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**SENT VIA PDF AND FEDERAL EXPRESS**

April 13, 2010

M. Cheryl Heying  
Executive Secretary  
Utah Air Quality Board  
State of Utah Department of Environmental Quality  
168 North 1950 West  
Salt Lake City, UT 84114-4850

**Re: Denison Mines White Mesa Mill  
Application for Approval of Modification of an Existing Source  
Under 40 CFR 61.07  
State of Utah Division of Air Quality  
Approval Order Number DAQE-AN0112050008-08**

Dear Ms. Heying:

## **1. INTRODUCTION**

This is an application for approval of modification of an existing source under 40 Code of Federal Regulations ("CFR") 61.07 (the "Application"), with respect to the construction and operation of a new tailings impoundment, Cell 4B, at Denison Mines (USA) Corp's ("Denison's") White Mesa Uranium Mill (the "Mill").

The Mill is located approximately six miles south of Blanding, Utah, and is operated by Denison under State of Utah Radioactive Materials License No. UT 1900479 (the "License"), State of Utah Ground Water Discharge Permit No. UGW 370004 (the "Permit") and State of Utah Air Quality Approval Order DAQE-AN1205005-06 (the "Air Approval Order").

The Mill is licensed to process natural uranium ores and selected alternate feed materials, which are uranium-bearing materials other than conventionally mined uranium or uranium/vanadium ores.

This Application is being made in conjunction with applications that have been made to the Executive Secretary of the Utah Radiation Control Board/Co-Executive Secretary of the Utah Water Quality Board for amendments to the License and Permit to authorize the specific design, construction and operation of Cell 4B.

While Cell 4B has not yet been constructed, it was contemplated, described, and assessed previously and is therefore contemplated by the License, being a critical component of the initial environmental analysis and licensing of the facility. See the *Environmental Report, White Mesa Uranium Project San Juan County, Utah*, January 30, 1978, prepared by Dames & Moore (the "1978 ER") and the *Final Environmental Statement Related to Operation of the White Mesa Uranium Project Energy Fuels Inc.*, May 1979, (the "FES"), prepared by the United States Nuclear Regulatory Commission ("NRC").

The current applications for amendments to the License and Permit therefore relate to the specifics of Cell 4B's design, construction and operation but not to the approval of the cell itself, which is already contemplated by the License.

Enclosed with this Application are the following Figures and Attachments:

**Figures:**

Figure 1-1.....	Regional Location Map
Figure 1-2.....	Mill Layout, Showing Proposed Location of Cell 4B
Figure 1-3.....	Schematic Drawing of Cell 4B

**Attachments:**

Attachment A.....	Consolidated Approval Order and Approval Order for Cells 4A and 4B dated June 26, 1989
Attachment B.....	EPA Approval Letter Under 40 CFR 61.08 for Cell 4A dated March 16, 1989
Attachment C.....	Summary of Compliance with the Requirements of 40 CFR 192.32(a)

## 2. BACKGROUND

The relevant background information is as follows:

- a) Construction of the Mill commenced in 1979, and the Mill was originally licensed for operations by NRC under Source Material License No. SUA-1358 in May 1980.
- b) The initial environmental analyses and the initial NRC License contemplated six cells in the Mill's tailings management system containing approximately 11 million tons of tailings solids, which would be the tailings resulting from 15 years of Mill operations at full capacity (see Section 3.2.4.7 of the FES and Section 3.4 and Appendices H and I of the 1978 ER). These are evaporation pond Cell 1-I (now referred to as Cell 1), a second evaporation pond (Cell 1-E), which has not been constructed, and a series of

80-acre cells, of which Cells 2 and 3 and half of Cell 4 (Cell 4A) have been constructed to date. 80-acre Cells 4 and 5 have been specifically contemplated and included in the License (see Figure 3.4 of the FES). With Cell 4A in place, Cell 4B will consume the second half (the second 40 acres) of the previously authorized 80-acre Cell 4.

- c) Construction of Cell 2 was completed in May of 1980, construction of Cell 1 was completed in June of 1981, and construction of Cell 3 was completed in September of 1982. As a result, all liquids and tailings solids generated prior to June 1981 were deposited into Cell 2. In September 1981, after completion of Tailings Cell 1, solutions were placed in both Cells 1 and 2, but all tailings solids were placed into Cell 2. Cell 3 was put into service after September 1982.
- d) Cell 4A was constructed in 1989, and licensed by NRC for operations in 1990. In conjunction with the initial approval of Cell 4A, the State of Utah Department of Health, Division of Environmental Health issued a Consolidated Approval Order and Approval Order for Cells 4A and 4B on June 26, 1989, a copy of which is included as Attachment A to this letter, and the United States Environmental Protection Agency ("EPA") issued an approval under 40 CFR 61.08 for Cell 4A on March 16, 1989, a copy of which is included as Attachment B to this letter.
- e) Cell 4A was only used for a short period of time for the evaporation of liquid solutions (raffinates) from the Mill's vanadium circuit, and its initial use ceased in 1990. As a result, damage occurred to the seams in the liner due to thermal stress from years of exposure to direct sunlight. Denison removed the residual crystals from Cell 4A in 2006 and deposited them into Cell 3. Cell 4A was relined with a new flexible membrane liner in 2007 and 2008, and approved by the Executive Secretary of the Utah Radiation Control Board/Co-Executive Secretary of the Utah Water Quality Board, through the issuance of amendments to the License and Permit, and put into service in 2008.
- f) The design specifications for Cell 4B were submitted by Denison on December 8, 2007, in a report entitled *Cell 4B Design Report, White Mesa Mill Blanding Utah*, prepared by Geosyntec Consultants (the "Design Report"). The design of Cell 4B is virtually identical to the design for Cell 4A, which design was approved earlier in 2007. The Design Report was followed by an *Environmental Report in Support of Construction of Tailings Cell 4B, White Mesa Uranium Mill, Blanding, Utah*, April, 30, 2008 (the "2008 ER"), and applications for amendment to the License and Permit in June, 2008. The 2008 ER was subsequently revised and resubmitted on September 11, 2009.
- g) In conjunction with the 2008 ER, Denison submitted a report entitled *Proposed Development of New Tailings Cell 4B for the White Mesa Uranium Mill*, dated April 2008, (the "2008 MILDOS Report") prepared by SENES Consultants Limited ("SENES"), which updated the *Dose Assessment in Support of the License Renewal*

*Application & Environmental Report for the White Mesa Uranium Mill*, February 2007, prepared by SENES (the “2007 MILDOS Report”) to include the addition of Cell 4B.

- h) During its review of Denison’s requests to amend the License and Permit to include the specific design and operating conditions applicable to Cell 4B, the State of Utah Division of Radiation Control (“DRC”) issued a number of interrogatories, requiring responses from Denison, including a request for Denison to perform a sensitivity analysis to demonstrate that reasonable variations in MILDOS input parameters (related to Cell 4B performance) do not change the conclusions of the 2008 MILDOS Report. As a result of this request, Denison submitted a letter report dated February 12, 2010, prepared by SENES (the “MILDOS Sensitivity Study”).
- i) On April 7, 2010, DRC published for public comment the proposed revised License and Permit, as well as a Statement of Basis dated April 6, 2010 (the “SOB”) in support of the proposed amendments to the Permit, and a Safety Evaluation Report dated April 6, 2010 (the “SER”) in support of the proposed amendments to the License. The proposed amended License and Permit as well as the SOB and SER are available on the DRC website at

[http://www.radiationcontrol.utah.gov/Uranium\\_Mills/IUC/cell4b/permitMod\\_licenseAmend.htm](http://www.radiationcontrol.utah.gov/Uranium_Mills/IUC/cell4b/permitMod_licenseAmend.htm)

- j) With the approval of the Executive Secretary of the Utah Radiation Control Board/Co-Executive Secretary of the Utah Water Quality Board, Denison commenced pre-construction excavation and site preparation activities for Cell 4B in November 2009. However, construction of Cell 4B will not commence until all required License and Permit amendments and approvals have been obtained.

### **3. NAME AND ADDRESS OF THE APPLICANT**

This Application is being submitted by:

Denison Mines (USA) Corp.  
1050 17<sup>th</sup> Street Suite 950  
Denver, Colorado 80265

### **4. LOCATION OR PROPOSED LOCATION OF THE SOURCE**

Per the Air Approval Order, the source has been defined as the entire Mill operating facility.

The Mill is located in central San Juan County, Utah approximately six miles south of Blanding, Utah. The Mill can be reached by taking a private road for approximately 0.5 miles west of Utah State Highway 191 South. The location is depicted in Figures 1-1 and 1-2.



The Mill is located on fee land and mill site claims, covering approximately 5,415 acres, encompassing all or part of Sections 21, 22, 27, 28, 29, 32, and 33 of T37S, R22E, and Sections 4, 5, 6, 8, 9, and 16 of T38S, R22E, Salt Lake Base and Meridian.

## **5. NATURE, SIZE, DESIGN, OPERATING DESIGN CAPACITY, METHOD OF OPERATION OF THE SOURCE AND EQUIPMENT USED FOR CONTROL OF EMISSIONS**

### **5.1 Nature of the Source**

The Mill is an operating conventional uranium mill. It has operated on a campaign basis over the years, depending on the availability of ores and market conditions. The Mill has been fully operational, processing conventionally mined uranium/vanadium ores, during the period from April 2008 to May 2009, and alternate feed materials from June 2009 to the current time. The Mill resumed processing conventional ores in March 2010.

Cell 4B will be an essential element of future operations at the Mill as its construction is necessary in order to continue providing sufficient impoundment surface area for the evaporation of Mill process water. Cell 4B will also provide additional tailings capacity which is necessary to accommodate the tailings volume associated with routine ore processing operations once Cell 3 is full and Cell 4A is partially full.

### **5.2 Size and Design of the Source**

As discussed in Section 2(b), above, the Mill was authorized in its initial NRC license for the construction of six cells in its tailings management system, of which three and a half have been constructed. The Mill's tailings system currently consists of one evaporation pond (Cell 1) and three tailings cells, of which one cell (Cell 2) has been filled and closed, and two cells (Cell 3 and Cell 4A (which is the first half of Cell 4)) are currently in operation. Design information relating to the size (surface area) of the cells that currently comprise the tailings system is provided in Table 1, below.

**Table 1 – Cell Specifications**

Cell Designation	Surface Area (Acres)	Approximate Capacity Cubic Yds	Estimated Capacity Dry Tons or Gallons
Cell 1	55	661,500*	133,600,000 gal*
Cell 2	67	2,015,000	2,337,400 dry tons
Cell 3	71	2,345,000	2,720,200 dry tons
Cell 4A	40	1,600,000	1,856,000 dry tons

\*Measured to the freeboard limit.

The area comprising the Mill's restricted area is approximately 500 acres. Included in this area are the cells described above as well as an ore pad, mill process building (which includes a semi-autogenous grind mill, and leach, countercurrent decantation, yellowcake precipitation, drying and packaging circuits), a solvent extraction building, a maintenance shop, a warehouse, an administration building and various associated facilities.

### **5.3 Operating Design Capacity of the Source**

The Mill has a nominal operating capacity of approximately 2,000 tons of conventional ore per day for a maximum yellowcake production of 4,380 tons of  $U_3O_8$  per year.

Capacity data for each cell in the current tailings system is provided in Table 1.

### **5.4 Method of Operation**

The "method of operations" at the Mill is phased disposal of tailings. Compliance with the NESHAP standards at 40 CFR 61.252(a) is determined annually for existing impoundments (i.e., Cells 2 and 3). The annual radon emissions for existing impoundments are measured using Large Area Activated Charcoal Canisters in conformance with 40 CFR, Part 61, Appendix B, Method 115, Restrictions to Radon Flux Measurements. These canisters are passive gas adsorption sampling devices used to determine the flux rate of radon-222 gas from the surface of the tailings material.

For impoundments licensed for use after December 15, 1989 (i.e., Cell 4A and proposed Cell 4B), Denison employs the work practice standard listed at 40 CFR 61.252(b)(1) in that all tailings impoundments constructed or licensed after that date are lined, are no more than 40 acres in area and no more than two impoundments are operated for tailings disposal at any one time.

The Mill conducts on-going tailings reclamation by the following processes. As each cell is filled with tailings, solutions are separated from tailings solids and pumped to the evaporation pond (Cell 1) or to another tailings cell. Tailings solids are allowed to dry in place. As each tailings cell reaches final capacity, reclamation begins with the placement of interim cover over the tailings. Tailings Cell 2 is full and has been completely covered with interim cover.

At the time of this Application, Cell 3 is nearly full and partially covered with interim cover, such that the uncovered liquid pool has been reduced significantly relative to the cell's total footprint. Cell 3 is currently receiving only tailings solids and slimes drain solutions from Cell 2. The Mill is attempting to complete the filling of Cell 3 and advancement of full interim cover during the 2010 operating year. In any event, disposal of tailings into Cell 3 will cease and the cell will be filled and taken out of service, before tailings solids are disposed of in Cell 4B. Once Cell 3 is filled and taken out of service, Cell 4A will be the only remaining disposal cell in active service, other than proposed Cell 4B.

## 5.5 Equipment Used for Control of Emissions

The primary method of controlling radon and other air emissions from the tailings system is by limiting the operative surface area. Section 29 of the Air Approval Order requires that the Mill operate in accordance with the requirements of 40 CFR 61, Subpart W. Under the Subpart W work practice standard followed by the Mill, the Mill may only have up to 80 acres of tailings surface (or two 40 acres tailings disposal cells) in operation at any time.

In addition, In order to maintain radon and other emissions As Low As Reasonably Achievable (ALARA), the Mill maintains a practice of concurrent/ongoing reclamation on active cells. The Mill advances cover over solids-filled areas of each cell as operations proceed and the cell fills, thereby further limiting the operative surface area.

Radon gas flux measurements have been made at Cells 2 and 3. Currently Cell 2 is fully covered and Cell 3 is partially covered with three to four feet of random fill. During the period 2005 through 2008, Cell 2 was only partially covered with such random fill. Radon flux measurements, averaged over the covered areas, were as follows for the years 2005-2009:

**Table 2**  
**Average Radon Flux From Tailings Cells 2005-2009**  
**(pCi/m<sup>2</sup>/sec)**

	2005	2006	2007	2008	2009
<b>Cell 2</b>	7.1	7.9	13.5	3.9	13.7
<b>Cell 3</b>	6.2	10.0	8.9	3.1	7.9

The radon-222 emission standard for existing impoundments (i.e., tailings disposal impoundments that were licensed prior to December 15, 1989), such as Cells 2 and 3, is 20 pCi/m<sup>2</sup>/sec. These empirical data therefore demonstrate that the random fill cover, alone, is currently providing an effective barrier to radon flux.

Upon final closure of each cell, including Cell 4B, a final cover will be placed over the tailings in accordance with the Mill's NRC-approved Reclamation Plan. The final cover has been designed to maintain long-term radon emissions from the cells within the regulatory limit of 20 pCi/m<sup>2</sup>/sec set out in UAC R313-24-4 (incorporating by reference the requirements of 10 CFR Part 40, Appendix A, Criterion 6(2)). See the discussion at pages 44 and 45 of the SER.

## 6. PRECISE NATURE OF THE PROPOSED CHANGES

Existing Cell 4A is a below-grade synthetically lined evaporation and solids disposal cell of approximately 1.6 million cubic yards capacity at the freeboard limit and encompassing approximately 40 acres inside its dikes.

The nature of the change would consist of the construction and operation of new Cell 4B. Cell 4B will have a similar design and identical function as the existing Cell 4A. Cell 4B will be a synthetically-lined evaporation and solids cell of approximately 1.9 million cubic yards capacity encompassing approximately 40 acres inside its dikes. The increased tailings capacity in Cell 4B compared to Cell 4A is due to the slightly greater average depth of Cell 4B compared to Cell 4A. Cell 4B will initially be used as an evaporation pond for solutions only. It will subsequently be used as a tailings disposal cell for the disposal of tailings solids, as operational needs warrant.

Figure 1-2 shows the location of proposed Cell 4B relative to the existing tailings cells. Figure 1-3 shows the dimensions and surface area of Cell 4B (which indicates that the designed surface area of Cell 4B is 39.84 acres).

A summary of the design features for Cell 4B follows. Each design element listed below is currently being evaluated by the Executive Secretary of the Utah Radiation Control Board/Co-Executive Secretary of the Utah Water Quality Board, and is undergoing extensive analysis, in conjunction with the applications for amendments to the License and Permit associated with the proposed construction and operation of Cell 4B.

The proposed design of Cell 4B consists of:

- a) North, South, East, and West dikes of 2H to 1V interior sideslope (except at the slimes drain);
- b) A foundation of subgrade soils over bedrock;
- c) A surface area inside the dikes of 40 acres, and a capacity of approximately 1.9 million cubic yards below the required 3 foot freeboard;
- d) Primary and secondary 60-mil HDPE flexible membrane liners ("FMLs") that extend across the entire cell floor and inside side slopes, and which sandwich a leak detection system;
- e) A permeable HDPE geonet leak detection system that extends across the entire area below the primary FML, with gravel-filtered leak detection sump;
- f) A manufactured geosynthetic bentonite clay liner beneath the secondary FML;
- g) North and East Dike splash pads to protect the primary FML from abrasion and scouring by tailings slurry;
- h) A perforated pipe and strip drain slimes drain collection system above the primary FML; and
- i) A concrete lined spillway to allow emergency runoff from Cell 4A.

See Part I.D.12 of the proposed amended Permit for a more detailed description of the proposed design of Cell 4B.

As mentioned above, other than a slight change in geometry, the proposed design of Cell 4B is virtually identical to that of Cell 4A. The installation and operation of Cell 4B will result in no change to:

- The design of the tailings system;
- The operation of the tailings system;
- The surface area of exposed tailings solids (other than the fact that the surface area of proposed Cell 4B at 40 acres will be less than the surface area of Cell 3 which is 71 acres, thereby actually reducing the surface area of exposed tailings solids);
- The throughput capacity of the Mill; or
- The proposed reclamation sequence for the Mill site.

## **7. PRODUCTIVE CAPACITY OF THE SOURCE BEFORE AND AFTER THE CHANGES ARE COMPLETED**

As described in Section 5.3 above, the Mill has a nominal operating design capacity of approximately 2,000 tons of conventional ore per day or 4,380 tons of  $U_3O_8$  production per year. The construction and operation of Cell 4B will not change the Mill's productive operating capacity.

As required by 40 CFR 61.252(b)(1), Cell 3 will be filled and closed prior to disposal of tailings solids into Cell 4B. Cell 4B capacity will replace the tailings management capacity lost by closure of Cell 3.

## **8. ESTIMATES OF EMISSIONS BEFORE AND AFTER THE CHANGES ARE COMPLETED**

In accordance with 40 CFR 61.252(b)(i), the Mill cannot have more than two tailings impoundments in operation at any one time for the disposal of tailings. This means that prior to Cell 4B coming into operation for the disposal of tailings, Cell 3 must cease operations. As a result, the total emissions from the addition of Cell 4B will not be significantly different from previously approved operations (which include the operation of Cell 3). The 2008 MILDOS Report takes these factors into account.

In the 2008 MILDOS Report, the calculated total annual effective dose commitments (including radon) calculated using MILDOS-AREA were compared to the Utah Administrative Code ("UAC") R313-15-301(1)(a) requirement that the dose to individual members of the public shall not exceed 100 mrem/yr (radon included). For the processing of Colorado Plateau ore at full Mill capacity, the maximum total annual effective dose commitments were calculated to be a maximum of 1.4 mrem/yr for an infant at the nearest potential residence, which is about 1.4% of

the UAC R313-15-301(1)(a) limit of 100 mrem/yr (radon included) to an individual member of the public. There was no significant difference in the dose assuming operation of Cell 4B compared to the current state of operations without Cell 4B. For the processing of higher grade Arizona Strip ore at full Mill capacity, the total annual effective dose commitments were calculated to be a maximum of 3.1 mrem/yr for an infant at the nearest potential residence, which is about 3.1% of the 100 mrem/yr limit (radon included) to an individual member of the public. Again, there was no significant difference in the dose assuming operation of Cell 4B compared to the current state of operations without Cell 4B. Overall, using conservative assumptions, the predicted annual effective dose commitments for operations with or without Cell 4B comply with UAC R313-15.

In addition, the 2008 MILDOS Report calculated 40 CFR 190 annual dose commitments (excluding radon) and compared those results to the 40 CFR 190 criterion, which is 25 mrem/yr to the whole body (excluding the dose due to radon) and 25 mrem/yr to any other organ, to any member of the public. The 40 CFR 190 doses were also used to demonstrate compliance with the ALARA (As Low As Reasonably Achievable) goal set out in UAC R313-15-101(4) (10 CFR 20.1101(d)) (i.e., the ALARA goal is to demonstrate that total effective dose equivalent to the individual member of the public likely to receive the highest total effective dose equivalent will not exceed 10 mrem/yr (absent the radon dose)). For the processing of Colorado Plateau ore at full Mill capacity, the 40 CFR 190 annual dose commitments were calculated to be a maximum of 4.8 mrem/yr for a teenager at the nearest potential residence (dose to the bone), which is about 19% of the 40 CFR 190 dose criterion of 25 mrem/yr. For the processing of higher grade Arizona Strip ore at full Mill capacity, the 40 CFR 190 annual dose commitments were at most 12 mrem/yr for a teenager at the nearest potential residence (dose to the bone), which is about 49% of the 40 CFR 190 dose criterion of 25 mrem/yr. Further, the 40 CFR 190 annual effective dose commitments demonstrate compliance with the UAC R313-15-101(4) (10 CFR 20.1101(d)) ALARA goal of 10 mrem/yr to the individual member of the public likely to receive the highest total effective dose equivalent (the maximum total effective dose equivalent (radon excluded) was 1.39 mrem/yr for an infant at the nearest potential residence). In each of these calculations, there was no significant difference in the dose assuming operation of Cell 4B compared to the current state of operations without Cell 4B. Overall, using conservative assumptions, ore processing with or without the operation of Cell 4B complies with the requirements of 40 CFR 190 and the ALARA goal set out in UAC R313 -15-101(4).

See the discussion on pages 1 through 5 of the SER for DRC's evaluation of the MILDOS modeling related to Cell 4B.

## **9. COMPLIANCE WITH THE REQUIREMENTS OF 40 CFR 192.32(A)**

As mentioned above, the work practice the Mill follows under 40 CFR 61.252(b)(1) is phased disposal in lined tailings impoundments that are no more than 40 acres in area and meet the requirements of 40 CFR 192.32(a) as determined by NRC.



As discussed in Section 6 above, and as indicated on Figure 1-3, Cell 4B will be a lined tailings impoundment that is no more than 40 acres in area. Compliance with the requirements of 40 CFR 192.32(a) is being determined by the Executive Secretary of the Utah Radiation Control Board/ Co-Executive Secretary of the Utah Water Quality Board, in his review of the applications to amend the License and Permit to include the specific design criteria and operating conditions applicable to Cell 4B. These determinations are discussed in the SER and the SOB. See also Attachment C to this Application for a summary of the requirements of 40 CFR 192.32(a) and the manner in which Cell 4B will satisfy those requirements, with references to the relevant pages of the SOB and SER, where applicable.

## 10. CONCLUSIONS

Based on the foregoing information, it is evident that Cell 4B will be a lined tailings impoundment that is no more than 40 acres in area and that, upon approval of amendments to the License and Permit by the Executive Secretary of the Utah Radiation Control Board/Co-Executive Secretary of the Utah Water Quality Board, will satisfy the standards set out in 40 CFR 192.32(a). It is further evident that, upon approval, Cell 4B will be capable of being operated in compliance with the provisions of 40 CFR Subpart W.

Based on the foregoing, Denison believes that it would be appropriate for the Executive Secretary of the Utah Air Quality Board to determine that the construction or operation of Cell 4B will not cause emissions in violation of a standard if properly operated, and to approve the requested modification pursuant to 40 CFR 61.08 (b).

Please notify us whether you agree that the foregoing requirements of 40 CFR 61.07 have been met, so that construction of Cell 4B can proceed.

If you should have any questions regarding this Application please contact me at 303-389-4132 or David C. Frydenlund, Denison's Vice President, Regulatory Affairs and Counsel, at 303-389-4130.

Yours very truly,



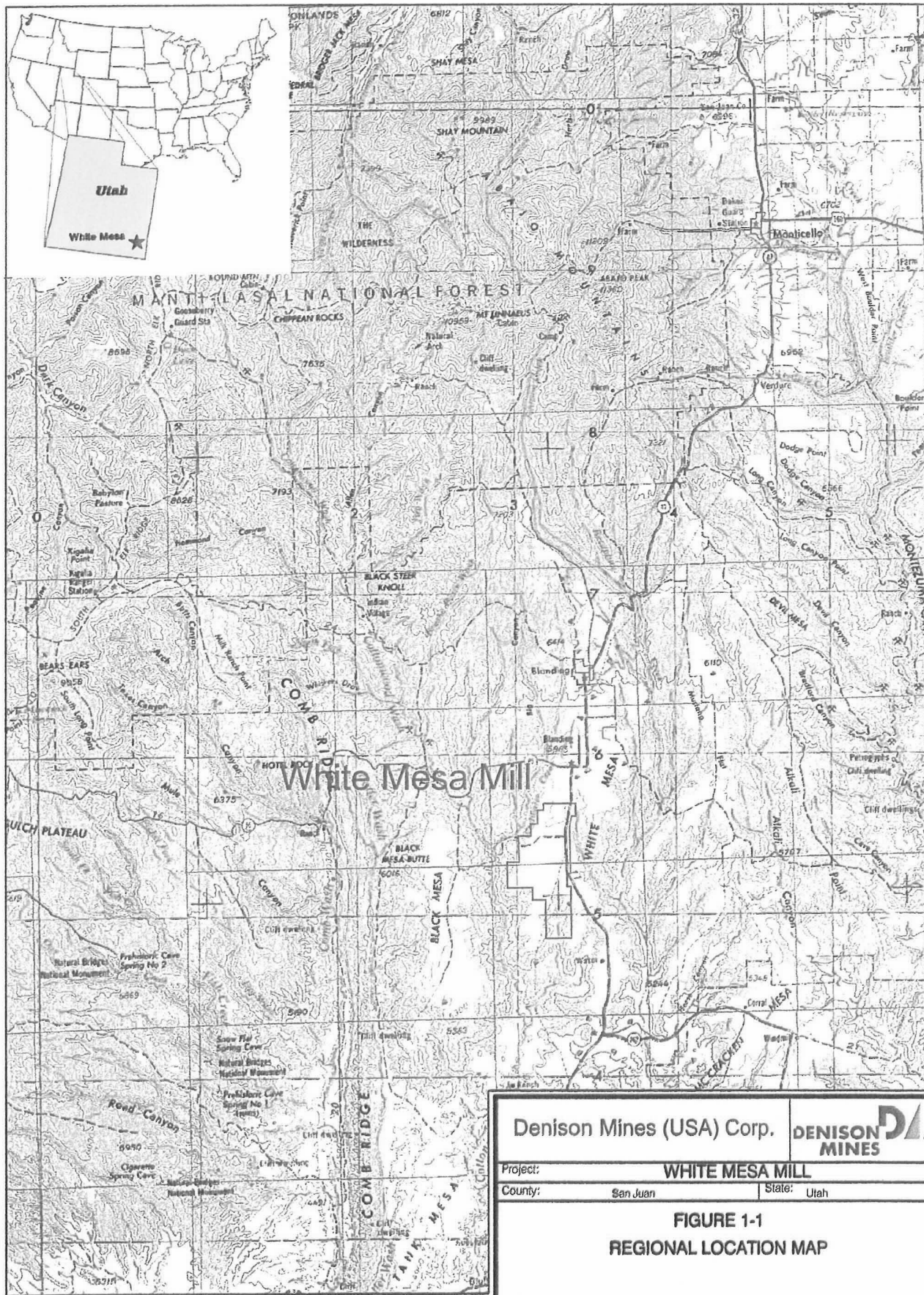
**DENISON MINES (USA) CORP.**

*for* Jo Ann Tischler

Director, Compliance and Permitting

cc: EPA, Region VIII, Attention: Director, Air and Toxics Technical Enforcement Program  
Dane L. Finerfrock, Executive Secretary, Utah Radiation Control Board  
Ron F. Hochstein  
David C. Frydenlund  
Harold R. Roberts  
David E. Turk.

**Figure 1-1**



Denison Mines (USA) Corp.



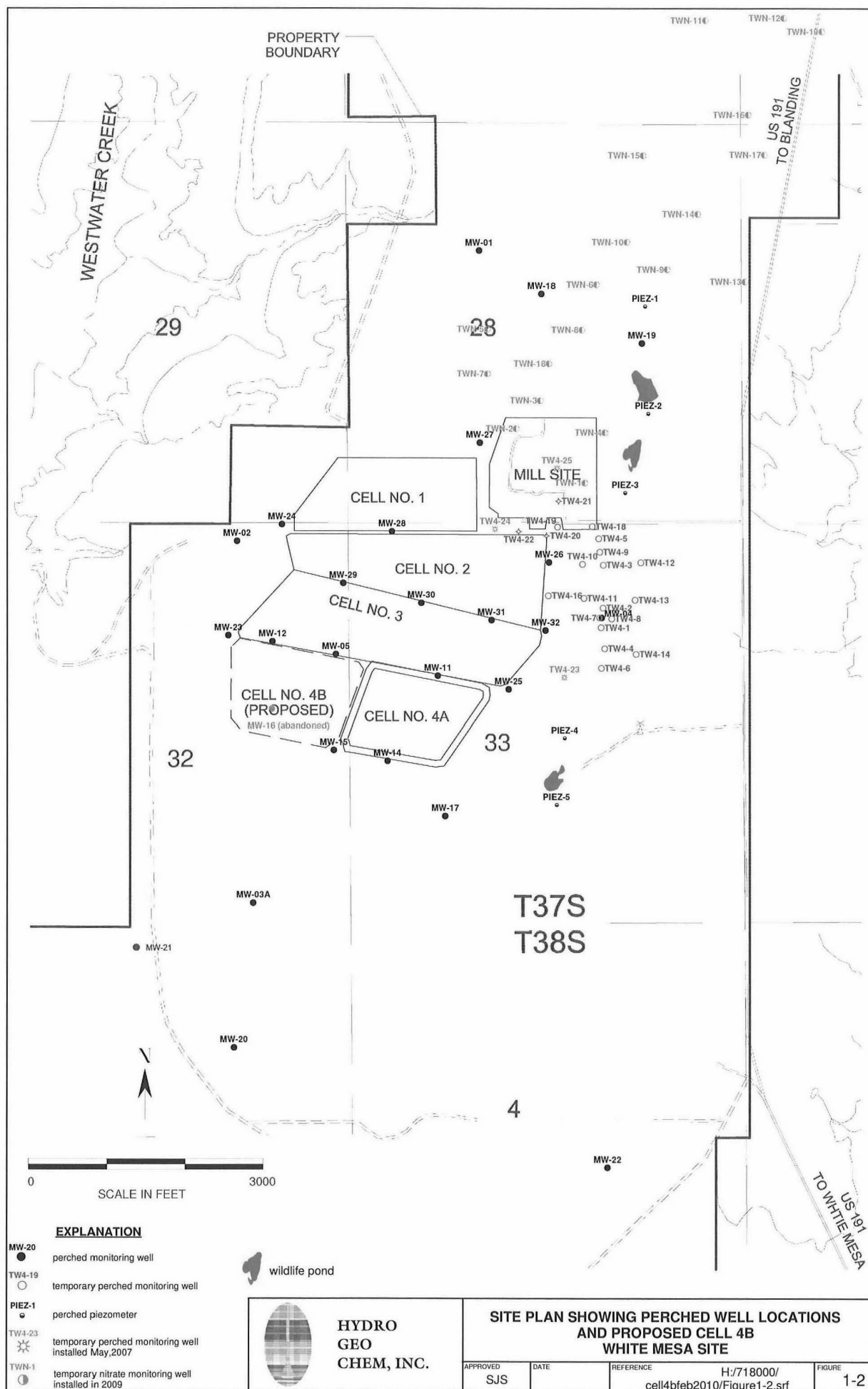
Project: **WHITE MESA MILL**

County: San Juan      State: Utah

**FIGURE 1-1  
REGIONAL LOCATION MAP**

Date: Nov 2009      Design:      Drafted By: D.Sledd

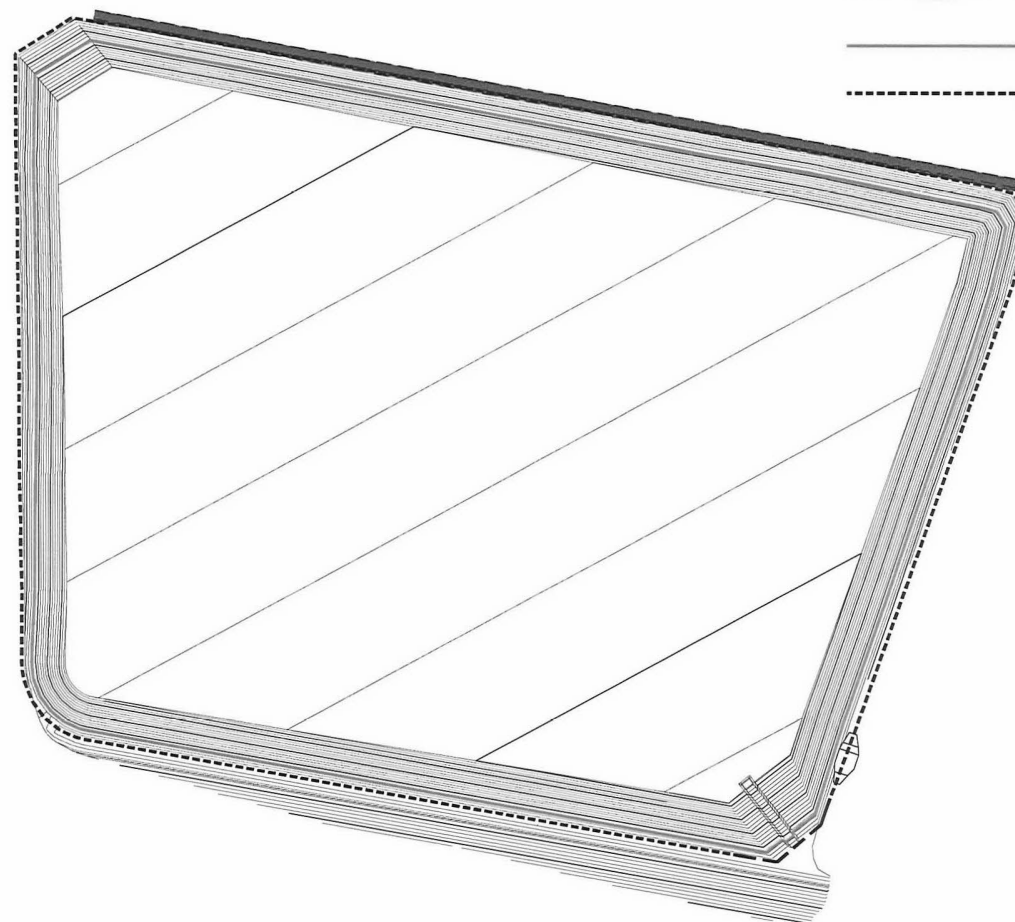
**Figure 1-2**



**Figure 1-3**



\\sawridge-01\Data\PR\A\SC0349\SC0349\PerSet\_Cell 4b\CONFORMED SET 11-04-09\Figure SC0349 Figure 1-3 perimeter 3 ft below.dwg



# LEGEND

- 5560 PROPOSED GRADING (10' CONTOUR)
- 5562 PROPOSED GRADING (2' CONTOUR)
- PERIMETER (3 FT BELOW TOP OF BERM IN SOUTHWEST CORNER OF CELL)
- LIMIT OF LINER

## NOTE:

1. PERIMETER AREA = 39.84 ACRES.

CELL 4B WHITE MESA MILL BLANDING UTAH		
Geosyntec consultants	DATE:	APRIL 2010
	PROJECT NO.	SC0349
		FIGURE 1-3

## Attachment A



# State of Utah

## DEPARTMENT OF HEALTH

### DIVISION OF ENVIRONMENTAL HEALTH

Norman H. Bangerter  
Governor

Suzanne Dandoy, M.D., M.P.H.  
Executive Director

Kenneth L. Alkema  
Director

Bureau of Air Quality  
288 North 1460 West  
P.O. Box 16690  
Salt Lake City, Utah 84116-0690  
(801) 538-6108

June 26, 1989

John S. Hammrick  
Umetco Minerals  
P.O. Box 669  
Blanding, Utah 84511

Dear Mr. Hammrick:

Re: Consolidated Approval Order and Approval Order for Cells 4A and 4B  
San Juan County, CDS Al

The above-referenced project has been evaluated and found to be consistent with the requirements of the Utah Air Conservation Regulations (UACR) and the Utah Air Conservation Act. A 30-day public comment period was held and all comments received were evaluated. The conditions of this approval order reflect any changes to the proposed conditions which resulted from the evaluation of the comments received. This air quality approval order authorizes the project with the following conditions and failure to comply with any of the conditions may constitute a violation of this order:

1. Umetco Minerals Corporation, located near Blanding, San Juan County, Utah, shall construct and operate according to the following notices of intent:
  - A. The notice of intent dated November 15, 1978 to operate the White Mesa Uranium Mill
  - B. The notice of intent dated July 22, 1988 to modify the vanadium circuit
  - C. The notice of intent dated February 15, 1989 to add Cells 4A and 4B
2. This approval order shall replace and void all previous approval orders.
3. The approved installations shall consist of the following equipment located at the plant:
  - A. A rotary ammonium metavanadate dryer
  - B. A Ducon dry cyclone installed on the off-gas stream of the rotary dryer
  - C. A new propane melting furnace
  - D. An existing propane melting furnace
  - E. An existing propane-fired multiple hearth dryer

- F. A new Kice dry cyclone located between the hearth dryer and the Sly No. 6 wet scrubber
  - G. A second fusion furnace and casting wheel
  - H. A new Ducon dryer scrubber
  - I. An existing Sly No. 6 wet scrubber
  - J. Yellow cake dryer
  - K. Yellow cake scrubber
  - L. Yellow cake packaging scrubber
  - M. Yellow cake enclosure scrubber
  - N. Leach demistor
  - O. Coal fired boiler and scrubber
  - P. Oil fired boiler
  - Q. Coal stockpile
  - R. Soil and overburden stockpiles
  - S. Ore grizzly and fabric filter dust collector
4. The equipment used to construct Cells 4A and 4B shall consist of the following:
- A. Scrapers (3)
  - B. Cat trucks (3)
  - C. Cat crawlers (2)
  - D. Front-end loader (1)
  - E. Compactor (1)
  - F. Grader (1)
  - G. Water truck (1)
  - H. Personnel vehicles (1)
  - I. Other equipment which does not produce air contaminants
5. Cell #4 shall consist of two separate cells, known as Cell A and Cell B. Cells 4A and 4B shall be sized to each have a volume not exceeding 1150 acre-feet (1,855,333 cubic yards) with a phased final surface area of no more than 40 acres each. Cell #4 shall be designed as a below-grade repository similar to the previously constructed cells in the Tailings Management System.
6. Visible emissions from any point or fugitive emission source associated with the installation or control facilities of Cell #4 shall not exceed 20% opacity. Opacity observations of emissions from stationary sources shall be conducted in accordance with 40 CFR 60, Appendix A, Method 9. Opacity observations of intermittent sources shall use procedures similar to Method 9, but the requirement for observations to be made at

15-second intervals over a 6-minute period shall not apply. The averaging time shall be the actual time interval over which visible emissions are observed. Any time interval with no visible emissions shall not be included.

7. The total amount of tailings to be deposited into five proposed cells over the life of the plant shall not exceed 10,950,000 tons. Compliance with these limitations shall be determined by an annual examination of company records by the Executive Secretary. Any changes to these limitations shall require an approval order in accordance with Section 3.1, UACR.
8. All unpaved roads and other unpaved operational areas shall be water sprayed and/or chemically treated to the extent necessary to maintain a surface damp condition. Control is required whenever the roads or areas are being used. An operational water truck shall be maintained on site and available during each operating day. If the water truck is out of service and the roads or operational areas become dry they shall not be used until a truck has been obtained and water has been applied. The equipment shall be capable of delivering a minimum application rate of water of 0.5 gallons per square yard. Records of water treatment shall be kept for all periods when the plant is in operation. The records shall include the following items:
  - A. Date
  - B. Number of treatments made
  - C. Rainfall received, if any, and approximate amount
  - D. Time of day treatments were made

Records of treatment shall be made available to the Executive Secretary upon request and shall include a period of time equal to the entire duration of the project. If chemical treatment is to be used, the plan must be approved by the Executive Secretary.

9. Fugitive dusts from the disturbed areas shall be controlled through the use of watering as dry conditions warrant or as determined necessary by the Executive Secretary. The speed of compactors shall not exceed 3 mph at any time.
10. The storage piles shall be watered to minimize generation of fugitive dusts as dry conditions warrant or as determined necessary by the Executive Secretary.
11. For front-end loading operations and truck dumping operations, the drop distances shall be kept as small as practicable. The speed of the scrapers shall not exceed 3 mph while loading and 12 mph while dumping. The moisture content of the materials shall be no less than 4% by weight during these operations. The moisture content shall be tested if directed by the Executive Secretary using a test method approved by the Executive Secretary.
12. The owner/operator shall comply with 40 CFR 61, Subpart W, National Emission Standards for Radon-222 Emissions from Licensed Uranium Mill Tailings. The owner/operator shall comply with Section 4.5.5, UACR during the construction and operation of the cells.

13. The vanadium circuit, the yellow cake dryer, and the coal fired boiler scrubbers shall be stack tested for particulate within 180 days of start-up. The emission rates/concentrations shall not exceed any of the following values:
  - A. Vanadium circuit scrubber
    - 1) 0.02 grain/dscf (68°F, 29.92 in Hg)
    - 2) 2.50 lb/hr
  - B. Yellow cake dryer - 0.40 lb/hr
  - C. Coal fired boiler - 5.70 lb/hr

The test method used shall be 40 CFR 60, Appendix A, Method 5. Notification of the test date shall be provided at least 30 days prior to the test. A pretest conference shall be held if directed by the Executive Secretary. It shall be held at least 30 days prior to the test between the owner/operator, the tester, and the Executive Secretary. The emission points shall be designed to conform to the requirements of 40 CFR 60, Appendix A, Method 1, and OSHA approvable access shall be provided to the test location.
14. Visible emissions from the following points shall not exceed the following values:
  - A. Vanadium circuit scrubbers - 15% opacity
  - B. All other points - 20% opacity

Opacity observations of emissions from stationary sources shall be conducted in accordance with 40 CFR 60, Appendix A, Method 9. Opacity observations of intermittent sources shall use procedures similar to Method 9, but the requirement for observations to be made at 15-second intervals over a 6-minute period shall not apply. The averaging time shall be the actual time interval over which visible emissions are observed. Any time interval with no visible emissions shall not be included.
15. The owner/operator shall use only propane as a fuel in the multiple hearth dryer, the two fusion furnaces, and the AMV rotayr dryer. If any other fuel is to be used, an approval order shall be required in accordance with Section 3.1, UACR.
16. The sulfur content of any coal or any mixture of coals burned shall not exceed 1.0 pound of sulfur per million BTU heat input as determined by ASTM Method D-3177-75. The sulfur content shall be tested if directed by the Executive Secretary.
17. The ore and coal loading areas shall be partially enclosed on three sides and have wetting agents applied to the ore grizzly.
18. The coal stock piles shall be sprayed with wetting agents to minimize fugitive dusts.
19. The tailings retention areas shall be sprayed with water or a crusting agent when dry conditions exist.



John S. Hammrick  
June 26, 1989  
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20. The mill area shall be graveled and, when necessary, sprayed with water as a minimum to minimize fugitive dust.
21. The soil and overburden stockpiles shall be sprayed between stockpiling and vegetation periods as required (records of spraying shall be maintained).
22. Unpaved haul/access roads shall have at least one inch of gravel as roadbase surface.
23. When the cells are filled with tailings, the surfaces shall be reclaimed in a manner such that wind-blown particulate emissions from the site are minimized. A plan for reclaiming the site shall be submitted to the Executive Secretary for approval no less than 180 days before the ponds are filled with tailings.
24. All installations and facilities authorized by this approval order shall be adequately and properly maintained.
25. The Executive Secretary shall be notified in writing upon start-up of the installation, as an initial compliance inspection is required.

Any future modifications to the equipment approved by this order must also be approved in accordance with Section 3.1.1, UACR.

This approval order in no way releases the owner or operator from any liability for compliance with all other applicable federal, state, and local regulations including the Utah Air Conservation Regulations.

"Allowable emissions" as defined in Section 1.12, UACR, for this source (the entire plant) are currently calculated at 214.32 tons/yr for particulate, 62.3 tons/yr for SO<sub>2</sub>, 80.7 tons/yr for NO<sub>x</sub>, 1.1 tons/yr for VOC, and 4.5 tons/yr for CO. These calculations are for the purposes of determining the applicability of PSD and nonattainment area major source requirements of the UACR. They are not to be used for purposes of determining compliance.

Sincerely,

  
F. Burnell Cordner, Executive Secretary  
Utah Air Conservation Committee

FBC:DER:slt

cc: EPA Region VIII, John Dale  
Southeastern Utah District Health Department  
David R. Ariotti, P. E.

## Attachment B



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION VIII

999 18th STREET - SUITE 500  
DENVER, COLORADO 80202-2405

MAR 16 1989

Ref: 8ATD

Mr. John S. Hamrick  
Site Environmental Coordinator  
Umetco Minerals Corporation  
P.O. Box 669  
Blanding, UT 84511

Dear Mr. Hamrick:

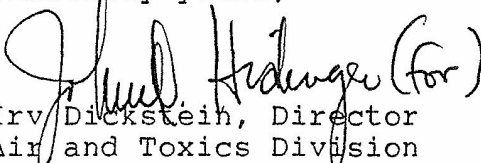
This is in response to your letter to the Regional Administrator, James J. Scherer (dated February 8, 1989) resubmitting your construction plan for a new tailings disposal impoundment at the White Mesa Uranium Mill. Our review of this submission is in accordance with the requirements of 40 CFR Part 61 - National Emission Standards for Hazardous Air Pollutants, Standards for Radon-222 Emissions from Licensed Uranium Mill Tailings.

In your original submittal the planned impoundment was greater than 40 Acre in size. In the resubmittal you indicate that the original impoundment which you named Cell 4 will be divided into two cells which you named Cell 4a and Cell 4b. Further your application indicates that for the present only Cell 4a will be constructed.

Accordingly I find that Cell 4a as described in your application will not cause emissions in violation of 40 CFR Part 61 Subpart W if properly operated. In accordance with 40 CFR Part 61.08 I am approving the construction of Cell 4a.

This approval does not relieve you of the responsibility for compliance with any applicable provisions of this part or any other Federal, State, or local requirements. I will be anticipating your notification of startup as required under 40 CFR 61.09.

Sincerely yours,

  
Irvin Dickstein, Director  
Air and Toxics Division

## Attachment C

## ATTACHMENT C

### SUMMARY OF COMPLIANCE WITH THE REQUIREMENTS OF 40 CFR 192.32(a)

Capitalized terms used in this Attachment and not otherwise defined below have the meanings set out in the Application.

As discussed in Section 9 of the Application, compliance with the standards set out in 40 CFR 192.32(a) is being determined by the Executive Secretary of the Utah Radiation Control Board/Co-Executive Secretary of the Utah Water Quality Board in his review of the applications to amend the License and Permit to include the specific design criteria and operating conditions applicable to Cell 4B. This Attachment is intended to summarize briefly the requirements of 40 CFR 192.32(a), and the manner in which the proposed design and operation of Cell 4B will satisfy those requirements. Where applicable, references will be made to the SER and SOB to refer the reader to the DRC's conclusions and analysis relating to these matters.

Congress created Title II of the Uranium Mill Tailings Radiation Control Act of 1978 ("UMTRCA") to regulate the management and disposition of uranium mill tailings and related wastes at active mill tailings sites. UMTRCA amended the Atomic Energy Act of 1954 ("AEA") by adding the definition of 11e.(2) byproduct material<sup>1</sup>, by adding Section 83 of the AEA<sup>2</sup>, which requires that mill tailings sites must be transferred to the United States Department of Energy (or a willing State) for long-term custody and maintenance, and by adding Sections 84<sup>3</sup> and 275<sup>4</sup> of the AEA, which give NRC broad authority to regulate the radiological and non-radiological aspects of mill tailings sites, *in accordance with general standards promulgated by EPA and specific regulatory requirements established by NRC*.

In 1980, NRC promulgated its 10 CFR Part 40, Appendix A Criteria<sup>5</sup>, based upon the findings in its Final Generic Environmental Impact Statement On Uranium Milling set forth in NUREG-0706.<sup>6</sup>

In 1983, EPA issued its general standards for active uranium mill sites at 40 CFR 192.32(a).<sup>7</sup> In 1985, NRC amended its earlier 1980 Criteria to conform them to EPA's generally applicable

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<sup>1</sup> See 42 U.S.C. 2014.

<sup>2</sup> See 42 U.S.C. 2113.

<sup>3</sup> See 42 U.S.C. 2114.

<sup>4</sup> See 42 U.S.C. 2022.

<sup>5</sup> 45 Fed. Reg. 65,521 (1980).

<sup>6</sup> NUREG-0706, Final Generic Environmental Impact Statement on Uranium Milling, (September, 1980).

<sup>7</sup> 48 Fed. Reg. 45,926 (1983) (codified at 40 CFR 192.30-.43).

standards,<sup>8</sup> although many of the Appendix A Criteria were consistent with the EPA standards and remained unchanged.

NRC determined that the Mill was operating in compliance with the requirements of 10 CFR Part 40, Appendix A, and hence in compliance with the standards established in 40 CFR 192.32(a) (as implemented by NRC), by virtue of renewing the Mill's Source Material License in 1997.

The State of Utah became an Agreement State for the regulation of uranium mills under Section 274 of the AEA in August of 2004. Section 274(d) of the AEA provides that NRC shall only enter into an Agreement with a State under Section 274, if among other things NRC finds that the State program is in accordance with the requirements of subsection 274(o) of the AEA. Subsection 274(o) provides that in licensing uranium mills the State shall require "compliance with standards which shall be adopted by the State for the protection of the public health, safety, and the environment from hazards associated with such material which are equivalent, to the extent practicable, or more stringent than, standards adopted and enforced by the Commission for the same purpose, *including requirements and standards promulgated by the Commission and the Administrator of the Environmental Protection Agency pursuant to sections 83, 84, and 275,*" [emphasis added].

Accordingly, upon granting the State of Utah Agreement State status for uranium mills in August 2004, NRC determined that the State of Utah's regulatory program contained standards equivalent to or more stringent than the standards established by NRC (implementing standards set by EPA under 40 CFR 192.32).

Upon the State of Utah becoming an Agreement State for uranium mills in 2004, the Mill's NRC Source Material License was replaced by the License and Permit.

Ongoing compliance with the standards set by NRC (implementing EPA's standards in 40 CFR 192.32) is therefore determined by the State of Utah Department of Environmental Quality ("UDEQ") through its administration of the License and Permit in accordance with State regulations and through the administration of the NESHAPS Program at the Mill.

However, even though compliance with the standards set out in 40 CFR 192.32(a), as implemented by NRC, are determined by UDEQ in the administration of the License and Permit in accordance with State regulations, the following discussion will address the various standards set out in 40 CFR 192.32(a), which have been incorporated into various State regulations, as they relate to proposed Cell 4B (the relevant paragraphs of 40 CFR 192.32(a) are set out below in italics, followed by Denison's comments in regular font):

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<sup>8</sup> 50 Fed. Reg. 41,852 (1985).



*(a)(1) Surface impoundments (except for an existing portion) subject to this subpart must be designed, constructed, and installed in such manner as to conform to the requirements of §264.221 of this chapter, except that at sites where the annual precipitation falling on the impoundment and any drainage area contributing surface runoff to the impoundment is less than the annual evaporation from the impoundment, the requirements of §264.228(a)(2)(iii)(E) referenced in §264.221 do not apply.*

The major design elements for Cell 4B are described in Section 6 of the Application and Part I.D.12 of the proposed amended Permit, and demonstrate that:

- Cell 4B has two or more liners and a leachate collection and removal system between such liners, in accordance with the standard set out in 40 CFR 264.221(c). See the discussion on page 4 of the SOB;
- The top liner is 60 ml HDPE and has been designed and constructed of materials to prevent the migration of hazardous constituents into such liner during the active life and post-closure care period, in accordance with the standards set out in 40 CFR 264.221(c)(1)(i)(A). See the discussion on page 4 of the SOB;
- Cell 4B has a composite bottom liner, consisting of at least two components. The upper component is 60 ml HDPE and is designed and constructed of materials to prevent the migration of hazardous constituents into this component during the active life and post-closure care period. The lower component is a geoclay liner that is designed and constructed of materials to minimize the migration of hazardous constituents if a breach in the upper component were to occur, in accordance with the standards set out in 40 CFR 264.221(c)(1)(i)(B). See the discussions on page 4 of the SOB and page 36 of the SER;
- The Cell 4B liner system is designed, and will be constructed, and installed to prevent any migration of wastes out of the impoundment or pond to the adjacent subsurface soil or ground water or surface water at any time during the active life (including the closure period) of the impoundment or pond, in accordance with the standards set out in 40 CFR 264.221(c)(1)(ii) and 40 CFR 264.221(a). See the discussion on pages 36 and 37 of the SER;
- The HDPE liner will be constructed of materials that have appropriate chemical properties and sufficient strength and thickness to prevent failure due to pressure gradients (including static head and external hydrogeologic forces), physical contact with the waste or leachate to which they are exposed, climatic conditions, the stress of installation, and the stress of daily operation, in accordance with the standards set out in 40 CFR 264.221(c)(1)(ii) and 40 CFR 264.221(b). See the discussion on pages 36 and 37 of the SER;
- Cell 4B will have a liner that will be placed upon a foundation or base capable of providing support to the liner and resistance to pressure gradients above and below

the liner to prevent failure of the liner due to settlement, compression, or uplift, in accordance with the standards set out in 40 CFR 264.221(c)(1)(ii) and 40 CFR 264.221(a)(2). See the discussion on pages 36 and 37 of the SER;

- The Cell 4B liner system will be installed to cover all surrounding earth likely to be in contact with the waste or leachate, in accordance with the standards set out in 40 CFR 264.221(c)(1)(ii) and 40 CFR 264.221(a)(3). See the discussion on pages 36 and 37 of the SER.
- The leachate collection and removal system between the liners and immediately above the bottom composite liner is also a leak detection system. This leak detection system is capable of detecting, collecting, and removing leaks of hazardous constituents at the earliest practical time through all areas of the top liner likely to be exposed to waste or leachate during the active life and post-closure period, in accordance with the standard set out in 40 CFR 264.221(c)(2). See the discussion on pages 4 and 5 of the SOB;
- The Permit requires that the operator shall collect and remove pumpable liquids in the sumps to minimize the head on the bottom liner (see Part I.D.13 of the draft Permit), in accordance with the standards set out in 40 CFR 264.221(c)(3). See the discussion on pages 9 and 10 of the SOB;
- The leak detection system is located completely above the seasonal high water table (which is located at least 40 feet below the bottom of the cells), as contemplated by 40 CFR 264.221(c)(4); and
- The design and construction of the new liner system will be approved by the Executive Secretary of the Utah Radiation Control Board/Co-Executive Secretary of the Utah Water Quality Board, as contemplated by 40 CFR 264.221(d).

Cell 4B has been designed, and will be constructed, maintained, and operated to prevent overtopping resulting from normal or abnormal operations; overfilling; wind and wave action; rainfall; run-on; malfunctions of level controllers, alarms, and other equipment and human error, in accordance with the standards set out in 40 CFR 264.221(g). Part I.D.3(c) of the Permit prohibits placement of tailings into Cell 4B above the flexible membrane liner in the cell. The Permit and the License also set freeboard limits for solutions in all cells that take into account wind and wave action and rainfall storm events (see Part I.D.12(a)4 of the Permit and condition 10.3 of the License). See also the discussion on page 39 of the SER.

The dikes of Cell 4B are designed, and will be constructed, and maintained with sufficient structural integrity to prevent massive failure of the dikes, even without presuming that the liner system will function without leakage during the active life of the unit, in accordance with the standard set out in 40 CFR 264.221(h). See the discussion on page 41 of the SER. In addition to the initial approval of the dikes by the NRC or Executive Secretary of the Utah Radiation Control Board/Co-Executive Secretary of the Utah Water Quality Board, the dikes are inspected every five years by the State Engineer.

The Permit and License specify all design and operating practices that are necessary to ensure that the foregoing requirements are satisfied, in accordance with the standards set out in 40 CFR 264.221(i).

(a)(2) *Uranium byproduct materials shall be managed so as to conform to the ground water protection standard in §264.92 of this chapter, except that for the purposes of this subpart:*

(i) *To the list of hazardous constituents referenced in §264.93 of this chapter are added the elements molybdenum and uranium;*

(ii) *To the concentration limits provided in Table 1 of §264.94 of this chapter are added the radioactivity limits in Table A of this subpart;*

(iii) *Detection monitoring programs required under §264.98 to establish the standards required under §264.92 shall be completed within one (1) year of promulgation;*

(iv) *The regulatory agency may establish alternate concentration limits (to be satisfied at the point of compliance specified under §264.95) under the criteria of §264.94(b), provided that, after considering practical corrective actions, these limits are as low as reasonably achievable, and that, in any case, the standards of §264.94(a) are satisfied at all points at a greater distance than 500 meters from the edge of the disposal area and/or outside the site boundary, and*

(v) *The functions and responsibilities designated in Part 264 of this chapter as those of the “Regional Administrator” with respect to “facility permits” shall be carried out by the regulatory agency, except that exemptions of hazardous constituents under §264.93(b) and (c) of this chapter and alternate concentration limits established under §264.94(b) and (c) of this chapter (except as otherwise provided in §192.32(a)(2)(iv)) shall not be effective until EPA has concurred therein.*

NRC determined compliance with the foregoing requirements by issuing the Mill’s original Source Material License, as amended from time to time. Upon the State of Utah becoming an Agreement State, NRC determined that the State’s groundwater protection regulations are equivalent or stricter than the standards set by 40 CFR 264.92, as implemented by NRC. The State enforces compliance with its groundwater protection regulations through the Mill’s Permit. The Mill has not applied for any alternate concentration limits at its points of compliance. See the discussion on pages 66 through 83 of the SER.

*(a)(3)(i) Uranium mill tailings piles or impoundments that are nonoperational and subject to a license by the Nuclear Regulatory Commission or an Agreement State shall limit releases of radon-222 by emplacing a permanent radon barrier. This permanent radon barrier shall be constructed as expeditiously as practicable considering technological feasibility (including factors beyond the control of the licensee) after the pile or impoundment ceases to be operational. Such control shall be carried out in accordance with a written tailings closure plan (radon) to be incorporated by the Nuclear Regulatory Commission or Agreement State into individual site licenses.*

*(ii) The Nuclear Regulatory Commission or Agreement State may approve a licensee's request to extend the time for performance of milestones if, after providing an opportunity for public participation, the Nuclear Regulatory Commission or Agreement State finds that compliance with the 20 pCi/m<sup>2</sup>-s flux standard has been demonstrated using a method approved by the NRC, in the manner required in 192.32(a)(4)(i). Only under these circumstances and during the period of the extension must compliance with the 20 pCi/m<sup>2</sup>-s flux standard be demonstrated each year.*

*(iii) The Nuclear Regulatory Commission or Agreement State may extend the final compliance date for emplacement of the permanent radon barrier, or relevant milestone, based upon cost if the new date is established after a finding by the Nuclear Regulatory Commission or Agreement State, after providing an opportunity for public participation, that the licensee is making good faith efforts to emplace a permanent radon barrier; the delay is consistent with the definition of "available technology" in 192.31(m); and the delay will not result in radon releases that are determined to result in significant incremental risk to the public health.*

*(iv) The Nuclear Regulatory Commission or Agreement State may, in response to a request from a licensee, authorize by license or license amendment a portion of the site to remain accessible during the closure process to accept uranium byproduct material as defined in section 11(e)(2) of the Atomic Energy Act, 42 U.S.C. 2014(e)(2), or to accept materials similar to the physical, chemical and radiological characteristics of the in situ uranium mill tailings and associated wastes, from other sources. No such authorization may be used as a means for delaying or otherwise impeding emplacement of the permanent radon barrier over the remainder of the pile or impoundment in a manner that will achieve compliance with the 20 pCi/m<sup>2</sup>-s flux standard, averaged over the entire pile or impoundment.*

*(v) the Nuclear Regulatory Commission or Agreement State may, in response to a request from a licensee, authorize by license or license amendment a portion of a pile or impoundment to remain accessible after emplacement of a permanent radon barrier to accept uranium byproduct material as defined in section 11(e)(2) of the Atomic Energy Act,*

*42 U.S.C. 2014(e)(2), if compliance with the 20 pCi/m<sup>2</sup>-s flux standard of 192.32(b)(1)(ii) is demonstrated by the licensee's monitoring conducted in a manner consistent with 192.32(a)(4)(i). Such authorization may be provided only if the Nuclear Regulatory Commission or Agreement State makes a finding, constituting final agency action and after providing an opportunity for public participation, that the site will continue to achieve the 20 pCi/m<sup>2</sup>-s flux standard when averaged over the entire impoundment.*

The Mill has an NRC-approved Reclamation Plan that is designed to limit releases of radon-222 by emplacing a permanent radon barrier. The Reclamation Plan will be amended to include Cell 4B prior to commencement of use of Cell 4B. See the discussion on page 56 of the SER.

*(a)(4)(i) Upon emplacement of the permanent radon barrier pursuant to 40 CFR 192.32(a)(3), the licensee shall conduct appropriate monitoring and analysis of the radon-222 releases to demonstrate that the design of the permanent radon barrier is effective in limiting releases of radon-222 to a level not exceeding 20 pCi/m<sup>2</sup>-s as required by 40 CFR 192.32(b)(1)(ii). this monitoring shall be conducted using the procedures described in 40 CFR part 61, Appendix B, Method 115, or any other measurement method proposed by a licensee that the Nuclear Regulatory Commission or Agreement State approves as being at least as effective as EPA Method 115 in demonstrating the effectiveness of the permanent radon barrier in achieving compliance with the 20 pCi/m<sup>2</sup>-s flux standard.*

The 20 pCi/m<sup>2</sup>-s radon-222 standard is being satisfied with the interim cover alone. There is no question that the final cover, which will include the addition of several additional feet of cover, will also comply with that standard. All testing has been and will continue to be performed by the 40 CFR Part 61, Appendix B, Method 115. See Section 5.5 of the Application and the discussion on page 44 of the SER.

*(a)(4)(ii) When phased emplacement of the permanent radon barrier is included in the applicable tailings closure plan (radon), then radon flux monitoring required under §192.32(a)(4)(i) shall be conducted, however the licensee shall be allowed to conduct such monitoring for each portion of the pile or impoundment on which the radon barrier has been emplaced by conducting flux monitoring on the closed portion.*

Radon flux monitoring is performed on Cells 2 and 3 annually in accordance with 40 CFR Part 61, Appendix B, Method 115 and 192.32(a)(4)(ii).

*(a)(5) Uranium byproduct materials shall be managed so as to conform to the provisions of:*

*(i) Part 190 of this chapter, "Environmental Radiation Protection Standards for Nuclear Power Operations"*

40 CFR 190.10(a) provides that operations from facilities such as the Mill shall be conducted in such a manner as to provide reasonable assurance that: "The annual dose equivalent does not exceed 25 millirems to the whole body, 75 millirems to the thyroid, and 25 millirems to any other organ of any member of the public as the result of planned discharges of radioactive materials, radon and its daughters excepted, to the general environment from uranium fuel cycle operations and to radiation from these operations."

As discussed in Section 8 of the Application, the Mill has demonstrated compliance with this requirement using NRC's MILDOS-AREA code for estimating environmental radiation doses for uranium recovery operations (Argonne 1998).

The analysis performed in the 2008 MILDOS Report assumed the Mill to be processing high grade Arizona Strip ores at full capacity (which has yet to be achieved in practice over an entire year), and calculated the concentrations of radioactive effluents at individual receptor locations around the Mill, including at the location of the member of the public most likely to receive the highest dose from Mill operations, with and without the operation of Cell 4B. The modeling indicated that even with these very conservative assumptions the dose to any member of the public did not come close to exceeding the standards set out in 40 CFR 190.10(a), nor was there any significant difference in the doses with the addition of Cell 4B. See Section 8 of the Application and the discussion on pages 1 through 5 of the SER.

*(ii) Part 440 of this chapter, "Ore Mining and Dressing Point Source Category: Effluent Limitations Guidelines and New Source Performance Standards, Subpart C, Uranium, Radium, and Vanadium Ores Subcategory."*

The Mill is designed not to discharge any pollutants to ground water. The Permit is intended to protect against any potential discharges to ground water. The Mill is also designed not to discharge any process wastewater to navigable waters. There are no navigable waters in the vicinity of the Mill that could be impacted by Mill operations.

*(a)(6) The regulatory agency, in conformity with Federal Radiation protection Guidance (FR, May 18, 1960, pgs. 4402-4403), shall make every effort to maintain radiation doses from radon emissions from surface impoundments of uranium byproduct materials as far below the Federal Radiation Protection Guides as is practicable at each licensed site.*

The Mill is required by NRC Regulatory Guide 8.31 and UAC R313-15-101(2) to employ the As Low As is Reasonably Achievable (ALARA) concept to all Mill operations in order to maintain doses from radiation to Mill workers and members of the public as low as reasonably achievable. This includes maintaining radiation doses from radon emissions from surface impoundments of uranium byproduct materials as far below the Federal Radiation Protection Guides as is practicable.

The Mill's success in its efforts to keep radon emissions from its tailings impoundments as low as reasonably achievable is evidenced by its NESHAPs results for 2005-2009, which indicate that the radon-222 fluxes for Cells 2 and 3 were well below the 20 pCi/m<sup>2</sup>/sec standard, based on current tailings management practices at the Mill. See Section 5.5 of the Application.