

The Oregon Department of Energy

PHONE 378-4000 TOLL FREE 1-800-221-1000

1975
TEN YEARS
SERVICE
TO THE
PEOPLE OF
OREGON
1985

TO: Energy Facility Siting Council

DATE: August 23, 1985

FROM: Felix R. Miera *FAM*

WM Record File

WM Project *64*

Docket No.

PDR ☒

LPDR

SUBJECT: Lakeview Status Report

Distribution:

GGruenert:

(Return to WM, 623 SS)

SAC

This report will summarize the progress made to date towards completion of pre-remedial activities for the Lakeview uranium mill site and in anticipation of initiating the final remedial action. Updates are provided on: proposed changes to the cooperative agreement; input from the Lakeview Remedial Action Advisory Committee; status of the Lakeview Environmental Assessment and the conceptual design presented in the draft Remedial Action Plan; the Departments recommendations to the Council on land-use findings, property acquisition and conditional approval of the conceptual design for the Remedial Action Plan.

Proposed additions to the State of Oregon/U.S. Department of Energy Cooperative Agreement

The Cooperative Agreement establishes the basic mechanism through which the state and U.S. DOE operate in this joint venture. Initially signed in June 1984, the state has requested that the following documents be submitted for state concurrence and approval (as opposed to only review and approval):

- Lakeview Environmental Health and Safety Plan;
- Lakeview Surveillance and Maintenance (S&M) Plan;
- Lakeview Final Certification Report;
- Lakeview Preliminary and Final Design Drawings and Specifications

The U.S. DOE has indicated that they would be in agreement with this request.

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PDR WASTE
WM-64 PDR

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WM DOCKET CONTROL
CENTER

The Department is currently in the process of preparing additional language for the Cooperative Agreement that will propose the development of a reporting program in connection with subcontractors performing uranium mill tailings remedial action work in Oregon. We are proposing that the state be provided with information regarding the number of Oregon residents hired, the number of Oregon firms awarded subcontracts, and the steps taken to fully and effectively publicize the availability of Lakeview related job and subcontract opportunities. The enabling federal legislation for the project does not allow either the U.S. DOE or Oregon to require hiring of residents or subcontractors from the state.

Lakeview Remedial Action Advisory Committee

An Advisory Committee meeting was held on August 14. The agenda and materials provided for the meeting are provided as Attachment 1. Also attached is a copy of the local media coverage of the meeting (Attachment 2). Most of the items listed on the agenda are covered in detail in this status report. One issue brought up included a discussion of how this committee could effectively continue to participate in this project over the next few years. It is envisioned that the local task force will continue to be involved in reviewing site design and construction progress and in making recommendations to the state of Oregon, the U.S. DOE and the site construction manager. Examples of task force involvement might include:

- ° The task force will be the forum for problems associated with such local impacts as dust control, traffic problems and road deterioration, contractor employee conduct, and others.
- ° The task force will suggest ways that the remedial action program can be of maximum benefit to the economic health of the community.
- ° The task force will act as the conduit for feedback from the community to the Lakeview project manager.

Status of the Environmental Assessment and the Remedial Action Plan

The U.S. DOE published the Environmental Assessment for the proposed remedial action of the Lakeview uranium mill tailings in April of this year. The purpose of the assessment was to describe the proposed remedial action and alternatives, and the environmental impacts of the proposed actions. The draft Remedial Action Plan presented the conceptual design for the final disposal site and was issued in March. The U.S. DOE solicited and received comments on both these documents from the State of Oregon (See Attachment 1), the U.S. Nuclear Regulatory Commission (NRC), and the general public. Both the State of Oregon and the NRC must concur on the design before it is final.

At the May 31 meeting, the Council listened to concerns that were raised with regard to the proposed remedial action. The U.S. DOE is in the process of finalizing the formal responses to submitted comments. Attached are the initial responses received by ODOE that for the most part address technical concerns (Attachment 3). We have been assured by the U.S. DOE that responses to all comments will be forthcoming within the next few weeks.

ODOE and the NRC will have the primary responsibility to ensure that concerns raised with regard to the Lakeview project have been adequately addressed and/or resolved by the U.S. DOE prior to recommending final concurrence on the conceptual design. In some instances, some of the concerns raised will require that the U.S. DOE and its contractors conduct a limited amount of additional field tests where data is not currently available, and provide further documentation or evaluation where necessary. The additional information will primarily address such key issues as liner requirements for the disposal site, surface erosion protection criteria for the final site covers and a more thorough characterization of background radiation levels for the preferred disposal site.

Department Recommendations on Land Use Findings

A preliminary report was presented to the Siting Council at the May 31st meeting, reviewing land use findings on the proposed remedial action for the Lakeview site. The findings for Goal 5 of the review recommended that additional on-site studies be conducted to determine if any plants on the U.S. BLM sensitive list (i.e., that are endangered, threatened, or limited in distribution in Oregon but which are common or stable outside Oregon) exist on the mill site or the Collins Ranch site and borrow area. In 1984, Western Resources Development conducted literature and site surveys of these sites that formed the basis of plant distributions in these areas. Their reports did not confirm that any plants on the BLM list were to be found in these areas. However, they also recommended that additional field studies be conducted during the growing season (April - June). Due to the range fire that encompassed the Collins Ranch site during the summer of 1984, it was felt that no beneficial information would be gained by conducting additional field surveys of this site this year.

Consultations with the U.S. DOE and their contractors, lead us to believe that we would not expect to encounter any of the sensitive plant species on this site. The Department therefore requests the Siting Council to finalize the findings of the review. We believe that the proposed action for protection of the public health, safety and the environment provide for the greatest benefit. Should additional on-site work indicate there is a possible impact on a Goal 5 resource, a program will be developed to conserve or protect the resource and ensure compliance with Goal 5.

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Department recommendations on the Conceptual Remedial Action Plan and Site Acquisition

As indicated earlier in this report, during review of the conceptual design it was determined that the U.S. DOE and its contractors would be required to gather additional information and provide further evaluation. The Department has determined that the final disposal site design is sound and requests the Siting Council grant provisional approval of the conceptual design. The Department further requests that the Siting Council Subcommittee on the Lakeview Remedial Action Program be empowered to adopt the Remedial Action Plan in final form, upon satisfactory resolution by the U.S. DOE of all concerns raised by the Oregon Department of Energy and the U.S. Nuclear Regulatory Commission. Final approval of the Remedial Action Plan by the Subcommittee would also be conditional on acquisition of the preferred final disposal site, i.e., the Collins Ranch site, as proposed in the supporting Environmental Assessment documentation.

The Department bases its recommendation on the following: the proposed action satisfies the requirements of the enabling federal legislation and meets the requirements of applicable Environmental Protection Regulations; the proposed action will adequately provide for the protection of the public health, safety and the environment.

It is further requested that the Siting Council give the Oregon Department of Energy authority to engage in negotiations for the acquisition of the Collins Ranch site as the preferred final disposal site. Should the State have to reinitiate the site selection process, it will delay the remedial action, cost the state additional monies, and may jeopardize the state's participation in the remedial action program with the assistance of the federal government.

Staff has discussed this recommendation in some detail with Council member Marlene Bayless Mitchell. Since she will not be able to attend this meeting, she would like the Council to know that she supports staff recommendations on the remedial action plan concurrence.

FM:tg
156-Memos (F1)

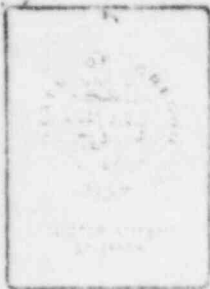
Lakeview Remedial Action
Advisory Committee Meeting
August 14, 1985
Meeting Time - 7:00 p.m.

Agenda

- I. Activity Status Report
- II. Progress Report by Sergeant, Hauskins & Beckwith on the geotechnical and geochemical evaluation of the proposed alternate site.
- III. Discussion of the Draft Remedial Action Plan
 - A. Comments submitted by the Oregon Department of Energy
 - B. Proposal for a "Lakeview Site Management Plan"
 - C. Recommendations on the Draft to be presented to the Energy Facility Siting Council
- IV. Public Comment Period

The Lakeview Remedial Action Committee welcomes public comments and suggestions relevant to matters within the Committee's jurisdiction. This opportunity is provided to bring concerns or matters not included on the agenda to the Committee's attention.

FM:tg
25-Sitmisc (F1)
08/08/85



The Oregon Department of Energy

LABOR & INDUSTRIES BUILDING, ROOM 102, SALEM, OREGON, 97310

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TO: Lakeview Advisory
Committee Distribution

DATE: August 9, 1985

FROM: Felix R. Miera

SUBJECT: Lakeview Remedial Action Committee Meeting

An Advisory Committee meeting is scheduled for August 14, 1985, at the Lake County Court House, Memorial Hall, beginning at 7:00 p.m. Enclosed is an agenda for the meeting. As you will note, there are several important items listed on the agenda for discussion.

Jim Brinkman of Sergant, Hauskins & Beckwith, a U.S. Department of Energy (US DOE) Contractor, will present the initial geotechnical and geochemical data and results collected at the proposed alternate site for final disposition of the tailings.

We would also like to discuss with you several items that deal with the Draft Remedial Action Plan issued by the US DOE in March 1985. Attached to this meeting announcement is a copy of our staff comments submitted on the Draft to the US DOE for your information.

In addition, there is also attached for your review and comment, a copy of a proposed "Lakeview Site Management Plan". The management plan was recently submitted to the US DOE and will be important to the accomplishment of the Final Remedial Action at the site. Your input is requested. Finally, we would like to discuss with you, the Department's recommendations to the Energy Facility Siting Council on the Draft plan. These recommendations will be made to the Council at their meeting in Lakeview September 6th.

FRM:tg
24-Memos (F1)



The Oregon Department of Energy

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1975
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1985

July 30, 1985

Mr. John Themelis
US DOE, Albuquerque Office
PO Box 5400
Albuquerque, NM 87115

Dear Mr. Themelis:

The Oregon Department of Energy (ODOE) has reviewed the Draft Remedial Action Plan (DRAP) proposed for the Lakeview Uranium mill tailings site. These comments are in addition to those provided primarily concerning the draft environmental assessment, but pertaining in part to the DRAP.

Of major concern to ODOE staff is the completion of the remedial action in a timely fashion, within budget projections, and above all in a spirit of keeping future radiation exposures as low as is reasonably achievable (ALARA). Toward this end, I will summarize several points of general comment that we wish to call out for your attention:

1. It is stated in several places in the DRAP, but has since been the subject of reconsideration, there shall be a two foot thick, low permeability clay liner beneath the final disposal site.

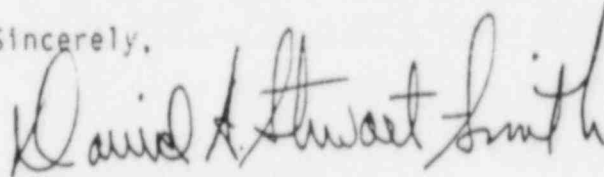
With the understanding that it is important that there be an appropriate balance of permeability between the cap and the liner, we feel strongly that the use of a liner is the only way to assure isolation of the tailings from the environment. Backed by our commitment to an ALARA-based site design, you may consider this a matter of concurrence.

2. A comprehensive site management plan, agreed to by the US DOE and the ODOE is Oregon's only way of assuring that state funds are being spent effectively, and that the waste isolation requested by the Act and the ALARA philosophy is achieved. Comments on the latest draft of this management plan have been forwarded to Dave Ball of your office.

3. We consider concurrence in the final RAP, to be provisional. There shall be several steps in facility design and construction where Oregon's approval must be provided prior to moving ahead with additional work. We will, after all, as the agency responsible for protecting the public health and safety in this matter, must be able to live with the results once remedial action is complete. These points are indicated in the information sent to Dave Ball.
4. The comments on the DRAP provided by the USNRC must be reconciled prior to Oregon's concurrence in the RAP.

In addition to these overall comments, we have prepared specific comments keyed to the DRAP. I have attached these as a separate document, to this letter. Thank you for this opportunity to provide comments on the DRAP, we look forward to continued cooperation in this project. We would especially like to thank the staff of the Jacobs-Weston technical assistance team for their assistance and hard work. In particular, Leon Stepp, Project Manager for Jacobs-Weston, without whose skill and effort we would be in a much less favorable position to proceed. Should you have any questions, or would like additional clarification on any of these comments, please contact me at (503) 378-3187.

Sincerely,



David A. Stewart-Smith, Manager
Radioactive Materials Program
Siting and Regulation Division

DS-S:ja
1-Letter(d1,f1)

Attachments

Oregon Department of Energy
Comments on the Draft Remedial Action Plan
Lakeview, Oregon

Page 28 (top bullet) - Please clarify how the distinction will be made between contaminated and uncontaminated wood chips from the raffinate pond.

Page 28 - Please provide a plan whereby the processing site and the relocation site will be stabilized and protected from damage and erosion between construction seasons.

Page 36 (5.6.1, 3rd paragraph) - Are any state or local permits required for the relocating of Hammersley Creek? How can ODOE be of assistance?

Page 43 (5.8.2) and Page 55 (7.2.5) - Last paragraph. Oregon must have equal standing as the US DOE regarding availability of information and final site certification.

Page 55 (7.2.4) - Oregon must have access to preliminary engineering drawings as well.

Page 56 (7.2.9) - What will be the level of US DOE audit involvement? How will the State of Oregon access this information?

Page 57 (8.1), paragraph 2 - The State of Oregon, being the eventual custodian of the disposal site must be involved as an equal partner in the design of the surveillance and maintenance (S&M) program. In addition, we believe that there should be an option for ODOE to serve as the S&M contractor.

Page 60 & 61 (9.6 & 9.8), paragraph 2 - These records and drawings should be available to the State as well.

Glossary - Designations of Radium-226 and Rn-226 - Radon-222 and Ra-222 do not serve any clarifying purpose, and are misleading. Please correct these.

Page B-32 (B.1.3.1.), third bullet - Will there be any confirmatory surveys to ascertain the degree of mixing and the usefulness of the assumption of average concentration values?

Page B-41 (B.1.3.4.) - Blending of the Radon barrier material to eliminate pockets of sand should be a requirement; it is stated in a permissive tense. The same blending will be necessary for the clay liner material.

Page B-74 (B.3.3.2.), paragraph 2 - Is an average permeability of 1×10^{-7} a reasonable figure for materials considered to be clay? What will be the projected travel times for tailings constituents from the site as a function of changes in permeability? Please provide this analysis, considering a range of 10^{-5} to 10^{-10} cm/sec permeability and an assessment of the availability of materials of this range of permeability in the Goose Lake Valley, or as a trucked-in clay material. Please consider SO_4 , U, Ra, As and Th, and a reasonable range of fluctuating groundwater levels. What would be the travel time to the edge of the 40-acre site given a reasonable range of parameters?

Discussion

Oregon is contributing significant state funding to the Lakeview remedial action program. Because of this, it will be necessary to commit to an action plan guiding the expenditure of these funds. This plan consists of the identification of significant points in the remedial action process where Oregon participation and concurrence will be necessary before work can proceed by the contractor. This management plan covers 3 time frames.

1. pre-construction property acquisition and engineering.
2. construction work and health physics.
3. post-construction approval and monitoring.

Each time frame will be presented in terms of decision points to be agreed upon by the State of Oregon before we will approve the expenditure of state funds.

Schedule oversight, fiscal oversight and mechanism for
involvement of local advisory committee

I. Pre-Construction Property Acquisition and Engineering

Property acquisition is the responsibility of the State of Oregon. Preparation for acquisition includes proof of title, property appraisals, negotiation, and if necessary, condemnation proceedings.

During the pre-construction phase, several key events must be reviewed and approved by the Oregon Department of Energy. These are:

1. initiation of preliminary engineering review by construction contractor.
2. initiation of site design engineering by construction contractor.
3. approval of a comprehensive environmental monitoring program to include preoperational.
4. approval of a final site design.
5. approval of construction phase health physics program.
6. approval of construction sub-contractors.

7. approval of contracts for borrow materials, water, and rights of entry or passage.
8. approval of overall construction plan for the entire project.

In addition, Lakeview Program Manager will review monthly statements of work performed and funds expended by federal contractors. Any discrepancies with overall site action plan will be reconciled with US DOE site manager and construction contractor site manager within 15 days of the end of the month. It is important that the Oregon Department of Energy maintain close communications with the UMTRA project office and federal contractors throughout this planning period.

II. Construction Work and Health Physics Program

The Oregon Department of Energy will maintain at least contact with the Albuquerque office US DOE, and with the construction contractor throughout the construction phase.

The Lakeview local task force will be involved in reviewing site design and construction progress and in making recommendations to the State of Oregon, the US DOE, and the construction site manager. This includes but is not limited to:

- * the task force will be the forum for problems associated with such local impacts as dust control, traffic problems and road deterioration, contractor employee conduct, and others.
- * the task force will suggest ways that the remedial action program can be of maximum benefit to the economic health of the community.

The construction contractor will produce a month-by-month schedule of work to be performed and an associated cost estimate by the beginning of each work session.

The State of Oregon will receive monthly statements of actual work performed and costs incurred within 15 days following the end of the statement period.

All discrepancies between the construction plan and actual work performed will be outlined in an attachment to the statement. In addition, any shortfall in the monthly goals shall be rescheduled within the same working season, and a construction plan amendment produced to show how the work can be made up that season.

During the construction phase, several key events must be reviewed and approved by the Oregon Department of Energy. These are:

1. approval of the month-by-month construction plan for each construction season by April 1st. We must have 2 working weeks to review and approve the seasonal month-by-month plan.
2. initiation of construction.

3. approval of the final excavation.
4. approval of final liner construction and placement.
5. approval of site condition for winter construction stoppage.
6. approval of final site completion, release of existing mill site properties for unrestricted use, and final approval of adjacent properties clean-up.

In addition, through periodic site inspections, the quality control of various aspects of site construction will be subject to state review, and authority to require changes to make improvement. This includes, but is not limited to:

- * dust control measures
- * health physics program (Oregon Health Division)
- * liner and cap material composition, condition, and placement
- * nuisance issues with local residents

III. Post Construction

The State of Oregon Department of Energy will have first consideration as the post-construction monitoring contractor.

As the federal post-construction monitoring funding comes to a close, a fund will be established in the state treasury. This fund will be sufficient to provide, from the interest of the account, for continued environmental monitoring by the State of Oregon.

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Siting council here Sept. 6

Lake County Examiner
Aug. 22, 1985

ODOE to recommend Collins site

By Dave Sneed

The Lakeview uranium mill tailings are one step closer to being relocated to the Collins ranch site.

At an Aug. 14 meeting of the Lakeview Remedial Action Advisory Committee, David Stewart-Smith, manager of the Oregon Department of Energy's Siting and Regulation Division, said he is ready to recommend the Collins ranch site as the relocation site for the tailings.

Stewart-Smith will make his recommendation to the Energy Facility Siting Council, a group tasked by the State of Oregon to make decisions such as tailings relocation, when that group meets in Lakeview Sept. 6.

The siting council is meeting in

Lakeview for the purpose of making a final decision on the tailings relocation. The U.S. Department of Energy has already recommended the Collins ranch site as the preferred relocation site.

Stewart-Smith said his recommendation is contingent upon two current problems being resolved, however. One of these problems is acquisition of the Collins property.

Stewart-Smith said he has talked to John Collins, owner of the property, and has set up a tentative appointment to talk to him about property acquisition. However, Collins has been busy with several projects he is working on with the Army Corps of Engineers and will not be available until around the beginning of September, said Stewart-Smith.

Concerning Collins' claim for fire damage restitution, Stewart-Smith said the paper work is done but Collins hasn't yet received the check. Until he gets the money, Collins will not allow anyone on his property to do appraisals for the acquisition.

About a year ago, engineers with the tailings relocation contractors accidentally started a fire which burned much of Collins' property including the proposed relocation area. A law suit was filed by Collins which is just now being resolved.

Stewart-Smith said he will recommend the Collins site only if a reasonable price for the land can be settled upon.

The other contingency to be met before Stewart-Smith will recommend the Collins site is whether questions the ODOE has concerning the Draft Remedial Action Plan (DRAP) can be satisfactorily resolved.

The DRAP is a document drawn up by the USDOE and the relocation contractors which details the relocation plan. Stewart-Smith said he has several questions about this document.

One of these questions is whether a two-foot thick, low-permeability clay liner shall be placed below the final disposal site. In a letter to the USDOE, Stewart-Smith said there should be.

"With the understanding that it is important that there be an appropriate balance of permeability

between the cap and the liner, we feel strongly that the use of a liner is the only way to assure isolation of the tailings from the environment," said Stewart-Smith.

Stewart-Smith also said at various times in the relocation process the State of Oregon must approve several steps in facility design and construction before additional work can be started.

"We will, after all, as the agency responsible for protecting the public and safety in this matter, must be able to live with the results once remedial action is complete," said Stewart-Smith in his letter to the USDOE.

Also at the Aug. 14 meeting, Stewart-Smith said the siting council has three options available to it if it the ODOE cannot obtain a reasonable purchase price with Collins. But each of these has disadvantages.

One of these options is to consider relocating the tailings on the Flynn ranch site. The Flynn site has been designated as a second acceptable relocation site.

If the Flynn site were chosen, however, a new DRAP would have to be drawn up at a sizable additional cost and a delay in the project of many months, said Stewart-Smith.

The Flynn site is also considerably further away from Lakeview than the Collins site and this additional distance means relocation to that site would cost \$6 million more. This additional cost

would have to be paid by the State of Oregon, said Stewart-Smith, because the U.S. Congress has agreed to pay for 90 percent of the relocation costs to the site preferred by the USDOE.

That preferred site is the Collins site. Therefore, if the State of Oregon chooses the more costly Flynn ranch site, it will have to make up the difference in cost.

A second option is to condemn the Collins property. This, said Stewart-Smith, is an action the ODOE would prefer not to take.

The third option is to go back to the drawing board. This course of action would put the Lakeview relocation project back years and drop it to the bottom of the government's funding priority list, said Stewart-Smith.

Also at the Aug. 14 meeting, Jim Brinkman, a hydrogeologist with one of the federal contractors Sergeant, Haukins & Beckwith, gave a geotechnical and geochemical evaluation of the Collins site.

Brinkman started his report by saying the contamination at the tailings present site is very limited. Detectable contamination has spread a maximum of 800 feet from the tailings pile and has penetrated only to a very shallow level in the ground.

Brinkman also said the actual tailings piles themselves contain the most contamination but this is fairly immobile. The nearby raffinate ponds contain less contamination. Continued on next page

State favors Collins site

Continued from previous page
but it is spreading faster, said Brinkman.

Concerning the Collins site, Brinkman said contamination of the ground water would be kept to a minimum because the tailings pile would be surrounded on all sides by low-permeability material. This would prevent almost any water from reaching the tailings.

Additionally, the water that did reach the tailings and become contaminated would be quickly neutralized by the highly carbonate nature of the lining. Brinkman estimated contaminated water would be neutralized by the time it percolated one foot into the lining.

The remaining contaminants that were not neutralized would be diluted by the water table to an undetectable degree, said Brinkman. At the Collins site the water table would be at least 20 feet below the tailings.

During the public comment period of the meeting, Stewart-Smith was asked what security precautions would be taken at both the current and the proposed tailings sites when the relocation operation was shut down during the winter months.

Stewart-Smith said no provisions have yet been made for that kind of security but must be addressed eventually.

Also in the public comment period, Stewart-Smith was asked what the impact would be on the tailing project if a state-wide initiative petition sponsored by Lloyd Marbet was passed.

Marbet is the director of a public interest group called Fore Laws on Board and has circulated a state initiative petition which would redefine radioactive waste to include tailings.



Tailings experts

Key figures in the Lakeview uranium mill tailings cleanup project are Felix Miera (left), manager of the project and David Stewart-Smith, manager radioactive materials program. Both are with the Oregon Department of Energy. (Examiner photo by Dave Sneed)

Stewart-Smith said, if passed, the law would not affect the Lakeview project because the project would be nearly finished by the time the law came into effect. Also the federal legislation which governs the Lakeview cleanup project specifies that it be done to federal, not state, standards. He said this determination was made after consulting with ODOE lawyers.

Finally, Stewart-Smith defined what role the Lakeview advisory committee will have during the relocation process. Concerning this matter, the Lakeview Site Management Plan reads as follows:

"The Lakeview local task force will be involved in reviewing site design and construction progress and in making recommendations to

the State of Oregon, the USDOE, and the construction site manager. This includes but is not limited to:

"—the task force will be the forum for problems associated with such local impacts as dust control, traffic problems and road deterioration, contractor employee conduct and others.

"—the task force will suggest ways that the remedial action program can be of maximum benefit to the economic health of the community."

At the Aug. 14 meeting, those in attendance met for the first time Felix R. Miera, the new Lakeview project manager with the ODOE. Miera replaces Dave Markley who formerly held the position.



JACOBS ENGINEERING GROUP INC.

ADVANCED SYSTEMS DIVISION, ALBUQUERQUE OPERATIONS

5301 CENTRAL AVENUE N.E. — SUITE 1700, ALBUQUERQUE, NEW MEXICO 87106
TELEPHONE (505) 846-4030

August 14, 1985

Mr. John G. Themelis
UMTRA Project Manager
U. S. Department of Energy
Uranium Mill Tailings Project Office
5301 Central Avenue, N.E., Suite 1700
Albuquerque, New Mexico 87108

Attention: Mark Matthews

Re: Response to NRC Comments on the
Lakeview Draft RAP, EA (D) PSCR,
(D) DSCR
Contract No. DE-AC04-82AL14086

Dear John:

The NRC submitted comments on the Lakeview Draft RAP and other reports in a letter dated June 19, 1985. Attached are the TAC responses to the NRC comments. Items of concern have been discussed with the NRC prior to formalization of responses. If you have any questions concerning the response to comments, please contact Leon Stepp of our staff or myself.

Very truly yours,
JACOBS ENGINEERING GROUP, INC.

Roger L. Williams
Project Manager

RW/LP/LS/tb

Attachment

RESPONSE TO
NRC COMMENTS DATED JUNE 19, 1985
ON
LAKEVIEW ENVIRONMENTAL ASSESSMENT
LAKEVIEW (D) REMEDIAL ACTION
LAKEVIEW (D) PSCR, AND
LAKEVIEW (D) DSCR (COLLINS RANCH SITE)

GROUND-WATER COMMENTS: DRAP

1. Comment

P. 21, Paragraph 3: Design Concept; and P. 35, Paragraph 2: "Ground-water Protection." Please provide the technical basis by which a one-foot-thick radon barrier and a two-foot-thick compacted soil liner are considered to be sufficient to protect the ground water from contamination due to contaminant leaching through the stabilized pile.

Response

The key to ground-water protection is to limit net infiltration from the atmosphere through the cover and contaminated materials. The cover is the primary deterrent to leachate generation and transport. Once moisture redistribution occurs and a dynamic equilibrium exists, water passing through the cover and contaminated materials will continue to move downward or seep laterally. Therefore, a liner does not act to limit the net rate of fluid migration, although it may attenuate the movement of some chemicals and may cause uniform seepage. The information obtained through the data collection and analyses should be used to:

- o Determine if the present cover is adequate for ground-water protection.
- o If the cover is not adequate then determine an adequate cover design.

The technical basis will be stated in the RAP along with any final thickness changes. The data backup for all technical decisions will be added to the PSCR and DSCR as appropriate.

2. Comment

The DRAP calls for a two-foot thick liner in the disposal facility. However, both the draft DSCR and DEA do not indicate that a liner will be used. This discrepancy should be clarified.

Response

The need for a liner in the disposal facility is being evaluated. The final evaluation/determination will be reflected in the RAP.

3. Comment

Page 21 of the DEA states that below-grade excavation of the disposal area will extend to approximately 25 feet below the surface. Page 35 of the DRAP states that depth to water at the Collins Ranch site ranges from 20 feet to 76 feet below the proposed base of the tailings (ground water could therefore be as close as 20 feet beneath base of tailings). Page 15 of the draft DSCR states that ground water at the Collins Ranch site ranges from

35 feet to 127 feet beneath the surface (ground water could therefore be as close as 10 feet beneath the base of the tailings). This discrepancy should be clarified.

Response

The DEA reflects data and information available at the time of its preparation in February, 1985.

The DRAP and DSCR, published more recently, considered additional data. The final RAP and DSCR will reflect total data collected and will be consistent one with the other.

GROUND-WATER COMMENTS: DEA

1. Comment

Page 66, paragraph 1, Page 69, paragraph 3. The Lakeview site pump test summary together with the slug test results from both the Lakeview site and Collins Ranch site were reviewed (see pages 132, 133, and 134 of the draft PSCR and page 28 of the draft DSCR). The hydraulic conductivity values and calculated velocities are inappropriate because they were derived from invalid analysis methods. None of the pump test analysis methods presented in Table 5.4 of the draft PSCR are valid because many of the assumptions inherent to these methods are violated. From the very limited geologic data presented in the review documents, it would appear that the aquifers underlying the Lakeview and Collins Ranch sites are unconfined. It is therefore recommended that the pump test data be re-evaluated, taking into account the apparent unconfined conditions and partially penetrating wells.

2. Comment

Following from No. 1 above, the Bouwer and Rice method presents the most representative values for K and T when analyzing the slug test data from the Lakeview and Collins Ranch sites. Assumptions inherent to the Skibitzke and Hvorslev methods invalidate their use at these sites. The geologic data presented in the review documents do not support the premise of confined or confined/leaky aquifer systems underlying these two sites.

Response to Comments 1 and 2 Above

Semi-confined conditions may be caused by the presence of predominantly clay lenses rather than by a single well-defined stratum (Jacob, 1946). Therefore, the Theis, Jacob-Cooper, Hantush-Cooper, and Hantush Modified Methods may be appropriate to assess the time-drawdown data for the deeper test at the Lakeview processing site. For pump tests in highly variable deposits, the observed responses in the observation wells, completed in the same interval as the pump well, should govern the methods used. For instance, if the data plot closely fit to a given type curve and the hydrogeologic conditions reasonably support the method of analysis, then the

results should be considered as reasonably representative. If the log-log plot of the time-drawdown data fit the Theis type curve and the calculated storativity is on the order of 10^{-3} to 10^{-5} , then the interval should be considered to be confined or semi-confined. For all pump test analysis methods, some assumptions will not be satisfied in any field situation.

The calculations and results represented in the LHV EA and RAP were checked and some were found to be in error. Tables 1 and 2 contain the corrected values of hydraulic conductivity using the Skibitske, Bouwer-Rice, and Hvorslev Methods. For each case, the Bouwer-Rice Method was used assuming an impermeable barrier at the base of the well and again assuming an impermeable boundary at a depth of 2000 feet. In some cases using the Bouwer-Rice Method, two straight lines were fit to portions of the data set. These values are shown with slashes between them. The Bouwer-Rice is considered to give the most representative values.

3. Comment

It is apparent from Tables 5.10, 5.11, 5.12, 5.13, and 5.15 (pp. 137-155) of the draft PSCR, that only one sample from each well was used to characterize the ground-water quality. It is recommended that additional samples be analyzed to better delineate temporal and spatial variability and to assist in determining the effects of geothermal activity versus contamination from the pile.

Response

A total of four sample sets (quarterly) will be used to adequately delineate temporal and spatial variability. The fourth set will be collected in October, 1985. The effects of geothermal activity versus contamination for the site have been identified with the use of stable isotope analyses of key water samples. These analyses indicate that downgradient sulfate and other dissolved solids are due primarily to the geothermal system rather than the site. The results of the quarterly sampling and stable isotope analyses will be included in the final PSCR and the final RAP.

4. Comment

Although a very limited amount of ground-water data is presented in the draft DSCR, no ground-water quality evaluation for the Collins Ranch site is presented in the DEA. As provided in Comment No. 4 above, additional ground-water quality data should be collected and evaluated to delineate the character of the alluvial aquifer underlying the Collins Ranch site. The evaluation should take into consideration temporal and spatial variability of the ground water.

Response

Quarterly ground-water samples will be collected at Collins Ranch to adequately delineate temporal and spatial variability. These data and analyses will be reported in the DSCR and the RAP.

Table 1 Slug Test Data
LKV01 (Lakeview Processing Site)

| Well ID | Date | Skibitzke (ft/day) | Bouwer-Rice ^a (ft/day) | Bouwer/Rice ^b (ft/day) | Hvorslev (ft/day) |
|----------------------------------|---------|-----------------------|--------------------------------------|--------------------------------------|----------------------|
| LKV01-501 | 8/26/84 | * | 2.3 | 1.6 | 2.4 |
| LKV01-502 | 8/24/84 | 0.063 | 0.070 | 0.046 | 0.099 |
| LKV01-503 | 9/5/84 | 1.023 | 0.702/0.362** | 0.499/0.257** | 0.595 |
| LKV01-511 | 9/8/84 | 3.91 | -- | -- | 1.72 |
| LKV01-512 | 9/9/84 | * | 2.63 | 1.70 | * |
| LKV01-513 | 9/11/84 | 1.02 | 0.63/0.087 | 0.45/0.063 | 0.48 |
| LKV01-514 | 9/12/84 | 0.042 | 0.28/0.019 | 0.18/0.012 | 0.28 |
| LKV01-517 | 9/13/84 | * | 1.54 | 1.01 | * |
| LKV01-518 | 10/5/84 | * | 2.70 | 1.88 | * |
| LKV01-521 | 9/8/84 | 0.56 | 1.04/0.21 | 0.76/0.16 | * |
| LKV01-522 | 9/9/84 | 1.72 | 1.86 | 1.24 | * |
| LKV01-523 | 8/29/84 | * | 1.17 | 0.81 | * |
| LKV01-524 | 8/29/84 | 0.61 | 0.33 | 0.21 | 0.25 |
| LKV01-525 | 9/7/84 | * | 5.38 | 3.71 | * |
| LKV01-526 | 9/8/84 | 0.23 | 0.42 | 0.27 | 0.32 |
| LKV01-516 | 9/10/84 | * | 2.50 | 1.62 | * |
| Number of values | | 9 | 19 | 19 | 8 |
| Arithmetic mean | | 1.02 | 1.28 | 0.867 | 0.768 |
| Arithmetic standard deviation | | 1.21 | 1.36 | 0.930 | 0.831 |
| Log mean | | 0.484 | 0.621 | 0.422 | 0.476 |
| Standard deviation | | 4.45 | 4.33 | 4.36 | 2.84 |

^a Assuming impermeable boundary at bottom of well.

^b Assuming impermeable boundary at 2000 feet depth.

* Invalid

** 2 lines fitted.

Table 2 Slug Test Data
LKV01 (Lakeview Disposal Site 8)

| Well ID | Date | Skibitzke (ft/day) | Bouwer-Rice ^a (ft/day) | Schwen/Rice ^b (ft/day) | Hvorslev (ft/day) |
|-------------------------------------|----------|-----------------------|--------------------------------------|--------------------------------------|----------------------|
| LKV02-508 | 10/05/84 | 2.75 | 0.79 | 0.55 | * |
| LKV02-513 | 10/05/84 | 1.38 | 0.47 | 0.34 | 0.67 |
| LKV02-514 | 10/05/84 | 0.64 | 0.31/0.15 | 0.23/0.11 | 0.33 |
| LKV02-515 | 10/05/84 | * | 1.33 | 0.96 | 1.41 |
| LKV02-516 | 10/03/84 | 0.049 | 0.055 | 0.039 | 0.106 |
| Number of values | | 4 | 6 | 6 | 4 |
| Arithmetic mean | | 1.20 | 0.518 | 0.372 | 0.629 |
| Arithmetic standard deviation | | 1.17 | 0.475 | 0.340 | 0.570 |
| Geometric mean | | 0.637 | 0.329 | 0.237 | 0.426 |
| Geometric standard deviation | | 5.81 | 3.17 | 3.17 | 3.01 |

^a Assuming impermeable boundary at bottom of well.

^b Assuming impermeable boundary at 2000 feet depth.

* Invalid.

** Two lines fitted.

Table 3 Summary of LKV Pump Test Analyses

| Pump well | Observation well | Analysis method | T (ft ² /day) | S | K (ft/day) |
|-------------------------------|------------------|------------------|--------------------------|-----------------------|----------------------|
| 519 | 503 | Jacob-Cooper | 64.3 | 1.1×10^{-4} | -- |
| 519 | 503 | Hantush-Jacob | 28.8 | 8.9×10^{-5} | 0.015 |
| 519 | 511 | Jacob-Cooper | 6.4 | 1.6×10^{-4} | -- |
| 519 | 511 | Hantush-Modified | 3.7 | 2.3×10^{-4} | 7.1×10^{-3} |
| 519 | 521 | Jacob-Cooper | 57.4 | 1.6×10^{-3} | -- |
| 519 | 521 | Hantush-Jacob | 41.4 | 2.0×10^{-3} | 4.9×10^{-2} |
| Arithmetic mean | | -- | 33.7 | 6.98×10^{-4} | 0.0237 |
| Arithmetic standard deviation | | -- | 25.4 | 8.64×10^{-4} | 0.0223 |
| Log mean | | -- | 21.7 | 3.24×10^{-4} | 0.0173 |
| Log standard deviation | | -- | 3.33 | 3.92 | 2.65 |
| 520 | 504 | Jacob-Cooper | 96.6 | 2.5×10^{-4} | -- |
| 520 | 504 | Hantush-Modified | 13.6 | 4.1×10^{-6} | 8.4 |
| 520 | 512 | Jacob-Cooper | 95.1 | 6.6×10^{-4} | -- |
| 520 | 512 | Hantush-Jacob | 90.6 | 8.5×10^{-4} | 4.3×10^{-2} |
| 520 | 512 | Hantush-Modified | 70.4 | 6.6×10^{-4} | 5.4×10^{-1} |
| 520 | 522 | Jacob-Cooper | 254 | 2.8×10^{-2} | -- |
| Arithmetic mean | | -- | 103.4 | 5.07×10^{-3} | 2.99 |
| Arithmetic standard deviation | | -- | 80.1 | 0.011 | 4.69 |
| Log mean | | -- | 76.6 | 4.69×10^{-4} | 0.580 |
| Log standard deviation | | -- | 2.60 | 17.02 | 14.0 |

GEOLOGY/SEISMOLOGY COMMENTS

DEA/DRAP

1. Comment

In order to adequately assess the Collins Ranch site against the EPA longevity requirements, additional information regarding the regional and site specific geology, seismology, and geothermal activity, similar to that provided for the Lakeview site, are required. Specifically, the DEA/DRAP should provide a discussion of the regional and site specific geology, seismology, and geothermal activity which includes the following:

- o The relationship between the regional tectonics and the site specific structural geology.
- o The relationship between the regional seismology and the MCE determined.
- o The relationship between the regional geothermal activity and the potential geothermal activity.
- o An assessment of the potential for liquefaction at the Lakeview and Collins Ranch sites.

The information required usually can be derived from a review of existing, pertinent geologic literature. The information should be documented by references to all relevant published and unpublished material. The UMTRA Project document review process will be expedited if the DOE submittals contain sufficient information for the reviewer to make an independent assessment of the conclusions regarding the geologic suitability of the Lakeview site and the proposed alternative site.

Response

Regional and site specific geologic, seismologic, and geomorphic studies are discussed in the draft Disposal Site Characterization Report for the Alternate Uranium Mill Tailings Disposal Site at Collins Ranch near Lakeview, Oregon, along with the Processing Site Characterization Report for the Uranium Mill Tailings Site at Lakeview, Oregon; both published and distributed in March, 1985.

GEOTECHNICAL/COVER DESIGN COMMENTS: DRAP

1. Comment

Page B-17. The method used for correlating blow count data with shear strength values should be specified. Friction angles of 38 degrees and 41.5 degrees for SM-ML materials appear somewhat high, based on typical values for a silty sand as shown on Table 17.1 of Terzaghi and Peck.

Response

Blow counts were correlated to strength using Figure 19.5 from Peck Hansen and Thornburn (copy attached). The average blow count in the upper foundation soils was 36 and that of the lower foundation soils was 53. Laboratory tests were run on silt (MH) soils from these zones with resulting PHI angles of 38 degrees and 41.5 degrees. Subsequent laboratory testing resulted in effective PHI angles of 39.5 degrees for a silty sand with gravel and 36.7 degrees for a similar material obtained from the deeper layer. Based on the triaxial test data, it is considered that the strength parameters selected are realistic for the materials encountered, and that an effective PHI angle of 38 degrees is conservative and appropriate for both layers.

Examination of the stability analyses indicates that minimum factors of safety were reached in circles that passed through the upper foundation soil (PHI = 38°) but did not touch the deeper soil. The exception was the short-term slope stability which did have a slip circle touch this "hard bottom." However, the resulting factor of safety was 4.5. This review indicates that changing the PHI angle of this lower layer from 41.5 degrees to 38 degrees would have no effect upon the factors of safety obtained. Results of these laboratory tests are attached.

2. Comment

Page B-42. The cover thickness calculation assumes a residual moisture content of 16.0 percent. However, NRC staff calculations using Equation 16 of NUREG/CR-3533 (Rogers, 1984) and grain size distribution data from Figures 9.2 through 9.11 of the Collins Ranch DSCR, resulted in a residual moisture content of 11.9 percent. Further, the average long-term moisture content calculated by DOE using the Rogers equation, also was 11.9 percent. Finally, the average in-situ moisture content for three near-surface (2.5 feet) soil samples from Table 9.1 of the Collins Ranch DSCR is 12.5 percent. The rationale for the moisture content assumed in the cover thickness calculations should be better documented to allow independent conclusions regarding the validity of the figure.

Response

Comparison of the gradation curves for this site indicates two distinct material types, a sandy silt and a silty sand. Comparison of the test pit and boring logs indicates that the near surface soils are predominantly silts, sandy silts, and a few clays. The silty sand soils are more limited under the site. The silty sand soils will not be used to construct the radon barrier or low-permeability layer, but will be removed and used for general restoration fill.

Capillary-moisture relationship tests run on representative borrow samples and reported in the Draft Disposal Site Characterization Report for the Alternative Uranium Mill Tailings Disposal Site at Collins Ranch near Lakeview, Oregon (March, 1985) show that the -2 bar moisture content ranges from 15 percent to 24 percent with an average of 20.9 percent. The -15 bar

moisture content ranged from 11 percent to 20.2 percent with an average of 16.9 percent. The optimum moisture content for these same soils ranged from 26.8 percent to 52 percent with an average of 42 percent.

Based on the facts that the radon barrier soils will be placed at a moisture content above optimum, and that most in-situ moisture contents are above 20 percent with many above 40 percent, and also recognizing the large difference between the compacted moisture content and the -2 bar moisture content, a conservative long-term moisture content of 16 percent was chosen. Due to the limited data associated with the study and the wide band of uncertainty associated with the curve fit of data, the application and validity of Equation 16 of NUREG/CR-3533 (Rogers, 1984) is considered questionable.

3. Comment

Page B-49. Table 6.5 of NUREG/CR-2642 indicates that a petrographic examination of rock provides valuable information regarding the overall quality of the rock. Therefore, the evaluation of riprap quality should include a petrographic examination. In addition, several of the tests specified utilize acceptance criteria which are not appropriate. As specified in Table 6.2 of NUREG/CR-2642, the weight loss after 250 freeze-thaw cycles should not exceed five percent, while values from the Schmidt impact hammer test should exceed 40. Additionally, provide the basis for the 20 percent increase in rock size to account for durability or lack thereof.

Response

Because of the nature of the formation of the rock source (basalt flow), petrographic examination of the rock was not regarded as the most appropriate indicator of the durability of the rock for this particular site. Better indications of the durability for the rock source are the following:

- o Absorption Test.
- o Sulfate Soundness Test.
- o Specific Gravity.
- o Los Angeles Abrasion Test.
- o Schmidt Hammer.

Due to the high cost of the freeze-thaw test, it is not recommended that this test be run unless the rock is of fair to poor quality as judged by the results of other tests. Also, the 250 cycles are excessive and is probably a misprint and should be 25 as suggested by AASHTO. To run 250 cycles would take 80 to 90 days which is an unacceptable amount of time.

For the Schmidt Hammer test, it is agreed that a reading greater than 40 should be used in the field as a quick indicator of durability. However, since the rock source is a basalt flow with variable durability, increasing the rock size by 20 percent and reducing the specification could be more realistic and would still provide a durable rock source.

4. Comment

Page B-45. The rock layers on the top and sideslopes should be designed to prevent erosion due to the inevitable concentration of sheet flow which will result from a PMP event. A concentration of flow has not been considered in the design.

Response

The foundation, tailings, and cover materials will all be compacted in place during construction. In addition, the tailings will be "blended" into a homogeneous soil as a result of the excavation, transportation, unloading, spreading, and compacting that will occur. Because of this "blending," the settlement across the pile will be uniform. Some differential settlement will occur due to differential loading; however, this has been calculated to be approximately 0.05 percent (0.22 feet in 450 feet). This settlement is considered negligible and within the tolerances of placement. Based on the above conditions, the need to take into account the effect of potential flow concentration is considered unnecessary in the conceptual design.

SURFACE HYDROLOGY AND EROSION COMMENTS: DRAP AND DEA

1. Comment

Based on a review of the conceptual design presented in the RAP, there is a major deficiency in the design of the diversion ditch (East Ditch) that will be constructed upstream of the remediated pile. A qualitative examination of the design indicates that the ditch can become clogged with sediment and debris on a routine basis and will thus need frequent and regular maintenance. Based on the need for such maintenance, the EPA long-term stability criteria (40 CFR Part 192) will not be met by such a design. Because the location of the sediment buildup cannot be predicted and because the sediment buildup could be concentrated, we conclude that flows could be blocked at critical areas in the ditch, resulting in flows over the remediated embankment. However, EPA standards could be met by one of the following methods:

- o Move the remediated pile upstream, where little or no drainage area has to be intercepted by a diversion ditch.
- o Design the rock protection on the remediated pile to resist the runoff from the additional contributing upstream drainage area.
- o Design the topslope of the pile such that runoff is directed toward, rather than away from, the diversion ditch.

Alternately, if none of the above methods are used to resolve the problem, additional information and analyses should be provided to document that blockage and sediment accumulation in the ditch will not be a potential problem.

Response

Calculations have verified that blockage and sediment accumulation in the ditch will not be a potential problem.

The east ditch was analyzed at four points. Velocities for the 50-, 100-, 500-year and PMP events were compared with sediment transport curves provided in EM-1110-2-1601. The Modified Universal Soil Loss Equation was utilized in order to estimate the amount of sediment expected to settle in the ditch. These analyses show that the ditches would be scoured by storm events with recurrence intervals of 50 years or greater. Supporting calculations are attached.

2. Comment

Based on an examination of the site and of the information provided in the geomorphic analyses, it appears that significant gullying occurs in the immediate site area. Because of this, there exists a potential for concentration of runoff into the diversion ditches at one or more points (where such gullies would discharge flow to the ditch). It is therefore important to design the erosion protection in the ditch to resist the forces associated with concentrated flows which could enter the ditch perpendicular to the ditch alignment. It is also important that the design is capable of resisting the forces associated with significant energy dissipation directly in the ditch at a location where a potential gully could discharge into the ditch. Accordingly, the ditch design (all ditches) should be revised to account for the above phenomena. Provide the bases for all assumptions and calculations.

In addition, the geomorphic analyses indicate that head cutting of the existing gullies and channels in the site area could be a potential problem. Additional erosion protection should be provided to prevent the occurrence of head cutting and to provide transitions where the flows from the proposed diversion ditches discharge into existing gullies and channels. Accordingly, the diversion ditches and ditch transitions should be designed to protect the remediated pile from damage due to the erosion of existing channels and gullies. Detailed plans of the transitional ditches should be provided for review.

Response

Since the drainage area above the east ditch is relatively flat above points where flow enters the ditch perpendicular to the ditch alignment and since the 5:1 sideslopes would be lined with a one-foot-thick layer of erosion protection, it is not expected that gullies could damage the ditches and no additional analysis is deemed necessary.

Detailed plans of transitions and bends will be provided during final design.

3. Comment

Our review of the site plan indicates that the alignment of the east diversion ditch is not conducive to long-term stability. There are several locations where flows in the diversion ditch are directed toward the stabilized tailings. It appears that either (1) the ditch alignment should be revised such that flows are not directed toward the tailings at channel bends, or (2) additional erosion protection should be provided at those locations where curvature is necessary. Revise the design accordingly, and provide that basis for all assumptions and analyses (EM-1110-2-1601 provides acceptable guidance for determining increases in shear forces at channel bends).

Response

Preliminary analysis of two curves in the ditch was performed using equations provided in EM-1110-2-1601 (calculations are provided in the attached calculation set). This preliminary analysis indicated that no additional treatment is required at these bends. However, if additional analysis is required it should be performed during final design, prior to construction.

4. Comment

For the east diversion ditch, it appears that peak PMF flows may have been underestimated. This is principally due to the fact that critical combinations of drainage areas and times of concentration were not considered. Based on a qualitative examination of the site plan (as presented on Sheet 11 of 20 Calculation No. 346703050313-7B), it can be seen that due to the shape of the drainage basin, there are several locations along the ditch where the drainage area is only slightly less than the total area at the ditch outlet, but the time of concentration (which was computed based on watershed length) is about half the time of concentration at the ditch outlet. This effectively doubles the peak flow in the east ditch, for example, at a point located about 900 feet southeast of Mt. Augur.

Accordingly, the design calculations should be revised to reflect the most critical combinations of drainage area and time of concentration in all the diversion ditches. Several points along each ditch should be checked, due to the shape of the watersheds draining into the ditches. In addition, changes may need to be made in the riprap design in the ditches to reflect the increased flow rates, as applicable.

Response

The calculations have been revised to reflect the most critical combinations of drainage area, time of concentration, and route times (see calculations provided). The erosion protection has also been redesigned. The peak flow at the point located approximately 900 feet southeast of Mt. Augur, however, was not doubled but was less than the previous design flow. The size of the erosion protection was determined using the exit discharge, which was larger than the previous design flow, so that only one D₅₀ need be specified for each ditch.

5. Comment

Our review of the rock protection for the sides of the tailings embankment indicates that the average rock size (D_{50}) needs to be increased. This is principally due to the fact that the rock voids will be filled with soil and that a majority of the runoff will pass over, rather than through, the rock layer. This results in an increase in the flow velocities which must be incorporated into the design.

For flow over a rock layer, the Stephenson method (used for designing the rock on the sides) is considered to be less applicable than the Safety Factors method (which was used for the top). We conclude that the Safety Factors method should be used in lieu of the Stephenson method, since very little flow will pass through the rock layer. The rock should be resized accordingly.

Response

Agreed. Revised text will contain increased D_{50} sizes that reflect all changes incorporated in determining the new values. These changes include the above, as well as the revised rainfall intensity distributions.

6. Comment

The methodology for determining rainfall distribution and intensities, as given in NRC Staff Technical Position Paper WM-8201, has been superseded by that given in the recently published Hydrometeorological Report (HMR) No. 55 (March, 1984). The NRC staff no longer endorses the methodology presented in WM-8201. WM-8201 was developed for use at active uranium mill sites, most of which are located in Wyoming, east of the Continental Divide. At the time of development of WM-8201, reasonable guidance for rainfall distributions in that area was unavailable and/or questionable. WM-8201 was formulated to provide that type of general guidance, based on Corps of Engineers rainfall distributions. The recent publication of HMR No. 55 has indicated that certain areas in Wyoming could be subject to rainfall intensities (especially of short duration) much greater than those given in WM-8210. As a result, the NRC staff intends to make appropriate modifications to WM-8201 to reflect the new data.

The modifications to WM-8201 will include recommendations to use the rainfall distribution guidance that is developed in the HMR that is appropriate for a given region. These modifications will be applicable to UMTRA Project sites in general. For the Lakeview site, in particular, the rainfall distributions developed from HMR No. 43 should be used, since this represents the most current estimate of rainfall potential for this area of the United States. Further, in developing rainfall distributions using HMR No. 43, extrapolation of the data for time intervals less than 15 minutes will be necessary.

Response

Rainfall distribution and intensities for this revised analysis were determined using distributions developed in HMR 43 and procedures similar to those presented in HMR 49. For durations less than 15 minutes, the one- to six-hour ratio data were input into a curve fit technique and the resultant equation was used to determine distribution values. The rainfall hydrographs and all pertinent calculations have been revised. Calculations are provided and the text will be revised accordingly.

RADON ATTENUATION AND RADIATION PROTECTION COMMENTS:

DEA V.I

1. Comment

Page 83. Based on a review of the background radiation for the Lakeview site, it was noted that the background Th-230 concentration was omitted. Thus, the background Th-230 concentration should be provided for the Lakeview site in order to complete the characterization of the site background radiological environment.

Response

Bendix Field Engineering Corporation (BFEC) conducted an extensive radiological site characterization survey at the Lakeview tailings site in 1984. Results of this study are contained in a report titled "Radiologic Characterization of the Lakeview, Oregon, Uranium Mill Tailings Remedial Action Site," published in June, 1984, and included as Appendix B to the Draft Processing Site Characterization Report for the Uranium Mill Tailings Site at Lakeview, Oregon (March, 1985). This report cites the number of soil samples analyzed for Th-230. Results indicate Th-230 levels representative of background. In addition, the Bendix report indicates samples were taken at five separate locations within a three-mile radius of the Lakeview tailings site for further background analysis. These samples will also be analyzed for Th-230. The results of these lab tests will be forwarded to the NRC when they are available.

2. Comment

Page 84. Based on a review of the Lakeview site gamma exposure rate, it was noted that information describing the distance from the pile that the gamma rate approaches background was omitted. Therefore, a gamma exposure rate isopleth for the Lakeview site should be provided.

Response

Figure 10 of the previously referenced radiological characterization report (Appendix B to the DSCR) indicates that gamma exposure rates greater than 18 microR/hr are primarily confined to the 258-acre Precision Pine site,

which includes the tailings pile, evaporation ponds, and mill yard areas. Gamma exposure rates are below 18 microR/hr at distances beyond approximately 1000 feet from each of these three areas.

3. Comment

Page 85. Based on review of the alternate site background radiation characterization, it was noted that air and soil site-specific radionuclide data were omitted. Thus, the background air and soil radionuclide concentration for U-Nat, Ra-226, and Th-230 should be provided for the Collins Ranch and Flynn Ranch sites.

Response

Four soil samples have been collected at the Collins Ranch and Flynn Ranch sites and are being analyzed for background levels of Ra-226, Th-230, and for natural uranium. Results of these analyses will be forwarded to the NRC when they are available.

4. Comment

Page 103. The footnote for Table 4.1 should reference Appendix H, not G.

Response

Agreed.

DEA V.II

1. Comment

(a)

Page H-7. The risk factor for excess fatal lung cancer, which in this DEA is 100×10^{-6} deaths per person-WLM, is used for the general population and for the remedial action workers. The Evans et al. (1981) reference, which gives the primary justification for using this risk factor, states that workers are at a higher risk than the general population for equal exposures to radon daughters. A higher risk factor comparable to those recommended by UNSCEAR and used by the NRC, should be applied to the remedial action workers.

Response

Since the preparation of the Lakeview EA, the risk factors for excess health effects have been reevaluated. A review of recent work on the effects of low level radiation shows that the United Nations Scientific Committee on the Effects of Atomic Radiation quoted a range of 200 to 450×10^{-6} deaths per person-WLM (UNSCEAR, 1977), while the EPA in its Final

Environmental Impact Statement for Remedial Action Standards for Inactive Uranium Processing Sites quoted 300×10^{-6} deaths per person-WLM (EPA, 1981). The BEIR-III report formulated an age-dependent model (NAS, 1980) for predicting the risk of lung cancer based on several studies of uranium and fluorspar miners. Evans et al. (1981) reviewed the BEIR-III study, lung cancer risk estimates published by other authors, and epidemiological evidence. They concluded that the most defensible upper-bound to the lifetime lung-cancer risk for the general population is 100×10^{-6} deaths per person-WLM. A compilation of these and other risk factor values is shown below:

| <u>Reference</u> | <u>Range ($\times 10^{-6}$) deaths per person-WLM)</u> |
|--------------------|---|
| UNSCEAR, 1977 | 200 to 450 |
| NAS, 1980 | 200 to 1400 |
| ICRP, 1981 | 150 to 450 |
| Evans et al., 1981 | 100 |
| EPA, 1982 | 300 |
| NCRP, 1984a | 100 to 200 |
| USNRC, 1979 | 360 |

Using the approximate medium values and ranges reported above, a value of 300×10^{-6} health effects per person-WLM will be used for both remedial action workers and the general population. This results in a risk factor three times higher than those values presented in the EA, Appendix H, for bronchial epithelium doses due to radon daughter inhalation. The risk factor of 300×10^{-6} health effects per person-WLM is equivalent to a dose conversion factor of approximately 15 rem per WLM (NCRP, 1984b).

Comment

(b)

Comparing total organ doses over 50 and 100 years for both workers and the general population would help to clarify the difference when compared to expected background exposures rather than comparing only relative risk.

Response

The primary intent of an environmental assessment is to compare the relative impacts of each alternative to aid in the decision for a preferred alternative. An estimation of risk from typical background exposures to compare to estimated risks from each alternative will be considered for inclusion in the Remedial Action Plan.

2. Comment

Page H-14. The MILDOS computer program utilizes area sources and actual meteorological data. Use of MILDOS would provide a realistic dose prediction from which general population health effects estimates could be calculated in order to compare to the upper bound already calculated as the worst case.

Response

For an environmental assessment, which compares relative risks from each of the alternatives, it is believed that the methodology used for radiological risk assessment is adequate while minimizing time and cost factors relative to the effort required by MILDOS runs. The risk assessment methodology used attempts to be realistic but conservative.

The assumption referred to is one of the more conservative assumptions and it is agreed that it would result in an overprediction. However, comments from previous risk assessment documents in general, suggest that the methodology used is not conservative enough. Therefore, DOE feels justified in using the methodologies employed in the EA.

RADON ATTENUATION AND RADIATION PROTECTION COMMENTS:

DRAP

1. Comment

Page 8, Section 2.5, states that, when working levels are between 0.02 WL and 0.03 WL, the government will have the flexibility to decide if measures should be taken to reduce working levels. This is inconsistent with the EPA standard in 40 CFR 192.12(b)(1). The standard requires that a reasonable effort be made to reduce working levels to below 0.02 WL. A decision to take no action would constitute the application of supplemental standards.

Response

Agreed. The text will be revised to read as follows:

The standard requires that residual radioactive materials be removed from buildings exceeding 0.03 WL. In cases where levels are between 0.02 and 0.03 WL, the Federal Government will have the flexibility to use measures such as sealants, filtration devices, or ventilation devices to reduce concentrations to below 0.02 WL.

2. Comment

Page 19, Section 4.3. A statement should be added to indicate that more vicinity properties may be identified as remedial action proceeds.

Response

Agreed. The text will be changed accordingly.

3. Comment

Page 31, Section 5.5.4. Based on review of the cover construction program, it is unclear which radionuclide is referenced. Please clarify that this is a cleanup limit, and not an EPA limit for unrestricted use.

Response

The text will be changed accordingly.

4. Comment

Page 41. Based on review of the dust control program, it appears that dust control will depend exclusively on spraying. The DRAP should recognize the possibility of extreme dust conditions and require more restrictive controls when warranted. Therefore, a specific set of criteria should be established in order to allow reduction or stoppage of work. If such programs are described in a separate document, the DRAP should reference that document.

Response

The RAP will be revised to reference the RAC Construction Safety and Health Management Program which states as follows:

SECTION XIV - ENVIRONMENTAL CONTROL and MONITORING

- A. Environmental control and monitoring are required to ensure that radioactive contamination, industrial toxics, or other hazardous materials do not disperse, by wind or water, into the general environment of the site.
1. Boundary dust collection discs and continuous air monitors will be an integral part of the RAC environmental control program. The dust collection discs will be monitored on a daily basis to track radioactive dust dispersion. Continuous air monitors will give monthly, quarterly, and annual results to monitor off-site dispersion of particulates. The RAC Environmental Assessment Manager will determine when particulates will be analyzed for gross alpha, or when isotopic and elemental analyses are necessary.
 2. In the event that either of the above control monitors indicate an increase approaching unacceptable levels of radioactivity subcontractors may be required to take the following action: reduce vehicle speeds, water dusty construction areas, and/or stop work for extreme weather conditions. The site RSO in conjunction with the site manager will determine when these measures will be necessary.
 3. Water monitoring is also required to ensure no significant degradation of potable water supplies during remedial action. Construction activities may require modification in the event that a contamination problem is indicated.

- B. Noncompliance with the above requests will be resolved through the RAC-Albuquerque Project Office.

Additional site specific controls will be developed and issued by the RAC prior to construction.

5. Comment

Page 51, Section 6.4.3. A signed statement by the employee, indicating that training was received, should be required. This statement should specify whether oral or written tests will be given. In addition, the supervisors should be given approximately four times the amount of training the workers receive; for example, 16 and four hours, respectively.

6. Comment

Page 56. As part of it's DRAP concurrence review, the NRC will need to review the "Radiological Support Plan" developed by DOE's contractor with the appendix applicable to Lakeview. Without this plan, we cannot evaluate the adequacy of the Environmental, Health, and Safety Plan contained in the RAP, Appendix D.

Response

The RAP will be revised to reference the RAC Health Physics Monitoring Plan which, in response to Comments 5 and 6, includes the following general information:

2.4 Health Physics Training Program

A formal radiological training program, including discussion of the biological effects associated with exposure to ionizing radiation, shall be provided to all site workers. The program will include discussion of radiological safety procedures, emergency procedures, and instructions concerning prenatal radiation exposure. Practical demonstrations of equipment usage will be incorporated, where appropriate. Literature concerning biological effects of radiation will be provided to workers, as will copies of USNRC Reg. Guide 8.13, "Instructions Concerning Prenatal Radiation Exposure."

All site personnel will receive formal instruction in construction safety procedures, as per the program outlined in the RAC Safety and Health Management Program Plan.

Initial training sessions will be approximately two hours in length. Appropriate levels of training will be required of workers, based on anticipated exposure levels, and upon level of management responsibility as discussed previously. Each worker shall pass a written examination demonstrating comprehension of the training program contents. Permanent records of instruction and examination results will be maintained by the site RSO and the RAC, with copies forwarded to DOE upon completion of each training session.

Topics to be considered during the radiological training sessions will include:

- o SUMMARY OF UMTRAP OBJECTIVES
- o RADIATION TYPES
 - Beta
 - Gamma
 - Alpha
- o UNITS
 - Roentgen
 - Rad
 - Rem
 - Counts per minute, CPM
 - Disintegration per minute per 100 cm², DPM/100 cm²
 - Curie, Ci
- o PROTECTION AGAINST RADIATION
 - Time (including calculation of dose and stay time)
 - Distance
 - Shielding
- o PROTECTION AGAINST CONTAMINATION
 - Protective clothing (including demonstration)
 - Smoking, eating, drinking in controlled areas
- o BIOLOGICAL EFFECTS
 - Effects of acute dose
 - Effects of chronic dose
- o RADIATION ZONES
 - Radiation symbol and colors
 - Controlled area
 - Radiation area
 - Airborne radioactive area
 - Posting, physical, and administrative areas
- o PERSONNEL MONITORING FOR RADIATION
 - Film or TLD badges
 - Self-reading dosimeters
 - Exposure records
 - Other types of personnel monitoring instrumentation
- o DOSE LIMITS (DOE ORDER 5480.1A)
 - Whole body dose
 - Skin dose

- Extremity dose
- Airborne activity
- Emergency dose
- NRC form, NRC-4

o PERSONNEL MONITORING FOR CONTAMINATION

- Survey when leaving contaminated area
- Whole body counting
- Bioassay

o RADIATION RECORDS

- Exposure records
- Bioassay records
- Accuracy of information
- Records retention

An appendix to the RAC Health Physics Monitoring Plan entitled Lakeview Health Physics Plan will also be issued prior to start of construction. That appendix will address training and other programs tailored to site specific conditions.

7. Comment

Page D-19. Due to the long biological half-lives for both Th-230 and Ra-226, NRC considers these bioassays to not provide representative indications of employee internal exposure. Therefore, U-Nat urinalysis should be used since it would be more sensitive and provide a more reliable indication of employee internal exposure.

Response

In evaluating analytical parameters for bioassay programs, U-nat was considered to exist in tailings in such reduced concentrations, due to the milling process, that other radionuclides may serve better as indicators of internal exposure. Typically U-nat is more soluble than Th-230 or Ra-226 in tailings, and would be more readily excreted in the urine. However, only five to 15 percent of the uranium originally in the ore remains in the tailings, and a wide range of solubilities exists for the radionuclides in the tailings due to the various milling processes employed at the 24 UMTRA Project sites. Therefore, Th-230 and Ra-226 were selected as more sensitive parameters for Lakeview. The RAC is currently considering site-by-site solubility determinations, and other methods of measurement to ensure the adequacy and validity of their bioassay programs. The RAP will reference the RAC Health Physics Monitoring Plan with Lakeview Site Appendix for more specifics on the Lakeview site program.

8. Comment

Page D-21. Based on a review of the respiratory protection program, it was noted that no provisions for an in-house working level (WL) action lev-

el were provided. A WL in-house action level should be defined (e.g., 0.05 WL). Thus, when the action level is exceeded, an investigation to determine cause can be triggered, and proper mitigative actions can be taken.

Response

Administrative limits and action levels for radiological monitoring data such as radon progeny measurements will be established by the RAC in the site specific Health Physics Monitoring Plan. The RAP will reference the RAC Health Physics Monitoring Plan with Lakeview Site Appendix for specifics on the Lakeview site program.

within which the sand cannot slip with respect to the base of the footing because of the roughness of the base, moves downward as a unit. As it moves it displaces the adjacent material. Consequently, the sand in two symmetrical zones $aO'bde$, one of which is illustrated on the left side of Fig. 19.4, is subjected to severe shearing distortions and slides outward and upward along the boundaries $O'bd$. The movement is resisted by the shearing strength of the sand along $O'bd$ and the weight of the sand in the sliding masses.

No completely adequate rigorous theory exists for calculating the ultimate capacity of a footing under such circumstances, but satisfactory approximate solutions have been obtained on the basis of various simplifying assumptions (Terzaghi, 1943; Meyerhof, 1955). It is assumed, as illustrated on the right half of Fig. 19.4, that the influence of the soil above the base level of the footing can be replaced by a uniform surcharge γD_f . Theory and experiment then indicate that the surface of sliding consists of a curved portion $O'e'$ and a straight section $e'b'$ that rises at an angle of $45^\circ - \phi/2$ with the horizontal. The load q_e' on the footing, the surcharge γD_f , and the weight W' of the sliding mass all produce normal stresses across the surface of sliding $O'e'b'$, which, in turn, develop frictional shearing resistance along the surface of sliding. When the mass is on the verge of sliding the resultant R of the normal and shearing stresses at any point such as f on the surface of sliding is inclined at the angle ϕ to the normal to the surface of sliding. The wedge $O'e'b'a'$ may be considered as a free body and its equilibrium investigated to evaluate q_e' . Various trials must be made to find the surface of sliding corresponding to the least value of q_e' that can be developed. This least value is designated the *gross ultimate bearing capacity*.

The results of such studies indicate that the gross ultimate bearing capacity may be expressed as

$$q_e' = \frac{1}{2} B \gamma N_\gamma + \gamma D_f N_q \quad 19.1$$

and the *net ultimate bearing capacity* as

$$\begin{aligned} q_e &= q_e' - \gamma D_f \\ &= \frac{1}{2} B \gamma N_\gamma + \gamma D_f (N_q - 1) \quad 19.2 \end{aligned}$$

In these equations, N_γ and N_q are dimensionless *bearing-capacity factors* depending primarily on ϕ . They may be evaluated by means of the chart, Fig. 19.5.

Equation 19.2 demonstrates that the bearing capacity of a footing on sand is derived from two sources: the frictional resistance due to the weight of the sand below the level of the footing and the frictional resistance due to the weight of the surrounding surcharge or backfill.

The unit weights of most sands, whether dry, moist, or saturated, lie within a fairly narrow range. Therefore, the unit weight of the sand is in itself not an important variable in the determination of the bearing capacity of a footing. However, if the sand is located below the free water surface, only its submerged weight is effective in pro-

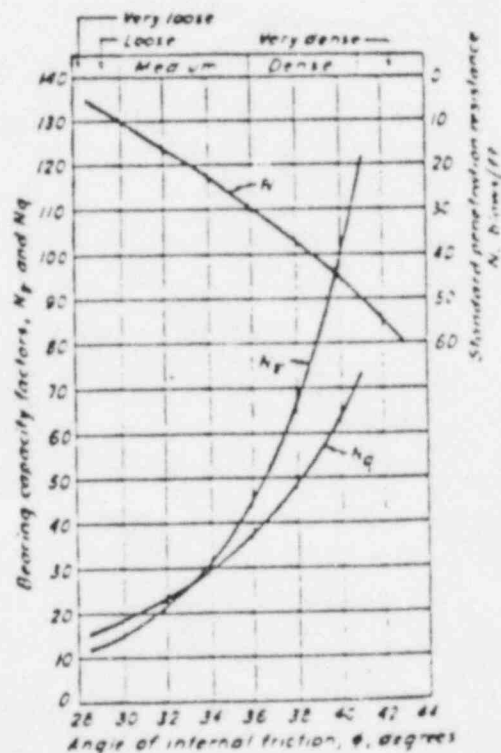
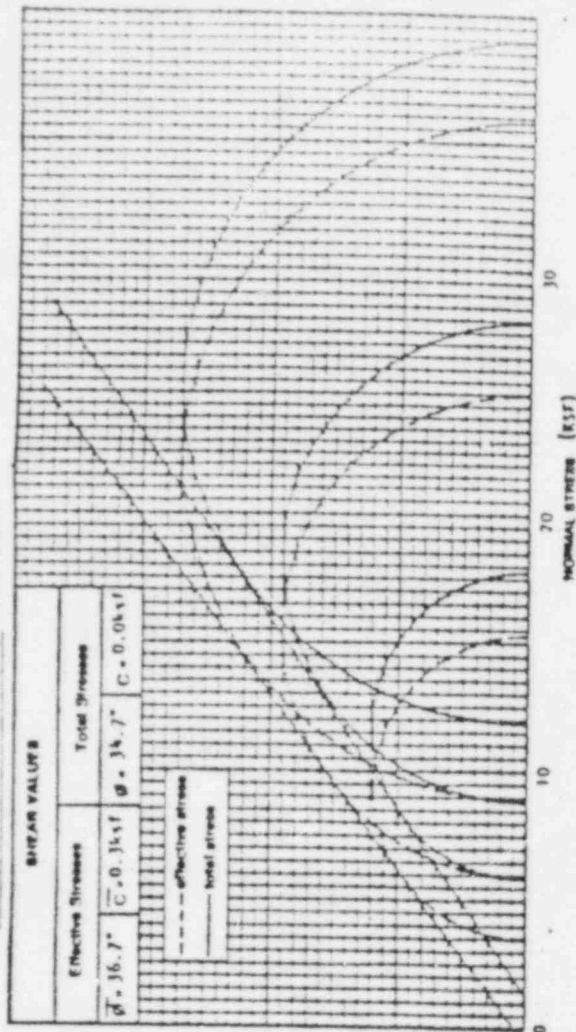


FIGURE 19.5. Curves showing the relationship between bearing-capacity factors and ϕ , as determined by theory, and rough empirical relationship between bearing capacity factors or ϕ and values of standard penetration resistance N .

SHEAR STRENGTH OF SOIL IN TRIAXIAL COMPRESSION

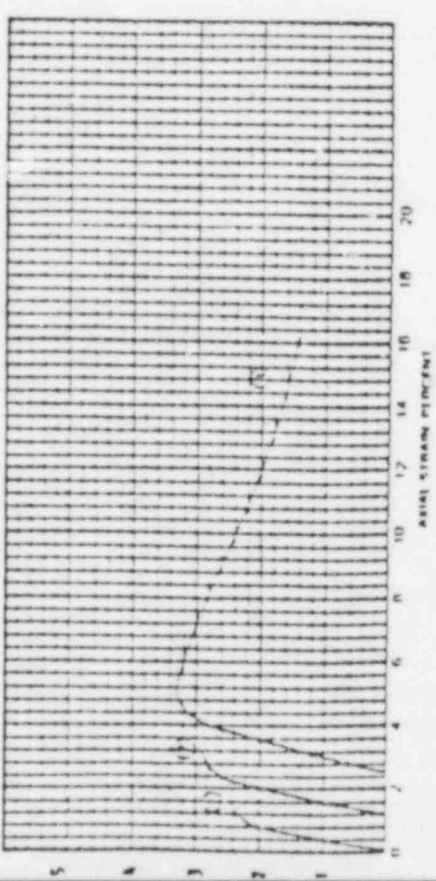
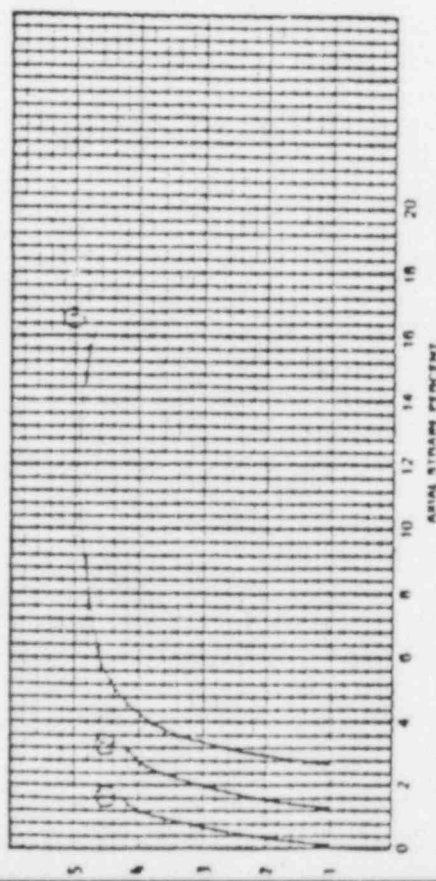
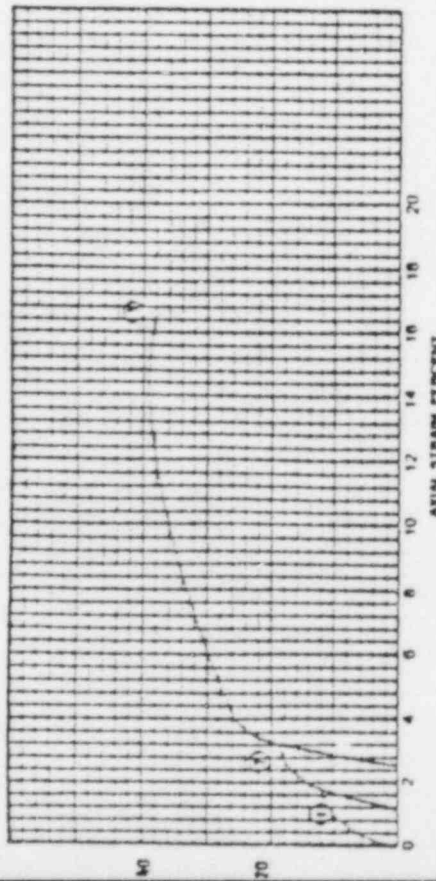
Job No. JE 012
Date July 17, 1985
Type of Test Saturated, consolidated,
undrained with pore pressure measurements



| STAGE | Specimen Location | | Initial Specimen Data | | | | | Soil Description |
|-------|-------------------|-------------|-----------------------|-------------|---------------|-------------------|----------------------|-----------------------|
| | Boring Number | Depth (ft) | Sample Type | Length (in) | Diameter (in) | Dry Density (pcf) | Moisture Content (%) | |
| 1 | 12A | 59.25-60.75 | 2.5" Tube | 8.899 | 2.365 | 101.1 | 12.6 | Sand, gravelly, silty |
| 2 | 12A | 59.25-60.75 | 2.5" Tube | - | - | 106.1 | 23.5 | Sand, gravelly, silty |
| 3 | 12A | 59.25-60.75 | 2.5" Tube | - | - | 107.3 | 22.9 | Sand, gravelly, silty |

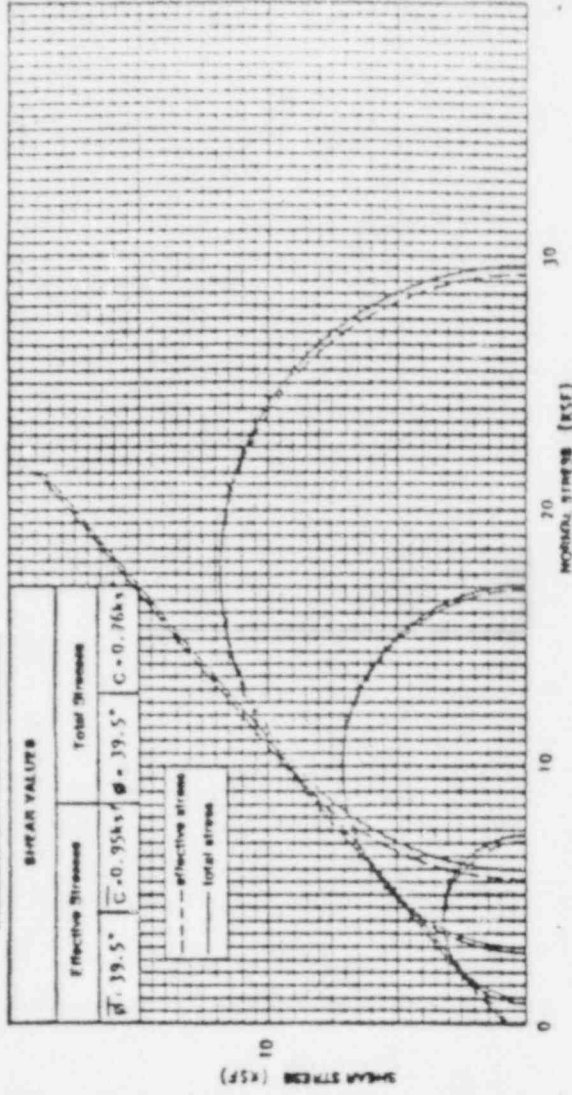
| STAGE | STAGE | Test Values at Failure as Plotted | | | | | | Remarks |
|-------|-------|-----------------------------------|-------------------------------|---------------------------------------|--------------------------------------|------------------------------------|-------------------|------------------|
| | | Total Confining Stress σ_3 | Total Axial Stress σ_1 | Deviator Stress $\sigma_1 - \sigma_3$ | Effective Lateral Stress σ_3' | Effective Axial Stress σ_1' | Pore Pressure u | |
| 1 | 1 | 5.962 | 17.634 | 11.672 | 3.528 | 15.260 | 2.436 | All units in ksf |
| 2 | 2 | 8.899 | 27.819 | 18.920 | 5.976 | 24.856 | 2.923 | All units in ksf |
| 3 | 3 | 11.808 | 39.009 | 27.201 | 8.726 | 35.927 | 3.082 | All units in ksf |

Specimen location depth on received tube was 57.5'-62.5'.



SHEAR STRENGTH OF SOIL IN TRIAXIAL COMPRESSION

Job No. IE 012
 Date July 17, 1985
 Type of Test Saturated, consolidated
 Undrained with pore pressure measurements.



| Specimen Number | Specimen Location | | Initial Specimen Data | | | | | Soil Description |
|-----------------|-------------------|------------|-----------------------|-------------|---------------|-------------------|----------------------|-----------------------|
| | Ranking Number | Depth (ft) | Sample Type | Length (in) | Diameter (in) | Dry Density (pcf) | Moisture Content (%) | |
| 1 | 36 | 9.75-10.75 | 2.5" tube | 5.370 | 2.365 | 96.6 | 16.9 | Sand, silty, gravelly |
| 2 | 38 | 9.75-10.75 | 2.5" tube | - | - | 97.1 | 29.9 | Sand, silty, gravelly |
| 3 | 38 | 9.75-10.75 | 2.5" tube | - | - | 101.0 | 27.4 | Sand, silty, gravelly |

| Specimen Number | Ranking Number | Test Values at peak σ_1/σ_3 | | | | | | Remarks |
|-----------------|----------------|---|-------------------------------|---|---|---|---------------------------|------------------|
| | | Total Confining Stress σ_3 | Total Axial Stress σ_1 | Differential Stress $\sigma_1 - \sigma_3$ | Effective Lateral Stress $\bar{\sigma}_3$ | Effective Axial Stress $\bar{\sigma}_1$ | Friction Angle ϕ (°) | |
| 1 | 36 | 1.022 | 1.309 | 0.287 | 0.806 | 2.073 | 0.33 | All units in psi |
| 2 | 38 | 2.902 | 17.129 | 14.227 | 2.765 | 16.265 | 1.28 | All units in psi |
| 3 | 38 | 5.962 | 29.616 | 23.654 | 5.859 | 29.313 | 1.80 | All units in psi |

Specimen location depth on received tube was 7.5'-12.5'.



JACOBS ENGINEERING GROUP INC.
ADVANCED SYSTEMS DIVISION, ALBUQUERQUE OPERATIONS

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TELEPHONE (505) 846-4030

August 14, 1985

Mr. John G. Themelis
UMTRA Project Manager
U. S. Department of Energy
Uranium Mill Tailings Project Office
5301 Central Avenue, N.E., Suite 1700
Albuquerque, New Mexico 87108

Attention: Mark Matthews

Re: Response to RAC Comments on the
Lakeview Draft RAP, EA, and Collins
Ranch DSCR
Contract No. DE-AC04-82AL14086

Dear John:

The RAC submitted comments on the Lakeview Draft RAP in a letter dated April 23-25, 1985. Recommended response to these comments was forwarded to DOE by TAC letter dated July 26, 1985. Enclosed are the TAC's revised responses to the RAC comments which incorporate DOE recommended changes. If you have any questions concerning the response to comments, please contact Leon Stepp of our staff or myself.

Very truly yours,
JACOBS ENGINEERING GROUP, INC.

A handwritten signature in dark ink, appearing to read 'Roger Williams', written over a horizontal line.

Roger L. Williams
Project Manager

RW/LP/LS/tb

Enclosure
CC: RHopkins (M-K)

ATTACHMENT A

Response to Comments Lakeview RAP, EA, and Collins Ranch DSCR

RESPONSE TO M-K COMMENTS DATED APRIL 24, 1985, ON THE LAKEVIEW RAP

General

The Remedial Action Plan should contain a section entitled Site Design Criteria to differentiate from actual design. The design criteria section should list those features which are "sacred" and which are considered essential to meet the design objectives for remedial action. These include limitations on flood encroachment, stabilization, radon barrier thicknesses and other essential features. These design criteria should be limited to those items which are essential to meet the objectives or the intent of the EPA Standards. These criteria items should not be actual design parameters; (e.g., the size of rock or the specific slope) but should be criteria requirements (e.g., to ensure adequate draining and provide adequate protection from run off). It should be left to the final design to address those criteria items and provide calculations or empirical data to demonstrate that the design criteria are met. These design criteria then become the key parameters which must have NRC concurrence for any revision to those requirements and which do not require NRC approval if the design adequately addresses meeting those criteria. The issue of NRC review and approval of the specific design then becomes a separate issue.

Response

The RAP references the generic Site Design Criteria (SDC) document. The SDC is currently being revised to reflect many of the above comments. The conceptual design demonstrates that the remedial action can be completed to meet the standards. The concurring agencies agree with the conceptual design and review the detailed design material to ensure that the remedial action remains basically the same as stated in the SDC and RAP. Any significant changes must be concurred in by the state, NRC, and DOE.

Comment

Page 22 was this page intentionally left blank? If so suggest it be so marked.

Response

All UMTRA Project planning documents are prepared in accordance with the "Format and Style for Environmental Documents, UMTRA DOE ALO-2." Page three, first sentence of that style manual states "each chapter starts on a right-hand (odd-numbered) page, even if the page must be left blank at the end of the preceding chapter."

In consideration of the above convention, no supplemental "blank page" notation will be added.

Comment

Section 3.3, Page 15. It is stated that the project is in an area of moderate to high seismic risk, associated with normal faulting within the region. Because the U.S. Seismic Zone Map shows the area to be in Zone 1 (minor risk), evidence should be presented to back up the stronger criteria proposed. Suitable evidence may be included in SHB Report (1984) that has not been received.

Response

The detailed back-up evidence requested is contained in the Lakeview PSCR and DSCRs. A reference notation will be added to LKV DSCR Figure 7.1 (Seismic risk map). Copy of the SH&B Seismic Report passed separately, is also contained in the DSCR as Appendix C and in the PSCR as Appendix D.

Comment

Section 3.4, Page 16, Paragraph 3. Will arsenic-contaminated soil beneath the tailing pile need to be removed?

Response

Yes, although there is no EPA standard for arsenic applicable to remedial action at an inactive uranium tailings site, the remedial action needs to eliminate any potential health hazard produced by toxic substances other than Ra-226 in the tailings so as to restore the site for unrestricted future use. Removal of contaminated material to a level of approximately 50 ppm arsenic increases the required excavation depth below the tailings by one foot. The excavation depth noted in the RAP includes removal of the arsenic-contaminated soil beneath the tailings pile. The RAP and PSCR will be expanded as appropriate to address this item.

Comment

Section 3.3, Page 15, Paragraph 3. Insert "processing" before site in the first sentence.

Response

Agreed. Final text will be changed.

Comment

Section 3.4, Page 17. A background-exposure-rate traverse survey will be performed and soil samples will be collected for analysis of radionuclide content prior to remedial action.

Are these data available?

Shallow ground water was collected from wells completed at 20 to 25 feet below land surface and deep ground water at depths greater than 70 feet. The attached figure clearly shows that the downgradient samples cluster with the background, geothermal samples, indicating that the high dissolved solids found downgradient originated from the geothermal system rather than the pond leachate.

This information will be added to the LKV PSCR and RAP/SCD as applicable.

Comment

Section 4.5.2, Page 21, Paragraph 3. Is a two-foot clay liner at bottom a firm requirement? Will not natural soils provide sufficient absorption of leachate?

Response

The proposed two-foot layer beneath the relocated tailings can best be described as reworked natural, in-situ soils, rather than a clay liner. Any sand lenses or layers would be removed, leaving a recompact silt and clay layer. The purposes of this layer are:

- o To eliminate any preferential pathways for vertical transport for at least two feet below the pile, i.e., guarantee a uniform layer under the pile to restrict vertical migration of leachate.
- o To guarantee a uniform layer with favorable attenuation properties of at least two-foot thickness below the pile.

In conjunction with the attenuating properties of the natural soils, the two-foot layer should protect the ground-water resource adequately.

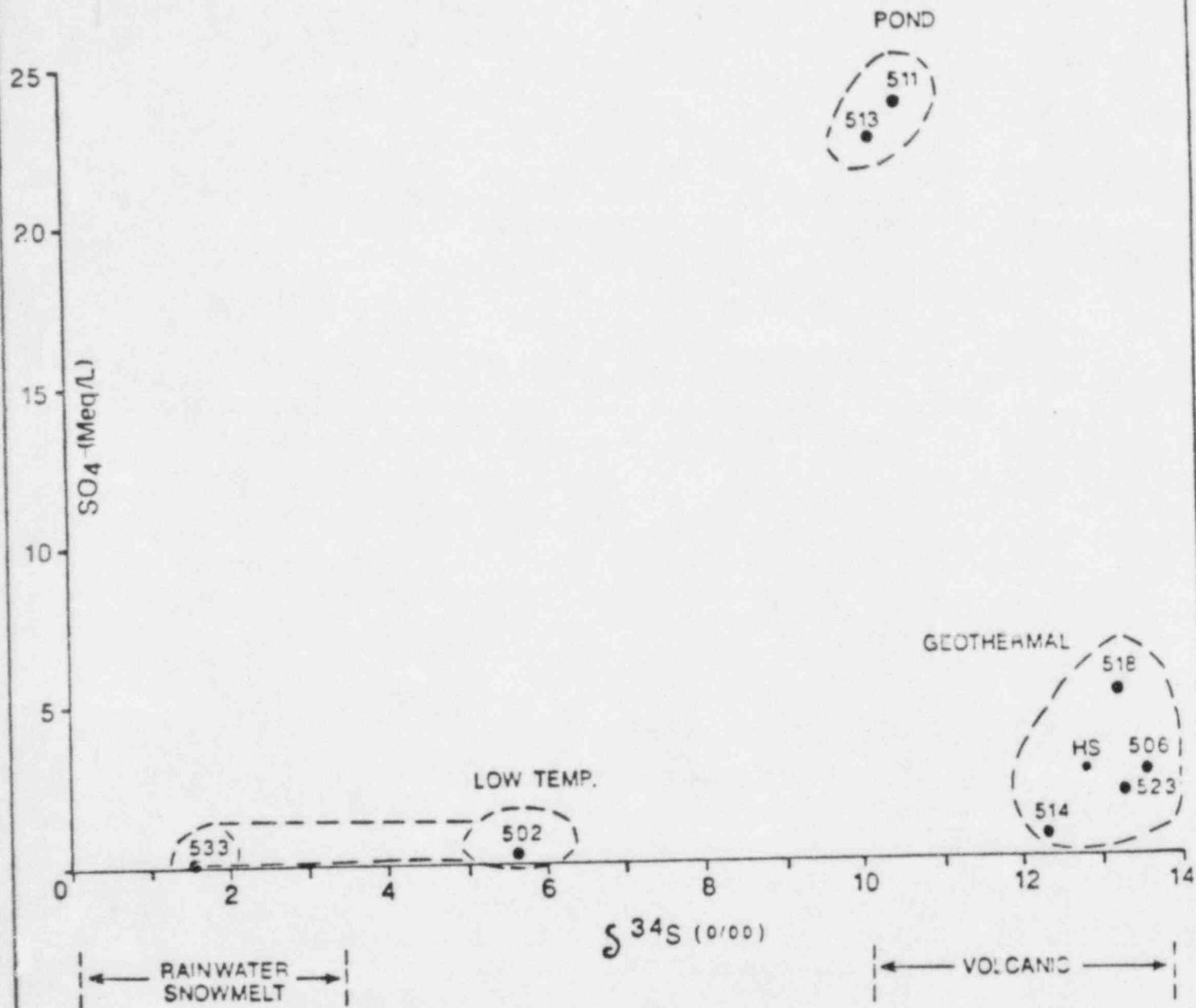
Additional soils-characterization data are being collected and will be transmitted as they are evaluated. These additional data will also be added to the LKV DSCR and RAP as appropriate.

Comment

Section 4.5.2, Page 21, Paragraph 4. Suggest Sentence No. 3 be changed to read, "The design slopes will provide the necessary factor of safety against embankment-slope failure and settlement under both static and seismic loading conditions."

Response

Disagree with the suggestion. The one vertical to five horizontal slope is a maximum design criterion acceptable to NRC. Any other design will require justification and separate review/approval.



DISTRIBUTION OF SULFATE CONCENTRATION vs.
SULFUR-34 ISOTOPE RATIO

increased amount will require separate justification, review, and approval. RAP words "dry weight" will be changed to "volume."

Comment

Section 5.5.3, Page 29, Paragraph 2. Water migration should be limited by cover rather than by a bottom liner. Natural soils will absorb leachate.

Response

The TAC concurs and further discussions with the state on this matter are underway.

Comment

Section 5.5.3, Page 31, Paragraph 3. Suggest the minimum topslope be two to four percent to facilitate surface drainage, and the restriction of the side slope to 5:1 be removed to permit an increase in available volume. The side slopes can be designed to provide the necessary factor of safety and to meet erosion-protection requirements.

Response

Disagree with changing the RAP. Top and sideslopes must be determined in order to perform slope stability, rock sizing, settlement and consolidation, and site drainage analysis. Slope restrictions are also included in order to obtain NRC and state concurrence. Design outside these restrictions will be subject to separate justification, review, and approval. For conceptual design purposes, a maximum four percent topslope will be used.

Comment

Section 5.5.4, Page 31. The proposed one-foot thick layer of silt and clay for the radon barrier appears to be inadequate. For placement and long-term durability, a 1.50-foot minimum thickness should be evaluated. It is anticipated that a plus or minus 1.50 inches will be specified for placement tolerance.

Response

Disagree with comment. Calculations performed in order to determine the radon cover thickness indicated 0.5 foot would be adequate to retard radon diffusion. Therefore, a one-foot thickness would be adequate and would provide any necessary factors of safety. Long-term durability will be provided by a two-foot-thick erosion-protection barrier. A standard placement tolerance of 0.1 foot should be specified. Design changes to economize constructibility should be submitted with justification for separate review and approval.

Comment

Sections 5.0 to 5.5.6. These sections were missing in the copy provided to M-K for review! Please provide for review!

Response

Missing sections have been transmitted as requested and copies included with this response.

Comment

Section 5.2, Page 23, Paragraph 2. Can rock cover be used instead of rock soil matrix to further reduce root penetration?

Response

Rock-soil matrix, or shallow soil over the rock cover, was a desire of the local advisory group so as to allow limited growth of grasses and continued grazing across the stabilized tailings. The possibility of root penetration of local indigenous vegetation through the two-foot-thick rock cover and 20-foot-thick slightly contaminated layer into the tailings is considered slight and acceptable in view of anticipated future surveillance and maintenance plans.

Comment

Section 5.2, Page 25, Paragraph 2. Does original topography refer to topography before start of milling operations? Could the site be graded to provide drainage rather than be backfilled to "original topography?"

Response

The sentence will be changed to read "will be backfilled and graded to promote drainage."

Because of the flat topography at the LKV site, excavation of contaminated material will leave depressions which will require restoration fill before grading will promote drainage. For purposes of the conceptual design, the volume of this restoration material was estimated to be the total volume of contaminated material less the tailings, vicinity properties material, and off-site windblown contamination.

Comment

Section 5.5.2, Page 29, Paragraph 1, Last Sentence. Suggest dropping five percent limit on organics and say that organics will be limited and evenly distributed in the upper portion of the pile.

Response

Disagree. Five percent organics by volume is considered the maximum allowable evenly distributed content of the stabilized embankment. Any

For purposes of the conceptual design, a 6000-foot, one-lane access loop was designed in order to estimate impacts for the Environmental Assessment. A loop was used because there is sufficient space north of the pile to have traffic leave from one point and enter at another to avoid congestion.

It is stated in the RAP that "the Remedial Action Contractor (RAC) has the responsibility of determining the exact location and size of all construction features . . ." Therefore, access roads can be designed in the manner that the RAC determines to be the most cost effective. Any alternate design that addresses the above perceived issues will be reviewed and evaluated separately.

Comment

Section 5.6.2, Page 37. Revise to state "Equipment will be monitored and decontaminated as necessary prior to leaving the Lakeview site." Equipment may or may not be monitored and may or may not need decontamination.

Should have a qualifier in there which states that the equipment will be decontaminated if necessary or as required.

Response

Agreed. Changes will be made in the text.

Comment

Section 5.6.3, Page 37. Change "will" to "may" in referring to provisions for laundering. Laundering may not be provided on the site.

Should state that the showers are for decontamination only.

Response

Agreed. The text will be changed.

Comment

Section 5.6.4, Page 37, Paragraph 3. Just a note for future consideration. With no electricity at Collins Ranch, we are looking at a large generator to operate a well, pumps, etc. The statement references "portable generators." Not realistic.

Delete "by portable generators." May run power lines or some other method. Leave it flexible.

Response

Agreed. Text will be changed.

Comment

Section 5.5.4, Page 33, Last Paragraph. Suggest a rock cover instead of a rock-soil matrix to better resist erosion and to reduce root penetration.

Response

Rock-soil matrix, or shallow soil, was a desire of the local advisory group so as to allow limited growth of grasses and continued grazing across the stabilized tailings. The possibility of root penetration of local indigenous vegetation through the two-foot-thick rock cover and 14-foot-thick slightly contaminated layer into the tailings is considered slight and acceptable in view of anticipated future surveillance and maintenance plans.

Comment

Section 5.5.6, Page 35, Paragraph 2. The compacted radon barrier will be less permeable than the compacted low permeability layer to avoid the possibility of the "bathtub" effect by compacting the radon barrier to a higher density than the clay layer at the base of the tailings.

This may be impractical to achieve and control.

Recommend deleting two-foot clay liner.

Response

See response to comment on Section 4.5.2, Page 21, Paragraph 3. Further data collection, evaluation, and discussion with state representatives on this matter are ongoing. During construction, overcompaction of the radon barrier and undercompaction of the low permeability layer should avoid a bathtub effect.

Comment

Section 5.6.1, Page 36, Paragraph 3. Why is Hammersley Creek to be relocated? What is the requirement for this "design."

It states, "Approximately 6000 feet of one-lane road would be constructed for site access." Will we not have two-way traffic of heavy hauling equipment.

Response

There is no requirement for relocating Hammersley Creek. However, since the creek flows between the tailings pile and the evaporation ponds area and creates extensive ponding in the southwest corner of the site during most of the year, it was determined that it should be relocated to flow south of the pile (but within the site boundary) in order to facilitate excavation and construction activities.

A borrow area containing at least 100,000 cubic yards of erosion-protection material suitable for use on the embankment ditches and roads has been identified.

Are appropriate sizes of rock available? Have gradations been run to determine quantities of various sizes that are present.

Response

Disagree with the recommendation. The conceptual design must identify a borrow area, test the material, and estimate the quantity of suitable material available. This identification is essential to assessing and comparing impacts in the environmental assessment. The identification of a "possible" borrow site should not be considered restrictive upon the RAC.

Comment

Section 5.6.11, Page 41, Paragraph 2, First Sentence. Change "a site security system" to "access control." The security issue is too politically sensitive and is not the primary purpose.

Response

Agreed. Change will be made.

Comment

Section 5.6.11, Page 41, Paragraph 3. A waste-water treatment facility will be installed and operated to protect against inadvertent contaminant release during construction.

Will a waste-water treatment facility be required if Oregon State does not consider it to be necessary?

Response

Due to the limited space and high ground-water levels associated with the Lakeview site, it was conservatively assumed, for the conceptual design, that a waste-water treatment plant would be useful to treat contaminated water prior to discharge. However, if it is determined during final design that a treatment plant is not necessary, that justification should be submitted for review and concurrence.

Comment

Section 5.7, Page 43, Last Paragraph. Delete the entire paragraph. The requirement that the Design Engineer will not proceed with detail design until all questions regarding that aspect of the conceptual design have been resolved is not necessary. That is a contractual requirement between the DOE and the RAC and should not be written into the agreements between the NRC and the State.

Comment

Section 5.6.4, Page 37, Paragraph 4. There is no developed water supply at the disposal site. Water for equipment decontamination, compaction, and dust control on the site may be developed from an on-site well. -

Does this mean an on-site well exists or that one will have to be drilled?

Response

The expected water need is approximately 20 million gallons over an 18-month period. The average need is 25 gpm. A supply of 50 gpm should be adequate with some on-site storage. This supply should be possible to obtain from wells that could be developed on the site. As stated on pages D-96 and D-102 of the LKV EA, there are at least two wells within a three-mile radius of Site B. These wells should be investigated and the depths, diameters, and yields identified. An evaluation of the capability of on-site wells should be based on the results of this proposed well canvass.

Comment

Section 5.6.5, Page 39, Last Paragraph. Delete "while maintaining one foot of freeboard." This detail is superfluous and it may have to be two feet.

Response

Sentence will be changed to read "while maintaining a minimum of one foot of freeboard or as required by permit."

Comment

Section 5.6.6, Page 39, Paragraph 2. Do not limit to ion exchange! Canonsburg is working well and is not using ion exchange!

Response

The limitation will be removed. It is anticipated that the Canonsburg unit will be used at Lakeview unless proven to be unnecessary.

Comment

Section 5.6.6, Page 40, Last Paragraph. Delete the second sentence which begins "The system will include . . ." Whether or not automatic controls are used is superfluous.

Response

Agreed. Sentence will be deleted.

Comment

Section 5.6.10, Page 41. We recommend not specifically identifying the borrow area location. It is irrelevant and can cause competition problems later.

based on preliminary design. A conceptual cost-estimate is based on a conceptual design described in the Remedial Action Plan.

Response

The word preliminary will be deleted.

Comment

Table 5.2, Page 47. We strongly recommend that an appropriate contingency be added to the table. Since this is a conceptual design and conceptual cost-estimate, we recommend a minimum of 35 percent; and based on history at Canonsburg, we recommend 50-percent contingency.

Response

A contingency is built into the cost-estimate. The CAN cost-estimate cannot be used as an example any more than the SLC or SHP cost-estimates.

Comment

Section 6.3.3, Page 50. Revise Item No. 4 to read "submit request for variance from the design criteria of this plan to the DOE Contracting Officer or Contracting Officer's Representative." The item as written implies the RAP is a standard, which it is not. Because of the nature of this document, the design criteria should be the only item specifically written for a site requiring specific State and NRC concurrence for revision. The conceptual design, installation, and Health and Safety Plan considerations are all a function of final design and the contractor or subcontractor selected. They should not be tied down and restricted to the point where the DOE Contracting Officer or the Contracting Officer's Representative approval is required.

Response

Comment will be incorporated.

Comment

Section 6.3.3, Page 50-continued. Revise Item No. 5 which states "include the requirement for compliance with the plan in all applicable subcontracts." The Remedial Action Plan shall not be referenced in subcontracts, it must be interpreted and applied in contract language; therefore, we recommend revising that item to read "include implementation requirements and procedures in all applicable subcontracts."

Response

Comment will be incorporated.

Response

The RAP is the concurrence document for the remedial action, not the RAC contract with DOE. A sentence will be added to point out the DOE/RAC interface.

Comment

Section 5.8, Page 43. The first paragraph requires a Radiological Support Plan. We recommend that the Radiological Support Plan be deleted. There is no such requirement in any documentation to date. Monitoring surveys are covered in the Health Physics Monitoring Plan and a Site Specific Supplement is prepared; however, no requirement for a Radiological Support Plan currently exists in any contractual documentation.

Response

The RSP refers to Appendix C of the RAP. The RAC's Health Physics Monitoring Plan is equivalent to the RSP. Lower case letters will be used in referring to the radiological support plan in that paragraph.

Comment

Section 5.9, Page 43. The specific numbers should be deleted from the paragraph or disclaimer should be added stating these as preliminary dimensions or that the exact dimensions will be detailed during final design. In addition, it states that the embankment will have a slightly convex top to facilitate drainage. It is the RAC's recommendation that this be changed to a requirement to design the top for drainage and allow the flexibility of either sloping it or making a convex top. It should not be restricted to convex.

Response

The word "convex" will be eliminated and the word "approximately" added.

Comment

Section 5.9, Page 43, Paragraph 3. Monuments will be established at set intervals designating the embankment as Federal property. What spacing of monuments will be required? Will the property be fenced to prevent or inhibit intrusion by humans or animals?

Response

The spacing is undesignated. Fencing is not considered necessary to prevent or inhibit intrusion by humans or animals under conceptual design conditions described for this site; however, county zoning restrictions currently being developed may require that the area be fenced.

Comment

Section 5.11, Page 44. Change the reference from the preliminary cost-estimate to conceptual cost-estimate. A preliminary cost-estimate is

Comment

Section 9.0, Page 59-61, General. In general, we recommend that the detail be deleted from this section and referred to the approved Quality Assurance Plans for DOE and for RAC. This avoids the problem of detail on issuance of daily inspection reports and other things which may be revised at any point in time.

Comment

Section 9.1, Page 59, Paragraph 2. Recommend revising the first sentence of the paragraph to read, "The RAC shall furnish a quality test and inspection plan for the site which defines the health, safety, and environmental activities to be incorporated into the design and/or performed during construction to ensure subcontract compliances and site certification." Delete the next to the last sentence beginning, "For procurement." The Quality Assurance Plan is generic in nature with specific inspection plans added for each individual site. In accordance with the prior sentence, test and inspection requirements shall be subject to approval by the DOE prior to the start of any physical job site construction work.

Comment

Section 9.2, Page 59. Delete the requirement to have a meeting. Whether a meeting is held or not, this level of detail should not be included in the Remedial Action Plan.

In the next to the last sentence, delete the words "within 10 working days after receipt of written notice acceptance of the Quality Assurance Plan." Since a Quality Assurance Plan was written generically during 1983, the list of procedures has been previously provided.

Comment

Section 9.3, Page 59. Delete the requirement for submittal of weekly summary inspection reports and delete the requirement for including a statement that all samples, materials, and equipment used are in compliance with the contract plans and specifications, except as noted in the reports. These certifications typically do not carry any weight and are meaningless inspections; other methodologies to ensure compliance with the contract plans and specifications are applied.

Comment

Section 9.3, Page 60, Last Paragraph. Delete the words "and shall furnish two legible copies of all inspection reports to the DOE." The RAC will supply, as part of the files at the end of the Project, copies of the Inspection Reports and all other files appropriate to each individual subcontract.

Comment

Section 6.4.3, Page 51, Last Paragraph. As per J. Morley's letter to R. Krishnan dated October 22, 1984, the 25 percent MPC limit should be referred to as an administrative warning limit only.

Response

Comment will be incorporated.

Comment

Section 7.1, Page 53. Revise the next to last sentence of Paragraph 1 to read "The RAC will provide quality assurance/quality control, prepare detailed design, manage field construction activities, and provide certification data."

Response

Sentence will be revised.

Comment

Section 7.1.b, Page 53, Item No. 3. Review and concurrence in final design by the NRC should be considered. Since the NRC currently reviews and concurs in final design on all the nuclear installations, eliminating their review and concurrence from these waste storage facilities appears to be causing some difficulty in getting concurrence in the Remedial Action Plan. With concurrence in the final design, the review and concurrence in the RAP may become much easier.

Response

A review step for NRC has been added. However, the NRC is not required to concur in final design unless significant changes are made from the RAP.

Comment

Section 7.2.b, Page 55, Paragraph 1. The site specific procedures are prepared by the RAC, not DOE.

Response

Disagree. The DOE is correctly named as the responsible party.

Comment

Section 7.2.7, Page 56. A DOE local Site Manager?

Response

Concur. Will be revised to note DOE Site Engineer.

construction schedules." The Remedial Action Plan should certainly have been discussed in detail prior to this date and specifics of construction methods should not be discussed. Methods may change based on circumstances on the site and any attempt to educate the people and lay out a rigid construction methodology can end only in detail scrutiny and disagreement.

In the following paragraph revise the last sentence to read, "This representative will work closely with the DOE to provide information and will meet frequently with the public throughout the construction period." Since many of the meetings, particularly at Canonsburg, are held informally between site workers and personnel living in the area who are interested in the project, it appears that these informal discussions should also be credited and recognized.

Response

Comments will be incorporated.

Comment

Appendix A. Do not see a permit for altering a water course. Page 41, Section 5.6.11, says that Hammersley Creek will be rerouted. Does this fall within the COE area of purview?

Response

The COE district engineer will need to review the final design and determine whether a permit is required. (Clean Water Act Section 404, Dredge and Fill Permit)

Comment

Section B.1.1.3, Page B-1, Last Sentence. The bottom should be constructed flat and natural settlement will provide the required slope.

Will natural settlement dependably provide slope toward interior of the embankment to prevent seepage at the toe?

Response

The sentence will be changed to read that the excavation bottom will be sloped one percent toward the interior.

Comment

Section B.1.2.4a, Page B-14 to B-21. Clarification of the following design parameters for slope stability analysis is required:

- a. MCE: Which value, 6.9 or 7.4, is proposed?
- b. $Q_{max} = 0.52$ g, reduced to 0.35 g in the embankment without response analysis.

Comment

Section 9.5, Page 60. Delete the words "approved by the DOE." Specific procedures are not currently approved by the DOE. However, the essential requirements of the nonconformance system are approved in the Quality Assurance Plan.

Comment

Section 9.7, Page 61. Delete the requirement to have copies of all codes and standards on the job site. Reword to state, "The RAC shall have access to the applicable Quality Assurance Codes and Standards available for reference by all personnel. The RAC shall maintain at the job site copies of all approved for construction drawings and specifications." To require copies of all codes and standards at each job site would be very expensive and very cumbersome. As long as the organization has ready reference to the documents, either through the Project Office or in local libraries, it is not necessary to have those standards on the site.

Comment

Section 9.8, Page 61. Delete the third sentence starting, "All variations." How as-building information is collected and recorded is a RAC specific procedure and should not be written into a generic Remedial Action Plan.

Delete the second half of the paragraph beginning with the words, "where the contract specifications." This includes too much detail as to exactly how approvals are made. These should be left to the individual detail procedures and are more a matter between the AE and CM portions of the RAC. The statement at the end of the paragraph may be left to require reproducible copies of as-built drawings.

Comment

Section 9.9, Page 61. Delete the requirement for certificates of compliance certifying that tested material is actually that material incorporated in the work. For nearly all applications, representative samples will be taken and will be acceptable for materials. In most cases, material incorporated into the work would require destructive testing, which is not acceptable in much of the work.

Response to all Section 9 Comments

Agreement has been reached with the RAC that the replacement Section 9 attached addresses all of the above comments and concerns satisfactorily.

Comment

Section 10.3, Page 64, Third Paragraph. In the paragraph beginning with "A Public Preconstruction Meeting" change the second sentence to read "Principal topics of discussion will include the remedial action design and

Proper section for note is B.1.4.1b.

Response

Reference will be corrected.

Comment

Section B.1.4.1b, Page B-48, First Paragraph, Last Sentence. Reference is made to Section B.1.4.2.

Formulas referenced are in Section B.1.4.1 not B.1.4.2.

Response

Reference will be corrected.

Comment

Section B.1.6.3, Page B-56, Paragraph 1. Last sentence refers to Section B.1.6.3.

Proper section for reference is B.1.6.2.

Response

Reference will be corrected.

Comment

Section C.3.2, Page C-5. Delete the specifics of excavation control monitoring. Excavation control monitoring should be left to current procedures and not specifically spelled out in a Remedial Action Plan. Whether or not in-situ monitoring devices can be proven that will work is an item left up to the detailed operation. Specific approval of the State and NRC should not be required if a workable methodology can be devised.

Response

Disagree with comment. The purpose of the section is to provide a description of the methods that may be used by the participating agencies. A careful reading of the section reveals that no specific method is disallowed.

Comment

Section C.3.4, Page C-6, Paragraph 1. The error limits referred to here cannot realistically be met based on the error associated with the sampling methods. Does this error need to be quoted here, if so, then it should indicate what source of error this represents, i.e., sampling statistics, counting statistics of the system or both? Delete reference to this error limits since it has been demonstrated to be unachievable at Canonsburg and Salt Lake City.

c. Horizontal Seismic Coefficient - 0.35 g appears to be high for pseudo-static analysis.

d. Soil Characteristics:

$\phi = 28^\circ$ for natural clay

$\phi = 38^\circ$ for natural silt

$\phi = 41^\circ$ for natural silty sand

All three of the above values appear to be high.

Response

Both 6.9 and 7.4 represent MCE values for two identified active faults. Through attenuation, the 6.9 MCE produces the maximum acceleration of 0.52 g at Collins Ranch. This bedrock acceleration was reduced to a 0.35 g, ground surface acceleration using figures developed by Seed (see Seed, 1982, reference in the RAP). While this is a high-horizontal coefficient for pseudo-static analysis, it is conservative and will result in a stable pile. To date no suitable method is available to allow further reduction of the acceleration.

As for the soil strength parameters, the natural clay and natural silt values are correct and were determined through field testing and/or laboratory analysis or determined using accepted methodologies. Supporting data are provided in the DSCR. Additional testing of the deeper natural silty sand foundation soils indicates that the friction angle should be reduced to 38 degrees. An evaluation of the stability analyses performed for the RAP shows that this change will not affect the stability numbers obtained for the long-term static and earthquake loading conditions.

Comment

Section B.1.2.5, Page B-29. The final disposition of clearing and grubbing products at each site requires further consideration. In the probable event that the five percent limit of organics in the embankment results in an excess of organics for disposition, alternative methods of disposal should be addressed and so stated. Without benefit of more specific information, it is currently assumed that all of the vegetation at the tailings area is contaminated.

Response

Initial calculations show that the percent of contaminated organics is less than five percent; however, if this percentage were to increase, alternative methods of disposal would be evaluated. The percent organics would not be allowed to exceed five percent due to consolidation and settlement considerations.

Comment

Table B.1.13, Page B-47. Size increased by 20 percent for durability (see Section B.1.5.2).

Comment

Section D.3.2, Page D-11. Delete in the first sentence the words "and occupied by a Health Physics Technician (herein and after referred to as a technician) during all normal periods of ingress or egress." Work at Canonsburg, Salt Lake City, and Durango does not currently require full-time occupation by a Health Physics Technician; however, the access control point is established.

Response

Agree. Changes will be made to Appendices C and D.

Comment

Section D.3.4, Subpart b, c, and d, Page D-15 and Page D-16. Equipment monitoring will be completed generally with B- hand held instruments. Surveys will be counted for alpha smearable. Contamination limits are not consistent with Section D.3.3, Page D-13.

Response

Disagree with comment. As stated in the UMTRA Project Environmental, Health, and Safety Plan, alpha detectors are the preferred instrumentation for equipment monitoring; however, beta instruments may be used under conditions where alpha monitoring would not have adequate sensitivity (e.g., if the equipment was wet or shielded by some other means). The contamination level as stated on Page D-13 of 500 dpm per 100 sq cm was a sensitivity requirement for the instrument used.

Comment

Section D.3.2, Page D-12, First Paragraph. Delete the entire paragraph. The technician may or may not be maintaining the access control point full-time and the access control log is not being used as a checklist to ensure that all contractor personnel are out of the controlled area before closing the access control point. The log is a listing of all untrained personnel.

Response

Agree. Changes will be made in Appendices C and D.

Comment

Section D.3.2, Page D-12, Paragraph 3. Orientation and training records, records of bioassay samples, and results and dosimetry issue (either TCD or SRD) are generally not kept by individual employee files but are kept in three separate files for those topics. (Same comment for previous RAPs.)

Response

Agree to change. A reference file will be maintained at the site. These records will be kept on file.

Response

Sentence will be changed to read laboratory (analytical) error limits.

Comment

Section C.3.4, Page C-7, Paragraph 1. Letter directive from J. G. Themelis to R. E. Hopkins, indicates off-site laboratory analysis is acceptable for final verification analyses. The letter also states that backfilling can and will proceed prior to the receipt of those results. Delete entire paragraph.

Response

The paragraph will be revised as follows:

Samples taken in the field will be prepared and analyzed. When convenient, this will be done prior to backfilling. When the property is to be backfilled prior to receiving the final analytical results, a quick field method (that provides a high degree of assurance that the property meets standards) will be developed and applied.

Comment

Section C.3.5, Page C-7, Paragraph 2. EPA standards do not require verification of Alpha contamination, i.e., no limits are specified. As a matter of good health physics practice, alpha surveys will be completed but not necessarily for final rad verification survey packages to verify EPA standards. Delete this paragraph from this section. Only gamma surveys, WL surveys, and in some cases, soil results, are required for final EPA standards verification. (Same comment given for previous RAPs.)

Response

Disagree with comment. This stated requirement is consistent with Section 192.21f 10 CFR Part 192. The proposed limits are in accordance with NRC Reg. Guide 1.86 and American National Standards Institute section 13.12.

Comment

Section D.2.9, Page D-8. Delete the last sentence. Quality Assurance Procedures and record keeping methods are not provided to DOE for approval. They are provided for information and are subject to DOE approval. The Quality Assurance Plan is approved by DOE and specific procedures may be disapproved; however, they are generally not submitted for approval.

Response

Disagree with comment. Do not agree that this is a significant difference.

Comment

Section D.3.2, Page D-12, Last Paragraph. Delete the first sentence or reword. Operations at Salt Lake City and Durango do not require surveying at the access control point before leaving a restricted area. Whether or not surveys are required depends on the specific circumstances and should not be worded so strictly that it precludes operations such as those being applied at Salt Lake City and Durango.

Response

Agreed. Changes will be made in the text.

Comment

Section D.3.4, Page D-15, Subpart b. Revise this section to allow the methodology being used at Salt Lake City and Durango, wherein vehicles would be routinely washed and then subject to survey based on operational experience at the site.

Response

Disagree with any revision to Section D.3.4. Paragraph 2 states that vehicles will be decontaminated and monitored "if necessary." This allows the recommended flexibility based on operational experience at the site.

Comment

Section D.3.4d, Page D-16, Paragraph 3. It is not feasible to wait for equipment to "dry" before surveying. In wet weather construction would come to a complete halt. Beta/gamma survey equipment is used under these conditions.

Response

Agreed, see previous response.

Comment

Section D.3.5, Page D-16. Delete the requirement for removing or fixing loose or removable contamination prior to demolition. Also, delete the requirement for work to be performed by experienced crews. In some cases, the decontamination of contaminated buildings may be done by crews not having that experience previously; however, work will be done under the direction of the RAC. It has also been demonstrated that the dampening of the buildings will be adequate in most cases. The experience at Canonsburg supports the fact that dampening will adequately control release of contamination.

Response

Changes will be made in Appendices C and D.

Comment

Section D.3.5, Page D-16 - cont'd. Delete the requirement for using nuclear grade industrial vacuum cleaners. There is no intention to use nuclear grade vacuum cleaners on this project.

Response

Section will be rewritten to clarify decontamination means that may be required.

Comment

Section D.3.6, Page D-17, Subpart b. Delete "and washers and dryers for laundering protective clothing." There is no current requirement or intention to put washers and dryers on site. This service will be provided by subcontractors which may or may not be on the site.

Response

Agree. Changes will be made in Appendices C and D.

Comment

Section D.3.7a, Page D-18, Paragraph 1. TLD badges nor controls will not be stored in a lead pig (as agreed at the April 2-3, 1984, Health, Safety, and Environmental DOE meeting discussion).

Response

Changes will be made in Appendices C and D.

Comment

Section D.3.7b, Page D-18, Paragraph 2. It may not be possible to collect urine samples from people who terminate under adverse conditions. Change to: "Every effort will be made . . ."

Response

Disagree. Do not consider the recommended (qualifying) change necessary.

Comment

Section D.3.8c, Page D-22, Paragraph 2. SCBAs should not be required for "short-lived radon decay products." This should be removed from the paragraph.

Response

Do not agree.

Comment

Section D.5, Page D-25, Paragraph 4. The current RAC documents approved by DOE do not include environmental monitoring plans for nonradioactive airborne particulate concentrations. Only radioactive particulates Ra-226, Th-230, Po-210, and Pb-210 are planned for routine analyses. Delete reference to nonradioactive environmental measurements. (Same comment given for previous RAPs.)

Response

Do not agree. The project EH&S Plan requirements must be met.

Comment

Section D.5.1, Page D-25, Paragraph 2. Delete reference to "EPA Regulations" for nonradioactive particulates analyses. These measurements are not in any currently defined scopes of work negotiated to date for the RAC. No comprehensive plans for nonradioactive routine monitoring exist. What EPA regulations are being referred to?

Response

Reference 40 CFR Appendix B will be added after EPA Regulations.

Comment

Section D.6.3, Page D-29. Reword the paragraph to state that controls will be placed at 6 pCi/l for a six-month average and 3 pCi/l for an annual average. Activities will be reviewed at any time the releases exceed 3 pCi/l above background and administrative action will be taken at any point where releases are above 6 pCi/l above background.

Response

Agreed. The change will be made in Appendices C and D.

RESPONSE TO M-K COMMENTS DATED APRIL 25, 1985, ON THE LAKEVIEW EA

Comment

Table 1.1, Page 9. "Transportation Networks" 290 trips per day over 24-month period--this is impossible with average snow fall of 61 inches.

Response

In order to determine environmental impacts during the NEPA process, certain conservative assumptions concerning truck trips, personnel requirements, fuel, energy, water consumption, and equipment use are made during preliminary conceptual designs. These estimates are made in order to provide equitable comparisons of the alternatives under consideration and are not meant to be interpreted as rigid requirements to be met by RAC.

Comment

Table 2.2 & 2.3, Page 30 and 31. Personnel Requirements--too high due to winter shut down. Estimate based on 24-month construction season.

Response

Same as previous response.

Comment

Page 126. Housing--Good possibility of more than 14 workers coming to town--M-K, Chem Nuclear, and maybe out of town subcontractors.

Response

The estimate of 14 additional workers moving to Lakeview for the remedial action work was based on a projection of the size of the work force required to do the job, an analysis of the skill levels and manpower available within the Lakeview area, and consideration given to the high unemployment in Lake County, Oregon. These estimates should be used for a comparison of each of the alternatives and should not be considered as absolute numbers to be met by the RAC.

Comment

Section 2.5, Page 37. Second paragraph makes reference to trucks returning from the Collins Ranch site hauling radon fill to the existing mill site.

This would mean having to wash the truck beds at the Collins Ranch site instead of just tarping them. Table 1.1 uses an average of 290 trips per day to the site. Washing the beds of 290 trucks per day would generate a large quantity of contaminated wash water. Where would that go? Would you need another water treatment plant? Is there that much water available?

Response

The trucks would have to be empty of tailings prior to loading with backfill. Washing may not be required.

RESPONSE TO M-K COMMENTS DATED APRIL 23, 1985, ON THE COLLINS RANCH DSCR

Comment

Section 8.0, Tailings. Figures 8.13 through 8.16, Pages 76 through 79, are illegible as reproduced.

Response

Figures have been redrafted and passed separately. New figures will appear in Final Collins Ranch DSCR.

Comment

Section 5.0, Ground Water. Ground-water level data collected from monitoring wells, continuing from February, 1985, should be transmitted as available for MKE design information.

Response

Ground-water level data are collected bi-weekly at the Collins Ranch site. This information will be transmitted to M-K routinely as it becomes available.

Comment

Section 3.0, Land Survey Data. In order to proceed with design, which status is active, we request that ground survey work be accomplished as soon as possible, as well as any further proposed soil-testing work (the report states completion within six months).

Response

Coordinates for well locations and the legal description of the site will be transmitted as they become available and will be included in the DSCR.

Comment

Figure 7.4, Page 51. Last line should read 9.5'-10.6' instead of 95'-106'.

Response

The figure has been redrafted. The new figure will appear in Final Collins Ranch DSCR.

Comment

Figure 7.6, Page 53, Paragraph. Last line should read 507 instead of 505.

Response

The figure has been redrafted. The new figure will appear in the Final Collins Ranch DSCR.

Comment

Table 9.3, Page 117. Test pit numbers should be 805 and 806 instead of 505 and 506.

Response

Test pit numbers have been corrected.

Comment

Table 9.7, Page 121. Test pit numbers should be 805 and 806 instead of 505 and 506.

Response

Test pit numbers have been corrected.

Comment

Section 3.2, Page 6. Is land acquisition in progress? What is such schedule?

Response

Acquisition of site land must follow the land survey program (see response to Section 3.0, Land Survey Data).

Comment

Section 3.5, Page 6. Is survey work in progress? What is such schedule?

Response

(See response to Section 3.0, Land Survey Data.)

Comment

Section 4.4, Pages 8,9. Is environmental characterization program in progress? What is the schedule for these?

Response

A gamma exposure rate traverse was completed and soil samples were gathered as part of a field data acquisition program conducted at Collins Ranch in May, 1985. Soils were analyzed for Ra-226 and Thorium-230. These laboratory analyses will be transmitted as they become available. All results will be incorporated into the Final Collins Ranch DSCR.

Comment

Section 5.5, Page 21. Are investigations and additional data being acquired for areas where uncertainties remain?

contract. The reports of inspection shall cover all work placement subsequent to the previous report and shall be verified by the RAC's designated QA representative.

9.4 MEASURING AND TEST EQUIPMENT CALIBRATION AND CONTROL

The RAC shall provide measuring and test equipment having the precision and accuracy needed to establish conformance with specified quality requirements. Calibrations shall be in accordance with nationally recognized standards. The RAC shall identify procedural systems for test equipment calibration and recall.

9.5 NONCONFORMANCES

A nonconformance and change procedural system shall be developed by the RAC and approved by the DOE.

9.6 RECORDS CONTROL

The RAC shall be responsible for generation, retention, and retrieval of legible records which provide objective evidence of conformance to the specified quality requirements. These records shall be considered valid only if they are completed and signed or otherwise authenticated and dated by authorized personnel. These records should include, but are not limited to:

- o Radionuclides in soil data.
- o Air monitoring data.
- o Design review files.
- o Water contaminant analysis.
- o Personnel radiation exposure data.
- o As-built drawings.
- o Test and inspection reports.
- o Engineering specifications.
- o Material certifications.
- o Certificates of compliance.
- o Reports and corrective action requests.
- o Operating procedures.

All records shall be available to the DOE for review upon request. All personnel radiation exposure records shall be turned over to DOE upon completion of the site remedial action.

9.7 CODES AND STANDARDS

The RAC shall have on the job site, no later than three weeks after site mobilization, the applicable quality assurance codes and standards available for ready reference by all personnel. The RAC shall maintain at the job site copies of all approved-for-construction drawings, specifications, and other documents which describe the remedial action.

9.8 RECORD DRAWINGS

The RAC shall develop QA procedural systems to assure the use of authorized (approved-for-construction) drawings and specifications and the maintenance of current record drawings. Two full-sized sets of contract drawings shall be used by the RAC for this purpose. All variations from the contract drawings shall be depicted. Generally, the drawings shall reflect only such changes and/or corrections to data and dimensions shown on contract drawings. Where the contract specifications or drawings permit optional use of more than one type of material or equipment, the type of material or equipment installed shall be shown on the drawings. The drawings shall be maintained in a current condition at all times, and shall be made available for review by the DOE at all times. Variations from the contract drawings shall be shown in the contract working drawings and shall be incorporated into the record drawings. Upon physical completion of the contract work, two reproducible copies of these drawings shall be furnished to DOE.

9.9 MATERIAL CERTIFICATION

The technical specifications may require that certain materials be certified. Two types of certifications that may be specified are:

- o Certificate of compliance.
- o Certified material test report (CMTR). When a CMTR is requested from the RAC or its subcontractors, it shall be accompanied by a certificate of compliance certifying that the tested material is actually that material incorporated in the work.

9.10 QUALITY ASSURANCE PROGRAM VERIFICATION

Verification of the QA Program implementation by DOE may be accomplished by:

- o Review of daily or weekly summary reports.
- o On-site inspections and surveillance.
- o Periodic audits.
- o Acceptance of DOE QA recommendations based on DOE QA audits of RAC activities.
- o Any combination of the above.

Response

An additional field program was conducted in May, 1985, to collect data to better characterize the following areas:

1. Infiltration.
2. Vertical permeability and unsaturated flow.
3. Attenuation properties of the site subsurface materials.

These data will be transmitted as soon as they become available.

Comment

Section 5.0, Page 20. What is the significance of second paragraph? Is buffering capacity being determined, and for what use?

Response

The measured high natural pH values in the ground water have little buffering capacity (or ability to withstand chemical changes). The first sentence postulates how this ground water chemistry was generated by infiltration through basalts in the Fremont Mountains. The effect of mixing tailings pore water with the natural ground water can be simulated using PHREEQE, a geochemical model that predicts the equilibrium chemical species and concentration in a mixed solution. The results of the simulation measure the buffering capacity or the ability of the ground water to assimilate the tailings seepage without creating large perturbations in the concentrations or types of species found in the existing natural ground water.

This simulation will be run if it is expected that certain mobile contaminant species will reach the water table. This will be determined from ongoing water-level measurements, from attenuative study data, and from infiltration and unsaturated flow information.

9.0 QUALITY ASSURANCE

9.1 GENERAL

The Remedial Action Contractor (RAC) shall provide and maintain an effective quality assurance (QA) program and procedural system which will assure that all work, materials, supplies, and services required under the contract conform to contract requirements, whether constructed or processed by the RAC or its subcontractors or procured by subcontractors or vendors. The RAC shall perform or have performed adequate inspections and tests as will ensure and substantiate that all work, materials, supplies, and services conform to contract requirements.

The RAC shall furnish a QA test and inspection plan which defines the health, safety, and environmental activities to be incorporated into the design and/or performed during construction to ensure contract compliance and site certification. Test and inspection requirements shall be approved by the DOE prior to the start of any physical job site construction work under this contract. If the RAC revises the plan, the RAC shall concurrently furnish a copy of the revision to the DOE for approval prior to implementing the revision on work under the contract.

9.2 QUALITY ASSURANCE PLAN

Before construction operations are started, the RAC shall meet with the authorized DOE QA representative to review and discuss the RAC's proposed project QA plan. The meeting shall develop mutual understanding relative to details of the individual site plan requirements including the formats to be used for recording and reporting tests and inspections, administration of the plan, personnel assignments, and the interrelationship between the RAC and the DOE QA representative. The RAC shall furnish a list of the procedures required to implement the project plan. This list shall include, at a minimum, procedures for data collection, analyzing samples, inspection and testing, and formats of reports to be used.

9.3 DAILY INSPECTION REPORT

The RAC shall prepare a daily report for every day worked, and a weekly summary report covering the RAC and/or subcontractor's operations in an appropriate format. These daily reports shall be maintained at the site until work is complete. These logs shall provide complete and factual evidence that continuous, effective quality control construction inspections and tests have been performed, including but not limited to: 1) the type and number of inspections and tests involved, 2) results of inspections and tests, 3) nature of deficiencies requiring corrections, and 4) corrective actions taken or to be taken.

The RAC shall maintain current records of all inspections and shall furnish, as part of the files at the end of the project, copies of the inspection reports and all other files appropriate to each individual sub-