

Committee in Session at 8:41 am on Monday, April 16, 1979.

Senator Keith Ashworth in the Chair.

PRESENT: Chairman Keith Ashworth
Senator Clifton Young
Senator Rick Blakemore
Senator Wilbur Faiss
Senator Jim Kosinski

ABSENT: Vice-Chairman Joe Neal

GUESTS: Mr. Al Edmundson, Chief, Consumer Protection Services,
Health Division
Mr. Steve McCutcheon, VTN, Consultants to the Chevron
Corporation
Mr. Robert Warren, Executive Secretary, Nevada Mining
Association
Mr. Twain Walker, Jr., Audit Manager, Legislative
Counsel Bureau
Ms. Georgia Massey, Assistant Supervisor, Life &
Health, Nevada Insurance Division
Ms. Pat Bates, Statewide Program Coordinator, Bureau
of Alcohol and Drug Abuse
Mr. Richard Garrad, Farmers Insurance Group
Mrs. Dorothy Ivy, Churchill County Employees'
Association
Ms. Lou Sayre, Churchill County Employees' Association

Chairman Ashworth opened the hearing on S.B. 237.

Mr. Al Edmundson, Chief, Consumer Protection Services, stated that the only change in the proposed amendments submitted on April 2, 1979 is the further change of the wording in Section 1(b), Exhibit "A". He stated that he had eliminated the sentence concerning the \$1 million limit. He stated that it was left under federal law, through the Nuclear Regulatory Commission, to determine the amount of money required for the long-term maintenance. He stated that he believed the determination would have to be made on an individual basis. By leaving the provision open-ended, it would have to be agreed upon during the licensure procedures.

Chairman Ashworth questioned if the amendment presented in Mr. Edmundson's letter of March 28, 1979 (April 2, 1979 Minutes, Exhibit "G") was still being requested. Mr. Edmundson stated that it was. He stated that the amount was not that large in order to get a representative sample of product.

Senator Kosinski stated that there was some ambiguous testimony during the last hearing concerning this 10,000 ton figure. He stated that there was indication that other states were utilizing the same procedure so the Research Division of the Legislative

Counsel Bureau polled the four states mentioned in the hearing; none of the four states have such an exemption at this time. He stated that he realized that 10,000 tons was not a lot of ore to be mined but felt that it would be a large amount in terms of reclamation. Senator Blakemore questioned if this amount was before processing. Mr. Edmundson stated that it was; the material is still in its natural state. Senator Blakemore questioned the concern expressed by Senator Kosinski. He stated that there are federal regulations concerning reclamation. Mr. Edmundson stated that the Division of Environmental Protection would handle this area.

Mr. Steve McCutcheon, VTN, Consultants to the Chevron Corporation, stated that the premier purpose of bulk sampling is to obtain representative ore samples than can be then shipped to an out-of-state operation to run metalurgical tests. He stated that, with an underground ore body, it is not possible to get representative samples purely by drilling.

Chairman Ashworth questioned the fact that the neighboring states dealing in this area do not have provisions such as the one proposed. Mr. Edmundson stated that after further checking with New Mexico, the provision was proposed; their staff would like to see this enacted but so far, their legislature has not approved it. Senator Young questioned if there are any states having this exception. Mr. Edmundson stated that he knew of none with the 10,000 ton exception. Mr. McCutcheon stated that under federal law, there is no source or radioactive material license required purely to mine. He stated that it is the refining and the concentrating process that the license applies to. He further said that under federal law, there is a specific exemption given to the possession, mining, etc., of unrefined and unprocessed ore; therefore, a license is not required. He stated that the ambiguity occurs over what point and what constitutes refined or processed ore. The purpose of the amendment is to try and resolve the ambiguity. Chairman Ashworth stated that he believed the samples would not necessarily all be taken from one pit. Mr. McCutcheon concurred and stated that, with underground mines, the need for bulk sampling is not usual. He stated that depending upon the deposition of the ore body, vertical shaft or horizontal shaft with drift would be utilized. He stated that the reason amendments such as that proposed are not "on the books" in other states is not that the problem has not occurred; the question still remains and they are attempting to clear up the ambiguity as to what constitutes processing of the ore.

Seantor Young questioned if there should be a license for crushing ore and questioned potential danger. Mr. McCutcheon stated that the tailings present the primary hazard; the exposures to mining the ore are relatively negligible. He said that crushing the ore, in terms of radiological releases, are very small. Senator Young questioned having the 10,000 ton figure at all. Mr. McCutcheon said it would hopefully clear up any ambiguity; it would not be a

commercial mining scale operation. Chairman Ashworth stated that by having the limitation, the state would be assured that the operation would remain on a small scale. Senator Young questioned placing a time period on extracting the ore. Mr. McCutcheon stated that he did not believe it was that much of a problem. Chairman Ashworth questioned if this 10,000 ton figure was total or yearly. Mr. McCutcheon stated that he would interpret it as total. Mr. Edmundson stated that it would be a "one-shot deal." Mr. McCutcheon said that he believed it should be confined to one identified ore body.

Senator Blakemore questioned if the bill provides for the Consumer Protection Services to be notified as to an operation's intent. Dr. Edmundson said that it did not. Senator Blakemore stated that he believed it would be proper to do so. Mr. McCutcheon stated that this would be the general license versus the specific aspects. He said that Chevron would have no objection with this; if the general license requirements were applied to this, it would be expected. Senator Young questioned the general license versus a specific license. Mr. Edmundson stated that a general license means, "a license effective pursuant to regulations adopted by the State Board of Health without the filing of an application to transfer, acquire, own, possess or use quantities of or devices or equipment for utilizing by-product material, source material, special nuclear material, or other radioactive material occurring naturally or produced artificially." In S.B. 237, on Page 3, Line 14, Mr. Edmundson read the criteria for a specific license. He said they would be exempting the sampling process from an actual license until 10,000 tons had been removed. He said that companies have sent letters of intent which prompted the proposal of this legislation. Mr. Edmundson explained the procedure companies must follow and stated that it could take from one to one and one-half years until the company could go into production. Mr. Edmundson stated that regulations would have to be developed for this type of operation; refinement and processing. Senator Young questioned if a specific license is required to drill and core. Mr. Edmundson stated that they may have to license just the core drilling without the exemption; he questioned the propriety of this.

Senator Blakemore questioned if Mr. Edmundson was notified if there was an area of contamination such as at the Nevada Test Site. Mr. Edmundson stated that the Nuclear Regulatory Commission works very closely with them.

Mr. Robert Warren, Executive Secretary, Nevada Mining Association, stated that without the exemption, the process might be extended for an unnecessarily long period time before an operation may go into production, thereby increasing costs.

Chairman Ashworth questioned the ramifications should this legislation not be passed. Mr. Edmundson stated that the Nuclear Regulatory Commission would take over and receive the fees.

Senator Young questioned if S.B. 237 seeks to preempt federal regulations or would it be on a dual basis. Mr. McCutcheon stated that there would be a possibility of some overlapping administration at least over the next two year period. He stated that as Nevada is an agreement state, the state is granted and assumes the responsibility for licensing unless the state chooses otherwise. In that event, the Nuclear Regulatory Commission would step in and there would have to be a joint agreement. Upon cessation of operations, the lands would revert to the federal government for the purposes of administration; if the state retains the authority, the land will revert to the state and all associated funds and bonding will go to the state as well.

Senator Kosinski questioned if an unmanageable burden would be imposed should the committee decide not to adopt the exemption and the Consumer Health Services establish an expeditious procedure for the purposes of drilling, ore sampling, etc., of less than 10,000 tons of ore. Mr. McCutcheon stated that it would not impose a burden if it were sufficiently expeditious; i.e., 35 to 40 days. Senator Kosinski questioned the necessity for the time period of one to one and one-half years for licensing. Mr. Edmundson stated that there is a great deal of interface with a number of other agencies. Senator Kosinski suggested a license solely for the purpose of what the exemption would accomplish with a maximum of 60 days in which to act on the application or it would be automatically approved. Mr. Edmundson stated that it could be done. Mr. Warren questioned if the federal government would recognize this exemption without legislative authority. Senator Kosinski stated that it would be a legislative provision giving the power to the agency to grant the expedited license. Mr. Edmundson stated that he believed they would. Chairman Ashworth suggested referring to it as an "exploratory license or permit" and establish another category in the law. He stated that he felt there should also be a time limit on this license. Mr. McCutcheon stated that he would have no problem with that. Mr. Warren stated that he did not believe a permit should be required to prospect but should be triggered when the material was to be moved. Senator Young stated that he believed there should be some notice so some agency in the state is aware that something is happening on the land. Mr. Warren stated that he would not want the operator to have to reveal his identity until some rock was ready to be moved; to maintain the secrecy of the operation until the claim is established. He suggested calling it a "development license." The committee directed that amendments be drawn up addressing this issue.

As to the removal of the \$1 million figure in Section 1(b) (April 2, 1979 Minutes, Exhibit "G"), Mr. McCutcheon stated that there was a rationale for the limit. He stated that it involved the assumption by industry that the management of the waste product would be such as to minimize, if not eliminate, long-term care and maintenance. He presented Exhibit "B" to the committee which provides some outline of the four basic concepts of disposal.

Chairman Ashworth questioned the problem with removing the \$1 million figure if the ultimate goal is to eliminate perpetual care and maintenance. Mr. McCutcheon stated that he did not have a strong argument against the removal of the figure providing the substitute language does give credit to those operators who would design a system that would make long-term care and maintenance a minor requirement. Senator Young questioned if there was a limitation on federal regulations. Mr. McCutcheon stated that at this point, there are no federal regulations to that effect. He said that the Nuclear Regulatory Commission does not enter into any bonding or funding arrangements with an operator. He stated that New Mexico does utilize the \$1 million ceiling; other states handle it on a case by case basis.

Mr. Twain Walker, Audit Manager, Legislative Counsel Bureau, referred to the proposed amendments submitted by Mr. Edmundson (April 2, 1979 Minutes, last page of Exhibit "G") which would provide for the proper accounting for the fees and revenues generated. He stated that a uranium mills licensing fund would be created and the uranium tailings perpetual care fund as well; the first would provide for the fees generated in subsection 1, paragraph a, the second fund to provide for the long-term care and maintenance as provided in paragraph b in subsection 1. He stated that on Page 2, Line 13, it is provided that the uranium tailings perpetual care fund will earn interest on the money that is deposited in the state treasury which will belong to that particular fund. He stated that it may be necessary to amend further should there be a change made based upon the need for the pre-production fees which may be provided for in another paragraph. Mr. Edmundson stated he did not believe there would be any fees until the operation applied for the license. Mr. Walker stated that would not pose a problem in that case.

Chairman Ashworth requested the amendments addressed in this hearing be submitted to the committee as soon as possible. Mr. Warren said they would be drafted today.

There being no further testimony, the hearing was closed on S.B. 237.

Chairman Ashworth opened the hearing on S.B. 75.

Ms. Georgia Massey, Assistant Supervisor, Life & Health, Nevada Insurance Division, proposed amendments to S.B. 75 (Exhibit "C"). She stated that the amendment would allow the proposed benefit structure to remain in effect but eliminate the mandate and leave it to the option of the applicant as to purchase or not purchase. This occurs in three places in the bill; the first is directed toward group insurance section of the law, the other two sections are directed to the medical service corporation and health maintenance corporation sections. Chairman Ashworth questioned if this type of insurance is available now. Ms. Massey stated that a very elaborate benefit structure, currently "on the books," is available at the option of the applicant. She stated that it is rather

expensive for someone to purchase and difficult for the insurance companies to rate. She stated the bill also provides for a task force to study benefit structures as well as licensing and certification. Chairman Ashworth questioned if Ms. Massey favored this provision and she responded that it was a "step in the right direction." She stated that the matter should be explored or it would be brought again and again before the legislature. Senator Young questioned if other states have studied this issue. Ms. Massey stated that other states have implemented mandatory or optional coverage for alcohol abuse but the benefit structures and procedures are so varied, adequate analysis is not possible.

Senator Kosinski questioned Ms. Massey's prior indication that the state insurance company may implement a pilot program. She responded that a meeting is pending at which this would be discussed; she said that if the committee for the state insurance would implement a pilot program, unless the proposed benefit structure is approved, they would have to follow the old law at considerable cost. Should that be the case, she did not feel the committee would approve a pilot program.

Ms. Pat Bates, Statewide Program Coordinator, Bureau of Alcohol and Drug Abuse, wished to remind the committee that the Bureau supports S.B. 75. She said that 21 states have implemented this type of legislation and have not proven there is increased or decreased costs in the implementation. Chairman Ashworth questioned if the Bureau supports the amendments presented by Ms. Massey. Ms. Bates stated that they do.

Mr. Richard Garrad, Farmers Insurance Group, questioned the one-year time period for the task force to report to the legislature (Page 9, Line 20 and 21). Senator Kosinski stated that the effective date was placed in the bill when it was assumed the coverage would be mandatory. The committee concurred that the appropriate change would be made to address this problem. Senator Young questioned if two years would be adequate time to study this issue. Mr. Garrad stated that he did not believe that it would be. Mr. Garrad also questioned the removal of certain mandatory benefits. He stated that the bill provided for the advisory committee to recommend to the Insurance Division as to how the rates should be established. Chairman Ashworth questioned if Mr. Garrod felt this was an area needing exploration as Ms. Massey had testified. He stated that the insurance companies cover all the allied ailments already. Mr. Garrod also questioned if the legislature was willing to authorize the Bureau of Alcohol and Drug Abuse to establish facilities for treatment at the expense of the private sector. He stated that he interprets this to mean a psychiatric institution; thereby, creating a new system of institutions within the licensing facility. He further stated that there is no mention of the Health Division licensing these facilities. Ms. Bates stated that the Bureau of Alcohol and Drug Abuse works in cooperation with the Bureau of Health Facilities; the Bureau of Health Facilities licenses the treatment programs that exist in the state and the

Bureau of Alcohol and Drug Abuse accredits the program content. This only applies to those institutions receiving state or federal funds.

Chairman Ashworth questioned amending the bill to allow for the task force, benefits at the option of the applicant and delete the rest of the bill. He asked the Bureau of Alcohol and Drug Abuse if that would be agreeable to them for the next two years. Ms. Bates said that would at least be a "step in the right direction." Ms. Massey stated that the most important sections of the bill were the benefit structure and the task force.

Senator Young questioned if the insurance companies were satisfied with the portion of Section 4 concerning benefit structures. Chairman Ashworth stated he was going to eliminate Section 4. Ms. Massey stated that Section 4 would have to remain; in fact, the entire bill would have to remain as it is establishing the benefit structure. Chairman Ashworth questioned if Ms. Massey concurred with the limits. She stated that they are more satisfactory than what is presently in the law. Mr. Garrad was not as concerned with the benefit structure but rather the establishment of other facilities. Ms. Bates stated that the bill would not establish anything new.

Ms. Lou Sayre, Insurance Committee for Employees of Churchill County, spoke in support of the amendments submitted by Ms. Massey to S.B. 75.

Ms. Dorothy Ivy, Insurance Committee for Employees of Churchill County, questioned the lifetime limitation. Ms. Massey stated that the "lifetime" pertains to the lifetime of the policy. Ms. Ivy questioned a policy that would "cut off treatment." Ms. Massey stated that the subcommittee had addressed that question and determined that if a person legitimately wishes to be helped, the coverage will be adequate.

There being no further testimony, the hearing was closed on S.B. 75.

Chairman Ashworth presented BDR 40-1832 regarding the limitation of scientific research upon human beings. The committee concurred to make the BDR a committee introduction.

Chairman Ashworth also presented the committee with BDR 40-977 which was the request of Judge Keith Hayes. The BDR relates to the establishment of a program to research therapeutic effects of marihuana on certain cancer and glaucoma patients. The committee concurred to make the BDR a committee introduction.

S.B. 75 (Exhibit "D")

Senator Kosinski moved to "Amend" and "Do Pass"
S.B. 75.

Seconded by Senator Faiss.

(Committee Minutes)

Discussion: Senator Kosinski stated the amendments would consist of those presented by Ms. Massey (Exhibit "C") and on Page 9, Section 16, delete Line 20.

Motion carried.

Yeas -- 5


Nays -- None

Absent -- Senator Neal

As to S.B. 325, Chairman Ashworth appointed Senator Kosinski, Senator Young and Senator Faiss as the subcommittee to address this issue. It was determined they will meet on the matter April 17, 1979 at 10 am.

There being no further business, the committee adjourned at 10:13 am.

Respectfully submitted,



Roni Ronemus
Committee Secretary

Approved:

Chairman
Senator Keith Ashworth

PROPOSED CHANGES TO S.B. 237

Proposed change: Section 1, line 3. Change the word may to shall.

Proposed rewording: Section 1(a), lines 4 through 9, page 1.

(a) Fees for licensing, monitoring, inspecting or regulating mills or other operations for the concentration, recovery or refining of uranium. Fees will be in an amount estimated to reasonably cover the actual cost of such activity. Payment of the fees is the responsibility of the person applying for a license or licenses to engage in uranium concentration, recovery or refining.

Proposed rewording: Section 1(b), lines 10 through 14, page 1.

(b) Fees for the care and maintenance of radioactive tailings and residues at the inactive uranium concentration, recovery or refining sites. The fees must be based on a unit fee for each contained pound of uranium oxide produced. Payment of the fees is the responsibility of the person licensed to engage in uranium concentration, recovery or refining.

Proposed rewording: Section 1(c), lines 15 through 23, page 1, and lines 1 through 3, page 2.

(c) A requirement for persons licensed by the state to engage in uranium concentration, recovery or refining to post adequate bond,

OVERVIEW OF NUCLEAR REGULATORY COMMISSION

URANIUM MILL LICENSING ACTIVITIES

J. J. Linehan and R. A. Scarano

Uranium Mill Licensing Section

U.S. Nuclear Regulatory Commission

Washington, D.C.

November 1976

INTRODUCTION

At last year's Uranium Mining Technology Conference, we discussed the problem areas, from the NRC perspective, associated with licensing of uranium milling operations and actions by NRC to deal with these problems. At that time, we first introduced our performance objectives for tailings management and discussed one method of satisfying these objectives. Over the past year, the industry has developed several more innovative and sound schemes for tailings management which I will describe today along with the NRC staff's position that below-grade disposal is generally the most environmentally sound, reliable, and reasonable method of tailings management with existing commercially available technology.

Three other areas of concern which I will touch on today are the NRC staff technical positions on preoperational radiological environmental monitoring, operational radiological environmental monitoring, and land clean-up criteria for mill sites.

TAILINGS MANAGEMENT

As you are aware, the major item of concern related to uranium milling operations is tailings management, which continues to receive increasing attention from state and federal agencies and environmental conservation groups. Since it was evident that the results of the NRC's generic environmental impact statement (GEIS) related to uranium milling, which will lead to regulations covering management and disposal of mill tailings, were a long way off, the licensing staff issued interim guidelines in May 1977 for the industry in the form of the following performance objectives for tailings management.

Siting and Design

1. Locate the tailings isolation area remote from people such that population exposures would be reduced to the maximum extent reasonably achievable.
2. Locate the tailings isolation area such that disruption and dispersion by natural forces is eliminated or reduced to the maximum extent reasonably achievable.
3. Design the isolation area such that seepage of toxic materials into the groundwater system would be eliminated or reduced to the maximum extent reasonably achievable.

During Operations

4. Eliminate the blowing of tailings to unrestricted areas during normal operating conditions.

Post Reclamation

5. Reduce direct gamma radiation from the impoundment area to essentially background.
6. Reduce the radon emanation rate from the impoundment area to about twice the emanation rate in the surrounding environs.
7. Eliminate the need for an ongoing monitoring and maintenance program following successful reclamation.
8. Provide surety arrangements to assure that sufficient funds are available to complete the full reclamation plan.

As can be seen, these objectives are tailored to allow industry flexibility in developing tailings management alternatives for specific sites.

We also expect the technical aspects of our proposed regulations coming out of the GEIS to be very much like these interim performance objectives which allow for flexibility with regard to specific methods of tailings disposal. The regulations will probably present a numerical limit on radon and gamma emissions, and state broad objectives with regard to groundwater protection, siting, and long-term stability. Working out detailed tailings disposal programs meeting the performance objectives of our regulations will still remain a site specific task.

In support of a license application, the applicant is required to perform and submit to the NRC an evaluation of viable tailings management alternatives for the proposed project. In reviewing the applicant's evaluation, the NRC staff places special emphasis on the relationship between proposed tailings management alternatives and the possible mill site alternatives. It is not unlikely that some sites will be unsuitable for disposal of tailings. In short, there may be some sites that should not have a milling operation.

Because of the attractiveness of disposal into a mined out pit, as will be shown by the first two plans I discuss today, industry must consider alternatives for tailings management in the development of a mining plan. It may be possible to alter mining plans to accommodate an environmentally acceptable tailings management scheme. The NRC will not accept the premise that a pit suitable for tailings disposal cannot be utilized since a mining plan that could have been developed or revised accordingly has already been finalized.

In the year since we issued the performance objectives, the industry has responded with innovative schemes which meet these objectives. I will discuss four of these methods in detail.

The first plan (Figure 1) involves disposing of slurried tailings into a mined out pit. The floor of the pit will be lined with three-foot minimum compacted clay. The walls of the pit will be lined with as much as twenty feet of compacted clay, not that twenty feet is needed; but it is laid as a road around the pit, and that width is necessary for equipment. Compacted overburden materials will be placed in the pit to a point at least ten feet above the groundwater table. During operations, the tailings are slurried into the pit; and excess water is decanted from the pit and transferred to a lined evaporation pond located on the surface. Following a drying out period, the tailings will be covered with the following combination of materials: four-foot overburden, two-foot compacted clay, four-foot overburden, and six inches of topsoil. The reclaimed area will be contoured and vegetated to blend with the natural contours of the surrounding land.

Because the open pit mine to be used covers 130 acres and will take four years to mine, impoundment of tailings will take place in stages (Figure 2). This scheme has the advantage of allowing for a staged reclamation program. Reclamation of the early impoundment areas will take place during the operating life of the mill. Following operations, the dried material and liner from the evaporation pond will be transferred to the last stage of the tailings impoundment area.

The second plan (Figure 3) is just a variation of the first in that dewatered tailings, i.e., 20-30 w/o moisture, will be impounded in the mined out pits. A three-foot compacted clay liner will be placed on the bottom of the pit, and compacted fill will be added to a minimum of ten feet above the water table; but a clay liner on the side walls is not necessary. Because of the reduction in the amount of solution that could migrate, which in turn inhibits the mobility of the toxic materials left in the tailings, impermeable side walls are not considered necessary.

The advantages of the second plan are the elimination of the expense involved in laying a clay liner on the side walls, the increased capacity for the tailings, and the reduced drying time prior to final reclamation.

The staged tailings impoundment and reclamation and covering are the same as discussed in the first plan.

The third plan (Figure 4) involves discharge of tailings slurry into an impoundment consisting of four individually constructed cells which are specially excavated to a depth of 40 to 50 feet below the existing grade because of the absence of any existing mined-out pits.

The sides and bottom of each cell will be lined with a synthetic liner: a 30-mil reinforced Hypalon liner on the sides and a 30-mil PVC liner on the cell bottoms. Each cell will be surrounded by an above-grade dam (40 feet high) that will provide an evaporation pond for the liquid portion of the tailings and prevent any surface runoff from flowing into the tailings impoundment. During operations, tailings will be deposited sufficiently below the natural grade to allow for the placing of a 15-foot cover of overburden and topsoil over the tailings cells without creating an above-ground mound. At the time of reclamation, a portion of the material from the dams surrounding the cells will be used as cover over the tailings; and the remainder will be hauled to the mine waste dump or used for reclamation of mining areas. Following completion of reclamation, the cover over the tailings will be contoured to the natural levels present prior to cell excavation. The use of four individual cells constructed sequentially at three to four-year intervals allows the applicant to make improvements and refinements resulting from experience with the construction and operation of the first cell and provides for a staged reclamation of the tailings impoundment areas.

The fourth plan (Figures 5 and 6) I will discuss today involves slurring tailings into a surface impoundment at the head end of a natural valley. The area is surrounded on three sides by natural hills, and a dam will be built on the lower fourth side. The floor of the basin will be lined with two feet of compacted clay which will be keyed into the clay core of the dam. Following operation and a drying out period, a covering of three-foot compacted clay, five-foot overburden, and one-foot topsoil will be put in place. The area will be contoured and revegetated with appropriate natural species. A very important feature of this program is that final contouring will provide for sloping the area towards a concrete spillway located on the side of the area. It is designed to divert water runoff from topping the dam thereby minimizing water erosion of the downstream side of the dam over the long term and result in positive deposition of sediment over time that will increase the cover over the tailings.

By examining elements of these schemes, we can see examples of how each of the performance objectives can be met.

Since we have some currently operating mills that are good illustrations of how not to site mills, such as next to a town or on the banks of a river, our first two objectives address appropriate siting. None of the proposals under consideration are sited in conflict with these objectives. In fact, the proposed sites are in areas with average population densities less than two persons per square mile. Therefore, the objective of minimizing population radiation dose is met.

Seepage is minimized in all these schemes by providing for a liner or, in the case of plan 2, by reducing the amount of solution that could migrate, which in turn inhibits the mobility of the toxic materials left in the tailings.

It is not shown in the figures; but in each case, elimination of blowing tailings during operation will be achieved by the implementation of an interim stabilization program which will be required by license condition. This program may include the use of chemical crusting agents, water sprays, or physically covering the tailings with soil.

Following operations, the reclamation plans for all schemes provide for the reduction of direct gamma radiation to essentially background and radon emanation to about twice background. This will be achieved by covering with various combinations of clay, overburden, and topsoil as discussed earlier. The depth of the proposed covers, which is dependent on the radon diffusion coefficients and gamma attenuation coefficients of each component, ranges from nine feet of cover for the fourth plan to 15 feet of cover for the third plan.

The reclaimed areas will be contoured, and vegetative or riprap cover will be placed to provide protection against wind and water erosion over the long term. Although it is recognized that some finite period (five to ten years) monitoring program will have to be implemented to assure that the reclamation specifications have been met, the programs have been designed to eliminate the need for an ongoing monitoring and maintenance program. Since plans 1, 2, and 3 utilize below-grade disposal of tailings, the reclaimed area will blend in with the natural contours of the land. Plan 4, while it is technically a surface impoundment plan, is located and designed such that the reclaimed area will be contoured to blend with the natural hills and will have erosion resistant characteristics equivalent to a below-grade scheme in the same area.

Finally, for all four plans, the applicant will be required by license condition to provide surety arrangements to assure that sufficient funds are available to complete the authorized reclamation plan.

As demonstrated by the plans presented, the performance objectives were designed to allow industry some flexibility in proposing various engineering solutions for disposal of tailings. We look to the uranium industry to take the lead in developing additional methods to meet the objectives, although we are strongly encouraging some type of below-grade disposal. As seen by plan 4, a surface impoundment plan may be acceptable if it is shown to result in a reclaimed impoundment area that has erosion characteristics comparable to the surrounding environs.

The programs I have discussed are proposed for new milling operations. We have also been extending the development of acceptable tailings management programs for currently operating mills within NRC jurisdiction. We asked each operator to propose programs meeting our performance objectives four through eight. Siting and impoundment area liners were no longer options for the piles already in place. We now have proposals addressing the objectives from all our mill operators which have been authorized or are in various phases of review. The proposals include (a) continued use of the existing tailings area with a firm reclamation program commitment, (b) discontinued use of the existing area with newly generated tailings impounded in mined out pits with a firm reclamation program for both areas, and (c) newly generated and existing tailings, that are now piled on the surface, impounded in mined out pits with a firm reclamation program. In all cases, surety arrangements covering the authorized program are required.

The NRC review of proposed tailings management programs utilizes a report recently prepared for us by Colorado State University. The central focus of the study was to identify and describe the potential failure modes which, over long time periods, could cause release of radioactive components of the tailings. The analysis of these potential failure mechanisms includes a description of the failure mechanism itself, a discussion of the natural or geotechnical processes that control it, an assessment of the magnitude of release that could result from a failure and the likelihood that the failure would occur within long time periods. The time periods considered range from a few hundred years up to 100,000 years.

An integral part of the NRC analysis of the proposed tailings management programs is the evaluation of site and design characteristics that could influence the magnitude and likelihood of failure for each mechanism. The failure mechanisms considered in the NRC evaluation are contained in Table I.

The NRC feels that as a result of recent industry proposals and studies performed for the generic statement on uranium milling, below-grade tailings impoundment programs are economically viable and very attractive environmentally by providing greater assurance of containment over the long term. It should be noted that the third plan I discussed shows that even at a mill with a low ore grade, about 0.05 percent in this case, below-grade disposal is economically viable. Therefore, in all cases the primary tailings management alternatives to be considered should be below-grade burial methods. If a specific site does not lend itself to an economically or environmentally sound below-grade program, a surface impoundment may be found acceptable. Its acceptability will depend on showing that location and design characteristics will assure long-term stability and that erosion of the reclaimed area will not take place at an accelerated rate when compared with the surrounding environs.

We do not feel that the four programs discussed here are the only acceptable ways to resolve the tailings issue. Some of the other methods that are currently being investigated are deep mine disposal, separating sands and slimes and "fixing" the slime portion with a solidifying agent such as concrete, the possibility of removal of the radium and thorium, and the burial of neutralized tailings between and in groundwater tables. We are looking for the industry to continue to take the lead in developing innovative tailings management programs that minimize the environmental and health effects attributed to uranium tailings.

ENVIRONMENTAL MONITORING

Environmental monitoring has become increasingly important due to the issuance of the EPA standard for allowable radiation dose to the public from fuel cycle facilities, which limits annual dose commitments to off-site individuals to 25 mrem or less (doses to whole body or single organ from all fuel cycle facilities excluding doses from radon and its daughters). To demonstrate compliance with this standard, it will be necessary for each mill to have a good data base for natural background levels of radionuclides in the site environs prior to the start-up of operations and a comprehensive monitoring program during operations. To provide interim guidance regarding these matters while formal regulatory guides are being developed, the NRC staff has prepared the following staff technical positions:

Preoperational Radiological Environmental Monitoring Programs for Uranium Mills

Preoperational radiological environmental monitoring programs at uranium mills are needed to provide baseline data on background radionuclide concentrations and radiation dose rates (including their variations) at the mill sites and their environs prior to initiation of mining and milling operations. These data are needed for use (a) in assessing the radiological impacts during the environmental review for a license, (b) in determining compliance with applicable environmental standards during operation, and (c) at time of site decommissioning as baseline reference data for cleanup. This staff technical position provides guidance on the program components for an acceptable preoperational radiological environmental monitoring program. However, it should be noted that this position paper establishes generic guidance and that the need for some program components must be determined based on site-specific considerations. This would include considerations relative to land use, potential pathways, and tailings disposal methods.

Applicants may propose alternatives to the sampling program outlined in this staff technical position. However, it should be emphasized that the preoperational program should to the extent possible include the same sampling program (frequency, locations, types of samples) as the proposed operational program. Therefore, any proposed alternative sampling program to the preoperational program outlined in this branch position should be evaluated in relationship to its applicability to an operational monitoring program (i.e., an alternative sampling program should not be proposed unless the same program is applicable to the operational monitoring program).

While I will not go into the specifics of this program, one point I want to emphasize is that for sites where mining operations will also take place, at least the first six months of the required 12 months of environmental monitoring data as well as the site survey data must be collected prior to the start of mining activities in order to provide a true reading of natural background radiation levels, especially for background concentrations of radon in air. Also let me point out that the NRC will not authorize operation of any new mills until at least six months of the required environmental monitoring and the site survey data is submitted to and reviewed by the NRC.

Operational Radiological Environmental Monitoring Program for Uranium Mills

Radiological environmental monitoring programs at uranium mill sites are needed to provide measurement data on the radiation dose rates and radionuclide concentrations in the mill site environs. These measurement data are needed:

- (1) To demonstrate or confirm compliance with applicable environmental radiation standards and regulations, e.g., 10 CFR 20, "Standards for Protection Against Radiation," and 40 CFR 190, "Environmental Radiation Protection Standards for Nuclear Power Operations (EPA Uranium Fuel Cycle Standards)." It should be recognized that the EPA limit, upon the effective date, will supersede the exposure limits, including concentration values, of the Commission's regulations, 10 CFR Part 20, that are now applicable for the general public. The EPA limit of 25 millirems, of course, is substantially less than the maximum levels now specified in Part 20.
- (2) To evaluate the environmental impact of the radioactive effluents from the milling operations, including estimates of the potential radiation doses to the public.

- (3) To evaluate the adequacy and performance of effluent control systems and procedures, including tailings retention systems. One important element in demonstrating compliance with the EPA limit will be the prevention of windblown tailings and dusting from ore piles. It must be recognized that airborne concentrations of radium-226 and thorium-230 must be maintained at very low levels to assure that the EPA standard is not exceeded. It is essential that each mill employ the most effective means available to prevent dispersion of tailings and ore dust from the mill site. Preliminary dose assessments being carried out for the GEIS and individual mills indicate that windblown tailings pose a threat to meeting the limit at residences near tailings sites. The importance of this measure cannot be overemphasized.

The staff technical position provides guidance on the minimum program components for an acceptable operational monitoring program at a typical mill. However, just as for the preoperational program, the need to include some of the program components should be based on site and mill operation considerations.

Interim Land Cleanup Criteria for Decommissioning Uranium Mill Sites

In addition to these staff technical positions on preoperational and operational radiological environmental monitoring, we have also developed a staff technical position paper, Interim Land Cleanup Criteria for Decommissioning Uranium Mill Sites. Since uranium milling operations involve the handling of large quantities of ore containing uranium and its daughter products in concentrations one hundred to one thousand times the concentrations of these radionuclides in the natural terrestrial environment, these milling operations have the potential for contaminating large areas of land both on and off the mill site. This contamination can result primarily from airborne dispersal of ore and tailings during the handling and storage of these materials.

Studies at inactive mill sites have indicated widespread contamination of these sites, extending in some cases over several hundreds of acres. Similar situations are expected to exist at some of the presently active mill sites. In order to minimize any further land contamination from blowing ore or tailings, the uranium mill operators are now being required by NRC to control the dispersal of these materials during the milling operations. It is expected with the implementation of good control practices that land contamination at new uranium mill sites can be limited to areas in close proximity to the mill buildings, ore pads, and tailings areas.

Since the operators of uranium mills are required by NRC to submit a decommissioning plan for the mill site which includes a cleanup of contaminated land areas as a part of the license application, the NRC staff has developed this interim guidance to aid mill operators in developing these decommissioning plans and in estimating the costs associated with land cleanup. The objectives of the criteria are to return the mill site to unrestricted use for any purpose whatsoever without any restrictions, control, or monitoring required. The NRC also plans to use these criteria to require interim cleanup around existing mill sites where blowing of tails has been a problem in the past.

SUMMARY

In summary, just as was the case last year, tailings management is still the major item of concern relating to uranium milling operations. As stated earlier, the NRC feels that below-grade disposal is the preferred method of tailings management. The upcoming GEIS on uranium milling will further lend definition to the NRC approach on tailings management.

Regarding environmental monitoring, it is imperative that each mill accumulate a comprehensive data base over the next two years in order to enable determination of compliance with the EPA standards to be effective in December 1980.

REFERENCES

1. Nelson, J. D. and T. A. Shepherd, Evaluation of Long-Term Stability of Uranium Mill Tailing Disposal Alternatives, Colorado State University, Fort Collins, Colorado, April 1978.

Applicants may propose alternatives to the sampling program outlined in this staff technical position. However, it should be emphasized that the preoperational program should to the extent possible include the same sampling program (frequency, locations, types of samples) as the proposed operational program. Therefore, any proposed alternative sampling program to the preoperational program outlined in this branch position should be evaluated in relationship to its applicability to an operational monitoring program (i.e., an alternative sampling program should not be proposed unless the same program is applicable to the operational monitoring program).

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Operational Radiological Environmental Monitoring Program for Uranium Mills

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- (2) To evaluate the environmental impact of the radioactive effluents from the milling operations, including estimates of the potential radiation doses to the public.

TABLE I. FAILURE MECHANISMS

A. ELEMENTAL

1. CAP

- a) Differential settlement
- b) Gullyng
- c) Water sheet erosion
- d) Wind erosion
- e) Flooding
- f) Chemical attack
- g) Shrinkage

2. LINERS

- a) Differential settlement
- b) Subsidence of subsoil and rock
- c) Chemical attack
- d) Physical penetration

3. EMBANKMENT

- a) Differential settlement
- b) Slope failure
- c) Gullyng
- d) Water sheet erosion
- e) Wind erosion
- f) Flooding
- g) Weathering and chemical attack

4. REVEGETATION

- a) Fire
- b) Climatic change

5. WATER DIVERSION STRUCTURES

- a) Slope failure
- b) Obstruction

B. NATURAL PHENOMENA

1. Earthquakes
2. Floods /
3. Windstorms
4. Tornadoes
5. Glaciation
6. Fire and Pestilence

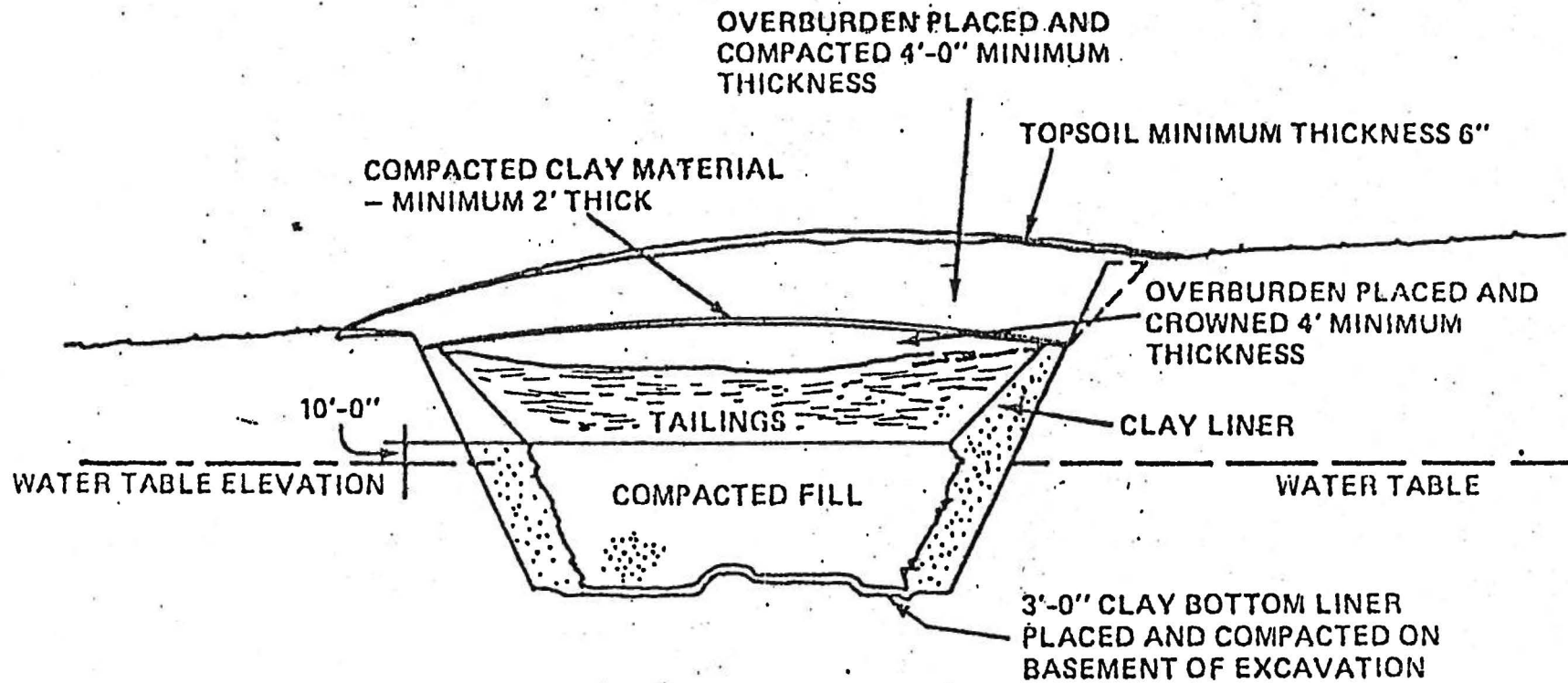


FIGURE 1. MINED-OUT PIT BURIAL-SLURRIED TAILINGS

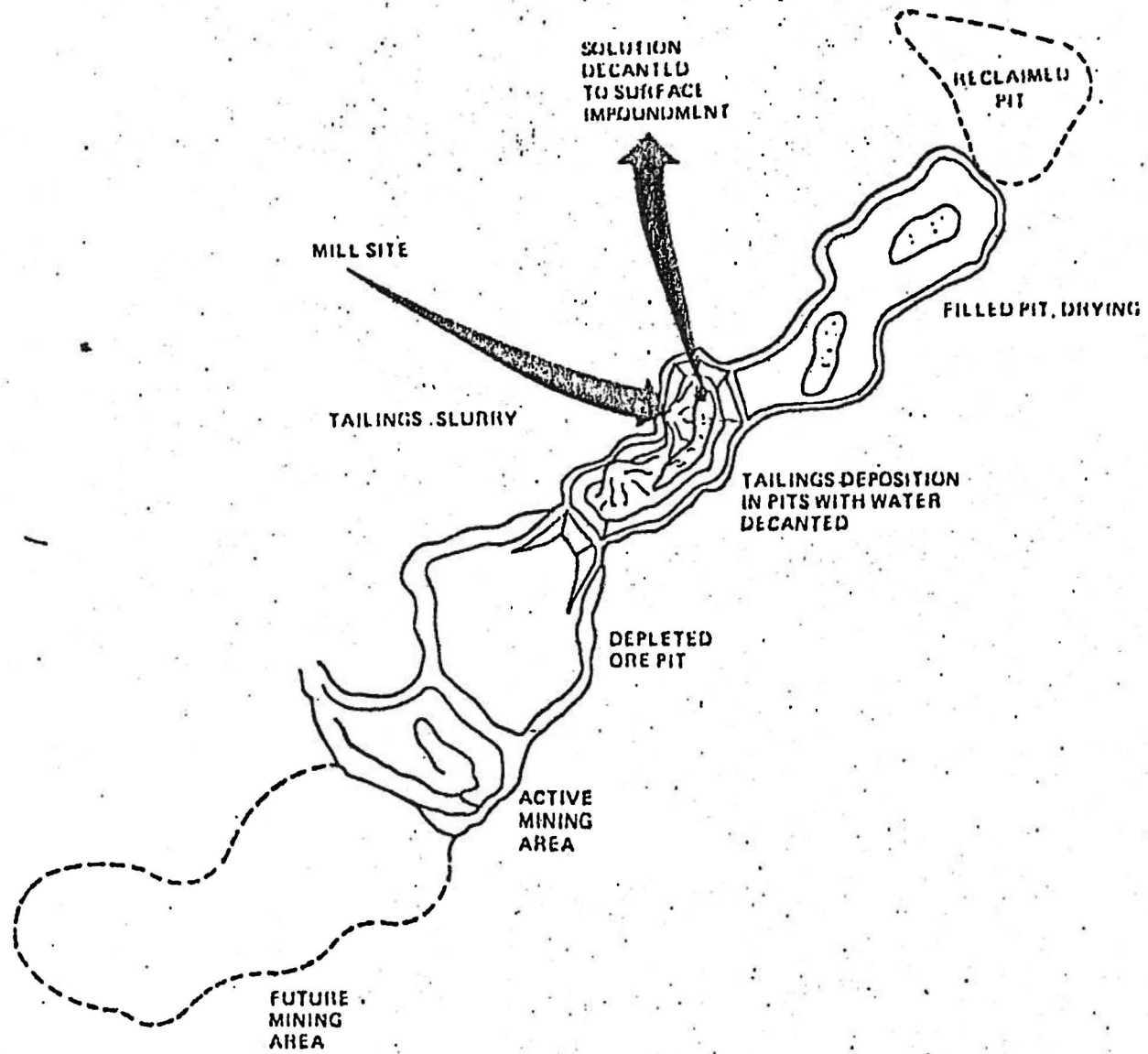


FIGURE 2. STAGED TAILINGS IMPONDMENT IN AN ACTIVE OPEN PIT MINE

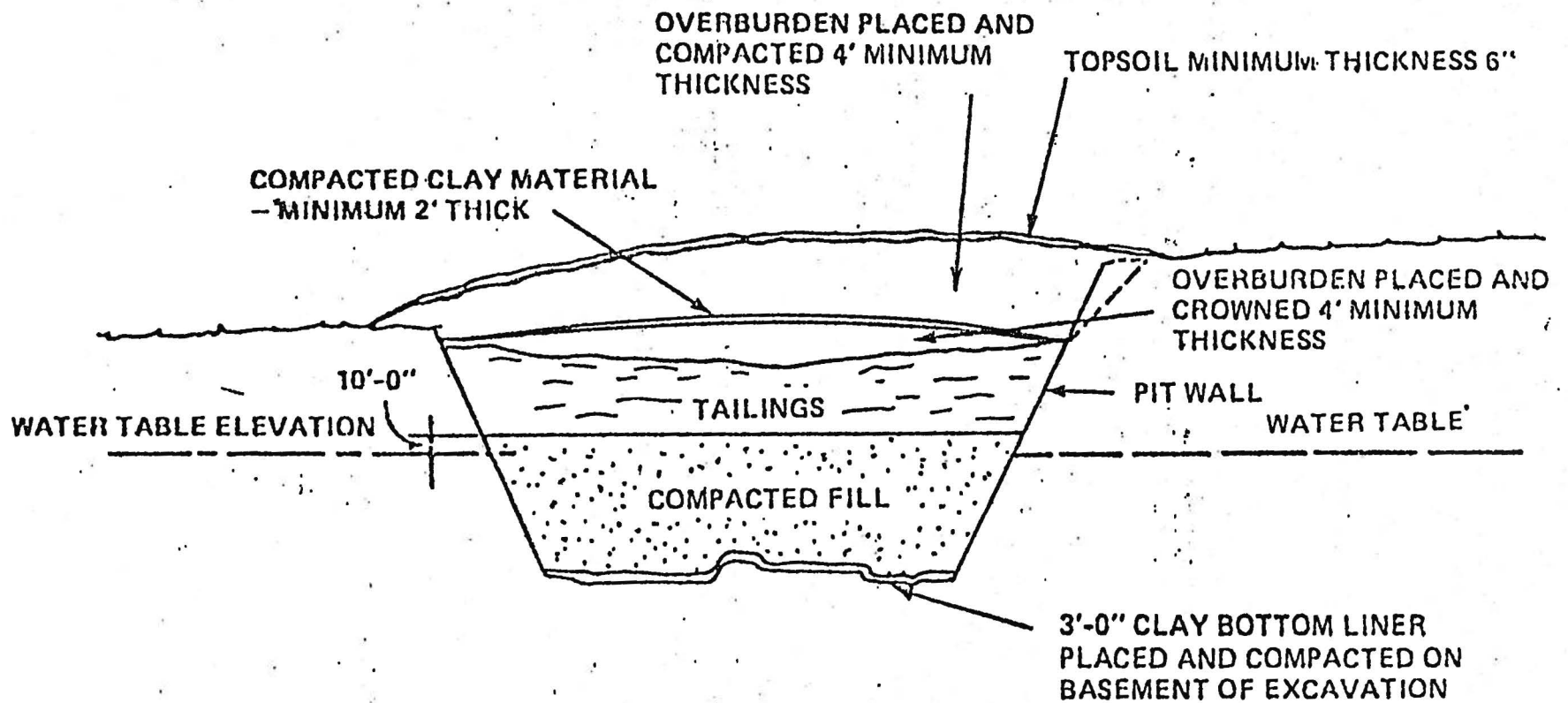
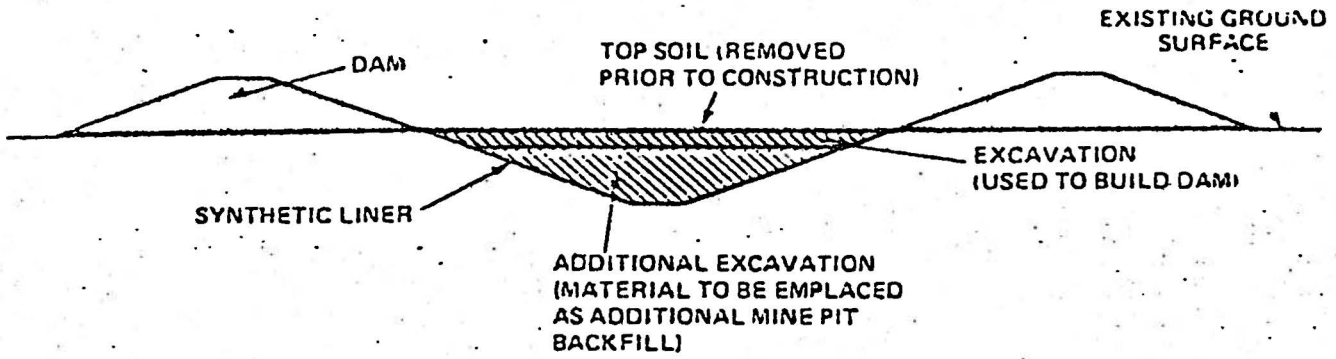
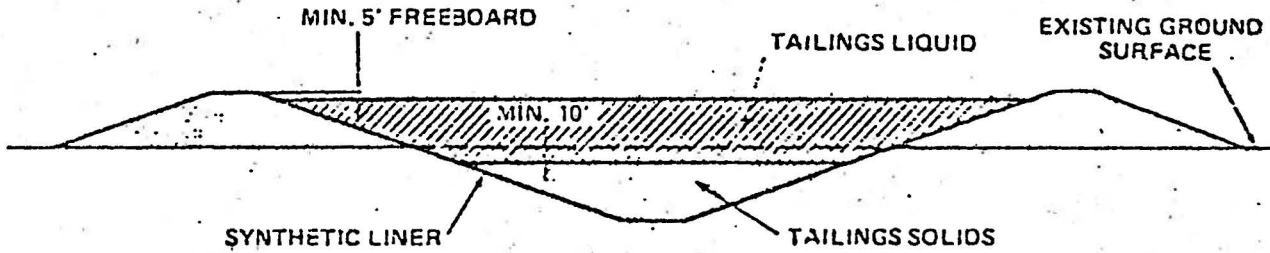


FIGURE 3. MINED-OUT PIT BURIAL-DEWATERED TAILINGS

TYPICAL CELL CONSTRUCTION



POST OPERATION/PRE-RECLAMATION



ABANDONMENT

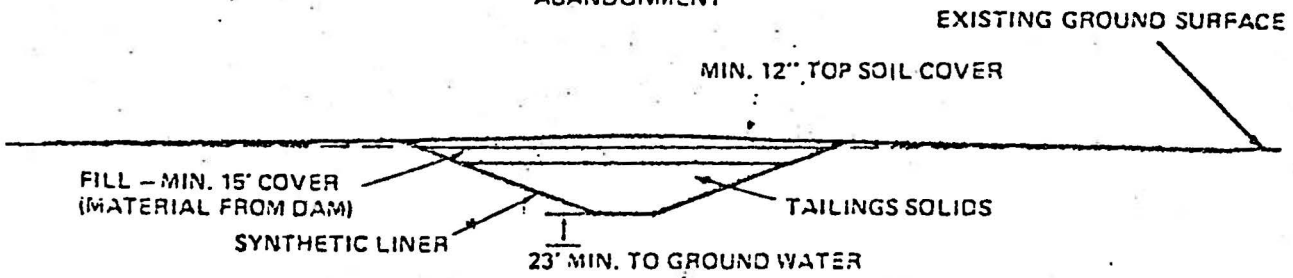
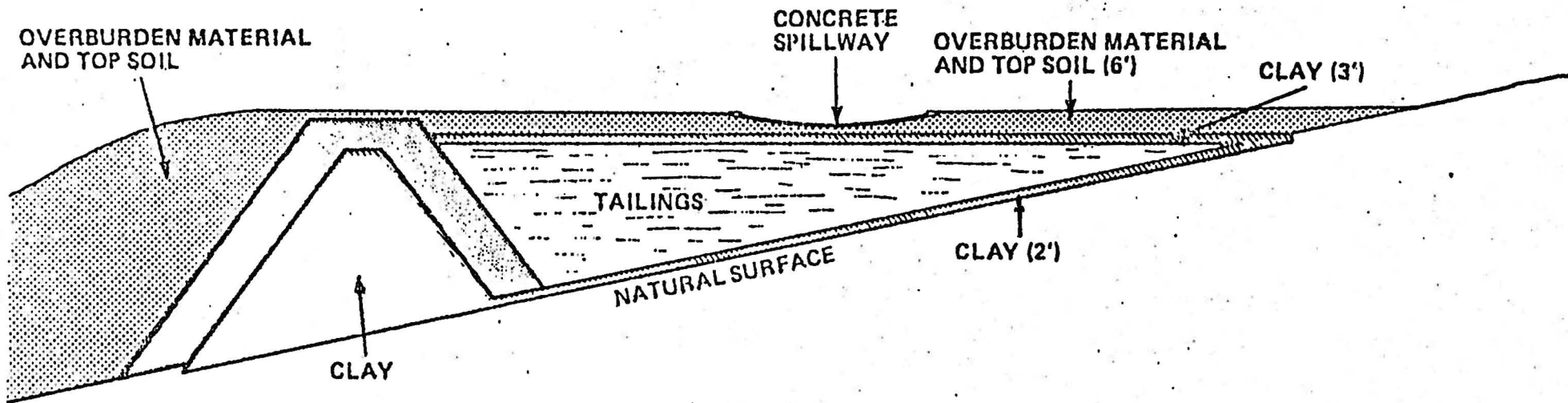


FIGURE 4. SPECIALLY EXCAVATED PITS FOR TAILINGS BURIAL

FIGURE 5
TAILINGS IMPOUNDMENT AT THE
HEAD-END OF A NATURAL VALLEY



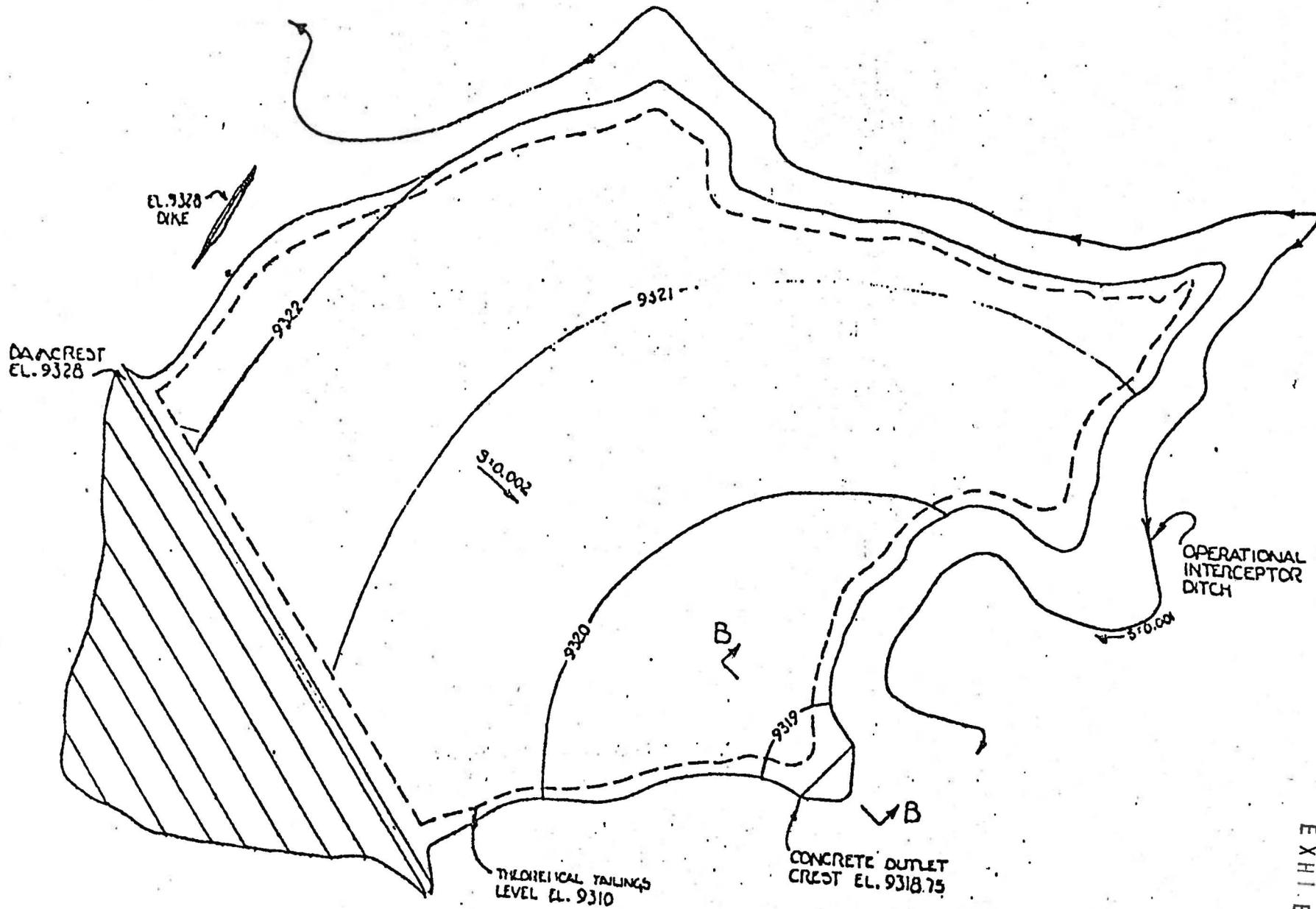


Figure 6. Tailings Impoundment at the Head End of a Natural Valley Plan View

STATE OF NEVADA
DEPARTMENT OF COMMERCE
INSURANCE DIVISION
201 SOUTH FALL STREET
CARSON CITY, NEVADA 89710
(702) 885-4270

DONALD W. HEATH, CLU
Commissioner of Insurance



ROBERT LIST
Governor

JAMES L. WADHAMS
Director

March 8, 1979

MEMORANDUM

TO: Senator Ashworth, Chairman
Committee on Human Resources and Facilities

FROM: Georgia Massey, Assistant Supervisor
Life & Health - Nevada Insurance Division

SUBJECT: Amendments to Senate Bill 75

With reference to Senate Bill 75, the Insurance Division wishes to propose the following changes:

1. Page 5, line 3, should be changed by deleting "both in new policies and renewals" and adding in its place "at the option of the applicant."
2. Page 6, line 42, should be changed as shown in "1", above.
3. Page 8, line 35, should be changed as shown in "1", above.

The above changes would allow the alcohol abuse benefit to remain at the option of the applicant whether to purchase or not. The coverage available for such expense should be those proposed in Senate Bill 75.

GM:scm

S. B. 75

 SENATE BILL NO. 75—COMMITTEE ON
 COMMERCE AND LABOR

JANUARY 23, 1979

Referred to Committee on Human Resources and Facilities

SUMMARY—Requires coverage for treatment of alcohol abuse
in group policies. (BDR 57-89)FISCAL NOTE: Effect on Local Government: No.
Effect on the State or on Industrial Insurance: No.

 EXPLANATION—Matter in *italics* is new; matter in brackets [] is material to be omitted.

AN ACT relating to insurance; requiring coverage for treatment for the abuse of alcohol in group insurance policies; creating a temporary advisory task force; and providing other matters properly relating thereto.

The People of the State of Nevada, represented in Senate and Assembly, do enact as follows:

- 1 SECTION 1. Chapter 458 of NRS is hereby amended by adding
 2 thereto the provisions set forth as sections 2 and 3 of this act.
 3 SEC. 2. 1. *An advisory task force, consisting of five members, is*
 4 *hereby created.*
 5 2. *The governor shall appoint:*
 6 (a) *One member who is a representative of the insurance division*
 7 *of the department of commerce.*
 8 (b) *One member who is a representative of the bureau.*
 9 (c) *One member who is a representative of the health insurance in-*
 10 *dustry.*
 11 (d) *One member who is a representative of the general public.*
 12 3. *The legislative commission shall appoint one member who is a*
 13 *legislator.*
 14 SEC. 3. *The task force shall:*
 15 1. *Review the procedures employed by the bureau for certifying*
 16 *persons, accrediting programs and licensing facilities, and recommend*
 17 *any necessary changes to the bureau.*
 18 2. *Advise the insurance division on carrying out the provisions of*
 19 *law relating to insurance coverage for treatment of the abuse of alcohol.*
 20 3. *Advise the 1981 session of the legislature on appropriate maxi-*
 21 *mum levels of benefits and methods of determining future benefit levels*
 22 *for insurance coverage for treatment of the abuse of alcohol.*