content be expanded to address and therefore facilitate legal and financial recourse available to citizens who, through no fault of their own, now may be unduly affected by the actions and controls needed to remedy years of on and off-site contamination. With equity in mind, sensible criteria the key, and on a case-by-case basis, a program and policy should be developed to determine those people eligible for financial subsidy, free or low cost water, or outright free relocation, in order to mitigate confirmed instances of unjust severe financial losses caused by contamination or institutional controls. Some may argue that the PEIS isn't the proper forum for addressing issues of financial liability. However, since nearby property owners, farmers, and ranchers are all vulnerable to significant financial loss and ruin--impacts resulting from compliance strategies, they are in fact relevant issues--issues that are in the best interests of the public to have them incorporated into the document. It certainly can and, probably will, motivate and influence the alternative selected.

Thank you for giving me the opportunity to actively participate in shaping the PEIS. If you have any questions, concerns, or need additional data, feel free to contact me at the address and numbers listed above.

Sincerely,

David A Rapstine, 11 Jul 95

DAVID RAPSTINE

2 Attachments
1. Excerpt, Falls City UMTRA
2. Figure 12-9

WC-28

URANIUM MILL TAILINGS REMEDIAL ACTION (UMTRA) PROJECT

TAC Public Affairs Department
Public Inquiry Record

PA Representative: **Date:** July 3, 1995

CALLER IDENTIFICATION:
Name: David Tomsovic **Phone:** (415) 744-1569
Representing: U.S. EPA (SF)
Address:

Call Source:

QUESTIONS OR COMMENTS:

PEIS

-- WASTE WATER DISCHARGE PERMITS

.. Region 8 office in Denver will provide us comments, but SF office is giving Denver their comments

--has questions about the permitting process as it relates to pump & treat option in PEIS (discharge back to surface water?) -- EPA might have to do some NEPA documents if this option is selected, especially in Arizona & Texas.

RESPONSE: L. Ulland returned call 7/5/95 11AM.
Discussed PEIS with Tomsovic; EPA Reg. 6 (SF) issues noted:
1. At those sites/states in which EPA has not delegated authority to state for administering the NPDES permit and active remediation is selected remedy, a NEPA document ~~may~~ will be required for the NPDES process. If that is the case, that EPA would prepare NEPA documentation, suggest EPA-DOE cooperate in preparing to eliminate or minimize duplicative efforts.
2. Suggested inclusion of a table that estimates the amount of contaminated groundwater under each of the sites.
3. Denver Reg. 8 will compile EPA comments + transmit. Contact in Denver is Paul Momper 303/293-1695

Source of information:

COORDINATION:

COMMENTS: 1.) called at 1:30 p.m. on July 3 -- needs to talk to Linda Ulland -- or someone in her office. Told him that I would have someone call on Wed, July 5.

Date\time response given:

WC-34

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VIII
999 18th STREET - SUITE 500
DENVER, COLORADO 80202-2466

JUL 13 1995

Ref: WM-EA

IN UPDC

Rich Sena, Acting Director
Environmental Restoration Division
U.S. Dept. of Energy
2155 Louisiana NE, Suite 4000
Albuquerque, NM 87110

RE: Draft Programmatic Environmental Impact Statement for the Uranium Mill Tailings Remedial Action Ground Water Project

Dear Mr. Sena:

According to our responsibilities under the National Environmental Policy Act (NEPA) and section 309 of the Clean Air Act (CAA), The Environmental Protection Agency (EPA) has reviewed the above referenced Draft Programmatic Environmental Impact Statement (DPEIS).

The DPEIS was well written and did a good job of disclosing information necessary to select a programmatic alternative. It seems to be a sound approach to the problem given the limited intent of the DPEIS. The EPA does have several general concerns and a few specific comments about the DPEIS.

One overriding general concern is the perception that most remediation efforts will focus on what is referred to in this document as passive remediation. Precipitation, adsorption, and ion exchange are all chemical/physical processes that will decrease the mass of contaminant present and transported in the ground water. None of these cause concern. However, a general reliance on flushing of contaminants from the aquifer does (dilution, dispersion, diffusion). The EPA would like to see more emphasis on removal of the mass contaminants than dilution and ground water transport away from processing sites.

Another general concern is the absence of reference to local land use authorities. The DPEIS recognizes potential contributions from other Federal, State, and Tribal entities but omits local governmental and quasi-governmental organizations.

There seems to be a significant reliance on previous site characterizations and the data derived from these efforts. Site characterization is the linchpin of remediation and must include the most complete and current data available. The EPA is not sure that adequate data is available today. Rather than

WC-44

characterization of a water table aquifer below a processing site, an understanding of the local aquifer system and its relationship to deeper ground waters as well as surface waters is of paramount importance. The hydrologic character of the bedrock is also very important.

NPDES Permits and EPA's NEPA Compliance: The DPEIS (C-11) discusses various methods to dispose of contaminated ground water following treatment. One method is via discharge to surface waters. Page C-11 states that discharge rates and effluent quality would be regulated to meet National Pollutant Discharge Elimination System (NPDES) requirements, as required by the Clean Water Act. The Final EIS should note that in at least one State (Arizona) the USEPA may be required by the EPA's NEPA regulations (40 CFR Part 6) to prepare and circulate appropriate documentation under NEPA (Environmental Assessment or Environmental Impact Statement). The Department of Energy should work closely with the appropriate EPA regional office to determine whether the EPA has to prepare NEPA documentation for the new source NPDES discharge permit application, and if so, whether the DOE and EPA should work cooperatively to prepare a single NEPA document addressing both the DOE's groundwater approach and the NPDES discharge. Additionally, we request that the DOE identify which UMTRA site or sites already have NPDES permits and, if feasible, which site or sites may be reasonably expected to require new source NPDES permits. For example, the UMTRA site with the largest amount of ground water contamination (Monument Valley, Arizona with .75 billion gallons) may will require surface discharges, since it may be impracticable to evaporate or inject such a large volume.

Volume of Contaminated Ground Water: It does not appear there is a table in the DPEIS depicting the amount of contaminated ground water at each of the 23 sites (Lowman, Idaho shows no sign of ground water contamination, DPEIS, p. sum-5). We suggest that such a table be included in the Final PEIS. Alternatively, it may be easy to incorporate data on the volume of contaminated ground water directly into Table 3.2 or Table 3.3.

The Hydrologic characterization discussion on Page 2-18 would be a good opportunity to establish a minimum standard for QA/QC including data quality and well construction. This would strengthen the reliance on referenced documents.

Geochemical Characterization, page 2-21: More detail is needed on appropriate selection of a background quality site.

Geochemistry of aquifer matrix materials, page 2-23: Computer modeling could be of use here to predict chemical/physical process.

Ground Water Data in DOE's Site-Specific NEPA Documents: The EPA requests that the Final PEIS and Record of Decision

contain a commitment that all future site-specific NEPA documents for the project include the full range of ground water data used by DOE in recommending a site-specific ground water decision. Including ground water data in the site-specific NEPA documents would enable the public and agencies to determine if the course of action recommended by DOE is appropriate for each particular location.

Pollution Prevention: The Council on Environmental Quality (CEQ) issued a guidance memorandum to Federal agencies concerning NEPA and pollution prevention in the January 29, 1993 Federal Register at pp. 6478-6481. This CEQ memorandum encouraged all Federal agencies to consider pollution prevention principles in their NEPA planning and decision-making and to incorporate such considerations in agency NEPA documents. It does not appear that the PDEIS reflects the CEQ's 1993 memorandum, although several project features may lend themselves to pollution prevention techniques. For example, will attempts be made to minimize or avoid construction and other land-disturbing actions in environmentally sensitive areas, and to use existing road alignments to reduce the amount of waste resulting from road construction activities? These and other pollution prevention techniques should be assessed by DOE as it undertakes site-specific activities. We recommend that the Final PEIS and Record of Decision include a commitment by DOE to adopt all reasonable, feasible pollution prevention measures in its site-specific actions.

Environmental Justice: The DPEIS does not appear to reflect the requirements of Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (Federal Register, February 16, 1994 at p. 7629). Site-specific EA's and EIS's for the UMTRA Ground Water Project should analyze the environmental effects of proposed ground water actions on minority and low-income communities. We suggest that the UMTRA project office refer to DOE's recent PEIS on Tritium Supply and Recycling for a useful approach to environmental justice issues.

The EPA agrees that the No Action alternative would not comply with EPA's groundwater standards at most of the UMTRA project processing sites. The EPA also agrees that significant adverse impacts to human health and the environment could result under the no action alternative.

The passive remediation alternative would expose the public and environment to hazardous contaminants for a significant period. It would rely on flushing contaminants rather than removal. The EPA would have environmental objections should this become the selected alternative.

The preferred action (a hybrid alternative) appears to be acceptable in that it would institute a formula of no action, passive remediation or active remediation depending on the

remediation needs and groundwater uses of each particular site.

Based upon the discussion in the DPEIS and the concerns and comments expressed above, the EPA is rating the preferred alternative EC-2 (Environmental Concerns - Insufficient Information). This means that the EPA review has identified environmental impacts that should be avoided to fully protect the environment and that the PDEIS does not contain sufficient information to fully assess environmental impacts that should be avoided to fully protect the environment.

Please contact Paul Momper of my staff at (303) 293-1695 if you have questions.

Sincerely,

J. William Geise, Jr., Acting Chief
Environmental Assessment Branch
Water Management Division

WC-47

CITY of RIFLE IN UPDC

202 RAILROAD AVENUE • P.O. BOX 1908 • RIFLE, COLORADO 81650 • (303) 625-2121 • FAX (303) 625-3210

July 6, 1995

Ms. Sharon Arp
Rifle Site Manager
U.S. Department of Energy
2155 Louisiana Blvd. NE, Suite 4000
Albuquerque, New Mexico 87110

Re: Ground Water Project

Dear Ms. Arp:

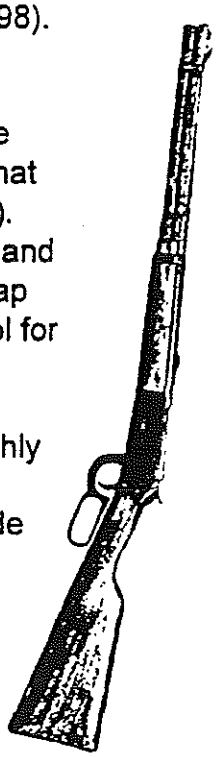
The City of Rifle has two concerns about the ground water remediation in Rifle. One issue relates to the contaminated domestic wells in the area, and I previously I sent you a letter concerning DOE's *Private Well/Spring Position Paper, Rifle, Colorado.*

The second issue concerns DOE's proposed action for the contaminated groundwater. As I read the proposal, institutional controls would be used to protect human health and the environment in the event the decision tree called for natural flushing, natural flushing with active remediation, or when standards can not be met.

Our concern is that institutional controls could be quite serious, and would include private property. The controls can include fencing, land use restrictions, federal purchase of land, eliminating all uses, etc (see sections 4.2.2.6 & 5.2, DOE/EIS-0198). These controls could be in place for up to 100 years.

If the number of contaminants is any indication of the severity of contamination, the New Rifle site is of particular concern. This is the only UMTRA site in the country that has all of the hazardous constituents present (see Table 2, SUM-6, DOE/EIS-0198). The ground water plume at this site appears to be about one mile by one-half mile, and extends about 1/2 mile west of the site (see Private Well /Spring Position Paper, map figure 3.3) The possibility of having an area this size under strict institutional control for up to 100 years is of great concern.

Based on past DOE actions, I have no doubt that the City of Rifle would be thoroughly consulted before any institutional controls would be implemented in our immediate planning area. Nevertheless, because both contaminated plumes are mostly outside our existing City limits, Rifle would not be in a position to reject onerous institutional



WC-35

controls and force more active remediation. Under the decision process, institutional controls will be the only option if active remediation is not judged to be effective.

It is our position that if the level of contamination is serious enough to warrant severe institutional controls in, or near, a municipality, active remediation should always be considered as part of the solution. If active remediation would significantly reduce the severity, area or duration of the institutional controls, it should then be included in the program. We ask that DOE modify the decision tree to include that provision.

The City has been extremely pleased about the effectiveness and safety of the surface mill tailings remedial action project. The lack of problems with a project this large speaks well of all concerned. We are hopeful that any ground water remediation will be equally successful.

Sincerely,

David Ling, Mayor

David A. Hawker, City Manager

cc: Arnold Mackley
Jim Hams

WC-36

STATE OF COLORADO

Roy Romer, Governor
Patti Shwayder, Acting Executive Director

Dedicated to protecting and improving the health and environment of the people of Colorado

HAZARDOUS MATERIALS AND WASTE MANAGEMENT DIVISION

4300 Cherry Creek Dr. S.
Denver, Colorado 80222-1530
Phone (303) 692-3300
Fax (303) 759-5355

222 S. 6th Street, Room 232
Grand Junction, Colorado 81501-2768
Phone (303) 248-7164
Fax (303) 248-7198

Colorado Department
of Public Health
and Environment

July 7, 1995

Mr. Rich Sena, Manager
Environmental Restoration Division
U.S. Department of Energy
Albuquerque Operations Office
P.O. Box 5400
Albuquerque, NM 87185-5400

Subject: Draft Programmatic Environmental Impact Statement (PEIS) UMTRA Ground Water Project

Dear Mr. Sena,

Attached please find the comments generated by the State of Colorado regarding the above referenced document. In general we agree with the preferred alternative posed by the PEIS. The preferred alternative provides necessary flexibility in choosing site-specific remedies. We would like to stress that the focus of this PEIS, and any Environmental Assessment that will tier off of it, must be protection of human health and the environment. Any site-specific strategy developed through this process must be protective.

Since this document is designed to simplify the site-specific NEPA process, we believe that all issues with project-wide implications should be addressed in this over-arching document. We have provided comments on some of the specific project-wide issues which we believe are not dealt with sufficiently in the PEIS. Our most serious concern is the lack of discussion regarding mitigative measures. We strongly believe that the document should contain proposed mitigative measures for all project-wide impacts. The most serious impact that will occur using the preferred alternative will be to private property owners. These impacts must be mitigated. Until this discussion is added to the PEIS, we feel that the requirements of NEPA have not been satisfied. Should you have any questions regarding these comments, please contact me at (303) 692-3387 or Wendy Naugle at (303) 692-3394. I thank you for the opportunity to review this document in its draft stage.

Sincerely,

Jeffrey Deckler
UMTRA Program Manager

cc: Don Metzler, DOE/AL
Jim Shanks, City of Grand Junction
Gary Tomsic, Gunnison County
Bud Franz, CDPHE/GJ
David Hawker, City of Rifle

CDPHE Comments Regarding UMTRA Draft PEIS for Ground Water

General Comments

1) **Impacts of the proposed action and mitigative measures.** The National Environmental Policy Act (NEPA) requires that all significant environmental impacts of an action be identified and mitigated. The PEIS should address all identified project-wide impacts, so that this discussion does not have to be recreated for each site-specific Environmental Assessment (EA). While the PEIS has identified some of the impacts that may occur, the discussion regarding mitigation is noticeably absent. We believe that the PEIS should contain a "laundry list" of possible mitigative measures that can be employed on a site-specific basis to mitigate the identified impacts. Then, during the EA stage for each site, the preferred mitigative measures for that site can be selected from the list.

We also believe that many of the impacts of the proposed action have been overlooked, or understated. We have provided some of the specific instances in our comments below. For example, impacts to private property owners, especially under the "passive restoration strategy" are significant and could potentially have legal ramifications for this project. DOE should provide a list of possible measures that can be used to address how the loss of use of private property, especially water rights, will be mitigated. In addition, the impacts of raising the water table, or conversely the impacts of drawing down the water table under the "active remediation strategy" are not addressed. Possible mitigative measures for these impacts should also be listed.

2) **Contaminants to be addressed.** There appears to be a discrepancy between the contaminants that are being addressed under the PEIS and those addressed by the site-specific risk assessments. For example, the Gunnison, CO risk assessment identifies iron and manganese as the contaminants causing the highest degree of risk. However, it appears that these contaminants will not be addressed under the ground water program since they are not listed in the EPA standards. If DOE does not plan to remediate these "unlisted" contaminants, then this is an impact of the project that must be addressed as part of the PEIS. In addition, ground water monitoring has identified radionuclide daughter products (i.e. Lead-210) in groundwater at some of the mill sites. This contamination is obviously from the mill processing activities, yet it appears that it will not be addressed under the ground water program. The position of the State of Colorado is that any constituent posing a hazard to human health or the environment, (whether specifically listed in the EPA standards or not) that has originated from uranium processing activities, must be addressed by the ground water project. The PEIS should clarify the proposed approach that DOE plans to take regarding "unlisted" ground water contaminants.

3) **Ground Water standards.** The PEIS should address the approach that will be used and the commensurate impacts that will occur when the UMTRA ground water standards are different from the Safe Drinking Water Act maximum contaminant levels. For example, the proposed EPA drinking water standard for uranium is 0.020 mg/l, while the UMTRA ground water standard for uranium is 0.044 mg/l. If a ground water source is to be used for a future water supply, and DOE remediates to 0.044 mg/l, an impact would occur in that further treatment, down to the 0.020 mg/l level would be required before the aquifer could be used for drinking water supply. The PEIS should also address how changes in the drinking water standards will impact the project. In addition, the PEIS does not discuss how specific state or tribal standards will be used in the ground water project. This discussion should be added, and any impacts due to the differences in standards should be addressed.

4) **Ground Water contamination on Vicinity Properties.** The State of Colorado has frequently stated our position that the ground water project must address ground water contamination that may have occurred on vicinity properties. We believe that sufficient data exists to indicate that groundwater contamination has occurred on vicinity properties (Bendix study of Lincoln Park). However, the PEIS does not address this issue. The PEIS needs to discuss the proposed method for addressing ground water contamination at VPs, any impacts that this method will have, and the proposed mitigative measures for those impacts. It should also note that since source material is being left in place, all portions of the proposed alternative (i.e. natural flushing) may not apply. In addition, the PEIS does not acknowledge the fact that vicinity property deposits may impact the ability to determine background concentrations at some mill sites (see specific comments regarding the Grand Junction and Rifle sites below.)

5) **Data uncertainties.** The document does not address impacts associated with the uncertainty of the ground water analysis. The sensitivity of various remedies to the accuracy of the site characterization should be considered in the selection process. For example, the sensitivity of natural flushing to flow velocity may be such that for sites where we are unsure of this parameter, natural flushing would not be considered as reliable and might not be chosen.

6) **Alternate water systems.** The use of alternate water systems as a complete remedy has been discarded because EPA standards would not be met. However, such a system may provide an excellent institutional control to be used in conjunction with natural flushing. The PEIS should specifically mention alternate water systems, as well as other specific institutional controls which might be considered. The impacts and mitigation of these impacts should also be included.

7) **Point of Compliance (POC).** Since the PEIS is designed to be an over-arching document, and Point of Compliance is a project-wide issue, we believe that the definition of POC merits discussion in the document.

8) **Passive remediation strategy.** We are concerned about the fact that there does not appear to be any consideration of the costs of mitigating potential impacts in deciding to use the passive remediation strategy. We believe that it is highly likely that there will be sites were passive remediation is technically feasible, however, overriding factors, like private property ownership rights will preclude the use of this option, as mitigating the impacts may become more costly than the active remediation strategy. The decision-making process needs to include the costs of mitigation in determining the best strategy under the proposed option.

Specific Comments

9) Page SUM-6, Table 2 and Page 3-5, Table 3.3. This table lists constituents exceeding the maximum concentration limits (MCLs) at each mill site. The list of constituents for most of the Colorado sites has been changed from those listed in site-specific surface Remedial Action Plans (RAPs). For example, the Gunnison, CO RAP lists 10 hazardous constituents exceeding the MCLs, however, this table shows only 2 constituents exceeding MCLs. The tables in the PEIS should be consistent with the approved surface RAPs. Any changes that have occurred in site-specific interpretation of ground water data should be noted and described in the site-specific NEPA documents rather than the PEIS.

10) Page SUM-8. Given the varying success of active treatment systems such as "pump and treat", the document should acknowledge that standards might not be met even with this aggressive approach.

11) Page 1-16. It is unclear how active treatment and natural flushing can be combined. We suggest adding an example to describe the combination of these two strategies.

12) Page 2-2. The decision-making process shows that application of supplemental standards is the first choice after no action, followed by ACLs. We would like DOE to reexamine this logic. The goal of ground water remediation should be to meet MCLs, as the first approach, if possible. Therefore, natural flushing and active treatment should be looked at as means to achieve these standards. However, if the impacts or costs of these options were significant, then supplemental standards, and lastly ACLs would be considered to justify not meeting the MCLs in a given situation.

13) Page 2-5. Section 2.3 2nd paragraph. The meaning of the statement "or fall within the EPA ground water standards" is unclear. Please clarify.

14) Page 2-7. This discussion understates the short term impacts. Drilling in some areas of contaminated ground water, for example, the Dos Rios subdivision in Gunnison, CO will have definable short term impacts to the homeowners in the area. Again, we recommend that possible mitigative measures be mentioned for these impacts.

15) Page 2-7. This discussion understates the long term impacts. The discussion should include the impacts due to infrastructure (pumping wells, treatment plants) remaining in place over an extended period of time. In addition, there will be impacts from the monitor wells remaining in place over long periods of time. As private property may change ownership many times over the course of the "remedial period", DOE should explain how long-term access to private property will be maintained. There will also be long term impacts from institutional controls which are not discussed in this document. These impacts, which include access restrictions, building restrictions, ground water use restrictions and property devaluation should be included in the document and possible mitigative measures should be presented for each impact identified.

16) Page 2-13. The discussion regarding exposure pathways is very confusing and unclear. We recommend rewriting this section. It may be helpful to begin the discussion with the last paragraph, followed by the discussion of how the exposure pathways are determined.

17) Page 2-14. Section 2.7.3 seems out of context, because in most cases site prioritization occurred before the risk assessments were completed. Thus, we think that it would make more sense to have the discussion of prioritization before the section regarding risk assessment.

18) Page 2-15. Section 2.8. This section should discuss any contaminants resulting from milling operations that have been <u>detected</u> in ground water at the processing, rather than only those which exceed MCLs.

19) Page 2-17. Use of the observational method is discussed in Section 2.8.1. As we have mentioned

in previous discussions, this creates potential funding difficulties on the part of the state, since there is never a complete plan of action or defined cost (rather, there are costs associated with each iteration). This is an impact that should be addressed.

20) Page 2-21. There is an implication in Section 2.8.1.2 that determinations will be made of contaminant concentrations in the unsaturated zone. How will this occur? What impacts will occur as a result of this testing? How will the data be interpreted? How will this information alter the ultimate decision for a site? Please clarify the intent of this section.

21) Figure 2-5 could be enhanced by showing a monitor well.

22) Page 2-27. As an initial comment, the State of Colorado is unlikely to favor contaminant isolation as a site specific remediation technology. We do not believe that this approach satisfies the intent of the EPA standards.

23) Page 2-30. State and federal regulations should be mentioned in the discussion of waste management methods. Residual Radioactive Material (RRM) should be added to the list of wastes which may be generated.

24) Page 2-31. There is discussion of disposing contaminated soils and sludges at an open UMTRA cell. Given the timing of the ground water program, the only open cell (assuming a "post-UMTRA" tailings management plan is implemented) will be the Cheney cell in Grand Junction. However, current plans allow for a maximum of 15,000 yards of non-Colorado UMTRA material to be disposed of in this cell. Since active systems can produce significant quantities of sludge, the document should consider alternate disposal locations with adequate capacity.

25) Page 2-32. Section 2.10. In order to clarify that the budgetary process has not predetermined any site-specific decisions, the last sentence of the first paragraph should be rewritten to state "These assumptions are for budgetary reasons only and in no way indicate that site-specific ground water compliance strategy decisions have been made prior to completion of the PEIS or site specific NEPA documents." This comment also applies to Page 3-7.

26) Page 3-4. Grand Junction and Rifle should be considered urban sites, since the mills are located in the towns.

27) Page 3-10. The Durango site surface has been revegetated by the Project and supports a healthy stand of vegetation. It is not "highly disturbed with limited vegetation". Also, the discussion on ground water usage should include the planned Animas-La Plata project, which will have its intake in the Animas River on the southern portion of the mill site.

28) Page 3-11. The Grand Junction site is owned by the state. Also, the discussion of ground water quality should note the possibility of vicinity properties impacting the "background" wells, and acknowledge the uncertainty of background at this particular site.

29) Page 3-13. The Gunnison site is owned by the state. Also, the discussion of the water system needs to be updated to indicate completion.

30) Page 3-14. Since DOE and CDPHE are currently discussing the appropriate cleanup in Johnson Wash and Lay Creek, it is premature to state that most of this contamination will not be cleaned up. Also, the statement on page 3-15 that there is no ground water contamination is misleading as there are wells drilled at the site that produce contaminated water from below the ground surface. This statement is also inconsistent with tables 2 and 3.3 which show several contaminants exceeding the MCLs at this site. It would be accurate to state that the contamination has not traveled beyond the site boundary.

31) Section 3.2. Site Descriptions. Site descriptions should all use the same units of measurement for commonly discussed parameters. For example, the discussion regarding the ground water flow velocity at Maybell, CO site uses feet per day, while the Old Rifle site is listed in units of feet per year.

32) Page 3-17. The discussion of the Rifle site ground water indicates that Colorado River stage impacts the alluvial flow regime, which is to be expected. However, in the Rifle Private Well/Spring Position paper, it is stated that the hydraulic gradient is constant regardless of the river stage. These documents should be consistent, and data should be provided to the state to support whichever conclusion is correct (we have asked for this data in our comments on the position paper). Also, the discussion of ground water quality should note the possibility of vicinity properties impacting the "background" wells, and acknowledge the uncertainty of background at this particular site.

33) Page 4-9. Section 4.1 needs to address potential impacts in developed areas, i.e. the Dos Rios Subdivision, in Gunnison, CO. If passive remediation is chosen as the strategy for the Gunnison site, many long-term impacts will occur. For example, monitor wells will remain in place for an extended period of time, potentially for 100 years in the middle of a residential area. Other impacts would include access restrictions, use restrictions, and decreased property values.

34) In Table 4.3, impacts to visual resources could occur in the long-term as well, and should be included.

35) Page 4-8. Section 4.2.1.3. Construction of ground water remediation facilities may also require storm water permits, which should be mentioned.

36) Page 4-8. In Section 4.2.1.4 impacts of raising the water table, impacts of drawdown on surface water, and impacts to water rights are not addressed. Possible mitigative measures for these impacts should also be listed.

37) Page 4-11, Page 4-23, and Page 4-32. There are visual impacts from monitor wells, particularly in developed areas which should be addressed in the document. Experience has shown that homeowners do not like to have monitor wells as part of their landscaping. DOE needs to address the mitigative measures of flush-mounting monitor wells or providing landscaping to hide the wells.

38) Page 4-25, Table 4.4. Footnote "a", should read "qualify". In addition, this table uses the term "temporary" in relation to reduction in property value. What time period is meant by temporary?

39) Page 4-33. The potential impacts to water rights should be discussed, and mitigative measures proposed.

40) Page 4-35, Table 4.5. We disagree that the proposed action has little or no impact on property value. If passive restoration is chosen as the remediation strategy, property values could be decreased significantly for an extended period of time. Since both active and passive remediation are strategies within the proposed action, it is unclear how the impacts for these options can be described differently.

UMT 64193

0.26.1

STATE OF WYOMING
OFFICE OF THE GOVERNOR

JIM GERINGER
GOVERNOR

STATE CAPITOL BUILDING
CHEYENNE, WY 82002

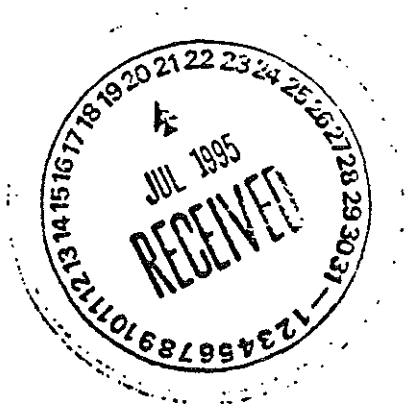
July 11, 1995

UMTRA Team
Environmental Restoration Management Office
U.S. Department of Energy
2155 Louisiana NE, Suite 4000
Albuquerque, New Mexico 87110

To Whom It May Concern:

On behalf of the State of Wyoming, please be advised that we have reviewed the Draft Programmatic Environmental Impact Statement, UMTRA Ground Water Project and we encourage the work to move forward. In accordance with our own comment period given to all affected state agencies, I have attached comments from the State Engineer's office for your review.

Thank you for the opportunity to comment on this study and I look forward to the progress of this project.



Sincerely,

Jim Magagna

Jim Magagna
Director of Federal Land Policy

JM:jh
Enclosures

THE STATE OF WYOMING

JIM GERINGER
GOVERNOR

GORDON W. FASSETT
STATE ENGINEER

State Engineer's Office

Herschler Building, 4-E
(307) 777-7354

Cheyenne, Wyoming 82002
FAX (307) 777-5451

MEMORANDUM

May 24, 1995

TO: Julie L. Hamilton, Office of the Governor

FROM: Richard G. Stockdale, Administrator-Ground Water Division

SUBJECT: Review of "Draft Programmatic Environmental Impact Statement for the Uranium Mill Tailings Remedial Action Ground Water Project." State Identifier No. 95-052

Wyoming has two sites involved in the subject "Uranium Mill Tailings Remedial Action Ground Water Project". The "Riverton Site" is located approximately two (2) miles southwest of Riverton, Wyoming and the "Spook Site" is located approximately forty-eight (48) miles northeast of Casper, Wyoming in Converse County. The "Riverton Site" has the potential for both surface and ground water contamination. The "Spook Site" probably has contaminated ground water only because there are no perennial streams in the area receiving ground water inflows. Also, the ground water quality of the "Spook Site" is closely associated with the ore body so it is difficult to tell background ground water quality from that quality created by infiltration of water from the tailings.

The only comments that the State Engineer's Office has are as follow. First, depending upon the type of remediation method utilized, permits to appropriate water may be required. This is particularly true if some sort of flushing-withdrawal-treatment-reinjection system is utilized. Some quantity of water will be "lost" in such a system and will require additional "make-up" water. Secondly, if a more passive remediation method is utilized, i.e. natural flushing, the State Engineer's Office should be made aware of the magnitude, composition, direction of movement, etc. of any contaminate plume so that prospective applicants for permits to beneficially utilize ground water near the contaminated areas can be advised of ground water conditions in the area.

Thank you for the opportunity to review and respond to the draft EIS.

xc: Gordon W. (Jeff) Fassett, State Engineer
Sue Lowry, State Engineer's Office

UMT 65398

0.26.1

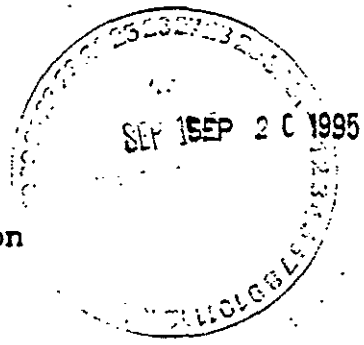
IN_UPDC

United States Department of the Interior

BUREAU OF INDIAN AFFAIRS
PHOENIX AREA OFFICE
P.O. BOX 10
PHOENIX, ARIZONA 85001

IN REPLY REFER TO:

Environmental Quality Services
File 4305.5 DOE-PEIS-UMTRA
(602) 379-6750



Mr. Rich Sena
Chief, Environmental Restoration Division
U.S. Department of Energy
2155 Louisiana NE. Suite 4000
Albuquerque, New Mexico 87110

Re: Comments to Draft Programmatic Environmental Impact Statement (PEIS) for the Uranium Mill Tailings Remedial Action (UMTRA) Ground Water Project, April 1995

Dear Mr. Sena:

Enclosed please find our comments concerning the Draft PEIS for the UMTRA Ground Water Project dated April 1995. Our comments pertain principally to the participation of Indian Tribes (Tribes) as cooperating agencies as described in 40 CFR 1508.5 of the National Environmental Policy Act of 1969, as amended (NEPA). We believe it is clear that Tribes merit this role because tribal lands are governed by a sovereign Tribal government whose local concerns and issues must be addressed during the remedial selection process. Similarly, States, although not sovereign governments, should participate as cooperating agencies. We recommend that designation of Tribes and States as cooperating agencies be mentioned in Section 1.3.2, "Cooperating Agencies".

The Draft PEIS for the UMTRA Ground Water Project is a well written document. Although this document is not site specific, the document was reviewed in a manner to determine its possible impact to the remediation of ground water at the Tuba City UMTRA Ground Water Project. Through the review of this document and our familiarity with the Tuba City UMTRA Site in Coconino County, Arizona, we believe that "Active Ground Water Remediation" as identified in Box 16 on page 2-3 of the subject document should be the proposed action at this site. As a result, we would expect that proposed remedial options will encompass innovative and creative ways to remediate the ground water with emphasis towards the mitigation of radioactive particles in the ground water.

In addition to the treatment of existing contaminated ground water at the Tuba City UMTRA Site, we believe a collection and/or treatment system should be established to treat contaminants in the vadose zone under the site in order to prevent additional migration

of contaminants into the ground water. Also, we believe efforts should be made to prevent contamination of additional ground water.

We support the concept of site specific UMTRA Ground Water Project NEPA documents for analyzing impacts and determining the most effective and economical ground water compliance strategy in accordance with 40 CFR Part 192 requirements. We recommend that the PEIS also address Executive Order 12898 concerning the issue of "Environmental Justice" in minority and low income populations. In evaluating the proposed actions and alternatives, the Department of Energy (DOE) should identify and evaluate any anticipated effects, direct or indirect, to these communities.

Regarding the Tuba City UMTRA Site, we would expect DOE, as the lead agency, to schedule, coordinate and communicate the status of remedial option processes on a consistent basis with both the Hopi Tribe and the Navajo Nation.

If you have any questions or require further information, please contact Mr. John Krause, Area Hazardous Waste Coordinator at (602) 379-6750.

Sincerely,

Area Director

Enclosure

Comments to the Draft Programmatic Environmental Impact Statement (PEIS) for the Uranium Mill Tailings Remedial Action Ground Water Project

Section 1.3.2, "Cooperating agencies", Page 1-10:

1. Paragraph Two, First Sentence: Delete this sentence, and replace with: "DOE, will participate as the lead agency for the PEIS, while NRC, and affected stakeholders to include Tribes and States will participate as cooperating agencies."

2. Paragraph Two, Second Sentence through Last Sentence: This information should be moved to a new paragraph which would be the third paragraph of the section. After this paragraph, a new paragraph should be added discussing Tribes and States:

> "Tribes and States, are governments which have jurisdiction over lands that have been impacted and are thus stakeholders, and also have government to government relationships with other Federal agencies with natural resource trust responsibilities. Consequently, these governments meet the legal jurisdiction criteria for participation as cooperating agencies consistent with CEQ implementation regulations (40 CFR 1501.6). For the Ground Water Project PEIS, the affected States and Tribes, provide consultation for sections of the PEIS which discuss local issues for which these governments have special expertise. These topics would include such areas as Tribal and State governmental policies, water resources, land use, and cultural issues."

Section 1.4.1, "EPA Standards", Page 1-12, First Paragraph, Second Sentence:

Delete the phrase "...NRC concurs...", and replace with "...NRC, applicable Tribes and States concur...".

Chapter 9.0, "GLOSSARY", Page 9-1:

We recommend that definitions in this glossary be consistent with terms to be included in the planned ground water cooperative agreement with the Hopi and Navajo Tribes and DOE.

Chapter 12.0, "AGENCIES CONSULTED DURING THE PREPARATION OF THIS STATEMENT":

Page 12-1: Was the U.S. Fish and Wildlife Seervice, the U.S. Corps of Engineers, and the Environmental Protection Agency consulted during the preparation of the PEIS? If so, these agencies should be listed.

Chapter 13.0, "AGENCIES, ORGANIZATIONS, AND PERSONS RECEIVING COPIES OF THE PEIS":

1. Page 13-1: Add the Phoenix and Flagstaff, Arizona Public Libraries to your list of organizations.

2. Page 13-2: Replace "Office of Environment Project Review" with "Office of Environmental Policy and Compliance"

3. Page 13-3: Replace "Gallup Area Office" with "Navajo Area Office".

HENRY, LOWERRE,
JOHNSON, HESS & FREDERICK
ATTORNEYS AT LAW
202 WEST 17th STREET
AUSTIN, TEXAS 78701
(512) 479-8125
FAX (512) 479-8269

MARY E. KELLY
Of Counsel
(512) 474-1082

September 20, 1995

Mr. Don Metzler
Groundwater Hydrology Manager
UMTRA Team
Environmental Restoration Division
Albuquerque Operations Office
Department of Energy
P.O. Box 5400
Albuquerque, New Mexico 87181-5400

FACSIMILE TRANSMISSION
Hard copy to follow

Regarding: Comments on Groundwater PEIS

Dear Mr. Metzler:

Following this cover note are comments submitted on behalf of Concord Oil regarding the UMTRA groundwater remedial action PEIS. Please feel free to give me a call, if I can be of help in elaborating on these comments.

Sincerely,

David Frederick

enc.

xc: Mr. Tom Pawel, President
Mr. Reagan McCoy, Vice-President

Post-it™ Fax Note 7671	Date 9/19	# of pages ▶ 34
To Russel Edge	From B. Martin	
Co./Dept. DOE	Co. Navajo UMTRA	
Phone # 845-6130	Phone # 871-6982	
Fax #	Fax # 871-7190	

THE NAVAJO NATION

ALBERT A. HALE
PRESIDENT

THOMAS E. ATCITTY
VICE PRESIDENT

September 19, 1995

Rich Sena, Acting Director
Environmental Restoration Division
Department of Energy
2155 Louisiana, NE, Suite 4000
Albuquerque, NM 87110

RE: Comments on the Draft Programmatic Environmental Impact Statement - UMTRA Project

Dear Mr. Sena:

Enclosed are the Navajo Nation's comments to the April, 1995 Draft Programmatic Environmental Impact Statement.

The proper cleanup of contaminated groundwater at the UMTRA sites located on the Navajo Nation is of paramount importance to the Navajo people. The Navajo Nation expects that these comments will be given due consideration.

If you have any questions, please contact Ms. Bernadine Martin, Navajo Nation UMTRA Project Director at 520/871-6982.

Sincerely,

Melvin F. Bautista
Executive Director
Division of Natural Resources
(520) 871-6593

Enclosure

COMMENTS
DRAFT PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT
SUBMITTED BY
THE NAVAJO NATION

General Comments on the Draft PEIS

1. The document appears to have been constructed to justify the selection of the Proposed Action Strategy, with emphasis on natural flushing, as the preferred alternative. On page 2.1, four alternatives are listed but only the last one, Passive Remediation, with flushing/no remediation, is analyzed. Why not analyze active remediation or institutional controls only? The approach taken by DOE appears to be slanted toward a desired end result.

2. Cited references are difficult to comprehend without some knowledge of how they apply. For example, in Section 2.8.1, the Draft PEIS cites the existence of three UMTRA project documents as evidence that DOE's technical approach for the groundwater program is consistent with UMTRA regulations. However, without having previously reviewed these documents, it is very difficult for a reviewer to comment on the adequacy of the approach proposed in the Draft PEIS.

3. One of the important contaminant pathways that can threaten human health on the Navajo Nation is via animal consumption. This threat is ignored in the discussion of human health risk assessment in Section 2 and in the discussion of environmental impact on human health in Section 4. This is not a matter that should be relegated to coverage in some later site specific documents. The threat to human health via animal consumption probably extends to many of the 24 sites covered by the Draft PEIS.

4. DOE's reliance on natural flushing as a remedy seems to assume that there is no other beneficial use for water other than to use it as a flushing medium. Water is becoming increasingly sought after to meet the growing needs on the Navajo Nation, for a domestic water supply, for stock water, for commercial use (e.g., laundries) and for industrial use (e.g., cooling water, water to inject into oil producing formations, water to make steam for injection or for food and other processing, etc.) For some commercial and industrial uses, it does not matter that the water is of poor quality; impurities can be reduced or removed. The water itself has significant value, which can only increase as demand increases in the future. If this sort of value was evaluated, the attraction of natural flushing would diminish.

   It is a matter of concern of the Navajo Nation that present approvals and/or acquiescence by the Navajo Nation to DOE flushing plans may later be deemed to be dedications of water to the flushing usage for as long as 100 years. Such a prior

water-use right could act to hamstring development on the Navajo Nation 20; 50 or 80 years from now. In such circumstances, it would be far better to deal with contaminants presently with a low-water-use alternative and preserve the scarce water resource for more beneficial future usages.

5. Another characteristic of uranium mill tailings that should have been addressed more thoroughly is the widespread soil contamination above the water table at the location of the tailings piles. This oversight is probably the result of the separation of the DOE responsibilities into a Surface Project and a Ground Water Project. Neither Project focuses adequately on the problem soils that exist below the surface and above the ground water.

These sites are very different from the typical urban ground water contamination sites where, for instance, a leaky underground storage tank might contaminate soil over a small area. At the mill tailings sites, the soil is contaminated over tens of acres and through unsaturated zone depths of 10 to over 60 feet.

This widespread residual soil contamination will not be addressed by the groundwater remediation program. Seepage through this soil will act as a continuous source of contamination to groundwater (particularly at sites like Tuba City where active seepage from the consolidating, restructured tailings piles is clearly taking place). Without eliminating this source of contamination, any groundwater clean-up will be prolonged and ineffectual.

The Draft PEIS makes only a minimal reference to the problem and remedial techniques for contaminated soil, with the exception of isolation, are virtually not discussed. This is a serious matter which needs attention.

6. Another missing evaluation relates to the geochemistry of contaminants specific to mill tailings sites. These toxic items (uranium, nitrate, sulfate and various metals) are treated in a very cursory and sometimes misleading manner. In order to understand the processes affecting the migration of these contaminants, their susceptibility to natural flushing or pump and treat remediation, or how they could be treated chemically or biologically in situ, it is necessary to have at least a basic understanding of the geochemistry involved so that informed decisions can be made. The Draft PEIS needs to address the geochemistry of the pertinent contaminants to explain the applicable geochemical processes and appropriate remedial approaches.

7. In the decision tree, Figure 2.1, there is no recognition that it may be reasonable and appropriate to pursue cleanup of groundwater to levels higher than an established

Alternate Concentration Limit, even to the background level. The final EPA regulation, Section III, under Cost, states "Further, once the basic criteria for establishing ACLs set forth in . . . have been satisfied, if a higher level of protection is reasonably achievable, this should be carried out." Thus, EPA considers ACLs to be a point of departure for determining the appropriate cleanup level. Perhaps this guidance applies to MCLs also. In any event, the decision tree does not recognize this alternative action. It should be so amended.

8. The risk assessment methodology proposed in the Draft PEIS deviates significantly from the standard EPA approach and the deviation needs to be justified. Specifically, the Draft PEIS approach does not include Reasonable Maximum Exposure (RME) estimates and has no provision for characterizing the non-carcinogenic risks of chemical mixtures (i.e., it does not use the hazard index method).

This is not in conformance with EPA's Final Rule. In Section II of that rule (Summary of Background Information), EPA states "UMTRCA requires that the standards established under Title I provide protection that is consistent, to the maximum extent practicable, with the requirements of RCRA". Since risk assessment is a key component in the development of UMTRCA standards, this would imply that UMTRA risk assessment methodology should be consistent with a RCRA approach, such as that presented in the RCRA Facility Investigation Guidance. EPA's final Corrective Action Plan directive provides an additional list of guidance documents to be utilized for human and ecological risk assessment, including Risk Assessment Guidance for Superfund (RAGS, Volumes I and II). It should be noted that these guidance documents support the use of hazard index methodology for human health risk assessment as well as RME-style calculations.

The claim is made that DOE's proposed risk assessment methodology will be easier for decision makers and the public to understand. (ABSTRACT, Human Health Risk Assessment Methodology for the UMTRA Ground Water Project, Nov. 1994). The Navajo Nation submits that the ease of communication is not, in itself, a sufficient reason for deviating from standard and accepted assessment techniques. Secondly, the Navajo Nation is not persuaded that the Monte Carlo simulations included in the Draft PEIS methodology are all that easy to understand.

9. The document is not well organized and is difficult to read and understand. Regarding organization, figures in Section 4 are referred to in Section 2 and there is considerable referencing of text from section to section and to outside references. As to readability and comprehensibility, the Draft PEIS uses terms such as "passive remediation" which nonetheless includes an action such as the imposition of institu-

tional controls. Also, it defines "no remediation" as one of the elements of "passive remediation" (e.g., in Section 2.4). Some thought should be devoted to making these terms mean what they say. Also, general location maps for the individual sites would be extremely helpful for the reader in evaluating this document.

Legal Concerns on the Draft PEIS

Section 1.2.4 of the Draft Programmatic Environmental Impact Statement For The Uranium Mill Tailings Remedial Action Ground Water Project addresses the role of Indian Nations in the Department of Energy's (DOE) Ground Water Project. Section 1.2.4 states that the "involvement of ...Indian tribes in the UMTRA [Ground Water] Project is defined through individual cooperative agreements."

The Navajo Nation disagrees with the DOE's statement that the Navajo Nation's involvement in the UMTRA Ground Water Project is defined by the Cooperative Agreement entered into by the Navajo Nation and the DOE. In limiting the Navajo Nation's involvement in the UMTRA Ground Water Project to the terms and conditions of the cooperative agreement entered into between the Navajo Nation and the DOE, the DOE is failing to take into account the following:

1. The Federal Government, and the DOE as a department within the Federal Government, has a Trust Responsibility to Indian Nations.

The Federal Government's Trust Responsibility to Indian Nations arises from Indian treaties, Federal Statutes, Executive Orders, legal decisions, and the historical relations between the United States and Indian Nations. In a broad sense, the Trust Responsibility derives from the United States' unique legal and political relationship with Indian Nations. In a narrow sense, the Trust Responsibility defines the precise legal obligations owed to Indian Nations by the Federal Government in managing the property and resources of Indian Nations. The Trust Responsibility imposes on the Federal Government, and the DOE as a department within the Federal Government, the duty to remain loyal to, and advance the interests of, Indian Nations, F. Cohen, Handbook of Federal Indian Law, p. 227, (1982 ed.).

2. The Federal Government, and the DOE as a department within the Federal Government, owes a Fiduciary Duty to Indian Nations.

The Trust Responsibility imposes on the Federal Government a Fiduciary Duty of the most exacting standards when dealing with Indian Nations and peoples. The United States Supreme Court has determined that the Federal Government, pursuant to its Fiduciary Duty, owes to Indian Nations "moral obligations of the highest responsibility and trust," Seminole Nation v. United States, 316 U.S. 286, 287 (1942), and is "bound by every moral and equitable consideration to discharge its Trust Responsibility with good faith and fairness," United States v. Payne, 264 U.S. 446, 448 (1924).

3. President Clinton's Pronouncement of Government-to-Government Relations with Indian Nations.

On April 29, 1994, President Clinton reaffirmed the United States' unique relationship with Indian Nations and issued a memorandum to all executive departments and agencies of the Federal Government titled Government-to-Government Relations with Native American Tribal Governments. This document requires that in all activities relating to the resources and rights of Indian Nations, the Executive Branch of the Federal Government must:

A. Operate within a Government-to-Government relationship with Indian Nations.

B. Consult, to the greatest extent practicable and permitted by law, with Tribal Governments before taking actions that affect Indian Nations.

C. Assess the impact of agency activities on Tribal trust resources and assure that Tribal interests are considered before the activities are undertaken.

D. Remove all procedural impediments to working directly with Tribal Governments on activities that affect trust property or governmental rights of Indian Nations.

E. Work cooperatively with other Federal Agencies to accomplish these goals established by the President of the United States.

4. Secretary of the Interior Babbitt's Order regarding Department of the Interior Responsibilities for Indian Trust Resources.

Secretary of the Interior Babbitt, on November 8, 1993, issued Secretarial Order No. 3175 titled Departmental Responsibilities for Indian Trust Resources. This Order

requires that whenever an action is taken by the Department of the Interior that affects Indian trust resources:

A. All anticipated effects on Indian trust resources must be explicitly addressed in the planning, decision and operational documents that are prepared for a project.

B. All actions taken by the Department of the Interior must be consistent with the Trust Responsibility owed to Indian Nations.

C. Bureaus and offices of the Department of the Interior are required to consult with the Indian Nation with jurisdiction over the resources that the proposed action by the Department of the Interior may effect.

D. All consultations with Indian Nations are to be open and candid so that Indian Nations may evaluate for themselves the potential impact the proposed Department of the Interior actions may have on their resources.

5. The DOE's American Indian Policy.

The DOE's American Indian Policy outlines the principals to be followed by the DOE in its interactions with federally recognized Indian Nations. Included within these principals are the following:

A. The DOE recognizes Tribal Governments as sovereign entities with primary authority and responsibility for Indian country. In keeping with the principle of American Indian self-government, the Department will view Tribal Governments as the appropriate non-Federal parties for making decisions affecting Indian country, its energy resources and environments, and the health and welfare of its populace. The DOE will recognize the right of each Tribe to set its own priorities and goals in developing and managing its energy resources.

B. In keeping with the trust relationship, the DOE will consult with Tribal governments regarding the impact of DOE activities on the energy, environment and natural resources of Indian Tribes when carrying out its responsibilities.

C. The DOE will take a proactive approach to solicit input from Tribal governments on departmental policies and issues. The Department will encourage Tribal Governments and their members to participate fully in the national and regional dialogues concerning departmental programs and issues.

D. DOE recognizes that there may be regulatory, statutory and/or procedural impediments which limit or restrict DOE's ability to work effectively and consistently with Tribes. In keeping with this policy, the DOE will seek to remove any such impediments. Additionally, the DOE will, to the maximum extent permitted by law, apply existing statutory, regulatory and procedural requirements in a manner that furthers the goals of this policy.

E. DOE will seek and promote cooperation with other agencies that have related responsibilities. In many areas of concern to DOE, cooperation and mutual consideration among neighboring governments (Federal, State, Tribal and Local) is essential. Accordingly, the DOE will encourage early communication and cooperation among all governmental parties.

In conclusion, the Navajo Nation finds the Draft Programmatic Environmental Impact Statement for the Uranium Mill Tailings Remedial Action Ground Water Project inadequate due to its failure to recognize the Federal Trust Responsibility to Indian Nations, the Fiduciary Duty owed by the Federal Government to Indian Nations, President Clinton's Pronouncement to work with Indian Nations on a Government-to-Government basis, Secretary Babbitt's Order, and the DOE's American Indian Policy.

The Federal Trust Responsibility to Indian Nations, the Fiduciary Duty owed by the Federal Government to Indian Nations, President Clinton's Pronouncement, Secretary Babbitt's Order, and the DOE's American Indian Policy operate separately and independent of the cooperative agreement entered into between the Navajo Nation and the DOE. In light of the Federal Trust Responsibility to Indian Nations, the Fiduciary Duty owed by the Federal Government to Indian Nations, President Clinton's Pronouncement, Secretary Babbitt's Order, and the DOE's American Indian Policy, the cooperative agreement entered into between the Navajo Nation and the DOE does not and can not define the Navajo Nation's involvement in the UMTRA Ground Water Project.

The Navajo Nation requests that the D.O.E. specifically acknowledge, and integrate into all decision making, the Federal Government's Trust Responsibility to Indian Nations, the Fiduciary Duty owed by the Federal Government to Indian Nations, the DOE's commitment to work with Indian Nations on a Government-to-Government basis and abide by President Clinton's Pronouncement, Secretary Babbitt's Order, and the DOE's American Indian Policy when addressing the Uranium Mill Tailings Remedial Action Ground Water Project on the Navajo Nation.

Specific Comments on the Draft PEIS

1. SUM-3; Table 1. The distinction between strategies is vague. No groundwater remediation at sites meeting maximum concentration limits is a "no action" strategy. There is no action regardless of whether or not the site characterization activities are performed. Characterization is not remediation and so there is "no action".

2. SUM-4; First Full Paragraph. The "step-by-step" approach described here considers the no remediation strategy first. However, Table 1 (on page SUM-3) addresses the active remediation strategy first. This is inconsistent and misleading as to what is considered to be the most important strategy.

3. SUM-4; Last Paragraph. Why is no remediation considered as part of the passive remediation compliance alternative?

4. SUM-5; Fourth Paragraph. This paragraph reads "All of the alternatives except the no action alternative involve the implementation of one or more of three strategies." This is misleading. Of the three strategies discussed, only one can be implemented, i.e., active remediation. Neither natural flushing nor the no ground water remediation strategy can be implemented; these seem to fall under the "no action" strategy.

5. SUM-5; Impacts Assessment. The use of "+/-" to assess impacts is confusing. The "+" means high potential for a negative impact. This is confusing to the lay person. It would be better to express the impacts as high, medium and low.

6. SUM-9; Table 4. The ranking is confusing. The title of the table should clearly state that this is a comparison of negative environmental consequences. In addition, it is confusing to have economic benefits ranked, in reverse, in the same table.

7. 1-2; Third and Fourth Paragraphs. The Draft PEIS states that "This document analyzes potential impacts of the alternatives, including the proposed action, which is DOE's preferred alternative." This statement is unclear, and tends to overstate the information provided in the Draft PEIS. That is, the potential impacts of the alternatives cannot be property addressed without completion of site characterization, monitoring, and the baseline health risk assessment for each UMTRA site. At this phase of the evaluation process, the exact "action" required is still undecided.

8. 1-7; Section 1.2.4. First Sentence. Please revise the first sentence to read, "The UMTRA requires that the states *and tribes* participate fully . . . ."

This section states that "Indian tribes are not responsible for paying any of the remedial action costs." Yet Section 1.4.1. states that "Indian tribes . . . will take the lead role in implementing and enforcing the institutional controls." The Navajo Nation's resources are not sufficient to erect fences, devote time to guarding structures, or conduct monitoring of sites. Since administrative controls are a part of the remedial action, and DOE is required to fund such activities on Indian lands, then DOE should fund administrative controls.

9. 1-8; First Full Paragraph, lines 7-9. This statement may not be true because the Surface Project does not appear to be in compliance at the Tuba City site. After moving and stabilizing the tailings in the "engineered disposal cell" (which is not underlain with a liner), the tailings are undergoing transient drainage which is predicted to last approximately 120 years as the tailings consolidate under their own weight. This is adding additional contaminated water to the aquifer. Section IV.A of the Final Rule (EPA, January, 11, 1995) states that, it there is excess moisture in the tailings, "it will normally be necessary to use a liner or equivalent to assure that groundwater will not be contaminated while the moisture level in the tailings adjusts to its long-term equilibrium value." The tailings will continue to contaminate the groundwater at this site for a long period of time because of the way they were disposed on and will postpone any final solution of the groundwater contamination problems far into the future.

10. 1-10; Section 1.4. There is no mention of the role of tribal laws and regulations in the UMTRA ground water project process. While the involvement of the tribes in the UMTRA Project through Cooperative Agreements is noted in section 1.2.4, this does not include any discussion of tribal jurisdiction over certain activities which DOE might undertake at UMTRA sites. This section should include a statement that DOE's activities at the UMTRA sites located on tribal lands are also subject to tribal laws and regulation by tribal agencies.

11. 1-10; Section 1.4.1. How will ACLs be established for constituents like SO4, TDS, Cl, Fe, NH4 and pH? What standards will NRC use to determine that human health and the environment will not be adversely affected?

12. 1-11; Last Full Sub-Paragraph, lines 3-7 from the bottom. In the list of potential contaminants of concern, only inorganic chemical constituents are shown. Organic solvents were used as part of the extraction process at some of the processing sites but do not appear to have been analyzed in the ground water samples. Since the geochemistry or organic contaminants can vary greatly from that of inorganics and because organics are often toxic at very low concentrations, their presence needs to be

determined before a remediation plan can be established and before a risk assessment can be performed.

13. 1-11; Last Sub-Paragraph (and first three lines on 1-12). An addition needs to be made indicating that in the development of alternative concentration limits "that human health and the environment would not be adversely affected" if the remediated water is used as a drinking water supply. This language is in the regulations (EPA, 1995) but was omitted here.

14. 1-12; First Full Paragraph, Last Statement. How will "quantity of water" be determined?

15. 1-12; First Bullet. Before the natural flushing alternative is selected, DOE should consider the volume and concentration of tailings covered. The concentration amounts would affect the loading rate (producing leachate) as time progresses. The concentration could also be affected by other factors such as seasonal, recharge, and the decline in source strength. In light of these factors, how will DOE determine the short/long term rates regarding whether the 100 years clean-up period can be obtained?

16. 1-12; Third Bullet. Does public drinking water also include livestock and agriculture uses? "Public drinking water" is not defined in the Glossary.

17. 1-13; "Supplemental Standards". The discussion of supplemental standards and limited use ground water does not make clear some important points within the Final Rule (40 CFR Part 192). Supplemental standards, as defined at 60 FR 2861 (third column), may be granted if "Groundwater at the site is of limited use (§192.11(e)) in the absence of contamination from residual radioactive materials . . . ." Limited use is meant to be equivalent to Class III ground water except that "for the purpose of qualifying for supplemental standards, human-induced conditions exclude contributions from residual radioactive materials". This point is not made clear in the document.

18. 1-13; Second Bullet. If supplemental standards are chosen, based on this point, the reasons must be compelling. There will be the possibility that the contaminated groundwater could be the only drinking water source in the future.

19. 1-13; Third Bullet. Cost should not be a reason for not cleaning up the ground water to background level, MCLs or ACLs. The potential for a "clear present or future hazard" requires a subjective judgment. Also the phrase, "at a vicinity site" has been

left out. The conditions from the Final Rule for 40 CFR 192.21 and 192.22 should be included verbatim to remove any possibility of misinterpretation.

20. 1-13; Sixth Bullet. At what point would ground water be deemed "limited use"? Before milling activities? After milling activities?

21. 1-13; Last Bullet. The significance of this statement is unclear. All the other six conditions listed above would result in the setting of a supplemental standard which is higher than the current regulatory standard. But this statement would appear to require a lower standard if radiation were high. Does this imply a standard lower than the 15 pCi/L gross-alpha standard? Or is the statement there to include gross-beta activity, for which no standard is given? Some clarification is needed.

22. 1-14; First Full Paragraph. Implementation of institutional controls as restrictive mechanisms, such as the rightful inhabitants of the land being restricted from their land, is unacceptable to the Navajo Nation under the no action strategy and under the no remediation strategy.

23. 1-19; Next to Last Paragraph. It is not clear what the Record of Decision ("ROD") applies to. Does the ROD only apply to the programmatic approach (most likely to the Proposed Action)? Will there be individual RODs for each of the sites on what specific actions will be taken there? Issuing of the ROD is a very important step in the regulatory process: prior to the ROD there is a lot of opportunity for public input, while after the ROD public input is more difficult.

24. 2-1; "Alternatives". The four alternatives listed in the Draft PEIS are really only reflective of three alternatives. That is, 1) No Action, and 2) Remediation - Active, and 3) Remediation - Passive. The additional alternative considers remediation to background levels of the constituents of concern in ground water, however, this is truly an element of alternative 2) above. It may be more time- and cost-effective to group active remediation to ANY level, i.e., background, Maximum Concentration Limits (MCLs), or Alternate Concentration Limits (ACLs) as a single alternative.

25. 2-2; Last Paragraph. In reference to supplemental standards, a description of the application of supplemental standards is discussed in Section 1.4.1 but a description of how elevated the standards can be above the background, MCL or ACL is missing. This matter needs to be addressed. Also, the paragraph is confusing; a rewrite is indicated.

26. 2-3; Figure 2.1. The decision tree is obviously cost-based, and is designed to avoid active remediation where possible. It also is in contradiction with the Final Rule, which requires that supplemental standards can be used only "after thorough investigation and consideration of all reasonable restoration alternatives" (emphasis added). By introducing the decision point for supplemental standards so early in the decision tree, such thorough investigation and consideration may be bypassed.

The decision-making methodology as illustrated by Figure 2-1 is lacking some critical elements. As described, the methodology lacks a mechanism for critical assessment of compliance strategy effectiveness, and for modifying compliance strategies at a specific site based on monitoring. This is illustrated where the outcome boxes with the various compliance strategies (Boxes 3, 7, 12, 16, and 17) are essentially "dead-ends". This begs the question of what will happen if a particular compliance strategy is chosen and implemented at a site. Will DOE choose not use the data gathered during characterization and monitoring to modify or change compliance strategies?

The decision tree should include a decision point between Box 2 and Box 3 in which a risk assessment is carried out to determine the potential health risks of the chemical mixtures present in ground water.

An implication of the flow chart is that the supplemental standards in Box 8 will be greater than the supplemental standards in Box 4. This indicates that Box 9 will yield a NO option since the human health and environmental risks will not change from their Box 4 levels.

In Boxes 10-14, the remediation alternative is conditioned on whether institutional controls can be established and effected. The Navajo Nation cannot say that tribal administrative and judicial controls can be extended and be maintained in full force for 100 years. The Navajo Nation must have some guarantee that if natural flushing is truly an alternative to be considered, then proper institutional controls will be maintained and funded by the DOE.

In Boxes 10, 13, 15, "attain" does not appear to be properly used. The descriptions do not clearly indicate a distinction when MCLs are exceeded.

27. 2-5; Section 2.3, First Sentence. Restoring to background levels or to "levels as close to background as possible" should be defined perhaps via parameter values.

28. 2-5; Second Paragraph. The basis for stating that the ". . . . no action alternative would not comply with the EPA ground water standards at the UMTRA Project

processing sites, . . ." is not provided. If the no action alternative is applied to a few sites where contamination ". . . does not exceed background levels or MCLs or where supplemental standards . . . would apply", it may also be applied if the results of the baseline health risk assessment indicate that the residual contamination in ground water at ACLs does not pose a significant impact to human health or the environment. This alternative should not be eliminated from further consideration until the results of site characterization, monitoring, or the baseline risk assessments are completed for each of the 24 sites.

29. 2-5; Last Full Paragraph. The language in the second sentence is not clear as to what the "may not be used" means. Does this mean it is forbidden to use active ground water remediation at limited use areas? That could be quite a mistake if the limited use aquifer discharges into a current or potential drinking water supply, i.e., Tuba City. The limited use aquifer may need to be cleaned up with active remediation to prevent the spread of contamination. Would there be a need for long term monitoring to document that water quality remains at background levels? What happens to the site if ground water quality deteriorates after the site is deemed remediated?

30. 2-5; Last paragraph. This paragraph illustrates an opinionated tendency throughout Section 2.3. It is stated that Active Remediation to Background Levels will mean that "a higher level of ground-disturbing activities would occur . . ." This depends on whether the treatment technology were used in situ or not. Most ground water remediation technologies require little excavation after well construction. Also, the description of floodplains is unclear. Floodplains throughout this country are heavily developed and populated at great expense to the government (e.g., flooding of the Mississippi River in 1994). Additionally, the statement that more ground water treatment, waste sludge and water would be generated under this strategy implies that under the proposed action, less treatment would be required, i.e., it assumes that supplemental standards or ACLs will be acceptable.

31. 2-6; First Full Paragraph. Using "risk-based analyses" to determine which strategy to use could be detrimental should long term monitoring indicate the spread of contamination. During this process, would alternative water sources and supplies be provided?

32. 2-7; Third Full Paragraph. In contrast to the statement on page 2-5 about ground disturbances due to active remediation activities, impacts are described here as non-existent or minimal. Of course, well construction will result in greater disturbances than the no-action strategy, but is it significant? Also, the continuing attempt to compare the relative character of strategies is difficult for the reader to sort out.

33. 2-8; Last Paragraph. It is stated that the proposed action is the most cost effective in the long-run. This assumes that there is no litigation resulting from the use of supplemental standards, alternate concentration standards, appropriation of water for flushing, and that institutional controls are maintained for 100 years.

34. 2-9; Section 2.6.3, Second Sentence. If DOE chooses to drill a new well through the contaminated groundwater to an uncontaminated source, cross-contamination could result during drilling or pumping. Tapping into uncontaminated ground water resources must be qualified.

35. 2-9; "Provide clean water at the point of use". Eliminating this activity at this point is unreasonable. While it should not be the complete solution to a ground water contamination problem, it is an approach that can be used in conjunction with remedial actions during the period of clean-up. Supplementing the water supply does not mean that DOE would not have to clean up a site. Supplemental water might even be necessary to carry out the favored flushing programs, where the water supply is inadequate to do all the long-term flushing plus provide for other essential uses.

36. 2-10; Section 2.7.1. The risk assessment determines if ground water contamination at the processing sites has the potential to adversely affect public health or the environment. Was true baseline environmental data collected prior to commencing surface remediation projects? Did the surface remediation projects result in impacts to subsurface material during disposal of liquid and radiation wastes?

37. 2-10; Second Bullet. The statement "Evaluate potential public health and environmental risks at the sites and determine need for an alternative water supply" is used as direction for site prioritization, but is in contradiction to section 2.6.3. See previous comment.

38. 2-11; Line 1. This statement needs to be clarified to indicate that only compliance strategies will be evaluated in the Risk assessment. Specific remediation plans should be analyzed in a document similar to the Feasibility Study used at Superfund sites.

39. 2-11; First Paragraph Under Bullets. The first sentence should indicate that the Proposed Action and the Active Remediation to Background Levels alternatives are health and environmental risk-based approaches.

40. 2-11; Third Paragraph Under Bullets. The risk assessment should not be completed while there are still major data gaps. For example, the plume needs to be characterized and the presence of toxic organics needs to be clearly determined. The use of

the "Baseline Risk Assessment" in the selection of compliance strategies should not occur until after site characterization is completed and the Draft Base Line Risk Assessment is completed.

41. 2-11; Last Paragraph, Second Sentence. The example given about ACLs being applied when natural attenuation would reduce contaminants to acceptable concentrations before reaching an exposure point appears to contradict the language of the Final Rule (EPA, 1995) which states that ground water being evaluated should be considered a drinking source (Sec. VI.B). This latter statement is a conservative but reasonable approach in that, once remediation has been completed, a water supply well could be installed in the area of the former plume. It is not possible to predict exposure point locations in the future, and so the exposure point must be assumed to be in the plume area, not along a point some distance away where attenuation could occur along the flowpath.

Also, if the risk assessments show that ACLs are not applicable for contaminant characterization, would the background limit be applied as an ACL? Would this be considered as a "supplemental" concentration limit, and would NRC have to concur with this system, process or procedure?

42. 2-12; Section 2.7.2, Second Paragraph. Apparently previous ground water data to determine surface water quality will not be used. Does this mean that all historical groundwater data will be used only for ecological risk assessment? Some rivers may be hydraulically connected to an unconfined aquifer. If you eliminate previous ground water data, all data related to the unconfined aquifer would not be considered and valuable information would be ignored.

43. 2-13; Last Paragraph. Are the referred background levels data taken from local or regional sources where possible, or is the data regional and taken from a reference source? Are comparisons of the data to background made on the basis of statistical analyses, or direct, untreated, numerical comparisons? This information should be stated in this paragraph.

44. 2-13; Last Paragraph, Fifth Sentence. It should not be assumed that "state" is inclusive of "tribes"; therefore, the sentence should read: "When available, state *and tribal* criteria . . . ." The term "tribal" should be added, when appropriate, throughout the paragraph and the rest of the document as well.

45. 2-14; Section 2.7.3. It is unclear whether the criteria used for site prioritization have equal weight in the evaluation process. That is, there is no distinction given to weighting of health risk (population or individual), ecological risk or risk timing.

Due to the unique religious and cultural value of water to the Navajo people, as well as the overwhelming dependence of the Navajo Nation on ground water sources for present and future supplies, ground water restoration at the Navajo sites must remain a high priority for DOE. Any future versions of the priority scoring system must continue to consider the unique values placed on ground water by the Navajo Nation. DOE's trust responsibility to the Navajo Nation must be considered as DOE prioritizes remediation activity.

46. 2-15; Section 2.8. This section on characterization and remediation has almost no discussion of residual soil contamination which most likely will act as a continued source of contaminants to ground water. Seepage from the uranium mill tailings has contaminated the soil from the surface down tens of feet to the water table over areas of tens of acres at the tailing sites. It will greatly prolong the ground water remediation project if these soil contaminants are not dealt with. Methods for characterizing the vertical and lateral extent of deep soil contaminants need to be discussed. Techniques used in remediating or isolating soil contaminants need to be presented and evaluated.

47. 2-15; Section 2.8, Second Sentence. The statement ". . . to obtain data to perform risk assessments to evaluate . . . ." implies that new data will be secured. Is it fair to assume that relevant historical data will not be used? If not, then the statement should be written more clear and reflect that relevant historical data will be used.

48. 2-17; First Paragraph. This paragraph describes the use of the observational method to plan and collect site characterization data and devise a remediation plan, noting the economy of that approach. Under this approach, decisions would be made based on the "most probable conditions" of the site. Such an approach connotes the application of personal judgment about what is most probable at the site. These judgments, informed as they may be, cannot be substituted for or override the conclusions arising from risk assessment procedures that are designed to establish reasonable maximum exposure limits to protect human health and the environment.

49. 2-17; Last Paragraph. Not included in the brief description of hydrogeologic characterization is a determination of discharge areas including springs, seeps, and subsurface flow. Please cite guidance used.

50. 2-18; Second Full Paragraph From Bottom. Ground water modeling is inadequately defined and explained in this section. There is no description of the likely source from which ground water model(s) may be selected, e.g., *U.S. EPA. Selection Criteria for Mathematical Models Used in Exposure Assessment: Ground Water Models EPA 600/8-88/075, May, 1988. U.S. EPA, Superfund Exposure Assessment Manual. EPA/540/1-88/001, April, 1988.* Additional information is needed to clarify the requirements of using an approved and verified ground water model.

51. 2-21; Section 2.8.1.2. This section on geochemical characterization needs to be broadened in its scope, particularly with the addition of specifics about geochemistry affecting the fate and transport of contaminants of uranium mill tailings. The text is presently too generic and does not address the specific geochemical processes of concern at these sites. If the PEIS is to serve as a planning guide, then the necessary basic information needs to be presented in the document.

    The discussion on the use of background is not clear. There is no description of whether background concentration data are taken from local or regional sources, or if published literature is the source of background information.

52. 2-21; Section 2.8.1.2., First Sentence. Not only does the characterization need to address the definition of contaminants related to uranium processing and their interaction with aquifer materials, but also to address both the natural and the impacted pore water geochemistry.

53. 2-21; First Bullet. Determination of the quality of the contaminated and uncontaminated water should not be restricted to just the contaminants of concern but should include all chemical parameters and constituents which affect a contaminant's mobility. These would include parameters such as ionic strength, redox potential, organic carbon content and concentration of ions which form complexes with metals and radionuclides.

54. 2-23; First Paragraph, First Sentence. Redox reactions needs to be added to the list of geochemical mechanisms and to Table 2.1. Almost all the contaminants of concern are sensitive to redox conditions (in conjunction with pH). Metals may be sensitive because they themselves have multiple oxidation states or because they form insoluble precipitates with reduced species such as sulfides. Uranium is very sensitive to redox conditions, being generally quite mobile under oxidizing conditions but essentially immobile under reducing concerns. Nitrates and sulfates, two primary contaminants of concern, can potentially be removed under reducing conditions. The redox chemistry of the contaminants of concern needs to be discussed, with respect to their

mobility, their response to natural flushing or to pump and treat remediation; their response to in situ remediation, and their susceptibility to ex situ treatment processes. Shallow water at most of the sites appears to have oxidizing conditions. Use of in situ remediation approaches, such as biological immobilization with sulfur reducing bacteria as is proposed for the Tuba City site, would require altering the redox conditions over a large volume of porous medium. While the process may work well as a laboratory bench scale, is it feasible to create a large scale reducing environment? What happens when remediation is completed and the pore waters revert to oxidizing conditions? The foundation for understanding the basic geochemical processes needs to be laid in this section. Geochemical specifics with respect to possible remediation alternatives should be discussed in the remediation Section (2.8.2.)

55. 2-24; "Natural Flushing". The feasibility of natural flushing as a restoration technique must be carefully evaluated before it is proposed for any site. This is particularly true of the three Navajo sites where the tailings have been stabilized in-place (Mexican Hat, Tuba City and Shiprock), as the stabilized tailings will remain as a potential source of continuing or renewed contamination. A thorough assessment must be made to determine the risk that physical and/or biological processes could compromise the integrity of the disposal cell over the 1000-year design lifetime, as part of the assessment of natural flushing as a restoration alternative at these sites.

The 100-year criterion for ground water cleanup by natural flushing is unacceptably long. Any reduction of available land and water resources, particularly for at least 100 years, will create significant socioeconomic impacts. Also, neither the DOE nor the Navajo Nation can guarantee the effectiveness of institutional controls at the Navajo sites for 100 years.

Determination that natural flushing will meet the proposed 100-year criterion for cleanup to acceptable levels (whether MCLs, ACLs, or supplemental standards) at any site must not preclude assessment by DOE for the potential for renewed contamination beyond 100 years, nor the possibility that DOE may need to implement an engineered restoration technique if the integrity of a disposal cell is compromised and renewed contamination does occur. An assessment would also need to be made of the potential for contamination of other aquifers within the 100-year period, whether through natural or induced leakage from contaminated aquifer(s). This is of particular concern at the Monument Valley site, where the presence of an alluvium-filled paleochannel provides a potential conduit for contaminant migration from the contaminated surficial aquifer into the underlying uncontaminated De Chelly Sandstone aquifer.

56. 2-24; Last Paragraph. The suggestion that gradient manipulation leading to dilution is an acceptable remediation method is inappropriate. The use of dilution to treat wastes is the last alternative that should be considered. Dilution radios may change seasonally and over the long term as a function of water consumption (e.g., increased population) and climate (e.g., drought versus wet season) change. Contaminate transport into major rivers (3-3; Paragraph 4) should be avoided in that the cumulative discharge from multiple sites of a contaminant results in an increased loading that can lead to concentrations greater than acceptable limits.

57. 2-25; Figure 2.5. The figure is misleading. It appears that the contaminant is disappearing in place when in fact dilution, attenuation and transport via the river result in contaminant redistribution.

58. 2-27; "Contaminant isolation". If this method is employed for ground water remediation, there is no indication of whether there will be some overlap with the Surface Project work that will either be underway or completed. If the Ground Water and Surface Projects have similar elements related to remedial measures, there may be considerable cost and time savings to both projects if information is shared.

59. 2-29; Figure 2.8. While it is understood that visual aids help the reader grasp the concepts discussed, the figures in this Part of the Draft PEIS seem to minimize the effects of nitrates. In this figure, nitrates are considered "least contamination" while uranium is considered "most contamination". This minimizes that hazardous nature of nitrates when it should be made clear that nitrates can be much more hazardous than uranium. Some discussion is needed regarding the possibility of extraction wells causing elongation of contaminant plumes; and "Capture Zone" should be defined in the Glossary.

60. 2-30; "Waste Management Methods". There may also be some overlap between the Ground Water and Surface Projects that can be used to develop cost and time efficient remediation strategies not included in this section. In addition, it is indicated in this section that wastes may be extracted from ground water for disposal purposes. Some of the wastes may contain compounds for which no regulatory limits exist, and ACLs must be generated. If this were the case, what would the basis for the ACLs be? Health risk, environmental risk, or other supplemental criteria?

61. 2-31; Third Bullet. Because of the probability that purge water will be contaminated, it should be treated prior to being disposed of.

62. 2-31; Last Paragraph, Second Sentence. U.S. EPA should be included since they are "directed to establish standards for the remediation and disposal of contaminated material from inactive uranium processing sites (see Section 1.2.3.)

63. 3-3; Last Paragraph. Ground water contaminants that exceed the background levels and that do not have an MCL should be addressed at a minimum.

64. 3-4; "Shiprock, NM". What sources were used to designate Shiprock as "suburban"? How DOE designates each site should be defined in the Glossary.

65. 3-6; "Cultural resources". This section states that many sites fall within or near "boundaries" of cultural interest to Native Americans. Please specify the sites and are they included as cultural resource concerns? See also comment #91.

66. 3-7; Section 3.1.2.2, last statement. Specify ". . . applicable *tribal and state* environmental regulations."

67. 3-8; Section 3.2.1, Last Sentence of Last Full Paragraph. On what basis is the statement that there are "no known threatened or endangered species at or near the site". Please make reference to the survey and the date it was performed.

The Final Rule (60 FR 2855) notes that the Monument Valley site has the estimated largest amount of ground water contamination (.75 billion gallons). While this is noted on page SUM-5, it should also be noted in the site description of the Monument Valley site.

68. 3-9; First Full Paragraph. "Confining aquifer" is not used throughout the document, but is defined in the Glossary. This would be a good place to use confining aquifer to describe the Shinarump Member and the De Chelly Sandstones.

69. 3-9; Second Full Paragraphs. It is stated that the "elevated concentrations" in the Shinarump and De Chelly aquifers at the Monument Valley site "would be the result of pumping process water during the former milling operations". However, no reference is cited by which this conclusion can be either confirmed or denied. The statement is unclear (the precise mechanism by which "pumping of process water" during milling operations caused elevated levels to occur in these aquifers is not described), and infers that through its characterization work to date, DOE has definitively concluded that contamination of these aquifers has not occurred from the tailings. This statement is misleading, and should be either deleted or replaced with a

general statement that the reason for these elevated concentrations is unknown at this time and needs to be further investigated.

70. 3-9; Third Full Paragraph. Which ground water source do the residents use for drinking water, livestock and agriculture? Throughout the document, nothing is written about water as a resource and how the local ground water sources are being used.

71. 3-9; Last Paragraph. Tuba City is not "sparsely populated". Using DOE's population figure of 7300 for Tuba City, the area should be designated a suburban community. Belfield, a city with a population of 881 (see last sentence on page 3-22 and Table 3.2), is considered to be a suburban community. Therefore, Tuba City, with a population approximately 8.5 times greater than Belfield should also be designated a suburban community.

72. 3-10; Second Full Paragraph. The Navajo Sandstone aquifer should be described as a "confining aquifer". **See Comment #68.**

73. 3-10; Second Full Paragraph. Which ground water source do the residents use for drinking water, livestock and agriculture? Throughout the document, nothing is written about water as a resource and how the local ground water sources are being used. Also, water uses from Moenkopi Wash occur <u>downgradient</u> of the plume; this should be included in the last sentence.

74. 3-12; Third Full Paragraph. Groundwater velocity is estimated at "0.2 to 5.0 ft . . . per day". We assume this is an error as other sections use the measure, "feet per year". Whether or not this is an error, consistent measures should be used to not confuse the reader.

75. 3-21; "Shiprock, New Mexico". Which ground water source do the residents use for drinking water, livestock and agriculture? Throughout the document, nothing is written about water as a resource and how the local ground water sources are being used.

76. 3-22; Last Full Paragraph. For purposes of accurate characterization, background ground water quality for the alluvial terrace should be defined on the SOUTH side of the San Juan River, not the north side.

77. 3-30; "Mexican Hat, Utah". Which ground water source do the residents use for drinking water, livestock and agriculture? Throughout the document, nothing is

written about water as a resource and how the local ground water sources are being used.

There is no discussion that the Mexican Hat site is actually located in Halchita and is adjacent to the Halchita community. A description of Halchita should be included in this section, i.e., population, distances between Halchita and Mexican Hat, and that a "scenic highway" runs by both towns.

78. 3-30; Third Full Paragraph, Last Sentence. On what information is this statement decided? It seems irresponsible and unprofessional to write off ground water that is discharging into the San Juan River as "not adversely affecting water quality". DOE is thereby minimizing additional harm such discharges may cause. **See also Comment #101.**

79. 3-30; Last Paragraph. The discussion about the Honaker Trail Formation and the Halgaito Shale is confusing. Which is "unconfining" and which is "confining"?

80. 4-1; Section 4.0,-Footnote c. The footnote is misleading as it is written; it implies that the contaminated water could equal the MCLs and still comply with cleanup standards. It would read easier as "sites that *do not exceed* maximum concentration limits. . . ."

81. 4-2; Last Paragraph. This paragraph does not include ground water as a resource and the potential impacts of the ground water as a resource, i.e., its current uses and potential future uses.

82. 4-7; Second Paragraph. The application of nutrient rich ground water to land does not necessarily result in remediation. Biotreatment via denitrification is a widely used, cost effective method of removing nitrate from water and should be considered as a treatment alternative.

83. 4-8; Last Paragraph. Include "tribes" in the last sentence since the Navajo Nation is currently applying for treatment as a state with regard to NPDES.

84. 4-9; Second Paragraph. This paragraph indicates that high nitrate water will be treated prior to land disposal, whereas on page 4-7, second paragraph (noted above), no pretreatment is described. This needs clarification.

85. 4-9; Last Paragraph. Considerable potential impacts on sensitive habitats are described, yet the summary of impacts on page 4-6, Table 4-3, does not reflect this. It

is unclear how a short-term duration of remediation was determined. Pump and treat, in situ and other ground water treatment methodologies often take years to achieve desired goals.

86. 4-11; Fifth Paragraph. Addition of fences, gates, signs and other institutional controls will likely affect visual resources and should be addressed. For instance, the Mexican Hat site is located less than a mile off a "scenic highway" from scenic Monument Valley north to scenic southeastern Utah.

87. 4-14; Third Full Paragraph. Costs provided in this paragraph indicate that considerably more information has been assimilated than has been provided in the Draft PEIS. This information was collected for the site specific determinations that were to follow acceptance of the programmatic approach. This information should be made available for review.

88. 4-16; Lines 1-10. Completion of a risk assessment on surface water contamination as a result of natural flushing is not acceptable. Further distribution of contaminants into other water sources should be avoided. Use of natural flushing, which is not a treatment process, should be carefully evaluated to preclude undesirable secondary results.

89. 4-16; Section 4.2.2.4. The expansion of institutional controls to mitigate expansion of a ground water plume resulting from natural flushing may not be feasible at the three (3) sites located in cities, seven (7) sites at the edge of towns or cities and most likely at some of the rural or remote settings. Use of natural flushing should be critically reviewed and evaluated.

90. 4-16 and 4-17; Last Paragraph of Section 4.2.2.5. This paragraph contradicts itself. The release of contaminated water is first stated as having a remote impact, however later in the paragraph, the release of contaminated water is said to increase as the natural flushing period increases, a period of 100 years.

91. 4-17; Section 4.2.2.7. All referenced cultural resource investigations are at least five years old. The Navajo Nation Archaeology Department and the Navajo Historic Preservation Department should be contacted to confirm whether these findings are still valid. The threatened and endangered species investigations are also out of date. The Navajo Fish and Wildlife Heritage Program has recently added species to its threatened and endangered species listing and should be consulted for an update. See **also comment #65.**

92. 4-17; Last Paragraph. Here the DOE asserts no significant impact on cultural resources, however, there is no evidence that DOE has made any comprehensive investigation to back up this allegation, particularly with respect to Indian lands. In the second paragraph, it is alleged that "remediation . . . by natural flushing would have a positive impact"; and that "Impacts to this Native American cultural resource would be reduced as natural flushing progressed." By emphasizing natural flushing, this paragraph implies that ground water cleanup by other methods, i.e., active remediation, would not have a positive impact, therefore, the statements are misleading. It is clearly preferable to have the water cleaned up immediately with some positive remediation program.

93. 4-18; Fifth Paragraph. Economic losses associated with the loss of land use for 100 years due to implementation of institutional controls cannot be evaluated. The potential for continued loss of land over time if, or when, the plume extends beyond its current boundaries will result in increased economic losses. The loss of Indian trust land has particular significance in terms of the federal trust responsibility. Each acre of trust land was dedicated by the United States for the perpetual, exclusive use and enjoyment of Indian occupants, considering their ancestral ties to that acreage. It is not acceptable in these circumstances for the United States to simply put a fence around tracts of trust land and in effect say, "you can't have this land after all, we are changing our minds about the trust land designation". Nor would it be acceptable for the government to force Indians to leave trust land and relocate them to some distant place without ancestral and community ties.

94. 4-19; Section 4.2.2.14. Costs provided in this paragraph indicate that considerably more information has been assimilated than has been provided in the Draft PEIS. This information was collected for the site specific determinations that were to follow acceptance of the programmatic approach. This information should be made available for review.

Of particular interest is whether or not there is any cost associated with the disruption of residents' lives and land usage by the institutional (fencing off of land) controls and the long-term dedication of some of the area's available water resources to the flushing function. In this latter category are costs for the use of water under Navajo Nation laws and regulations.

The costs cited are $14 to $24 million per site for natural flushing. In Section 4.2.1.14, costs are said to be $86 to $162 million per site for active remediation to background levels. There is no indication whether the lower cost is decisive in any way for the preference toward natural flushing. This should be disclosed in light of

the EPA Final Rule observation that " . . . Congress provided no authority that protection of ground water at each site should be limited by cost/benefit considerations." (Federal Register page 2858, third column).

95. 4-19; Last Paragraph. It should be noted that water bearing units of 150 gallons per day are sufficient for a family in a remote or rural area, such as the Navajo Reservation. Cleanup of water for use in such circumstances should definitely be considered.

The consideration of the 150 gallon per day criterion is much too superficial in this paragraph. The reader is left with the impression that the 150 gallon figure is a rock-solid, inflexible figure that will allow DOE to ignore areas where small water quantities are normal and essential. That impression is wrong and must be corrected.

The 150 gallon limitation is new, having been adopted in the 1995 Final Rule by adding subparagraph (e) to Section 192.11: (e) "Limited use groundwater means groundwater that is not a current or potential source of drinking water because . . . (3) the quantity of water reasonably available for sustained continuous use is less than 150 gallons per day. The parameters for determining the quantity of water reasonably available shall be determined by the Secretary with the concurrence of the Commission." Note that the Nuclear Regulatory Commission must be involved in the decision to set water quantity limitations, presumably in a separate proceeding beyond the scope of the procedures contemplated in the Draft PEIS.

Also, the writers of the Draft PEIS should note the EPA discussion of how treatment/remediation may be handled in areas of short water supply (Federal Register page 2861, columns two and three). There is clearly a lot of discretionary choice available to DOE planners and there should be adequate and full consultation with residents and tribal governments on this matter. On this point, the EPA's description of an appropriate procedure is noteworthy: "Restoration of groundwater may be carried out by removal, wherein the contaminated water is removed from the aquifer, treated, and either disposed of, used, or re-injected into the aquifer, and in situ, through the addition of chemical or biological agents to fix, reduce, or eliminate the contamination in place." (Federal Register, page 2862, third column).

96. 4-20; Lines 1-5. The implication that only three of the seven criteria for applying supplemental standards would be used is out of place. This statement belongs in Section 1.4.1. on page 1-13. Justification for this statement is not provided.

97. 4-20; First Full Paragraph. A new term, "concentration levels" is introduced in the discussion of supplemental standards. This is not to be confused with the term "alternate concentration limits". The term is not included in the glossary.

98. 4-20; Fourth Full Paragraph. The inclusion of the no remediation alternative in the active remediation strategy does not make sense.

99. 4-21, First Paragraph. This paragraph indicates that if alternate concentration limits were applied, a risk assessment would have to be conducted. On page 4-20, second full paragraph, it was assumed that a risk assessment would be performed. It is not clear whether or not a risk assessment would be required prior to the use of alternate concentration limits. This needs clarification.

100. 4-21; Last Paragraph. This paragraph is unclear and needs clarification. It states that the impact of applying supplemental standards "would have little or not impact on ground water . . ." then in the same sentence states " . . . could affect less contaminated" water.

101. 4-25; Table 4.4. The table does not reflect the text. In addition, short term impacts are given the same weight as long term impacts (e.g., dust emissions). As a result, the impacts related to active ground water remediation are over stated and those related to natural flushing are under stated. The severity of the impact is also not addressed. Use of numbers (i.e., 1 is "low", 2 is "moderate", 3 is "high") could be used to provide a numerical assessment of impact. For example, the indication that an impact to human health due to the ingestion of contaminated water resources under the active ground water remediation strategy is unfounded and not referred to in the text in this section. Page 4-30, paragraph 3 however, states that this strategy would have the least potential for an impact. Numerical ranks would make the distinctions between alternatives clear. The usefulness of the table is limited in its current format. Several other examples follow:

There is an indication that an impact to human health due to accidents should be included in the natural flushing and no remediation strategies. Accidents could occur during the risk assessment, water management and monitoring phases of each strategy. Impacts due to surface water contamination from waste water in the active ground water remediation are not founded. In fact, the statement pertaining to impacts from waste management for all the strategies state the same conclusion: "No potential negative impacts on human health and the environment . . . are expected". The table needs to be corrected so that the text and table summary are in agreement.

Also, there are other sources of exposure to impacted water resources not included in this table, such as inhalation and dermal exposure. Even though their relative contribution to overall risk may be lower than the risk posed due to water ingestion, they should be considered as part of the potential risk picture posed by the sites.

102. 4-28; Section 4.4. The comparison of alternatives is marred by the lack of agreement in the text in Sections 4.2 and 4.3, which were used to provide the assumptions used in the comparative analysis. These subjective comparisons may or may not be valid. Weighting impacts to human health equivalent to visual impacts or noise impacts, particularly given that the latter are expected to be short term whereas the former would be long term, is unacceptable. the use of "+", "-" and "0" is confusing: a "+" means a high potential for negative impact to human health and a high potential for positive impacts to economic benefits. In addition, the use of "-" does not mean that there is a low potential for negative impact but rather that the impact is lower than one of the other alternatives. In other words, a "-" indication could still result in unacceptable impacts to human health and the environment. This misleading and confusing comparative technique needs to be more accurately presented. Use of the descriptive terms such as high, low, moderate, and absent may be of more value.

103. 4-35; Table 4.5. This table is a comparison of long term impacts associated with each alternative. The table shows that relatively high negative impacts (as indicated by the "+") would be associated with the active remediation to background levels alternative. Page 4.9, paragraph 1 however, states that "In the long term, active ground water remediation would eventually eliminate this source of contaminated water entering the environment."

Cultural resources are separated into surface and ground water in the text. According to the text (Section 4.2), the only alternative resulting in a positive effect on ground water cultural resources is the active remediation of background levels alternative. Surface impacts associated with this alternative are no worse than that associated with natural flushing, which may take up to 100 year to remediate ground water cultural resources. The passive remediation alternatives do not treat the ground water which is considered "a cultural resource of significance to many Native Americans" (page 4-17, paragraph 4). The coding of this environmental factor needs to be re-evaluated.

The text for waste management impacts is exactly the same for all alternatives. It is unclear how the coding of the environmental factor was made. This needs to be clarified.

104. 4-38; Section 4.5.1. It is a gross overestimation to state that the UMTRA sites may have a positive impact on human health or the environment. This terminology carries the connotation that removal of mill tailings may result in a positive impact. A more fair statement is that removal of mill tailings removes the source of continued adverse impacts. The "positive" statement implies that remediation will improve site conditions to a level that exceeds the original condition of the site, which may not be the case.

105. 4-38; Fourth Paragraph. The implementation of the active remediation to background levels alternative would not have a "similar positive cumulative impact" on surface water as the proposed action; it would have a greater positive impact. This is because the proposed action may allow the use of supplemental standards, ACLs, and natural flushing--all of which allow for higher levels of contaminates to remain in groundwater.

106. 4-39; Third Full Paragraph. The implementation of the active remediation to background levels alternative would not have a "similar positive cumulative impact" on surface water as the proposed action; it would have a greater positive cumulative impact. This is because the proposed action may allow the use of supplemental standards, ACLs, and natural flushing--all of which allow for higher levels of contaminates to remain in groundwater.

107. 7-1; Section 7.0. Some of the materials identified as "irrevertibly" lost such as wood, and metal during implementation of the proposed action could, in fact, be recycled at the termination of the Ground Water project. If this option has been reviewed, and eliminated from further consideration, reasons for such elimination should be stated in this section.

108. 9-3; "Hydraulic Barrier" Definition. The definition is difficult to understand. Perhaps it can be re-written: "The area where ground water flow is not leaving or entering the capture zone which is caused by pumping ground water from wells".

109. 12-1; Section 12.0. All tribes should be listed separately from states as independent governmental bodies. The four Navajo Nation sites should not be listed as, for instance, "Tuba City, Arizona" but "Tuba City, Navajo Nation (AZ)". State boundaries within tribal lands are artificial geographic constructs, since the tribes are sovereign nations.

110. 13-1; Section 13.0. The Navajo Nation Environmental Protection Agency ("NNEPA") should be listed as a separate agency receiving copies of the PEIS. The

NNEPA is the Navajo Nation's environmental regulatory authority and is separate from the Division of Natural Resources.

111. B-1; Section 1.0. The citation listed as "EPA, 1989" refers to the guidance document entitled *Risk Assessment Guidance for Superfund*, Volume II, which is the ecological guidance document. This document is not a guidance for human health evaluation. Guidance for human health evaluations is more likely to be found in the U.S. EPA's *Risk Assessment Guidance for Superfund (RAGS), Volume I, Human Health Evaluation Manual (Part A). Interim Final. EPA/540/1-89/002.* This should be cited in this section and in Section 8.0 (References). If DOE intends to use alternative methods and guidance, it should be so stated in this section.

112. B-2; Section 2.0. This section does not indicate if background is determined locally, regionally, or if it is based on published literature. There is no indication as to whether there is any statistical treatment of background, or if evaluation of site-specific data will be made by direct numerical comparison to background data. There is no detail indicating how the exposure point concentration term will be developed, e.g., will the U.S. EPA's *Supplemental Guidance to RAGS: Calculating the Concentration Term* (May 1992) be used?

113. B-3; Section 3.0. Figure B.1 does not indicate that inhalation is a pathway that should be considered in the risk assessment. The presence of radon gas in the ground water may result in a complete inhalation pathway through domestic ground water use. Even if the latter is secondary to that of ingestion, it should still be addressed since risks across all potential pathways are additive.

Surface water is not addressed by the pathway analysis. That is, surface water that may have been impacted directly by ground water, or indirectly, exist at sites such as Rifle, CO; Shiprock, NM, Green River, UT, Mexican Hat, UT, and Salt Lake City, UT. The potential to contact impacted surface water may arise from ingestion, inhalation, dermal exposure during recreational activities, or from consumption of fish. Even if these pathways are secondary to that of ground water ingestion, they should still be addressed because risks are additive.

114. B-6; Section 4.0. If toxicity data is not available from the Integrated Risk Information System, or from the Health Effects Assessment Summary Tables, are there other sources of toxicity data that are approved for use at these sites? If not, does DOE propose to generate toxicity data for the anticipated compounds, and those that may not have been identified in the currently available data sets?

How will DOE account for chemical interactions? Will DOE use a data base of information as MIXTOX? Current risk assessment methods do not allow for quantification of effects such as synergism or antagonism between compounds, however, qualitative statements regarding possible compound interaction may be made. Such statements may not be limited to additivity and antagonism. If this is the intent, it should be stated in this section.

The majority of the compounds listed in earlier sections of the Draft PEIS identify compounds that may have deleterious impacts on human health and the environment following chronic (long-term) exposure. Because all the site characterization and monitoring data for each site are not completed, there may be other compounds detected onsite that can have acute (short-term) impacts, if present in sufficient concentrations. The Draft PEIS does not address the potential for acute impacts to be evaluated. If they are not expected, and there is sufficient technical data to support that contention, it should be stated in this section.

115. B-7; Section 5.0. It is unreasonable to assume that many of the constituents detected at an UMTRA site have nutritional essentiality. It may be likely that, for example, selenium has some nutritional value, but this is certainly not true for other compounds such as arsenic, uranium, radon, cadmium, lead or barium. It is misleading to state that ". . . many of the compounds associated with mill tailings are beneficial to" health," and as such this type of statement should not appear.

For each UMTRA site it is likely that risk characterization will be based on multiple exposures to multiple compounds. The overall impact to human health will be defined using carcinogenic risk probabilities, and noncarcinogenic hazard ratios. The distinct definitions should be provided in the section along with a definition of the comparative criteria that will be used to determine the point of departure for risk management decision-making. Will the criteria listed in 40 CFR Part 192, Section III, be used as ranges for acceptable risk?

It is unclear as to whether risk ranges will be set up for comparison based on the outcome of the probability curves generated as part of the Exposure Assessment. No information is provided with respect to the uncertainty analysis component of the risk assessment process.

116. B-8; First Paragraph. The second sentence states: "Currently the EPA has no guidance for quantifying potential impacts to ecological receptors but has developed a qualitative approach . . . ." This is wrong. In 1993, the EPA published the Wildlife

Exposure Factors Handbook (Volumes I and II). These documents present guidelines and data for carrying out a qualitative analysis.

117. B-8; Last Paragraph. It is unclear if the experimental approach described in this paragraph will be implemented. Experimentation of this type should be performed in a controlled environment and not on land with animals used by the local population, as indicated.

118. B-9; Section 7.0. It is not usual to place risk mitigation measures in the risk assessment documentation. This information is typically found in a Feasibility Study phase or Corrective Measures Study, because the results of the risk assessment become one of the criteria for selecting the appropriate remedial strategy. If the intent is to identify risk mitigation measures in the risk assessment, in an effort to wrap the human health and ecological evaluations, and the EIS process into a single document, this should be stated.

119. C-1; Introduction. It is recommended that additional treatment technologies described in the following references be evaluated:

EPA (U.S. Environmental Protection Agency), 1994. *Ground-Water Treatment Technology Resource Guide.* EPA/542-B-94-009, Office of Solid Waste and Emergency Response. Technology Innovation Office, Washington, D.C.

EPA (U.S. Environmental Protection Agency), 1990. Assessment Technologies for the Remediation of Radioactively Contaminated Superfund Sites. EPA/540/2-90/001. Office of Solid Waste and Emergency Response, Office of Radiation Programs, Washington, D.C.

120. C-2; Lines 20-23. For sites where heavily contaminated soil remains in the unsaturated zone or where seepage from disposal cells continues to occur, it could be unlikely that natural flushing could solve the ground water contamination problem while additional contaminants are being continuously added.

A second comment on this section is that care must be taken when using rivers as ultimate disposal zones ("points of groundwater discharge into surface bodies"). Some metals from tailings leachate (for instance, mercury) can become concentrated in the sediment and in aquatic plants growing on that sediment and can then bioconcentrate up the food chain.

121. C-2; Last Paragraph. Solute transport models are very strongly influenced by the assumptions made about their input parameters. Dispersivity, which controls the magnitude of dilution from mixing, is difficult to quantify. For it and other model parameters, conservative assumptions need to be made to ensure a margin of safety with uncertainties.

122. C-4; Section 3.1.1. During the use of infiltration trenches or other water application techniques during gradient manipulation, the possibility of flushing soil contaminants out of the zone above the initial water table needs to be taken into account. For instance, if well oxygenated water were introduced, an enhanced removal of reduced species by oxidation could occur. This flushing may be either desirable or undesirable, but its possibility should not be ignored.

123. C-6, Lines 3-4. The "contaminant isolation" to reduce a contaminant source from entering the groundwater is not the same thing as the "waste isolation" approaches discussed at the bottom of the page. Those waste isolation approaches refer to ground water, and there is no discussion of contaminant isolation techniques applicable to sources above the ground water except for capping and surface control. If there are other applicable containment isolation technologies to prevent ground water contamination, then those need to be discussed here.

At what type of sites would the surface water control method be used? Would this apply only to those sites where the tailings were removed for disposal elsewhere? Would these measures be used over a shallow plume?

124. C-11; "Disposal of contaminated groundwater". Under the reinjection option, would UIC permits be required? From which agency would such permits be obtained?

125. C-11; "Evaporation". The listing of evaporation methods should include the possible use of mist evaporation systems, which will allow treatment of higher water volumes and allow for much smaller evaporation ponds.

126. C-12; Section 3.2.3. It needs to be acknowledged here that it is not possible to destroy radionuclides in the treatment process, rather it is only possible to move them from one medium or place to another. Also, this entire section is much too generic. How do these treatment technologies relate to the identified contaminants of concern (i.e., how viable are they)?

127. C-12; Section 3.2.3, Lines 6-10. Oxygen gas is not a byproduct of denitrification, rather the oxygen in the nitrate goes to bicarbonate ion.

128. C-14; Oxidation/reduction. This subsection discusses how to create oxidizing conditions, however, the shallow contaminated aquifers are generally well-oxidized. A more pertinent discussion would be about how to create reducing conditions, since most of the contaminants of concern are more likely to be treatable under those conditions.

129. C-16; Lines 7-8 From Bottom. How bioremediation might be used at UMTRA sites needs to be expanded upon, particularly since it is a possible proposed approach at the Tuba City site. What processes would mobilize contaminants? Which would mobilize them? How would the proper environmental condition be created (particularly for anaerobic bioremediation proposed at Tuba City)? What would happen to the insoluble reduced species when oxidizing conditions returned after the termination of remediation? Wouldn't they oxidize and become mobile once more?

END OF COMMENTS

**COMMENTS OF CONCORD OIL COMPANY
ON DOE's DRAFT PROGRAMMATIC ENVIRONMENTAL IMPACT
STATEMENT FOR THE URANIUM MILL TAILINGS
REMEDIAL ACTION GROUND WATER PROJECT (DOE/EIS 0198)**

1. The Draft PEIS fails to inform decisionmakers and the pubic of reasonable alternatives that would avoid or minimize adverse impacts of the proposed groundwater remediation program. See, 40 CFR § 1502.1. This failing is principally attributable to the PEIS's failure to (1) rigorously explore and objectively evaluate all reasonable program alternatives and (2) present this evaluation in a comparative form. See, 40 CFR § 1502.14. Because of these failures, the "heart" of the Draft PEIS is largely missing, and the document cannot serve its action-forcing purpose. See, 40 CFR §§ 1502.1 and 1502.14.

a. The Draft PEIS does not consider the reasonable alternative of according different remediation frameworks to "wet" and "dry" sites. DOE has historically characterized the Cannonsburg and Falls City sites as "wet" sites (37 and 30 inches rainfall annually, respectively); the Lowman, Idaho, site (27 inches rainfall annually) might reasonably be added to the "wet" category. Draft PEIS, Table 3-2. Given the many uncertainties attending the risk assessment science that underlies DOE's proposed action, and given the lack of attention paid by the proposed action to contamination in the unsaturated (vadose) zone, one might reasonably accord to "wet" sites more stringent cleanup standards than one accords other sites.

b. The Draft PEIS does not consider the reasonable alternative of according different remediation frameworks to sites in areas that are seismically active or that are in areas with high potential for inter-aquifer communication.

c. The Draft PEIS does not consider the reasonable alternative of according different remediation frameworks to sites at which background water conditions are particularly difficult to determine.

d. The Draft PEIS does not consider the reasonable alternative of requiring site groundwater cleanup to meet the standards of the state in which the site is located. EPA has determined that groundwater cleanup "consistency" between the

federal and state programs should be determined by DOE in consultation with the states. 60 Fed. Reg. 2856 (January 11, 1995). The Draft PEIS itself (p. 2-13) commits the DOE to reliance on the various state criteria for determining toxicity to aquatic life, so a desire for uniformity across all UMTRCA sites would not seem to justify disregarding out of hand state cleanup standards. In Texas, at least, there are numerous safeguards that attend cleanup under state standards (generally, see, § 43.90(f)(3), Tex. R. Control Rad.) that are missing under the UMTRCA Title I standards. For example, there are 52 more groundwater contaminants that must be considered under the Texas state standards (based on 10 CFR 40, App. A, Criterion 13) than under the federal standard (based on 40 CFR § 192, App. I).

2. The Draft PEIS also fails to lay a credible foundation for analyses of the various alternatives offered or that should have been offered, principally because the Draft PEIS does not discuss in any depth -- and, sometimes, not at all -- the reasonably foreseeable indirect effects of the proposed action and the conflicts between the proposed action and the objectives of the states or smaller locales in which the groundwater sites are located. See, 40 CFR § 1502.16.

a. The Draft PEIS does not consider the impacts of the various alternatives it analyzed on the values of surrounding properties. Had it done so, there would have been additional information available to decisionmakers on the relative costs to state and local governments of each of the alternatives. Analyses of the relative dependence on property taxes of state and local governments where the sites are located would have provided decisionmakers with information on which to decide, for example, that the active remediation alternative should always be implemented in certain states or that supplemental concentration limits should not be approved in certain states.

b. The Draft PEIS did not analyze how the various alternatives it considered or should have considered would be likely to affect the development of state cleanup standards at uranium mill tailings facilities not subject to UMTRCA Title I. Basically, by setting a low federal floor for cleanup standards, DOE encourages relaxation of state standards and this, in turn, leads to amplified environmental and health harm, because of the number of sites under state

jurisdiction and because of the relatively fewer resources available to state regulators.

3. The Draft PEIS is not clearly written. It is imprecise in its use of terms or does not define its terms, with the result that the Draft PEIS is not calculated to be readily understood by the relevant decisionmakers or the public. See, 40 CFR § 1502.8.

a. The Draft PEIS (p. 1-11) acknowledges that the EPA's final UMTRCA groundwater cleanup standards (generally, 40 CFR § 192) have only recently been established. The Draft EIS acknowledges that DOE was required to comply with the proposed EPA standards, until final standards were promulgated. The Draft PEIS, then, states, "for this reason, the planning of the Ground Water Project was done under the proposed standards." It is unclear whether the PEIS, certainly a component of the Ground Water Project, utilized the proposed or the final EPA standards The former is certainly a reasonable reading of the text. If that reading is correct, it is incumbent on DOE to justify reliance on outdated standards (now that the final standards are available); if that reading is incorrect, the text should be modified to remove the ambiguity.

b. The Draft PEIS (pp. 1-10 through 1-14) correctly explains the EPA's hierarchy of UMTRCA site groundwater cleanup standards. Under 40 CFR § 192.12(c), groundwater must be "cleaned" to:

i. background conditions or "maximum concentration limits", whichever values are less stringent, or

ii. if maximum concentration limits have not been set for a contaminant or if other special circumstances exist, alternate concentration limits, or

iii. for "limited use" groundwater, to "supplemental standards," which are the least stringent of all.

EPA requires supplemental standards come as close "as reasonably achievable" to meeting the background/MCL or alternative concentration limits. 40 CFR § 192.22(a). DOE's proposed action assumes that "limited use" groundwater need not be remediated, if environmental and human health risks are acceptable. See, Draft PEIS, p. 2-2 and Figure 2.1. The

Draft PEIS does not explain how DOE has determined the unremediated values of contaminants at sites underlain by limited use groundwater come as close as reasonably achievable to the background/MCL or alternative concentration level values. (Frankly, it strains credulity to believe this is uniformly true.) If, as seems probable, that determination has not really been made, the proposed action should be modified to bring it into compliance with 40 CFR § 192.22(a) (i.e., so it does not assume an outcome that legally must be reached by analysis), and the Draft PEIS should describe in detail the manner by which the required determination is to be made.

c. The "limited use groundwater" determination may only be made if the groundwater in question can not be a potential source of drinking water because of high solids, low flow, or background (i.e., not due to uranium mining and processing) contamination that can not be cleaned up using reasonable public water system technologies. 40 CFR § 192.11(e). The Draft EIS does not, but should, explain for decisionmakers and the public:

i. how DOE will determine what will be the technologies future public water systems would reasonably employ to clean water, especially, water that is deficient as to only the contaminants found in a site's background water (e.g., high uranium or radium);

ii. over what period of time DOE will investigate a groundwater's potential for drinking water use (i.e., will DOE consider the water's potential for use only in the 20-year or 50-year future, or will DOE consider more distant times when general water scarcity is likely to make some currently uneconomical water economically viable?);

iii. how DOE will evaluate the reasonableness of groundwater blending (i.e., mixing with higher quality water), in particular, as a current or potential technology by which limited use groundwater might be made drinkable; and, perhaps most importantly,

iv. how DOE will determine that groundwater contaminants do not result from mining or processing activities (e.g., if DOE plans to rely on ratios of

various elements or isotopes found "naturally" in groundwater, what exactly are those ratios, or, if DOE plans to rely on "updip" groundwater samples to determine background conditions, what will DOE do at sites where there are no "updip" samples to be had?).

d. EPA's supplemental standards may only be relied upon, in the instance of limited use groundwater, if a particular supplemental standard ensures reasonably projected future uses (not just drinking water uses) of the groundwater are preserved. 40 CFR §192.22(d). The Draft PEIS does not, but should, explain for decisionmakers and the public:

i. how DOE has determined that just leaving the limited use groundwaters in their polluted states will uniformly result in ensuring reasonable future uses of the waters are protected;

ii. how DOE will determine the reasonable future uses of groundwater (e.g., by what methods will DOE determine costs of alternative purification technologies, or by what methods will DOE project an area's agricultural or industrial trends?); and

iii. over what period of time will DOE attempt to make these use projections.

e. The Draft PEIS apparently contemplates use of a risk assessment methodology other than that used in the RCRA program, that is, other than the methodology set out in Risk Assessment Guidance for Superfund, Volume II (EPA, 1989, EPA/540/1-89/001). The decision should be justified to use instead the methodology more or less described at Draft PEIS pages 2-10 through 2-15, Appendix B, and Human Health Risk Assessment Methodology for UMTRCA Groundwater Project (Jacobs Engineering, Nov. 1994). This explanation is particularly in order, in that UMTRCA standards are generally required to be consistent with the RCRA standards. 42 USCA § 7918(a). It may be that the risk assessment methodology described in the Draft PEIS is superior to that used under RCRA, but the Draft PEIS certainly does not explain that fact to decisionmakers or the public.

The risk assessment methodology to be used is not as clearly described in the Draft PEIS as it should be. In particular,

the deficiencies of risk assessment "science," which science, after all, underlies any claim that DOE's preferred alternative (i.e., the proposed action) is rational, need to be fairly presented to the decisionmakers and the public. That the science has numerous deficiencies does not necessarily militate against DOE's preferred alternative, but it is unreasonable of DOE not to lay the facts of the deficiencies before the decisionmakers and public.

At a more specific level, at least the following questions about the risk assessments proposed by DOE should be answered:

i. how will risks posed by contaminants in the unsaturated zones above aquifers be addressed;

ii. will contaminant species be eliminated from toxicity review based only on human health implications, or will the implications of these species for wildlife, particularly livestock, be considered, also;

iii. how will it be determined (for purposes of exposure assessment) what the reasonable future land uses in an area are and how long a future time will be considered in determining reasonable future uses;

iv. why was it determined that only the existing biological community would be considered in the evaluation of the impacts of contaminants on non-humans (see, Appendix B-8 -- this would seem to be inconsistent with the requirement of 40 CFR § 192.22(d) that supplemental standards ensure projected uses also are protected);

v. will toxicological data on populations potentially to be exposed to the contaminants consider differences between the sensitivities of the U.S. population as a whole and the sensitivities of the particular sub-sets of the population (i.e., American Indian and Mexican-American) that are most likely to be exposed to the contaminants;

vi. on what basis was it decided the risk assessments will not consider the air-borne exposure pathway;

vii. by what objective means will it be determined that there are sufficient groundwater data to support the use of probabilistic curves, rather than expected values or uniform distributions, to describe contaminant concentrations;

viii. will probabilistic curves be used to represent possible contaminant intakes by both humans and livestock, and will these curves be adjusted to well-reflect reality in the generally hot regions in which the UMTRCA sites are found;

ix. Appendix B suggests, but does not actually say, the toxicity assessment components of risk assessments will consider the non-carcinogenic (as well as the carcinogenic) implications of contaminants - are both implications to be evaluated in the risk assessments;

x. given that it is generally recognized that toxic levels for many trace elements are only slightly higher than normal intake levels, how will risks of intake of trace elements, in particular, be evaluated (again, given the particular population sets found near UMTRCA sites and given the climate peculiarities [i.e., heat] at some of those sites);

xi. how does DOE justify its apparent decision to utilize EPA's chemical-induced cancer risk curve in assessing the cancer risk posed to humans by chemical contaminants, since the risk of cancer is cumulative with exposure (note, EPA's radiation-induced cancer curve), but EPA's chemical-induced cancer curve assumes a constant average daily intake;

xii. the Jacobs Engineering Human Health Risk Assessment document cited earlier indicates (p. 11) DOE's risk assessments will be based, in part, on late 1970s national body weight data; how will DOE determine its UMTRCA site risk assessments may reasonably rely on this foundation, given the particular population subsets and climates found near UMTRCA sites;

xiii. will DOE's risk assessments consider the likelihood that an individual who is in the future hypothesized to be exposed to contaminants through a

groundwater pathway may have had abnormal prior occupational exposure (e.g., from work in the uranium industry) to the same contaminant; and

xiv. are the variable values chosen from the probability distribution curves during the Monte Carlo simulations that produce the risk outputs themselves interdependent (e.g., if a high value for meat consumption is selected during a simulation run, is a high value for water consumption also more likely than a low value to be selected)?

4. Finally, the Draft PEIS's description of conditions at the Falls City site, the only site about which Concord Oil has any sophisticated understanding, omits important facts and contains errors that should be corrected. Presumably, the Draft PEIS's inclusion of site-specific information is intended to afford decisionmakers and the public some opportunity to evaluate the reasonableness of the alternatives DOE proposed or should have proposed. To serve that function, all the site descriptions need to be accurate and inclusive of important details.

Regarding the Falls City site:

a. it is incorrect to state the surface cleanup was completed in June 1994; NRC has not concurred in the surface cleanup to date, and DOE has not even completed its vicinity property surveys at Falls City;

b. it should be explained that the Falls City site is immediately east of a state superfund site ("Butler Ranch") at which hazardous materials were illegally dumped, and that the Falls City site itself is characterized by unexplained high levels of thorium contamination;

c. it should be made explicit that what the Draft PEIS characterizes as a "low-yield" upper aquifer is, nonetheless, an aquifer that yields more than EPA has determined to be the threshold for "limited use groundwater" designation;

d. it should be explained that the lower aquifer at Falls City may be interconnected with the upper aquifer both by geologic pathways and by the numerous wells and boreholes in the area; the observation of apparent mining-related contamination at two points in the lower aquifer should be

mentioned;

e. that the Falls City area is one of historic seismic activity should be explained;

f. the statement that there is no indication of groundwater discharge to surface streams should be tempered to reflect that there are seeps to surface streams on the site and adjoining properties that may provide pathways for upper aquifer contamination of surface waters;

g. the Draft PEIS's statement that groundwater in the upper aquifer can not be treated by methods currently employed by public water systems in the region should be reworded to make the relevant statement, which is DOE's analysis of whether the contamination could be cleaned up by methods that are or in the relevant future could be used by public water systems, whether in the region or elsewhere; and

h. the Draft PEIS comments that the water in the upper aquifer is of limited use for livestock and is of no other use (now or in the future, presumably) and, that, therefore, its contaminants pose no threat to human health or the environment (again, now or in the future, presumably) should be deleted; this language states as factual conclusions (DOE's) hypotheses that are still to be proven by data collection and risk analyses.

This concludes Concord Oil's comments.