



UNITED STATES

NUCLEAR REGULATORY COMMISSION

REGION IV

URANIUM RECOVERY FIELD OFFICE
BOX 25325
DENVER, COLORADO 80225

APR 19 1987

Quivira Mining Company
ATTN: Dr. John C. Stauter, Director
Nuclear Licensing and Regulation
P. O. Box 25861
Oklahoma City, Oklahoma 73125

Gentlemen:

We are in receipt of your letter dated March 31, 1987 requesting amendment of Source Material License SUA-1473 to authorize processing of alternate feed materials at the Ambrosia Lake Mill. We have initiated our review of your request, and hope to complete the review within approximately one month.

During a meeting held at the URFEO office on April 2, 1987, Quivira Mining Company requested an interim authorization to receive and store the alternate feed material at the Ambrosia Lake Mill pending NRC approval to process the material. Our review of your submittal indicates that the alternate feed material constitutes "source material" as defined in 10 CFR 40.4(h). The transfer of source material to a person authorized to receive such source material under a specific license issued by the Commission is authorized in 10 CFR 40.51(b)(5). The transfer of the source material to the Ambrosia Lake Mill is in accordance with 10 CFR 40.51(b)(5) and is therefore acceptable.

Please note that this letter does not authorize processing of the alternate feed material. Amendment of SUA-1473 is necessary before processing can begin. Should you have any questions, please contact Mr. Pete Garcia of my staff at (303) 236-2820.

Sincerely,

Harry J. Pettengill, Chief
Licensing Branch 2
Uranium Recovery Field Office
Region IV

RECEIVED

APR 19 1987

NUCLEAR LICENSING

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PDR ADOCK 04008905
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UNITED STATES
NUCLEAR REGULATORY COMMISSION

REGION IV
URANIUM RECOVERY FIELD OFFICE
BOX 25325
DENVER, COLORADO 80225

SEP 8 1987

URFO:RSH
Docket No. 40-8905
SUA-1473, Amendment No. 5
04008905210E

Quivira Mining Company
ATTN: Dr. J. C. Stauter, Director
Nuclear Licensing and Regulation
P.O. Box 25861
Oklahoma City, Oklahoma 73125

Gentlemen:

Pursuant to Title 10, Code of Federal Regulations, Part 40, and in accordance with your letter dated August 6, 1987, Source Material License SUA-1473 is hereby amended to authorize the processing of calcium fluoride generated during the yellowcake purification process at Sequoyah Fuels Corporation's Gore, Oklahoma facility by modifying License Condition No. 31, which reads as follows:

31. The licensee is authorized to process alternate feed materials (raffinate and calcium fluoride sludges) from Sequoyah Fuels Corporation's Gore, Oklahoma facility in accordance with the submittals dated March 31, July 15, and August 6, 1987.

All other conditions of this license shall remain the same. The license is being reissued in its entirety to incorporate the revision specified above.

The issuance of this amendment was discussed and agreed to via telecon between Mr. Jim Cleveland of Quivira and Mr. Pete Garcia of my staff on September 17, 1987.

FOR THE NUCLEAR REGULATORY COMMISSION

R. Dale Smith, Director
Uranium Recovery Field Office
Region IV

Enclosure: Source Material License SUA-1473

8711060221
10pp. (A-2)

SEP 20 1987

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APPENDIX B

QUIVIRA'S NESHAP QUESTIONS TO EPA

Rio Algom Mining Corp.

September 13, 1990

Certified Mail
Return Receipt Requested P 568 963 612

Mr. Hank May
Radiation Representative (6T-ET)
U.S. Environmental Protection Agency, Region VI
Allied Bank Tower
1445 Ross Avenue
Dallas, Texas 75202-2733

Re: NESHAP Regulation Policy and Clarification

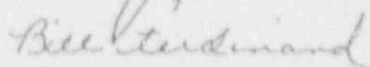
Dear Mr. May:

As we discussed during our meeting at your office in Dallas on August 21, you requested a written follow up to our questions pertaining to the newly promulgated NESHAP regulations as contained in subparts T and W. Attached are Rio Algom Mining Corp. and its subsidiary, Quivira Mining Company, questions which we believe need further clarification.

We believe that these issues need further clarification and explanation so that the future development and operation at our facilities can be achieved while maintaining compliance with the dual regulations of EPA and NRC.

If you need further information or have questions please call me at (405) 842-1773.

Sincerely,



Bill Ferdinand, Manager
Radiation Safety, Licensing
& Regulatory Compliance

Attachments: as stated

xc: M. Freeman
R. Luke
File

NESHAP Questions - Subparts T & W

Question 1:

If a tailings impoundment meets the definition of operational as defined in Subparts T and W, including:

1. Being licensed to accept additional tailings;
2. Has an approved groundwater Detection Monitoring Plan\Corrective Action Plan;
3. Has not begun final closure;
4. And complies with the regulations as defined in 40 CFR 264.221 which includes a still in force *existing impoundment exemption*, as referenced by Subpart W regulations 40 CFR 61.252(c) and 40 CFR 192.32 (a):

is the tailings impoundment still considered operational?

Question 2:

Does the term "ore" as used in 40 CFR 61.220(c) and 40 CFR 61.251(g) define only conventional mined material? If so, are alternate feed material exempt from this section of the regulations?

Question 3:

Under the definitions as contained within 40 CFR 61.221(c) and 40 CFR 61.251(g), uranium byproduct material or tailings is defined to mean the waste produced by the extraction or concentration of uranium from any ore processed primarily for its source material content.

It is not clear from this definition whether other materials normally considered byproduct material, such as contaminated processing equipment and the uranium mill itself when decommissioned are considered byproduct material. It is also not clear if this includes in-situ leaching byproduct material. What are EPA's definitions of byproduct material and waste, and do they include such things such contaminated equipment associated with uranium processing?

Question 4:

Within Subpart T, regulation 40 CFR 61.222 - Standard, it indicates that a tailings impoundment must satisfy two conditions in order to be termed "*disposed of*":

1. Tailings impoundments must not exceed the radon flux standard of 20 pCi/m²/second;
2. Long term reclamation completed within two years.

Due to the physical impossibility of completing long term "disposal" within two years, is this the intent of the regulation that both must be completed within two years or does the two year limit only apply to reducing the average radon flux to 20 pCi/m²/second?

Question 5:

Due to the dual regulation of uranium mills by both EPA and NRC, conflicting regulations between the agencies will arise. For instance, EPA Subpart T regulation 40 CFR 61.222 (b) states long term stabilization of tailings impoundments must be completed within two years.

However, the permittee's NRC license states that decommissioned mills and contaminated materials will be placed within the tailings impoundment upon final completion of milling operations. Final completion of milling operations may exceed EPA's mandated deadline of two year period for long term stabilization.

Another example, NRC's regulation 10 CFR 40, Appendix A, criteria 2, states that to avoid proliferation of small radioactive waste disposal sites, byproduct material from in-situ leaching (ISL) operations shall be placed within existing tailings impoundments. As such, some NRC licenses contain specific language that ISL byproduct material be disposed of within an existing tailings impoundment. How are these and other differences to be addressed and in what type of forum? Is the two year period for long term stabilization going to result in proliferation of disposal sites rather than the non-proliferation of disposal sites?

Question 6:

If a tailings impoundment has been designated as non operational and is being reclaimed, can new lined cells that comply with all regulatory requirements be constructed on a portion of the closed impoundment with only that area containing the new cells be classified as operational?

Question 7:

What are the waiver procedures or requirements if the impoundments are not going to meet the two year time frame for final disposal and what interface structure exists between EPA and NRC to effect final reclamation activities in compliance with the requirements of both agencies? Will a NRC approved reclamation plan meet the requirements of 40 CFR 61.222(b)?

Question 8:

Within 40 CFR 61.223(a) - Compliance Procedures, it states *"Sixty days following the completion of covering the pile to limit radon emissions but prior to long term stabilization of the pile, the owners or operators of uranium mill tailings shall conduct testing for all piles within the facility..."*. Does this mean all tailings impoundments within the facility must be tested for radon flux emanation or just that individual pile covered to comply with the radon flux standard?

Question 9:

As stated within 40 CFR 61.223(a) - Compliance Procedures, it declares that 60 days following completion of covering the pile, radon flux testing shall be conducted. Rio Algom interprets this as stating that testing will be started within 60 days rather than the literal interpretation of testing on the 60th day or completed within 60 days. Is this interpretation correct?

Question 10:

The regulations in 40 CFR 61.223(a) and (b) cite specific time schedules for prior notification, sampling and reporting. Specifically, in 61.223(b) it states that EPA shall be provided a report of the sampling results 90 days *after the testing*

is required. Does EPA mean that the sampling results are due 90 days after testing is required to begin or actually intended to state 90 days after testing is completed?

Question 11:

What does the term *radon cover* mean in 40 CFR 61.223(a) and when can testing begin? Can a *radon cover* be tested to determine compliance even if additional cover will be placed on the impoundment as part of the final cover design?

Question 12:

The standards in Subpart T and W, 40 CFR 61.222(a) and 40 CFR 61.252(a) respectively, state radon flux shall not exceed 20 pCi/m²/second from the mill tailings pile. Quivira interprets this as meaning the flux standard is applicable only from the tailings material to the atmosphere. As such, background flux of the cover material may be taken into consideration. Is this correct?

Question 13:

Within 40 CFR 61.251(f), phased disposal method, it states that tailings are managed and disposed in lined impoundments and immediately dried. What does the term "immediately dried" mean?

Question 14:

Within the approved method for determining compliance with the radon flux standard, 40 CFR 61, Appendix B, Method 115, it requires 100 samples for each cell for each of the following areas: saturated beaches, loose\ dry top surfaces, and sides. In consideration that all cells may not be 40 acres in size but may be as small as 1 acre in size with extremely small beaches or dry top surfaces, are there procedures for alternate quantities of samples?

Question 15:

Within 40 CFR 61, Appendix B, Method 115, Radon Flux Measurements, it requires 100 samples to be collected from saturated beaches. How does EPA propose such samples be taken from these areas when such areas contain slimes or other unconsolidated conditions and access would endanger personnel?

Question 16:

Contained within Subpart W, 40 CFR 61.253 - Determining Compliance, it states that when measurements are made over a one year period, EPA shall be provided a schedule of measurement frequency. It also states that EPA must be notified 30 days in advance of any measurement. Since EPA will be provided a schedule of measurement frequency over a one year period, isn't the 30 day notice rule fulfilled?

Question 17:

Within 40 CFR 61.04, it requires all requests, reports, applications, submittals, and other communications be submitted to the appropriate EPA regional office. It also requires this information to be sent to the state, if EPA has delegated authority to implement and enforce national air pollutant standards. Has EPA delegated such authority to New Mexico or Utah? If such authority has been granted, is this in conflict with The Atomic Energy Act section 274 as amended which indicates that Non-Agreement States are without authority to regulate or license an AEC facility?

APPENDIX C

FUTURE DISPOSAL CELL LOCATIONS



Quivira Mining Company

February 22, 1991

Mr. Ramon Hall
U.S. Nuclear Regulatory Commission
Uranium Recovery Field Office
P. O. Box 25325
Denver, Co. 80225-0325

RE: NRC License No. SUA-1473
Docket No. 40-8905

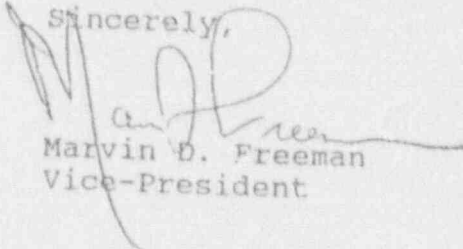
Dear Mr. Hall:

NRC was copied on an EPA letter to Quivira Mining Company requesting additional information pertaining to Quivira's "Application for Approval for Construction" of a small lined cell on Tailings Pond 2 at the Ambrosia Lake, New Mexico facility. A copy of Quivira's response to EPA is attached.

The Ambrosia Lake tailings facility is licensed by NRC under the referenced license; however, EPA has also issued criteria covering this site under the NESHAP regulations. As previously discussed, this has resulted in conflicting requirements and schedules which are impossible for operators to comply with.

Also attached are two letters from Senator Alan K. Simpson (R-WY.) to EPA Administrator William K. Reilly addressing this issue.

Sincerely,


Marvin D. Freeman
Vice-President

MDF:jet

Attachments: As stated

CC: B. Ferdinand - w/o attachments
File(s)

EPAUNITED STATES ENVIRONMENTAL PROTECTION AGENCY, REGION VI
1445 Ross Ave. at Fountain Place
Dallas, TX 75202-2733**FACSIMILE REQUEST AND COVER SHEET****TO**

PLEASE PRINT IN BLACK INK ONLY

PLEASE REMOVE ALL STAPLES

Bill Ferdinand

FACSIMILE # (405) 848-1208
CONF. # (405) 842-1773**OFFICE/PHONE**

Rio Algom Mining Corp.

REGION/LAB

6305 Waterford Blvd.

FROM

HANK MAY

PHONE

(214) 655-7223

MAIL CODE

GT-ET

OFFICE

U.S. EPA Dallas Regional Office

DATE SENT**NUMBER OF PAGES NOT TO INCLUDE COVER SHEET****TIME SENT**

Please number all pages

INFORMATION FOR SENDING FACSIMILE MESSAGES**FACSIMILE
NUMBER****VERIFICATION
NUMBER**FTS: 255-2164
COMM: (214) 655-2164

See Addressee

As we discussed at 12:05 pm CST APR. 11 1991

It should be noted, however, that approval of the application to construct is based upon our understanding of the following factors:

1. The tailings impoundment subject to Subpart W will only be placed on dry areas of the underlying tailings impoundment # 2. (For this purpose a dry area is an area overlying tailings the moisture content of which will not be significantly increased by the presence of the new disposal cell.)
2. The construction of, or operations at, the proposed new tailings cell will not cause a delay in the timely disposal of the tailings in tailings impoundment #2.
3. This approval does not affect the owner/operator's obligation to comply with the Subpart T NESHAP requirements for the underlying tailings pile. Since the Subpart W pile will remain physically distinct from the underlying Subpart T tailings impoundment #2, impoundment #2 will retain its status as a Subpart T pile. In determining compliance, an inspector must be able to evaluate the status of both the Subpart T and W tailings impoundments.
4. The requirements of 40 CFR §61.223 must be met by the underlying tailings impoundment #2 after placement of the liner and prior to adding the Subpart W tailings impoundment. Alternative compliance testing procedures may be used, if prior EPA approval is obtained in accordance with 40 CFR §61.223 (a).
5. Periodic checks of the phased disposal cell's liner should be performed. If the liner is disturbed additional requirements to ensure compliance with both Subparts T and W may be necessary.
6. The number of Subpart W tailings impoundments to be ultimately approved will be strictly limited. At some point, if additional disposal cells are added in the future, the overall site would have to be recognized as being in "operation" and therefore subject to the requirements of Subpart W.

Quivira Mining Company

April 16, 1991

Certified Mail
Return Receipt # P 568 963 646

Mr. Hank May
Radiation Representative
U.S. Environmental Protection Agency, Region VI
Allied Bank Tower
1445 Ross Avenue
Dallas, Texas 75202-2733

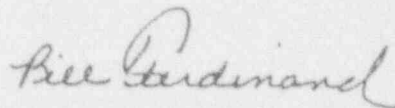
Re: Supplement Information
Application For Approval of Construction
Phased Disposal Tailings Cell

Dear Mr. May:

Quivira Mining Company submits the following supplemental information pursuant to telephone conversations and Agency facsimile material on April 11 and 12. Pursuant to these discussions, Quivira requests the approval for construction of the three (3) additional cells as indicated in the February 1, 1990 submittal, Appendix C, as well as the originally proposed cell. This submittal reflects Quivira's commitment in the operation of the phased disposal cell and compliance with regulations in Subpart T of 40 CFR §61.

It is Quivira's understanding that upon Agency concurrence with this supplemental information, EPA Region VI will shortly thereafter issue the permit for construction of a phased disposal tailings cell at the Ambrosia Lake facility. Your attentiveness on this matter is appreciated.

Sincerely,



Bill Ferdinand, Manager
Radiation Safety, Licensing
& Regulatory Compliance

Attachments: (as stated)

CC: H. May - Via Facsimile
R. Calegari
M. Freeman
R. Luke
P. Luthiger
H. Whitacre
File

SUPPLEMENTAL INFORMATION

APPLICATION FOR APPROVAL OF CONSTRUCTION

For A Phased Tailings Disposal Cell

At

Quivira Mining Company's

Uranium Processing Facility

Ambrosia Lake, New Mexico

Presented To The

U. S. Environmental Protection Agency

April 1991

The following supplemental information reflects Quivira Mining Company's commitment in the operation of its phased disposal cells and operation towards compliance with regulations contained in 40 CFR 61, Subpart T.

1. The tailings impoundments subject to Subpart W will only be placed on dry areas of the underlying tailings impoundment #2. (For this purpose, a dry area is meant to be an area that overlies existing tailings whose moisture content will not be significantly increased by the presence of the new disposal cell).
2. The construction of, or operations at, the proposed new tailings cell will not cause a significant delay in the timely disposal of the tailings in tailings impoundment #2.
3. EPA's approval does not affect the owner/operator's obligation to comply with the Subpart T NESHAP requirements for the underlying tailings pile. Since the Subpart W pile will remain physically distinct from the underlying Subpart T tailings impoundment #2, impoundment #2 will retain its status as a Subpart T pile. In determining compliance, an inspector will be able to evaluate the status of both the Subpart T and W tailings impoundments.
4. The radon flux limits in 40 CFR §61.223 will be met for that portion of the underlying tailings impoundment #2 after placement of the liner and prior to adding tailings to the Subpart W tailings impoundment. Alternative compliance testing procedures may be used, if prior EPA approval is obtained in accordance with 40 CFR §61.223 (a).
5. Periodic checks of the phased disposal cell's liner will be performed. If the liner is disturbed additional requirements to ensure compliance with both Subparts T and W, should it be necessary, will be implemented.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 6

1445 ROSS AVENUE, SUITE 1200

DALLAS, TEXAS 75202-2733

APR 24 1991

Mr. Bill Ferdinand, Manager
Radiation Safety, Licensing
& Regulatory Compliance
Rio Algom Mining Corporation
6305 Waterford Blvd., Suite 325
Oklahoma City, Oklahoma 73118

Re: National Emission Standards for Hazardous Air Pollutants
(NESHAPs), Standards for Radon Emissions from Operating Mill
Tailings, 40 CFR Part 61, Subparts A and W.

Dear Mr. Ferdinand:

This is in response to your application of November 16, 1990, and supplemental amendments of February 1 and April 18, 1991, which were submitted pursuant to 40 CFR §61.07 NESHAPs for approval to construct four new disposal cells for mill tailings at Quivira's uranium mill site at Ambrosia Lake, New Mexico.

Specifically, your application is for approval to construct four new synthetic, double lined, tailings cells to dispose of low specific activity (LSA) byproduct material resulting from the extraction of uranium using the phased disposal processing method in accordance with 40 CFR §61.252(b)(1). All material proposed to be processed at the Ambrosia Lake facility is classified as source material in accordance with Nuclear Regulatory Commission (NRC) source material license, SUA-1473, license condition 31. None of the material to be processed is mixed waste. The mill feed material includes raffinate and calcium fluoride generated by the Sequoyah Fuels Uranium Hexafluoride (UF₆) conversion facility at Gore, Oklahoma. These materials are generated as LSA byproduct material during Sequoyah Fuels' process of converting the "yellowcake" uranium mill product to UF₆. The LSA radioactive byproduct material generated at Sequoyah Fuels contains extractable quantities of uranium in concentrations comparable to, or in excess of, normal uranium feed ores. Subsequently, both materials have been officially determined by NRC as being source material, in accordance with 10 CFR §40.4(h).

The proposed tailings impoundment cells are to be located within the NRC restricted area boundary at Quivira's Ambrosia Lake uranium

processing mill. The cells are to be constructed below grade within the existing tailings impoundment #2 and each cell will be designed to hold approximately 2,700 dry tons of LSA byproduct material. The proposed phased disposal cells are to be constructed as double lined impoundments each with a secondary leachate collection/leak detection system between the liners. The top and bottom synthetic liners each are to be 90 mil thick and made from Deery Membrane #6 or equivalent liner material. The leachate/leak detection system is to be placed between the two geomembranes within a clean, coarse sand blanket. The interstitial blanket is to be 6 inches thick with a leachate collection/leak detection system located in the middle of the cell at the base of the juncture of the cell site wall slopes and the cell floor. The detection system is to be made from 4 inch, schedule 40, perforated PVC pipe and will extend the entire length of the cell and will collect all fluids by gravity flow. There are to be two leak detection monitoring stations located in the middle of each cell on each of the longer embankments.

In accordance with the September 24, 1990, NRC-approved reclamation plan for tailings impoundment #2, the northern portion of tailings impoundment #2 is to be contoured and compacted to allow the phased disposal cells to be built below grade while also complying with NRC geotechnical requirements, including final grade design, tailings stability, radon attenuation cover thickness and construction quality control. The impermeable liner of the proposed cell disposal areas is anticipated to reduce the radon emissions from the underlying tailings well below the 20 pCi/m²-second standard.

Based on our review of the information received in your application to construct the new phased disposal cells, Region 6 of the Environmental Protection Agency has determined that the new sources will not cause emissions in excess of the requirements and provisions of 40 CFR Part 61, Subparts A and W for radionuclides. Approval is hereby granted for the requested construction described in the application as supplemented by the information sent to us with your letters of February 1 and April 16, 1991. In particular, Attachment A lists our understanding of five factors which were carefully considered. It should be understood that the number of Subpart W tailings impoundments to be ultimately approved in the future will be limited. At some point, if additional disposal cells are added in the future, the overall site would have to be recognized as being in "operation" and therefore subject to the requirements of Subpart W.

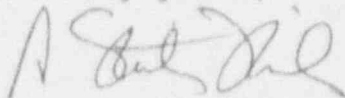
This approval is granted solely under Section 112 of the Clean Air Act, and implementing regulations of 40 CFR Part 61, and in no way affects approvals or activities required by other applicable requirements at 40 CFR or other Federal or state regulatory authorities. Further, this approval does not limit any action which this Agency could take to implement or enforce air pollution

requirements, including those required to prevent imminent and substantial endangerment to health.

All notifications and reports required by applicable NESHAP should be sent to:

Mr. A. Stanley Meiburg
Acting Director
Air, Pesticides and Toxics Division (6T)
US Environmental Protection Agency
1445 Ross Avenue
Dallas, Texas 75202-2733

Sincerely yours,



A. Stanley Meiburg
Acting Director
Air, Pesticides & Toxics Division (6T)

cc: Judith Espinola, New Mexico
Environmental Improvement Division

Ramon E. Hall, Nuclear Regulatory Commission
Uranium Recovery Field Office.

Attachment A: Factors Considered During Review

Approval of this application to construct is based upon our understanding of the following factors:

1. The tailings impoundment subject to Subpart W will only be placed on dry areas of the underlying tailings impoundment #2. (For this purpose a dry area is an area overlying tailings the moisture content of which will not be significantly increased by the presence of the new disposal cells.)
2. The construction of, or operations at, the proposed new tailings cells will not cause a delay in the timely disposal of the tailings in tailings impoundment #2.
3. This approval does not affect the owner/operator's obligation to comply with the Subpart T NESHAP requirements for the underlying tailings pile. Since the Subpart W cells will remain physically distinct from the underlying Subpart T tailings impoundment #2, impoundment #2 will retain its status as a Subpart T pile. In determining compliance, an inspector will be able to evaluate the status of both the Subpart T and W tailings impoundments.
4. The requirements of 40 CFR §61.223 must be met by the underlying tailings impoundment #2 after placement of the liner and prior to adding the Subpart W tailings impoundment. Alternative compliance testing procedures may be used, if prior EPA approval is obtained in accordance with 40 CFR §61.223 (a)
5. Periodic checks of the phased disposal cell's liner will be performed. If the liner is disturbed additional requirements to ensure compliance with both Subparts T and W may be necessary.

Quivira Mining Company

April 25, 1991

Certified Mail
Return Receipt Requested P 568 963 649

Mr. Hank May
Radiation Representative
U.S. Environmental Protection Agency, Region VI
Allied Bank Tower
1445 Ross Avenue
Dallas, Texas 75202-2733

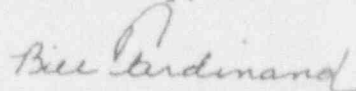
Re: Clarification of Phased Disposal Tailings Cell

Dear Mr. May:

This letter is to verify our understanding of item #4 as contained in Attachment A of EPA's letter dated April 24, 1991. Per our discussions, item #4 is not meant to be construed as requiring the completion of final reclamation activities on tailings impoundment #2 prior to disposing of raffinate tailings within the newly approved disposal cells. Rather, the intent and requirement of item #4 is after placement of the synthetic liner, Quivira must document compliance with the radon flux standard of 20 pCi/meter²/second for the underlying tailings using the procedures as outlined in 40 CFR §61.223.

This understanding is pursuant to our meeting on April 12 and today's telephone conversation and unless advise otherwise, we will conclude this to be correct. We appreciate your attentiveness on this application.

Sincerely,



Bill Ferdinand, Manager
Radiation Safety, Licensing &
Regulatory Compliance

xc: M. Freeman
R. Luke
P. Luthiger
H. Whitacre
file



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 6

1445 ROSS AVENUE, SUITE 1200

DALLAS, TEXAS 75202-2733

MAY 23 1991

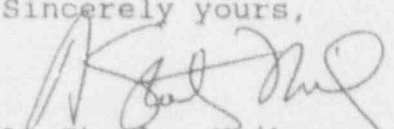
Mr. Bill Ferdinand, Manager
Radiation Safety, Licensing
& Regulatory Compliance
Rio Algom Mining Corporation
6305 Waterford Blvd., Suite 325
Oklahoma City, Oklahoma 73118

Dear Mr. Ferdinand:

This responds to your letter of April 25, 1991, to Mr. Hank May of my staff. You asked for clarification of the intent of item #4 of Attachment A to my letter to you of April 24, 1991, approving construction of four tailings disposal cells at Quivira's Uranium Mill site at Ambrosia Lake, New Mexico.

The intent of item #4 of Appendix A is to insure that the portion of tailings impoundment #2 covered by a new disposal cell is in compliance with the radon emissions standard at 40 CFR 61.222(a) following the placement of the synthetic liner but prior to adding tailings to the new disposal cell. There was no intent to require the entire tailings impoundment #2 to be covered, as specified at 40 CFR 61.223(a) before conducting the radon emissions testing specified at 40 CFR 61.223(a).

Sincerely yours,


AK Stanley Meiburg
Acting Director
Air, Pesticides & Toxics Division (6T)

cc: Judith Espinosa, New Mexico
Environmental Improvement Division

Ramon E. Hall, Nuclear Regulatory Commission
Uranium Recovery Field Office.

Quivira Mining Company

July 16, 1991

Certified Mail
Return Receipt Requested P 558 963 657

Mr. Hank May
Radiation Representative
U.S. Environmental Protection Agency, Region VI
Allied Bank Tower
1445 Ross Avenue
Dallas, Texas 75202-2733

Re: Quivira Mining Company - Amendment To Change Liner Material
Phased Disposal Tailings Cell
Ambrosia Lake, New Mexico

Dear Mr. May:

Pursuant to our telephone conversation on July 9, 1991, Quivira Mining Company requests an amendment to the cell construction specifications as approved by EPA in Mr. Meiburg's letter dated April 24, 1991. This amendment became necessary because the contractor anticipated to construct the phased disposal cells, has subsequently declined to work the job. As a result, new liner material must be selected as the Deery #6 membrane material is propriety material and solely offered by this contractor.

In its place and in accordance with EPA's April 24, 1991 approval letter, Quivira has selected an equivalent liner material made of high density polyethylene (HDPE) geomembrane. This material meets or exceeds the National Sanitation Foundation (NSF) Standard 54 for HDPE and has a permeability of 1.8×10^{-13} cm/second. This is several orders of magnitude better than the Deery #6 geomembrane liner which has a permeability of 2.1×10^{-10} cm/second and exceeds EPA's RCRA permeability liner requirement of 1×10^{-7} cm/second.

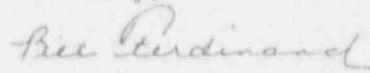
Due to this liner replacement, the interstitial layer consisting of 6 inch layer of sand must also be changed. The new HDPE liner has lower coefficient of friction then the Deery #6 liner and thus does not buttress sand as effectively. If not changed, sand slumping and ultimate failure could occur on the phased disposal cell. In its place, Quivira proposes to use HDPE drainage net. This material is commonly used in hazardous waste disposal cells and serves as a replacement for conventional aggregate systems such as sand and gravel. The drainage net also eliminates the need for the longitudinal pipe system (long side of cell) as the drainage net allows the quick drainage of fluids to the cell's central leachate/leak detection pipe for rapid leak

detection. Further details on the liner and proposed interstitial layer are contained within the proposed amendment.

All other specifications and items contained within the November 19, 1990 application and the February 1 and April 16, 1991 supplemental submittals remain the same. The new HDPE liner and drainage net material will perform and comply with the Subpart W, 40 CFR §61.252 requirements.

We would appreciate your attentiveness on this matter. We would be willing to meet with you on short notice in order to expedite the review and approval of this amendment on liner construction. Please call me at (405) 842-1773 for this purpose or if you have further questions.

Sincerely,



Bill Ferdinand, Manager
Radiation Safety, Licensing
& Regulatory Compliance

Attachments: (2)

cc: R. Calegari
T. Fletcher
M. Freeman
R. Luke
P. Luthiger
H. Whitacre
file

AMENDMENT TO CHANGE LINER MATERIAL

For The Phased Tailings Disposal Cells

At

Quivira Mining Company's

Uranium Processing Facility

Ambrosia Lake, New Mexico

Presented To The

U. S. Environmental Protection Agency

July 1991

Amendment To Change Liner Material

A. Purpose

The purpose of this amendment is to change the type of construction material used in the phased disposal cell. These changes encompass the geomembrane liner including the material and construction of the interstitial layer. All other items previously approved by EPA remain the same. This propose amendment was necessitated after the anticipated contractor declined to work the job after Quivira received EPA approval for construction. As a result, new liner material must be selected as the Deery #6 membrane material is propriety material and solely offered by this contractor.

B. Design and Construction

The proposed amendment on the approved construction on the phased disposal cells would involve changing the geomembrane liner from Deery #6 to an equivalent liner made from high density polyethylene (HDPE), and to replace the 6 inch layer of sand with an interstitial layer consisting of HDPE drainage net. The cell construction would still be constructed as a double lined impoundment with a secondary leachate collection-leak detection system between the liners. The site location, size and construction specifications remain unchanged and are detailed in the original application dated November 16, 1990, and the supplemental submissions dated February 1 and April 16, 1991.

The HDPE liner is a high density seamed liner made from virgin, high molecular weight, polyethylene resin. This HDPE geomembrane liner has a coefficient of

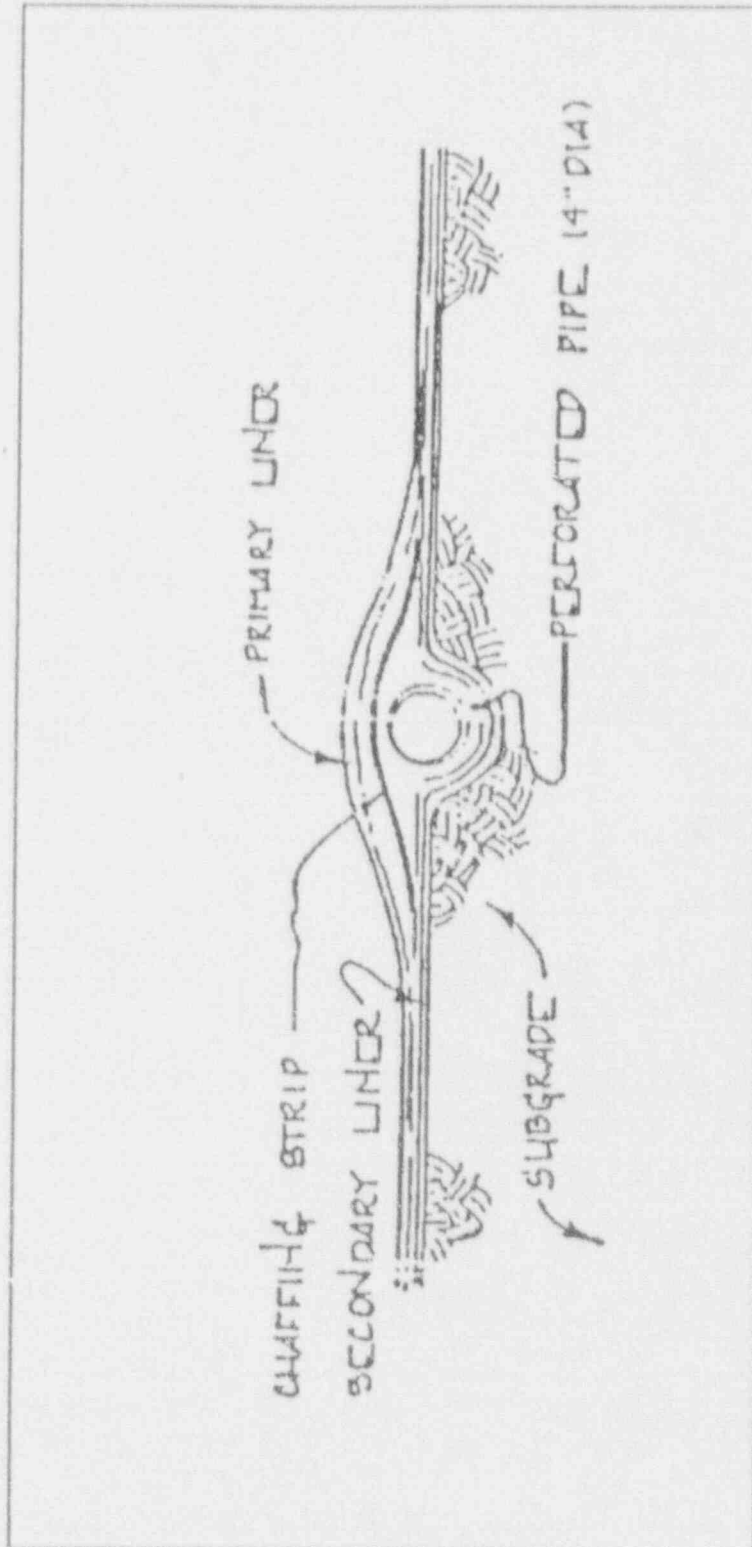
permeability of 1.8×10^{-13} cm/second which exceeds and is better than EPA's permeability standard of 1×10^{-7} cm/second for RCRA hazardous waste disposal sites. A complete listing of the physical properties for the proposed HDPE geomembrane material is contained in Appendix A.

As contained in the original application submittal dated November 16, 1990, the initial construction of the double lined cell will consist of building a base foundation for the bottom liner. The construction site will be smoothed, graded, and compacted to a minimum of 90% standard proctor. This will stabilize the ground and provide a stable base foundation for the liner.

Construction of the double lined cell will begin by placement of a 40 mil HDPE bottom liner atop the compacted foundation. Individual geomembranes liner sections are overlapped from 2 to 7 inches and are "welded" creating a sealed HDPE seam. Upon completion of the installation of the bottom liner, the area and "welds" are inspected to assure proper geomembrane liner placement and acceptable welds. All areas deemed unsatisfactory will be repaired, rewelded or replaced.

The detection system and drainage net will be placed between the HDPE geomembranes in areas recessed in the middle of both sides and the cell floor. A typical cross section of the leachate collection/leak detection system within the geomembranes is shown in Figure 1.

FIGURE 1



The leachate collection\leak detection system will remain 4 inch diameter, schedule 40 perforated PVC pipe or equivalent.

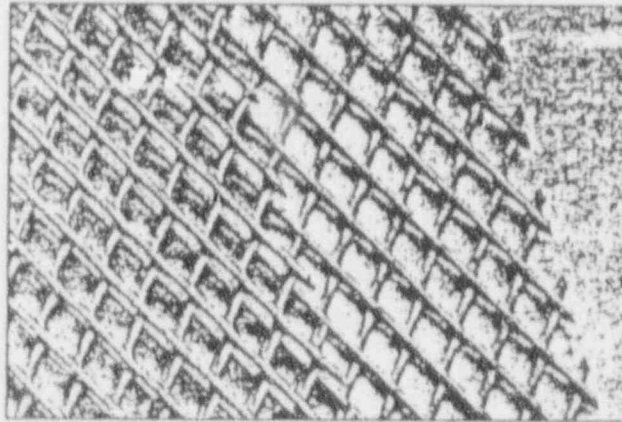
Quivira proposes to replace the approved interstitial 6 inch sand layer with HDPE drainage net. The HDPE drainage net will be installed along the side slopes of the cell due to slumping considerations. Since slumping is not a factor on the bottom of the cell, Quivira proposes that EPA approve the use of either the HDPE drainage net or the interstitial layer 6 inch sand layer on the bottom areas of the cell. Both provide the necessary support and transmissivity required in the leachate collection\leak detection system. The HDPE drainage net is built such that it provides a high transmissivity of fluids. This allows for quick detection and remedial action in the event of a leak. As such, the longitudinal drainage pipe (long side of cells) become unnecessary because of the quick drainage of solutions within the drainage net. All solutions will be collected by gravity flow within the sloped, center leachate collection\leak detection system.

The HDPE drainage net is constructed with the same material as the HDPE geomembrane liner and is a profiled mesh made by extruding two sets of HDPE strands together forming a diamond shape. The drainage net exceeds RCRA guidelines for transmissivity of fluids in a leak detection system. Figure 2 shows the interstitial HDPE drainage net.

The two (2) leak detection monitoring stations are located in the middle of the cells on each side of the longer embankments. Gravity flow is provided by the 0.3%

grade from the north and south cell side walls towards the middle of the cell. The cell is design such that one wall will be sloped at a 10:1 grade for the entrance of construction equipment. The other side slopes are at a 3:1 slope.

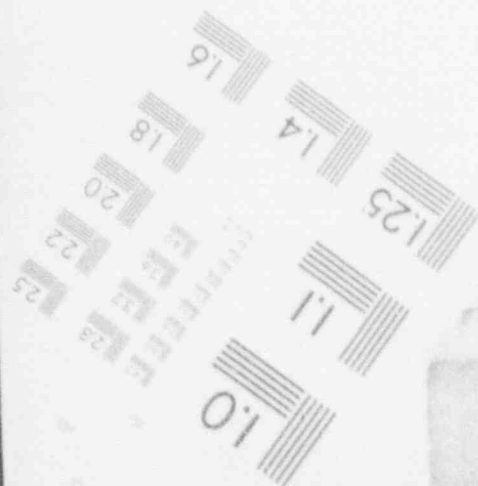
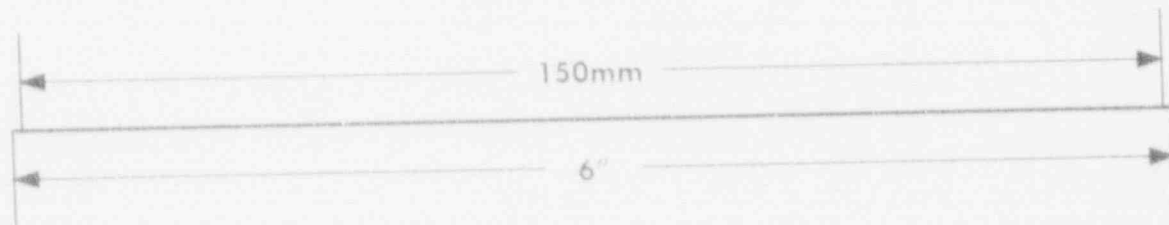
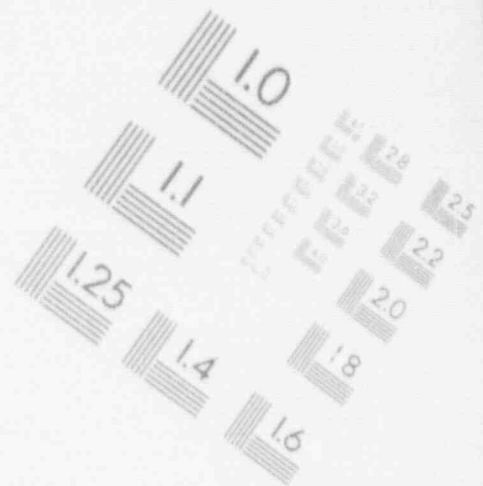
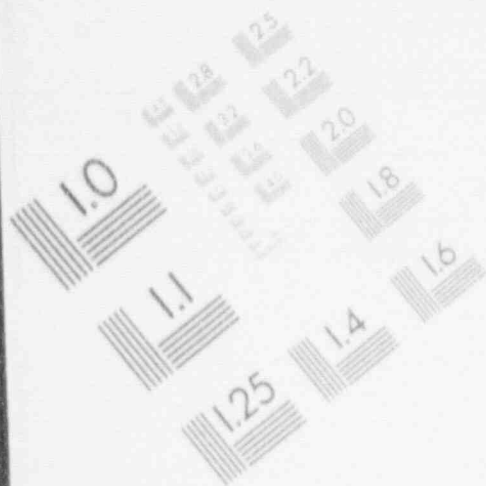
FIGURE 2



Upon final installation of the drainage net and interstitial leachate collection\leak detection system and subsequent inspection to insure proper installation, the upper geomembrane consisting of 60 mil HDPE will then be installed. Once again, the individual geomembrane liner sections are overlapped from 2 to 7 inches and are "welded" resulting in a sealed seam. Upon completion of the installation of the upper liner, the area and "welds" are inspected to assure proper geomembrane liner placement and acceptable welds. All areas deemed unsatisfactory will be repaired, rewelded or replaced. Contained in Appendix B are revised Drawings 2 and 3 which shows the cross-sectional cut of the interstitial layer and leachate\leak detection system.

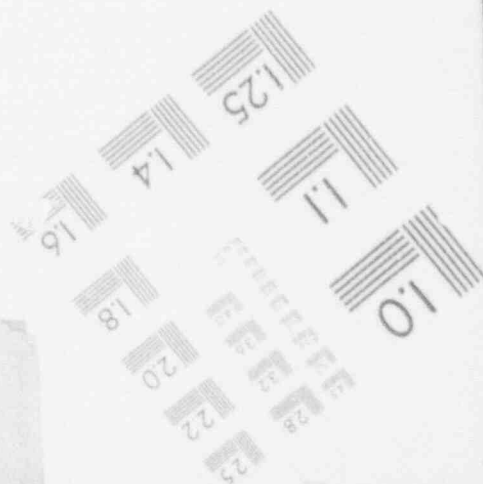
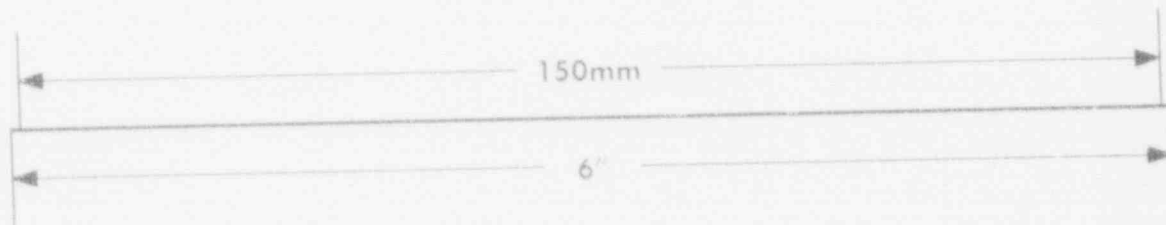
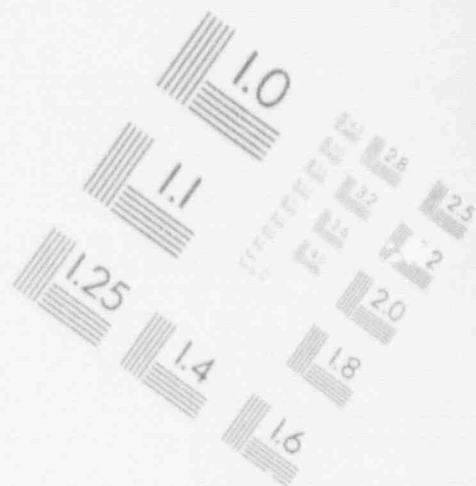
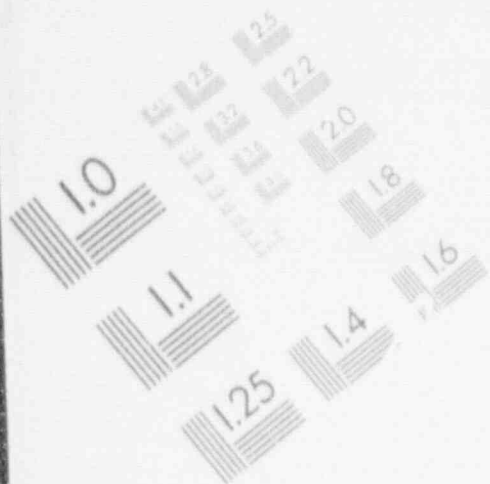
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IMAGE EVALUATION
TEST TARGET (MT-3)



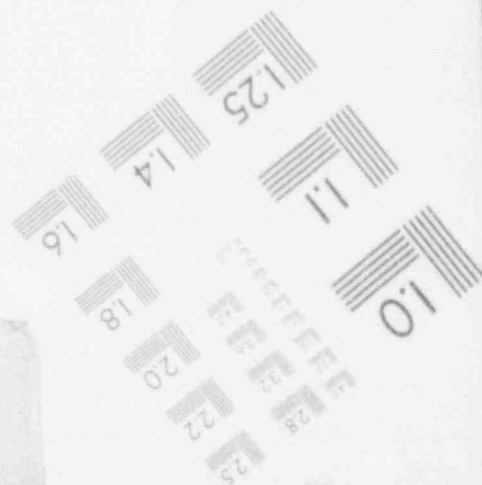
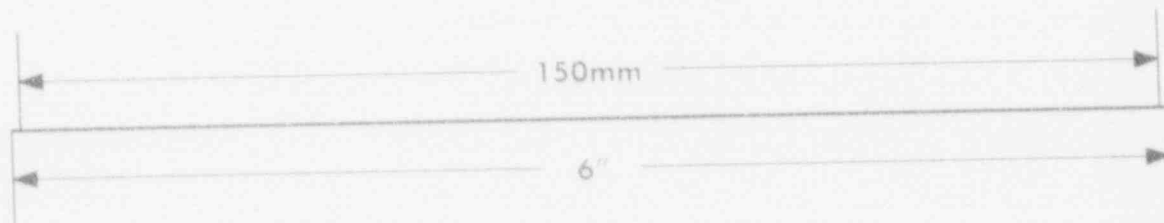
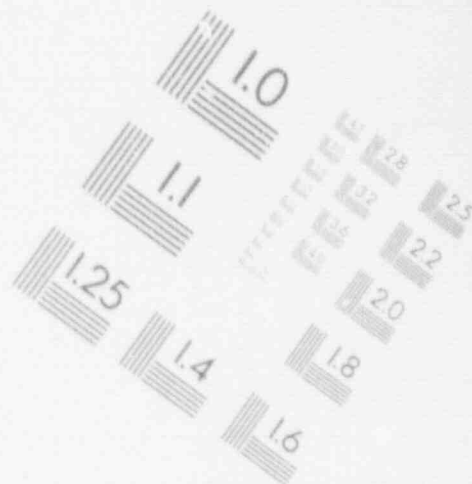
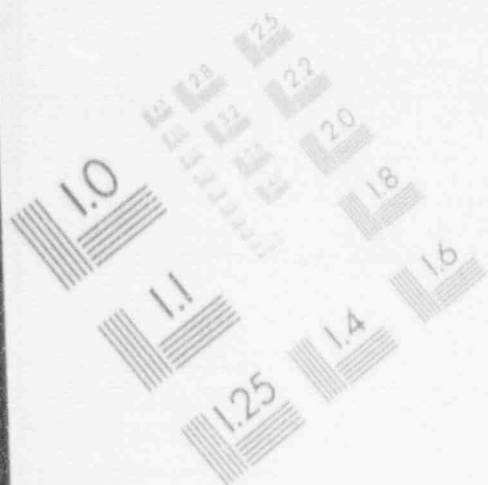
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IMAGE EVALUATION
TEST TARGET (MT-3)



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IMAGE EVALUATION
TEST TARGET (MT-3)



Tests performed on the HDPE geomembrane liner indicate excellent resistance to strong acids and bases including sulfuric acid and sodium carbonate. These chemicals are used in Quivira's uranium extraction processes. The resistance tests indicated that neither of these chemicals had a negative affect on the HDPE geomembrane liner. Because of these characteristics and the better permeability coefficients, the HDPE liner is equivalent to the Deery #6 liner and compatible with Quivira's uranium extraction processes. The proposed HDPE geomembrane and drainage net provides ample environmental protection against ultraviolet, hydrostatic pressure (wind-wave actions), soil conditions and ambient temperatures. Therefore, Quivira request that EPA approve the new geomembrane and interstitial material as it provides equivalent protection as the previously approved Deery #6 geomembrane liner and interstitial sand layer. According to the maker of the HDPE geomembrane liner, National Seal Corporation, this material is used in other EPA approved hazardous waste sites throughout the country.

C. Operation

The operation of the impoundment cell will continue to meet the requirements as contained in 40 CFR §61.252 for the phased disposal cell method. The cell will be filled with LSA byproduct material resulting from the batch campaign processing of the mill feed material. Upon completion of filling the cell, the cell will be dried and covered to meet the radon flux standard as required by 40 CFR 61.252 (a).

As previously stated in prior submittals, the source feed material will be processed in a batch campaign involving several intermittent cycles per year. These cycles are

dependant upon receipt of feed material and weather considerations. As such, it is anticipated that most batch processing of the feed material will occur during the summer months.

After processing of the mill feed material, residue slurry product from the feed material will be pumped to the impoundment cell via a HDPE pipeline and spigoted into the phased disposal cell. A minimum 3 foot freeboard will be maintained on the disposal cells. The cell and spigoting system will be inspected daily for structural integrity in accordance with NRC's Regulatory Guide 3.11.1, "Operational Inspection and Surveillance of Embankment Retention Systems For Uranium Mill Tailings". The leak detection system will be monitored weekly with the findings documented and filed for inspection.

D. Emission Control

Radon flux emissions from the cell will be controlled in accordance with 40 CFR 61.253, Appendix B, Method 115, Section 2.1.3 (a). As such, during the operating life of the cell, all solid materials contained within the cell will be covered with a minimum of 2 inches of water. This will result in a zero emanation of radon flux. After drying for final closure, the cell will be covered to meet the 20 pCi/meter²/second radon flux standard as described by Appendix B, Method 115.

APPENDIX A

PHYSICAL PROPERTIES OF HDPE GEOMEMBRANE

and

DRAINAGE NET

ENVIROSEAL™ HDPE GEOMEMBRANE

National Seal Company's ENVIROSEAL geomembranes are extruded using domestic, virgin, first quality, high molecular weight, polyethylene resin and are manufactured specifically for the purpose of containment in hydraulic structures. The HDPE compound used in ENVIROSEAL geomembranes has been formulated to be chemically resistant, free of leachable additives and resistant to ultraviolet degradation.

60 MIL PHYSICAL PROPERTIES

ALL PROPERTIES MEET OR EXCEED NSF STANDARD 54 SPECIFICATIONS FOR HDPE

PROPERTY

MINIMUM AVERAGE ROLL VALUES (unless otherwise indicated)

	English		Metric	
	Units	Value	Units	Value
THICKNESS, ASTM D 751, NSF Mod., Nominal	mils	60.0	mm	1.52
Minimum Average	mils	58.2	mm	1.49
Lowest Individual Reading	mils	57.0	mm	1.45
DENSITY, ASTM D 1505			g/cm ³	0.94
MELT FLOW INDEX, ASTM D 1238, Cond E, Max.			g/10 min	1.0
CARBON BLACK CONTENT, ASTM D 1603	percent	2 to 3	percent	2 to 3
CARBON BLACK DISPERSION, ASTM D 3015	rating	A1 or A2	rating	A1 or A2
MINIMUM TENSILE PROPERTIES, ASTM D 638, NSF Mod.				
Stress at Yield	psi	2200	MPa	15.2
	ppl	132	kg/cm	23.6
Stress at Break	psi	3800	MPa	26.2
	ppl	228	kg/cm	40.8
Strain at Yield	percent	13	percent	13
Strain at Break	percent	600	percent	600
TEAR RESISTANCE, ASTM D1004	ppl	700	kg/cm	125
	lbs	42	kg	19.1
PUNCTURE RESISTANCE, FTMS 101, 2065	ppl	1300	kg/cm	233
	lbs	78	kg	35.5
BRITTLENESS TEMP, ASTM D 746 B, Pass	°F	-103	°C	-75
ESCR, ASTM D 1693, NSF Mod., Pass	hours	1500	hours	1500
DIMENSIONAL STABILITY, ASTM D1204, NSF Mod, Max. percent		2.0	percent	2.0

NATIONAL SEAL SEAMING PROPERTIES

(All NSC seams will demonstrate a Film Tearing Bond in Peel and Shear)

SHEAR STRENGTH, ASTM D 4437, NSF Mod.	psi	2000	MPa	13.8
	ppl	120	kg/cm	21.5
PEEL ADHESION, ASTM D 4437, NSF Mod. (hot wedge fusion weld)	psi	1500	MPa	10.3
	ppl	90	kg/cm	16.1
PEEL ADHESION, ASTM D 4437, NSF Mod. (fillet extrusion weld)	psi	1300	MPa	8.97
	ppl	78	kg/cm	14.0

A1089

NSC

NATIONAL SEAL COMPANY

1255 MONMOUTH BLVD
GALESBURG, IL 61401
800-323-3820 309-343-3418
FAX: 309-343-1536

ENVIROSEAL™ HDPE GEOMEMBRANE

The following data is provided for informational purposes only and is not intended as a specification, warranty or guarantee. National Seal Company does not generally perform conformance testing for these properties.

60 MIL CHARACTERISTICS

PROPERTY

MINIMUM AVERAGE ROLL VALUES

(unless otherwise indicated)

	English		Metric	
	Units	Value	Units	Value
MODULUS OF ELASTICITY, ASTM D 882	psi	80,000	MPa	552
HYDROSTATIC RESISTANCE, ASTM D 751 A	psi	450	MPa	3.10
COEF. LINEAR THERMAL EXPANSION, Nominal	/°F	6.7×10^{-5}	/°C	1.2×10^{-4}
SOIL BURIAL RESISTANCE, NSF 54, Max. Change	percent	10	percent	10
OIT, 200°C, 1 atm O ₂ , Al pan	minutes	100	sec	6,000
TENSILE IMPACT, ASTM D 1822	ft lbs/in ²	238	kJ/m ²	600
VOLATILE LOSS, ASTM D 1203A, Max.	percent	0.1	percent	0.1
OZONE RESISTANCE, ASTM D 1149, 168 hrs, 100 pphm	No Cracks		No Cracks	
WATER VAPOR TRANSMISSION, ASTM E 96, Max.			g/hrm ²	0.005

STANDARD ROLL DIMENSIONS*

TYPICAL ROLL VALUES

	English		Metric	
	Units	Value	Units	Value
WEIGHT	lbs	5,000	kg	2,270
WIDTH	ft	15.0	m	4.57
LENGTH	ft	1,110	m	338
AREA	ft ²	16,650	m ²	1,547

*VALUES ARE APPROXIMATE

CUSTOM ROLL SIZES AND HALF SIZE ROLLS AVAILABLE

SHEET IS ROLLED ON 12" DIAMETER CORES

A1089

NSC

NATIONAL SEAL COMPANY

1255 MONMOUTH BLVD
GALESBURG, IL 61401
800-323-3820 309-343-3418
FAX: 309-343-1536

ENVIROSEAL™ HDPE GEOMEMBRANE

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40 MIL PHYSICAL PROPERTIES

ALL PROPERTIES MEET OR EXCEED NSF STANDARD 54 SPECIFICATIONS FOR HDPE

PROPERTY

MINIMUM AVERAGE POLL VALUES (unless otherwise indicated)

	English		Metric	
	Units	Value	Units	Value
THICKNESS, ASTM D 761, NSF Mod., Nominal	mils	40.0	mm	1.016
Minimum Average	mils	00.0	mm	0.066
Lowest Individual Reading	mils	38.0	mm	0.965
DENSITY, ASTM D 1505			g/cm ³	0.94
MELT FLOW INDEX, ASTM D 1238, Cond. E, Max.			g/10 min	1.0
CARBON BLACK CONTENT, ASTM D 1603	percent	2 to 3	percent	2 to 3
CARBON BLACK DISPERSION, ASTM D 3015	rating	A1 or A2	rating	A1 or A2
MINIMUM TENSILE PROPERTIES, ASTM D 638, NSF Mod.				
Stress at Yield	psi	2200	MPa	15.2
	ppl	88	kg/cm	15.8
Stress at Break	psi	3800	MPa	26.2
	ppl	152	kg/cm	27.2
Strain at Yield	percent	13	percent	13
Strain at Break	percent	600	percent	600
TEAR RESISTANCE, ASTM D1004	ppl	700	kg/cm	125
	lbs	28	kg	12.7
PUNCTURE RESISTANCE, FTMS 101, 2065	ppl	1300	kg/cm	233
	lbs	52	kg	23.6
BRITTLENESS TEMP, ASTM D 746 B, Pass	°F	-103	°C	-75
ESCR, ASTM D 1693, NSF Mod., Pass	hours	1500	hours	1500
DIMENSIONAL STABILITY, ASTM D1204, NSF Mod, Max.	percent	2.0	percent	2.0

NATIONAL SEAL SEAMING PROPERTIES

(All NSF seams will demonstrate a Film Tearing Bond in Peel and Shear)

SHEAR STRENGTH II, ASTM D 4497, NSF Mod.	psi	2000	MPa	10.0
	ppl	80	kg/cm	14.3
PEEL ADHESION, ASTM D 4437, NSF Mod.	psi	1500	MPa	10.0
(hot wedge fusion weld)	ppl	60	kg/cm	10.7
PEEL ADHESION, ASTM D 4437, NSF Mod.	psi	1300	MPa	8.97
(fillet extrusion weld)	ppl	52	kg/cm	9.31

A1089

NSC

NATIONAL SEAL COMPANY

1255 MONMOUTH BLVD

GALESBURG, IL 61401

800-323-3820

309-343-3418

FAX: 309-343-1536

ENVIROSEAL™ HDPE GEOMEMBRANE

The following data is provided for informational purposes only and is not intended as a specification, warranty or guarantee. National Seal Company does not generally perform conformance testing for these properties.

40 MIL CHARACTERISTICS

PROPERTY	MINIMUM AVERAGE ROLL VALUES <small>(unless otherwise indicated)</small>			
	English		Metric	
	Units	Value	Units	Value
MODULUS OF ELASTICITY, ASTM D 882	psi	80,000	MPa	552
HYDROSTATIC RESISTANCE, ASTM D 751 A	psi	300	MPa	2.07
COEF. LINEAR THERMAL EXPANSION, Nominal	/°F	6.7×10^{-6}	/°C	1.2×10^{-4}
SOIL BURIAL RESISTANCE, NSF 64, Max. Change	percent	10	percent	10
OIT, 200°C, 1 atm O ₂ , Al pan	minutes	100	sec	6,000
TENSILE IMPACT, ASTM D 1822	ft-lbs/in ²	238	kJ/m ²	500
VOLATILE LOSS, ASTM D 1203A, Max.	percent	0.1	percent	0.1
OZONE RESISTANCE, ASTM D 1149, 168 hrs, 100 pphm	No Cracks		No Cracks	
WATER VAPOR TRANSMISSION, ASTM E 96, Max.			g/hr·m ²	0.006

STANDARD ROLL DIMENSIONS*

TYPICAL ROLL VALUES

	English		Metric	
	Units	Value	Units	Value
WEIGHT	lbs	5,000	kg	2,270
WIDTH	ft	15.0	m	4.57
LENGTH	ft	1,670	m	509
AREA	ft ²	25,050	m ²	2,327

*VALUES ARE APPROXIMATE

CUSTOM ROLL SIZES AND HALF SIZE ROLLS ARE AVAILABLE
SHEET IS ROLLED ON 12" DIAMETER CORES

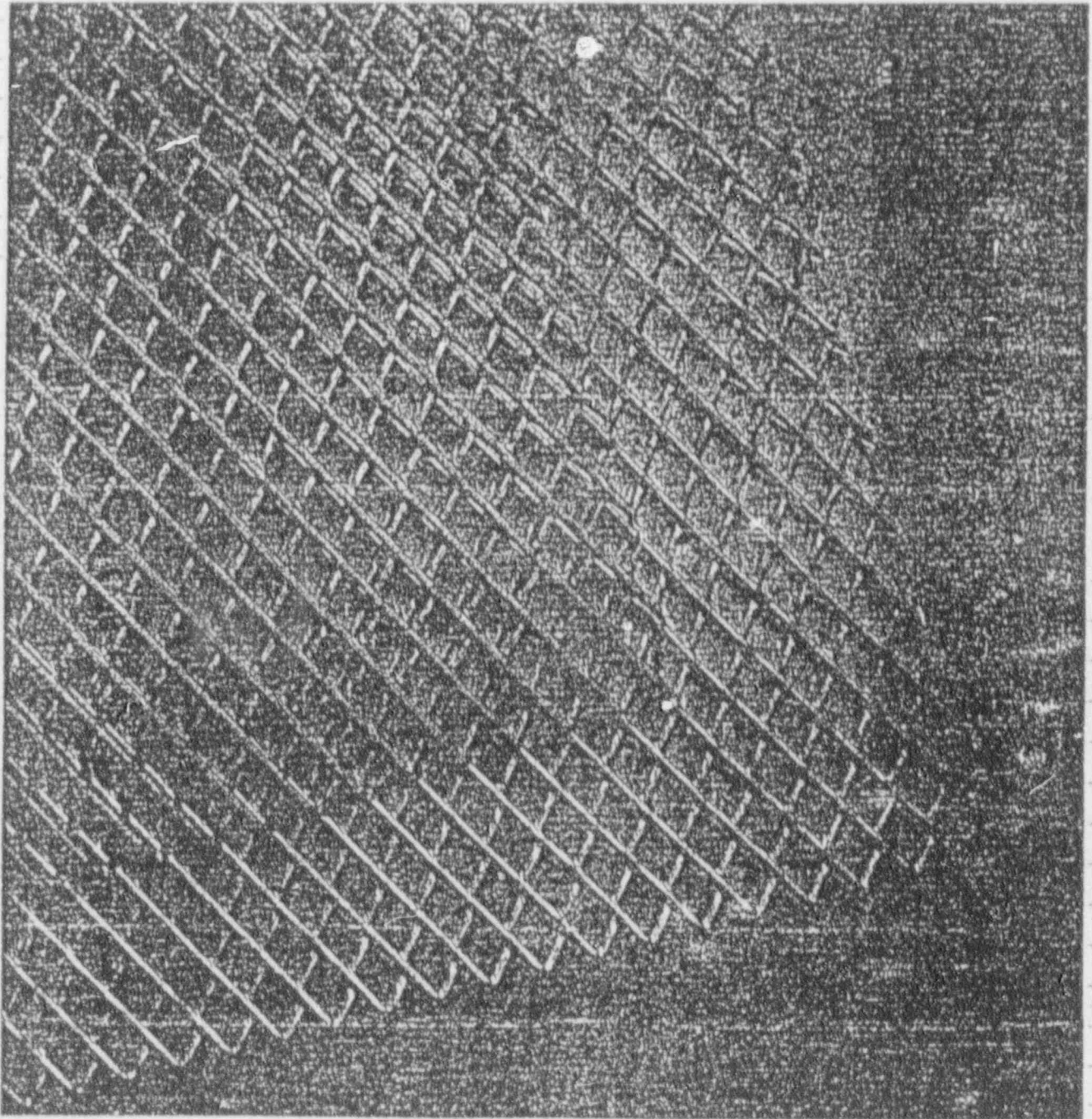
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NSC

NATIONAL SEAL COMPANY

1255 MONMOUTH BLVD
GALESBURG, IL 61401
800-323-3820 309-343-3418
FAX: 309-343-1536

POLY-NET®





FLUID SYSTEMS, INC.

POLY-NET™

PN-4000 FOR CLAY LINED FACILITIES
PN-3000 CN — "CAP-NET"

SPECIFICATION	PN-4000	PN-3000 CN
ROLL LENGTH (MAXIMUM) (FT.)	300	300
ROLL WIDTH (+ 1 in.—0 in.) (FT.)	6.9	6.9
THICKNESS (IN.)	.300	.200
S.F. IN ROLL	2025	2025
WEIGHT PER ROLL (LBS.)	500	233
WEIGHT PER S.F.	.245	.115
*Available to Lengths of 400 Feet		
PROPERTY	PN-4000	PN-3000 CN
RAW MATERIAL (ALL DOMESTIC)	POLYETHYLENE (VIRGIN MATERIAL)	POLYETHYLENE (VIRGIN MATERIAL)
MANUFACTURING	FOAMED + EXTRUDED	FOAMED + EXTRUDED
COLOR	BLACK	BLACK
CARBON BLACK	2%	2%
DENSITY & POLYMER (g/cm ³)	.936	.936
MELT INDEX (g/10 MIN)	1.10	1.10
TENSILE STRENGTH (LBS./IN.) (MACH. DIRECTION)	58	24
TENSILE STRENGTH (LBS./IN.) (TRANS. DIRECTION)	33	11
ELONGATION TO BREAK (MACH. DIRECTION)	175%	180%
ELONGATION TO BREAK (TRANS. DIRECTION)	105%	150%
POROSITY	.81-.84	.81-.84
U.V. RESISTANCE	STABLE	STABLE
TRANSMISSIVITY	— SEE TABLES —	— SEE TABLES —

POLY-NET IS PROUDLY MANUFACTURED IN THE U.S.

7759 MONTGOMERY ROAD
CINCINNATI, OH 45236
800/346-9107
613/984-3800

APPENDIX B

REVISED DRAWINGS #2 and #3



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 6

1445 ROSS AVENUE, SUITE 1200

DALLAS, TEXAS 75202-2733

AUG 15 1991

Mr. Bill Ferdinand, Manager
Radiation Safety, Licensing
& Regulatory Compliance
Rio Algom Mining Corporation
6305 Waterford Blvd., Suite 325
Oklahoma City, Oklahoma 73118

Re: National Emission Standards for Hazardous Air Pollutants
(NESHAPs), Standards for Radon Emissions from Operating Mill
Tailings, 40 CFR Part 61, Subparts A and W.

Dear Mr. Ferdinand:

This is in response to your letter to the EPA of July 16, 1991, and its accompanying Amendment to Change Liner Material. You asked for EPA to approve changes in the liner and interstitial materials and installation design from those previously approved by our letter (A. Stanley Meiburg to Bill Ferdinand dated April 24, 1991). The Amendment is required because the contractor chosen to construct the phased disposal cells has declined to bid on the job, and the liner material planned for use is a proprietary material which is not available through alternative sources.

Specifically, the new design employs high density polyethylene (HDPE) seamed geomembrane liners made from virgin, high molecular weight, polyethylene resin in place of the previously proposed Deery membrane #6 liner, which is a seamless, thermoplastic geomembrane composed of asphalts, oils, resins, antioxidants, and synthetic polymers. The upper HDPE liner is 60 mils thick, and the lower HDPE liner is 40 mils thick, compared with the Deery Membrane #6 which was to be 90 mils thick. The new design employs an HDPE drainage net placed between the two liners on the sloped sides, in place of six inches of coarse sand as in the previous (approved) design. For cell bottoms, where slumping of the sand is not a potential problem, the Amendment requests approval to use either the HDPE drainage net or a six inch interstitial layer of sand.

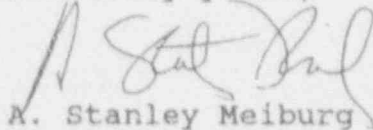
We have completed our review of the Amendment and its transmittal letter, and we find the proposed alternative liner to be equivalent to the previously proposed Deery Membrane #6 liner. We also find the HDPE drainage net to be equivalent to the six inch interstitial layer of coarse sand. Approval is hereby granted for the changes

requested in your letter of July 16, 1991, and the accompanying Amendment to Change Liner Material, dated July, 1991. All other specifications, descriptions and commitments contained within Quivira Mining Company's original application of November 19, 1990, and supplemental amendments of February 1, 1991, and April 16, 1991, remain unchanged.

All notifications and reports required by applicable NESHAP should be sent to:

Mr. A. Stanley Meiburg, Director
Air, Pesticides and Toxics Division (6T)
U.S. Environmental Protection Agency
1445 Ross Avenue
Dallas, Texas 75202-2733

Sincerely yours,



A. Stanley Meiburg
Director
Air, Pesticides & Toxics Division (6T)

cc: Judith Espinosa
New Mexico Environmental Improvement Division

Ramon E. Hall
Nuclear Regulatory Commission