

Uranium Watch

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December 21, 2011

Mr. Rusty Lundberg
Director
Division of Radiation Control
195 N. 1950 West
Salt Lake City, Utah 84116
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RE: Comments on License Renewal for White Mesa Uranium Mill,
License No. UT1900479 - License Amendment #5

Dear Mr. Lundberg:

On behalf of Uranium Watch, Living Rivers, Glen Canyon Group of the Sierra Club, Grand Canyon Trust, and Center for Biological Diversity, I submit the following comments on the proposed license renewal for Denison Mines Corporation's License Renewal for the White Mesa Uranium Mill Facility located near Blanding, Utah.

These comments incorporate by reference any comments on the White Mesa License Renewal that have been submitted by the Ute Mountain Ute Tribe, including any Ute Mt. Ute Tribe requests for action by the Utah Department of Environmental Quality, Division of Radiation Control, or Denison Mines (USA) Corporation.

1. BACKGROUND

1.1. On October 14, 2011, the Division of Radiation Control (DRC) issued a notice for the renewal of the existing Radioactive Material License (RML) No. UT1900479 for the Denison Mines (USA) Corporation's (Licensee's) White Mesa Uranium Mill Facility near Blanding, Utah. The DRC solicited comments on the RML renewal, draft Safety Evaluation Report, and draft revised License. The original due date for comments was extended to December 21, 2011.

1.2. Source material licenses for uranium mill facilities in Nuclear Regulatory Commission (NRC) Agreement States, such as the State of Utah, are governed in part by

the Atomic Energy Act of 1954 (AEA), as amended. 42 U.S.C. § 2021 addresses "Cooperation with states" and contains requirements for licenses that have a significant impact:

42 U.S.C. § 2021(o): State compliance requirements: compliance with section 2113(b) of this title and health and environmental protection standards; procedures for licenses, rulemaking, and license impact analysis; amendment of agreements for transfer of State collected funds; proceedings duplication restriction; alternative requirements

In the licensing and regulation of byproduct material, as defined in section 2014(e)(2) of this title, or of any activity which results in the production of byproduct material as so defined under an agreement entered into pursuant to subsection (b) of this section, a State shall require--

(3) procedures which--

(C) require for each license which has a significant impact on the human environment a written analysis (which shall be available to the public before the commencement of any such proceedings) of the impact of such license, including any activities conducted pursuant thereto, on the environment, which analysis shall include--

(i) an assessment of the radiological and nonradiological impacts to the public health of the activities to be conducted pursuant to such license;

(ii) an assessment of any impact on any waterway and groundwater resulting from such activities;

(iii) consideration of alternatives, including alternative sites and engineering methods, to the activities to be conducted pursuant to such license; and

(iv) consideration of the long-term impacts, including decommissioning, decontamination, and reclamation impacts, associated with activities to be conducted pursuant to such license, including the management of any byproduct material, as defined by section 2014(e)(2) of this title; and

(D) prohibit any major construction activity with respect to such material prior to complying with the provisions of subparagraph (C).

1.3. The content and public participation requirements for this written environmental analysis is similar an analysis under the National Environmental Policy Act,

42 U.S.C. § 4321, et seq. For example, the House Report on the Uranium Mill Tailings Control Act of 1978¹ proposed that this section should explicitly reference NEPA: "Require the preparation for each license a written analysis consistent with the policy and provisions of the National Environmental Policy Act of 1969 of the impact of the operations under such license on the environment, which shall be available to the public before the commencement of any such proceedings."

1.4. Utah Administrative Code (UAC) Section R313-24 - Uranium Mills and Source Material Mill Tailings Disposal Facility Requirements, at R313-24-3 - Environmental Analysis, describes the requirements for the Licensee's Environmental Report, and requires the Executive Secretary to provide a written analysis of the environmental report for public notice and comment pursuant to UAC R313-17-2:

(1) Each new license application, renewal, or major amendment shall contain an environmental report describing the proposed action, a statement of its purposes, and the environment affected. The environmental report shall present a discussion of the following:

(a) An assessment of the radiological and nonradiological impacts to the public health from the activities to be conducted pursuant to the license or amendment;

(b) An assessment of any impact on waterways and groundwater resulting from the activities conducted pursuant to the license or amendment;

(c) Consideration of alternatives, including alternative sites and engineering methods, to the activities to be conducted pursuant to the license or amendment; and

(d) Consideration of the long-term impacts including decommissioning, decontamination, and reclamation impacts, associated with activities to be conducted pursuant to the license or amendment.

(2) Commencement of construction prior to issuance of the license or amendment shall be grounds for denial of the license or amendment.

(3) The Executive Secretary shall provide a written analysis of the environmental report[,] which shall be available for public notice and comment pursuant to R313-17-2.

¹ House Report 95-1480, Part 2, Uranium Mill Tailings Control Act of 1978, House of Representatives, 95th Congress, 2nd Session.

2. GENERAL COMMENTS

2.1. The DRC should post all White Mesa Mill licensing documents on the DRC website, including inspection reports, notices of violation, correspondence with licensee, reports that must be submitted to the DRC each year by the Licensee, and other pertinent licensing documents. Posting these documents on the DRC website promotes better understanding of activities at the mill and the transparency and responsiveness of agency actions affecting the public interest.

2.2. The Safety Evaluation Report (SER) refers to many documents that are not readily available to the public. The DRC must make all referenced documents available on the DRC website no later than the date on which public notice for comments is published.

2.3. The License Renewal Application (LRA) contains thousands of pages of data and information contained in five separate volumes, extensive supplementary material, and lengthy responses to interrogatories. Yet the SER that evaluated those thousands of pages of data and information is a mere 46-pages (much of which consists of quotations from the LRA or conclusory statements regarding the adequacy of the LRA). *See* § 2.4, *infra*.

2.4. Indeed, as noted below, the SER completely fails to address substantive topics referenced by the AEA and DRC regulations. *See* §§ 3.1.2 and 3.1.3, *infra*. Accordingly, the SER does not reflect a thorough and independent evaluation of the LRA. Specifically, the SER fails to evaluate the LRA with sufficient particularity and specificity, to identify incomplete information, to identify all commitments to future actions by the Licensee, and to describe how the DRC will assure that the Licensee will implement the actions and protective measures described in the LRA.

2.5. The SER repeatedly states that, after reviewing information or additional information provided by the Licensee, the DRC concludes that the Licensee has met all applicable requirements. However, the SER never explains the basis for these statements, nor identifies the criteria used by the DRC to evaluate the adequacy of the Licensee's commitments.

2.6. The SER should discuss, with specificity, how the DRC will determine that the Licensee is complying with all of the commitments made in the SER and license renewal application. This discussion should include the items that the DRC will evaluate in inspections and enforcement reviews, the specific items that the DRC will check for compliance, the specific compliance review forms used by the DRC, and other information that will provide a basis for determining compliance.

2.7. For some sections of the SER, the DRC fails to connect the technical review with a specific volume and section of the LRA or other document submitted by the Licensee. As a result, it is impossible to ascertain what information the DRC finds to be "adequate" and the basis for the adequacy determination. By failing to provide this information to

the public, the DRC violates its obligation in UAC R313-24-3.

2.8. The SER at page 5 states: "Federal regulations and NRC Regulatory Guides are also applicable via reference in UAC R313-24, in License Conditions contained in the Licensee's RML and in the License Renewal Application." However, the SER does not identify the applicable NRC Regulatory Guides, making it impossible for the public to fully evaluate the written analysis. The SER must identify each applicable NRC regulation, guidance, and communication² used as a basis for the DRC's review of the LRA.

2.9. The SER should describe how the Licensee has complied, or will comply, with the applicable provisions in 10 C.F.R. Part 40 Appendix A.

2.10. The SER, Draft License, and License Renewal Process reveal significant failures by the DRC to implement applicable federal statutes and regulations and DRC regulations.

2.11. The SER failed to evaluate the full impact of the operation of the Mill on the Mill workers. The Mill is subject to regulation by the Mine Health and Safety Administration (MSHA), yet there is no evidence that the DRC reviewed MSHA files, which provide information regarding health and safety inspections, accidents, health and safety violations and orders, penalties, and payment of penalties. This information, in addition to links to the specific regulations that the Licensee violated, are readily available to the public.³ A review of the MSHA compliance history shows non-compliance at every regular health and safety inspection.⁴ Most of White Mesa violations have to do with failures to properly maintain a safe workplace. In addition, the Licensee received a penalty of \$ 2,768.00 in June 2011 for failing to "instruct each miner with information about the physical and health hazards of chemicals in the miner's work area, the protective measures a miner can take against these hazards, and the contents of the mine's HazCom program" (30 C.F.R. § 47.2(b)).⁵

2.12. The terms and conditions contained in the SER and Renewed License do not ensure the long-term health and safety of the public due the failure to fully identify and

² <http://www.nrc.gov/materials/uranium-recovery/regs-guides-comm.html>.

³ <http://www.msha.gov/drs/drshome.htm>.

⁴ MSHA Inspections of White Mesa Mill
2011 – 4 regular inspections; 36 citations; \$ 10,441 in penalties; 10 penalties yet to be assessed.
2010 – 3 regular inspections; 28 citations; \$ 12,238 in penalties.
2009 – 2 regular inspections; 18 citations; \$ 8,969 in penalties.
2008 – 2 regular inspections; 42 citations; \$ 9,213 in penalties
2007 – 1 regular inspection; 10 citations; \$ 600 in penalties.

⁵ <http://www.msha.gov/30CFR/47.2.htm>.

characterize the environmental impacts of the Mill operation and fully develop appropriate measures to mitigate those impacts.

3. SAFETY EVALUATION REPORT

3.1. SER's Compliance with the AEA and DRC Regulations. Section 3.1 of the SER (page 5) states: "The purpose of this Safety Evaluation Report (SER) is to identify and summarize the information the [DRC] evaluated in its review of [the RML application] and the grounds upon which the DRC staff concluded whether regulatory requirements are satisfied."

3.1.1. The license renewal requires an environmental analysis pursuant to the requirements in 42 U.S.C. § 2021(o)(C) and UAC R313-24-3. The SER does not meet these requirements. The SER is a technical and descriptive document that neither analyzes the environment impacts of the operation of the White Mesa Mill, nor supplements to the three previous environmental analyses.⁶

3.1.2. The SER does not assess the radiological and non-radiological impacts to the public health from the activities to be conducted pursuant to the license renewal or any impacts on groundwater resulting from such activities. The SER does not consider alternative engineering methods to the Mill's activities or the long-term impacts, including decommissioning, decontamination, and reclamation impacts, associated with activities to be conducted pursuant to such license, including the management of any 11e.(2) byproduct material. Such assessments are required under 42 U.S.C. § 2021(o)(C).

3.1.3. The SER does not analyze the impacts on land use, transportation, geology and soils, water resource, ecological resources, socioeconomic conditions, air quality, noise and odor, historic and cultural resources, visual/scenic resources, environmental justice, and waste management, nor include a list of proposed mitigation measures associated with these environmental impacts.

3.1.4. The DRC must issue for public comment a full environmental analysis of the operation of the White Mesa Mill that meets the requirements of UAC R313-24-3 and 42 U.S.C. § 2021(o)(C).

⁶ The three prior analyses are: (1) Final Environmental Statement, White Mesa Uranium Project, Energy Fuels Nuclear, Inc., NRC, May 1979, NUREG-0556; (2) Environmental Assessment Prepared by the Uranium Recovery Field Office in Consideration of the Renewal of Source Material License No. SUA-1358 for UMETCO Minerals Corporation, White Mesa Mill, NRC, September 1985; and (3) Environmental Assessment for the Renewal of Source Material License No. SUA-1358, Energy Fuels Nuclear, Inc., White Mesa Uranium Mill, San Juan County, Utah, NRC, February 1997.

3.1.5. The Atomic Energy Act at 42 U.S.C. § 2021(o)(D) prohibits any major construction activity prior to compliance with the provisions of subparagraph (C). Therefore, the Licensee must be prohibited from carrying out any major construction activities until the DRC issues an environmental analysis of the RML application that complies with the AEA and DRC regulations.

3.1.6. The last environmental analysis of the mill operations occurred in 1997. Since that time there have been a number of significant changes in the mill operation, the environment, and the mill's impacts to the environment. Significant changes in the mill operation include the processing and disposal of waste from mining and milling operations that contained radioactive and non-radioactive hazardous materials not found in natural uranium ore. *See* § 3.1.7, *infra*. The environmental impacts from the processing and disposal of these materials, known as "alternate feed" have never been analyzed. The environmental analysis for the RML application must include a complete description of the amounts, types, characteristics (physical, radiological, and non-radiological) of the alternate feeds stored, processed, and disposed of at the Mill.

3.1.7. The environmental analysis must evaluate the environmental impacts from the processing and disposal of the "alternate feed" waste streams that have never been the subject of an environmental assessment, including the waste streams from Allied Signal Corporation, Metropolis, Illinois; Cabot Performance Materials, Boyertown, Pennsylvania; Ashland 2 Formerly Utilized Sites Remedial Action Program (FUSRAP) site, Tonawanda, New York; Cameco Corporation, Blind River and Port Hope, Ontario, Canada; Ashland 1 and Seaway Area D FUSRAP site, Tonawanda, New York; St. Louis FUSRAP site, St. Louis, Missouri; Linde FUSRAP site, Tonawanda, New York; W.R. Grace, Chattanooga, Tennessee; and Heritage Minerals Incorporated, New Jersey.

3.1.8. The environmental analysis must go beyond the requirements in UAC R313-24-3 and comply with the requirement in 42 U.S.C. § 2021(o)(C), which requires a written analysis of the impact of the operation of the White Mesa Mill on the environment that have not previously been considered (or insufficiently considered) in previous environmental analyses, including the cultural resources and activities of the White Mesa Band of the Ute Mountain Ute Tribe.

3.1.9. The public was not afforded that opportunity to comment on the full scope of the License Renewal, because the DRC did not provide an environmental assessment of the License Renewal for public notice and comment, as required by 42 U.S.C. § 2021(o)(C) and UAC R313-24-3(3).

3.1.10. We request that the DRC conduct a scoping process before initiating the environmental analysis required by the AEA and DRC regulations, as described above.

3.2. Alternate Feed Circuit. Section 3.2.3 of the SER (page 8) states: "During the time in which the License Renewal Application was under review, the Licensee added a new Alternate Feed Circuit to the Mill."

3.2.1. The Licensee did not request authorization from the DRC to construct and operate a separate alternate feed circuit. Instead, the Licensee used the Safety and Environmental Review Panel (SERP) process to add the additional alternate feed circuit. Therefore, the DRC did not evaluate the environmental impacts from the operation of a circuit that processes alternate feed simultaneously or separately from the circuits that process ore.

3.2.2. License Condition 9.4.B states: "The licensee shall file an application for an amendment to the license, unless the following conditions are satisfied. . . B(3) The change, test, or experiment is consistent with the conclusions of actions analyzed and selected in the Environmental Assessment dated February 1997." License Condition 9.4.C states that Part B determinations shall be made by a "Safety and Environmental Review Panel (SERP)." The June 12, 2009, SERP Report No. 2009-01 (Section 2.1, pages 3-5) approved the new alternate feed circuit without submitting a license amendment request because, according to the Licensee, the alternate feed circuit (among other things) "is expected to produce no environmental impacts beyond those assessed in the EA [Environmental Assessment] dated February 1997, and is consistent with the conclusions regarding actions analyzed in the EA." However, the February 1997 EA,⁷ never identified and assessed the environmental impacts of the processing of alternate feed and the disposal of those processing wastes and alternate feed debris (such as concrete blocks and tree limbs and branches) in the tailings impoundments. As a result, the new alternate feed circuit has never been evaluated, pursuant to the applicable requirements for environmental review.

3.2.3. The construction and operation of the alternate feed circuit should have been the subject of a license amendment request, and the DRC should have evaluated the environmental impacts of the operation of that circuit. The methods used to store and process "alternate feed," migration of dust and radionuclides from alternate feed storage, impacts to workers from the unique radiological and non-radiological hazards associated with alternate feed, the potential offsite dose from the alternate feed processing, the methods used to model the dose from alternate feed, potential groundwater contamination, and the impacts to the integrity of the tailings liner systems should have been the subject of DRC and citizen review in the context of a license amendment request.

3.2.4. The DRC must fully assess the impacts of the new alternate feed circuit and the processing of alternate feed in the environmental analysis required by 42 U.S.C. § 2021(o)(C) and UAC R313-24-3.

3.2.5. The License should be amended to require the Licensee to notify the DRC of any changes to the Mill operation that the Licensee will make using the SERP process

⁷ Environmental Assessment for the Renewal of Source Material License No. SUA-1358; Energy Fuels Nuclear, Inc.; White Mesa Uranium Mill; San Juan County, Utah; NRC, February 1997.

prior to initiating the SERP process and prior to making the change, so that the DRC can determine if a license amendment, rather than the SERP process, is required.

3.3. Alternate Feed Program.

3.3.1. High-Thorium Content Material SOP. Section 3.2.3.1 of the SER (page 9) discusses procedures for the processing of alternate feed material.

3.3.1.1. The Licensee has a Standard Operating Procedure (SOP) for "alternate feed" with High-Thorium Content Material (e.g., material containing thorium-232 and progeny), approved by the NRC on December 18, 2000. The SER does not specify the applicability of the SOP to the receipt, processing, and disposal of materials containing thorium-232 (Th-232) and progeny, which includes the more highly radioactive thorium-228 (Th-228). The DRC must determine the specific level of Th-232 and Th-228 that demands the use of the SOP for High-Thorium Content Material.

3.3.2. Radiation Modeling. Section 3.2.3.1 of the SER (page 10) states: "As part of the 2007 LRA, the Licensee performed a MILDOS AREA Modeling on Arizona Strip ores which have an average grade of 0.64% U₃₀₈ and Colorado Plateau ores with an average grade of 0.25% U₃₀₈. The Licensee also stated that: *'The foregoing analysis for conventional ores sets the environmental envelope for Mill operations that can be performed without considering the need for further modeling. Alternate feed materials are handled so as not to allow potential exposures to the public to exceed the potential exposures from processing Arizona Strip ores at full capacity without further modeling and if further modeling is required without exceeding the applicable regulatory standards and ALARA goal specified in R313-15-101 R313-15-301 and 40 CFR 190.'*"

3.3.2.1. The SER states that there may be additional modeling of the potential exposures associated with processing "alternate feed" that is not within the environmental envelope associated with processing ore from the Colorado Plateau and Arizona (0.25% to 0.64 % uranium by weight). However, not only does DRC fail to establish a specific standard to trigger the need for additional modeling to assure that processing emissions will not exceed regulatory emission standards, DRC also fails to recognize that, according to the LRA (Vol. 1, page 28), alternate feeds from a number of sources *already* exceeds the uranium levels of natural ore. Uranium levels greater than Arizona Strip ore from alternate feeds in Section 3.1.7 (for which no environmental analysis has ever been performed) contain uranium ranging in weight from 0.74 % (W.R. Grace) to 50.0% (Rhone-Poulenc). The DRC must require the Licensee to specify which alternate feeds will require additional modeling to determine doses and compliance with dose standards and to submit the results of that modeling to the DRC.

3.3.2.2. The MILDOS AREA Model only considers the radioactivity from the U-238 decay chain. It considers neither the U-235 decay chain, nor the Th-232 decay chain. Therefore, the model underestimates the dose from uranium and ignores any dose from Th-232, Th-228, and progeny. Unlike ores from Arizona Strip and the Colorado

Plateau, some of the alternate feeds contain Th-232 and progeny, many of which, such as radon-220, are more radioactive than the progeny of U-228. Uranium is removed from the alternate feed at the mill, but not Th-232 and the more highly radioactive Th-228. Therefore, the DRC and the Licensee must develop a method to include Th-232 and progeny in the dose calculations and compliance determinations.

3.3.2.3. Apparently, the Licensee last ran the MILDOS AREA Model in 2007. The record does not indicate whether the Licensee performed additional modeling for alternate feed processing or adjusted the model after the construction of the Alternate Feed Circuit and took into consideration the emission of radionuclides from the Th-232 decay chain that are present in some of the alternate feeds.

3.3.2.4. The SER did not provide specific information regarding the current (2011) status of each tailings pond and tailings impoundment and how each impoundment may contribute to offsite emissions of radon and radioactive particulates. The status of Cell 2 is of particular interest, because the Cell-2 is no longer receiving tailings and may be in the process of drying out. When the fluid on top of a tailings impoundment starts to dry, there is a greater potential for the release of radon and radioactive particulates. According to 10 C.F.R. Part 40 Appendix A, Criterion 8: "The greatest potential sources of offsite radiation exposure (aside from radon exposure) are dusting from dry surfaces of the tailings disposal area not covered by tailings solution and emissions from yellowcake drying and packaging operations." It is not apparent that the DRC and Licensee took into consideration the presence or absence of tailings solution on each tailing impoundment in determining offsite emissions.

3.3.3. Impacts. Alternate feed materials have unique chemical and radiological constituents and characteristics not found in natural ores.

3.3.3.1. The chemical and radiological properties and constituents, including any unique processing chemicals, must be determined for each alternate feed that has been or may be processed at the Mill. The SER must evaluate the potential for the wastes from the processing of alternate feed to compromise the integrity of the tailings cells that have or may receive those wastes.

3.3.3.2. The SER must address the handling and processing of alternate feed with respect to the chemical content of the materials and its effect on workers. Some of the waste streams contain non-radioactive hazardous chemical constituents that can adversely affect workers. Some of these hazardous and non-hazardous chemical constituents can react with the chemicals during processing and create compounds that could be hazardous to worker health.

3.3.3.3. The SER must address the migration of radioactive gas and particulates offsite from the alternate feed storage and loading areas. This would include a plan to

cleanup areas where alternate feed had accumulated offsite in ground and surface water and in soils.

3.3.3.4. The DRC and the Licensee must determine whether any of the unique chemicals or radionuclides found in the alternate feed processed at the Mill are present in any of the liquid that has leaked from the liner systems or if any of these chemicals or radionuclides have been detected in the monitoring wells and make that information available to the public.

3.3.4. Identification of Alternate Feed Sources. Section 3.2.3.1 of the SER (page 11) states: DRC staff determined that there were three (3) sources of alternate feed material, approved by the NRC in the past that the Licensee would not receive in the future." The Mill's current License contains fourteen license amendments authorizing the processing of "alternate feed." As a result, there are currently eleven (11) license amendments authorizing such processing.

3.3.4.1. The SER does not explain the criteria for retaining the eleven (11) license amendments. Some of these license amendments apply to alternate feed that may have been disposed of elsewhere. The SER should provide a complete update on the status of these remaining waste streams. License amendments for waste streams that have already been disposed of elsewhere and will not be processed and disposed of at the White Mesa Mill should be deleted from the license.

3.3.4.2. For each license amendment, the SER should identify the amount of "alternate feed" that has been approved by license amendment and the amount of feed material that has already been received at the Mill from each source. Each amendment was approved based on a certain amount of materials as described in the license amendment request. If the Licensee has received, stored, or processed more materials than authorized, or anticipates such receipt, storage, or processing, it must submit a new license amendment request.

3.4. Radiation Safety.

3.4.1. Radiation Safety, Section 5.5 of the SER (page 16) states: "The state requirements for Radiation Protection Programs are found in UAC R313-15-101. . . ." The requirements in R313-15-101(4) correspond with the NRC's requirements in 10 C.F.R. § 20.110(d).

3.4.1.1. Section 5.5 should also include the radiation safety requirements in UAC R313-15-301 - Dose Limits for Individual Members of the Public, which are applicable to the Licensee. The requirements in UAC R313-15-301(1), (2), and (3) correspond with the requirements in 10 C.F.R. § 20.1301. The requirement in UAC R313-15-301(4) references the requirements in the EPA's generally applicable environmental radiation standards in 40 C.F.R. Part 190.

3.4.1.2. The SER should include a full discussion of the Licensee's compliance with all applicable radiation standards, the specific emission sources that are monitored, and the methods used to determine compliance.

3.4.1.3. The SER should reflect a determination by the DRC that the Licensee is properly calculating the offsite doses to the public and that the doses are within regulatory limits.

3.4.1.4. The SER should discuss whether the Licensee measures radon progeny, in addition to radon, when determining compliance with the dose limit requirements in R313-15-301, including 40 C.F.R. Part 190. The Licensee's particulate and radon monitoring programs do not include the monitoring of radon progeny. The necessity of including radon progeny when determining compliance with dose limits that include radon is discussed in the NRC's *Draft Interim Staff Guidance: Evaluations of Uranium Recovery Facility Surveys of Radon and Radon Progeny in Air and Demonstrations of Compliance with 10 CFR 20.1301, Draft Report for Comment (ML112720481)*.⁸

3.4.1.5. The Licensee is required to measure the radon emissions from the operating tailings impoundments and demonstrate that the Radon-222 emissions to the ambient air from an existing uranium mill tailings pile shall not exceed 20 pCi/(m²-sec) (1.9 pCi/(ft²-sec)) of radon-222 (40 C.F.R. § 61.252). Annual compliance reports must be submitted to the Utah Division of Radiation Control (DAQ) annually. The SER should include information about how the Licensee uses that data to demonstrate compliance with the offsite dose limitations. Additionally, the SER must include information about how the emissions and doses from the ponds containing processing waste water are measured and included in the offsite dose calculations.

3.4.2. Exposure Calculations and Record Maintenance. Section 5.5.2.4 of the SER (page 21) states: "In Section 4.0 of Appendix E of the 2007 License Renewal Application, the Licensee documented how the Derived Air Concentration (DAC) is calculated for conventional ores, alternate feed, and tailings. The licensee also documented how dose was calculated for each employee and what records were kept and maintained. The DRC evaluated the exposure calculations and records maintenance and confirmed that it meets all requirements in UAC R313-24-4[,] which references 10 CFR 40.61."

3.4.2.1. The SER asserts that the DRC evaluated the exposure calculations records and confirmed it meets all the requirements in UAC R313-24-4, which references 10 CFR 40.61. Sections 40.61(a) and (b) only address the retention of records and do not address how the DAC should be calculated for conventional ores, alternate feeds, and tailings. Therefore, the SER does not include a determination that the Licensee has used the

⁸ NRC Accession Number. Document is available on NRC web-based ADAMS:
<http://wba.nrc.gov:8080/ves/>.

correct methods for calculating the DAC for conventional ores, alternate feeds, and tailings.

3.4.2.2. The Licensee's Radiation Protection Manual (LRA, Vol. II, Section 4, pages 273-278) discusses the DACs for conventional ores, alternate feed, mixtures, ore, and tailings. Specifically, Section 4.1.2 of the Manual discusses the method for determining the DACs for Alternate Feed Materials. It is clear from this discussion that the Licensee may have no data or information regarding the DAC of an alternate feed when it is received at the Mill, and, as a result, the Licensee must make assumptions regarding the solubility and relative activity of radionuclides in the feed. If the solubility and activity of radionuclides in the feed are not known, the Licensee assumes that the feed is composed entirely of the most restrictive radionuclide and solubility class. This assumption may not be accurate for some of the alternate feed received at the Mill, resulting in an underestimation of the DAC. The mixture rule used by the Licensee is based on NRC Regulatory Guide 8.30.⁹ Regulatory Guide 8.30 discusses the radioactivity of uranium and radon and progeny, but not Th-232 and progeny. Some of the alternate feed contains significant levels of Th-232 and progeny, which are more highly radioactive than uranium progeny. Further, the percentage of uranium in some of the alternate feed is much greater than the percentage of uranium found in natural ores, and feed material may contain other radionuclides and at levels not found in natural ores. Therefore, based on the information provided by the Licensee, DRC cannot determine that the DACs for alternate feeds processed or to be processed at the Mill have been properly calculated. As a result, the DRC does not have a basis for determining that the Radiation Protection Program is protective of the worker health and safety.

3.4.2.3. The DRC must thoroughly review and assess the methodology used by the Licensee to determine the DACs for alternate feeds. The DRC must include the results of that assessment in the SER. The assessment must be both comprehensive and written in plain English so a person not conversant in the methodologies of health physics can understand the assessment.

3.5. Reclamation Plan. The SER in Section 5.5.5 (page 27) states that the DRC intends to consider Denison's Infiltration and Contaminant Transport Model (ICTM) Report and Reclamation Plan (Revisions 4.0 and 5.0) at an unspecified time.

3.5.1. Tailings impoundments that no longer are being used for the disposal of mill tailings should be closed and reclaimed immediately in accordance with an approved reclamation plan. In addition, enforceable reclamation milestones are required for non-operational tailings impoundments, pursuant to 10 C.F. R. Part 40 Appendix A, Definitions in Introduction and Criterion 6A. Enforceable reclamation dates for an interim cover and final cover must be imposed as License Conditions, after public notice and an opportunity for public comment, as part of the Reclamation Plan approval process.

⁹ <http://pbadupws.nrc.gov/docs/ML0212/ML021260524.pdf>.

When tailings Cell 2 and 3 are no longer receiving tailings, the Licensee must submit a license amendment request to establish reclamation milestones. The Environmental Protection Agency (EPA) rescinded a National Emission Standard for Hazardous Air Pollutants at 40 C.F.R. Part 61 Subpart T, based on the assumption that all tailings impoundments would proceed to the reclamation phase as soon as technically feasible.

3.5.2. The SER should be revised to reflect the recent submittal of the Revised Reclamation Plan (Revision 5.0).

3.6. Semi-Annual Effluent Monitoring. The SER at Section 5.6.1.1 (page 30) contains a list of the Semi-Annual Effluent Monitoring requirements.

3.6.1. Although there is a list of the Semi-Annual Effluent Monitoring requirements, the SER does not connect these monitoring requirements to specific limits or standards for the effluents that are being monitored, and fails to explain how the monitoring program is used to demonstrate compliance. If there were no standard associated with the monitoring requirement, then the SER must discuss why the monitoring is being carried out and what determinations are being made based on the collected data.

3.7. Evaluation of Alternatives. The SER at Section 8 (page 37) lists some of the alternatives considered by the Licensee, concluding that: "The DRC determined that all reasonable alternatives were considered, as required in UAC R313-24-3(1)(c)."

3.7.1 Section 8 does not meet the requirement in 42 U.S.C. § 2021(o)(C) that the DRC conduct its own environmental analysis that considers the alternatives, including alternative sites and engineering methods, to the activities to be conducted pursuant to such license. The conclusory statement regarding alternatives falls well short of the reasoned analysis envisioned by both the AEA and DRC regulations.

4. DRAFT RENEWED LICENSE

4.1. License Condition 9.1. License Condition (LC) 9.1 states:

New construction of any mill process water, wastewater storage, and/or tailings disposal embankments is prohibited until after the licensee demonstrates compliance with the requirements of License Condition 9.11, and receives prior Executive Secretary approval.

After such approval, this license may be amended to authorize new construction of surface impoundments for storage and disposal of mill process water, wastewater and tailings.

4.1.1. We support DRC's proposal to prohibit new construction of any mill process water, wastewater storage, and/or tailings disposal embankments until after the

licensee demonstrates compliance with the requirements of LC 9.11. It is important that the DRC approve the Reclamation Plan Rev. 5.0 and the ICTM Report and that all funding for the reclamation of the current site is assured before there is any additional expansion of the Mill. The approval process for the Reclamation Plan and ICTM Report will bring forward any issues related to the reclamation of the site, adequacy of the decommissioning plan, establishment of appropriate reclamation milestones, and the long-term integrity of the site.

4.1.2. The wording of LC 9.1 should be clarified. It describes mill water storage ponds and tailings cells as "embankments." This is not the usual terminology. These types of water storage ponds and tailings impoundments should be described with more specificity. Further, the phrase "and receives prior Executive Secretary approval" should be clarified. As currently stated, this phrase could mean DRC's approval of the ICTM Report and Reclamation Plan or DRC's "approval of a request to construct any mill process water and wastewater storage ponds and/or tailings disposal impoundments."

4.1.3. The AEA prohibits "any major construction activity with respect to such material prior to complying with the provisions of [42 U.S.C. § 2021(o)(C)]." Accordingly, prior to any major construction activity, including the construction of new ponds and tailing disposal cells, the DRC must develop and make available for public comment and an opportunity for an adjudicatory hearing an Environmental Analysis of the proposed activity.

4.2. License Condition 9.4. LC 9.4(B)(3) states: "The change, test, or experiment is consistent with the conclusions of actions analyzed and selected in the NRC Environmental Assessment dated February 1997."

4.2.1. LC 9.4(B)(3) should be changed to spell-out Nuclear Regulatory Commission at the first instance that the agency is referenced in the license.

4.3. License Condition 9.7. LC 9.7 states: "As per the Memorandum of Agreement (MOA) negotiated by the Utah State Historic Preservation Officer (SHPO), the Advisory Council on Historic Preservation (ACHP), the NRC and Energy Fuels Nuclear Inc. (EFN) and ratified on August 20, 1979 and as amended on May 3, 1983 and substantially as implemented in NRC License SUA-1358." LC 9.7 also includes additional provisions, based on the designation of sites as "contributing" or "undetermined": "The licensee shall avoid by project design, where feasible, the archaeological sites designated "contributing" in the report submitted by letter to the NRC dated July 28, 1988;" and, "Additionally, the licensee shall conduct such testing as is required to enable the Executive Secretary to determine if those sites designated as "Undetermined" in the report and located within 100 feet of present or known future construction areas are of such significance to warrant their redesignation as "contributing."

4.3.1. The July 1988 list of Archeological Sites Related to the White Mesa Project submitted by the Licensee to the NRC and referenced in the LC 9.7 is incomplete

and inaccurate. None of the sites on the Bureau of Land Management (BLM) land transferred to Energy Fuels Nuclear (EFN, the original Licensee) are listed. Several sites that have not been excavated are listed as "excavated," and a site that was excavated is listed as a site "to be excavated." There is conflicting information regarding which sites are "contributing" and which are "undetermined."

4.3.2. Cell 1, which receives processing fluids, was partially constructed in Section 29, Township 37 South, Range 22 East, before it was transferred to EFN by the BLM. There is no evidence that EFN, their contractors, the BLM, the Utah State Historic Preservation Officer, or the NRC has determined whether the uranium mill construction activities would impact the cultural sites in Section 29.

4.3.3. License Condition 9.7 must be updated and revised for some of the following reasons: 1) The MOA of 1979 and 1983 have been superseded; 2) the list of applicable federal statutes is out of date; 3) the July 1988 list of "contributing" and "undetermined" archeological sites is incomplete and inaccurate, *see* §§ 4.3.1 and 4.3.2, *supra*; and 4) the April 13, 1981, letter regarding research design is out of date and does not meet current requirements.

4.4. License Condition 9.11. LC 9.11 incorporates conditions associated with the requirement for submittals, including the ICTM Report, Reclamation Plan (Revision 5), updated Surety, and reimbursement of costs for agency review.

4.4.1. We support the inclusion of the new LC 9.11 as set forth in the draft renewed license. *See* § 4.1.1, *supra*.

4.5. License Condition 10.1.B and C. LC 10.1.B. states: "The licensee may not dispose of any material on site that is not 'byproduct material', as that term is defined in 42 U.S.C. Section 2014(e)(2) (Atomic Energy Act of 1953, Section 11(e)(2))." LC 10.1.C states: "The licensee may not receive or process any alternate feed material without first applying for and obtaining approval of a license amendment. For any such proposal, the licensee shall demonstrate that it will comply with Condition 10.1(B). Any such demonstration shall include: (1) Demonstration of compliance with the NRC Regulatory Summary 2000-23 Recent Changes to Uranium Recovery Policy, November 30, 2000," 42 U.S.C. Section 2014(e)(2) defines byproduct material as: "the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content."

4.5.1. LC 10.1.B should be corrected to reflect that the AEA was adopted in 1954, not 1953, and the phrase "as amended" should be added because the 1978 amendment (adopting the Uranium Mill Tailing Radiation Control Act) that incorporated the definition found in Section 11e(2) into the 1954 Act. Therefore, LC 10.1B. should read: "The licensee may not dispose of any material on site that is not 'byproduct material', as that term is defined in 42 U.S.C. Section 2014(e)(2) (Atomic Energy Act of 1954, as amended, Section 11e.(2))."

4.5.2. The conditions in LC 10.1.C directly contradict the condition in LC 10.1.B that prohibits the disposal of any material that is not 11e(2) byproduct material, i.e., tailing or wastes produced by the extraction or concentration of uranium or thorium from any "ore." Alternate feed is a waste from mineral processing operations, which have physical, chemical, and radiological characteristics different than natural ores. The NRC redefined that waste as "ore," once the waste has been processed at a licensed uranium mill. Alternate feed is not "ore" as contemplated by the AEA or regulations adopted by both the EPA or NRC, pursuant to the AEA. Therefore, the wastes from processing "alternate feed" do not meet the definition of 11e(2) byproduct material.

4.5.3. NRC Regulatory Summary 2000-23 - Recent Changes to Uranium Recovery Policy (November 30, 2000), is not an amendment to the AEA or a NRC regulation adopted through a rulemaking process. The NRC did not make Regulatory Summary 2000-23 available for public comment. That NRC is not authorized by statute to amend the AEA or its regulations by issuing a policy.

4.5.4. The Uranium Mill Tailing Radiation Control Act of 1978 (UMTRCA) (Public Law 95-604), an amendment to the AEA, directed the EPA to "promulgate. . . standards of general application for the protection of the public health, safety, and the environment from radiological and nonradiological hazards associated with the processing and with the possession, transfer, and disposal of byproduct material, as defined in section 2014(e)(2) of this title, at sites at which ores are processed primarily for their source material content or which are used for the disposal of such byproduct material." In 1983, EPA issued standards for both active and inactive uranium recovery sites. These standards, which are applicable to the White Mesa mill, did not contemplate the processing of anything but natural "ore" at a licensed uranium mill. The EPA has not adopted any policies that redefine the term "ore" or indicate that these standards are applicable to the processing of "alternate feed." Therefore, the EPA standards that apply to processing of ore and disposal of the tailings and wastes from the processing of ore at the White Mesa Mill (40 C.F.R. Part 190 and Part 192) do not apply to the processing of "alternate feed" or the disposal of the tailings and wastes from the processing of "alternate feed."

4.5.5. UMTRCA required the NRC to conform its regulations to the EPA standards. Accordingly, in November 1985, NRC changed its regulations in 10 CFR Part 40, Appendix A to be consistent with EPA's standards.¹⁰ The NRC regulations, as promulgated, contemplated the processing of natural "ore" and did not contemplate the processing of other types of feed materials.

¹⁰ <http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/mill-tailings.html>.

4.5.6. Alternate feed is not "ore,"¹¹ because the alternate feed was regulated as a different type of material under the AEA. Some of the materials that have been processed as "ore" were regulated under the AEA as "source material," as "11e(2) byproduct material," or as low-level radioactive waste. However, uranium "ore" (prior to delivery at a uranium mill) is not regulated under the AEA¹² or other federal regulatory programs, such as EPA Superfund and Formerly Utilized Sites Remedial Action Program (FUSRAP). Therefore, the alternate feed that is regulated under the AEA cannot be considered "ore."

¹¹ "Ore" like the word "water," is a word of common and extensive usage with a clear and accepted meaning. The word "ore," As defined in several sources:

- Ore - a naturally occurring solid material from which metal or other valuable minerals may be extracted. *Illustrated Oxford Dictionary*, DK Pub. 1998.
- Ore - A native mineral containing a precious or useful metal in such quantity and in such chemical combination as to make its extraction profitable. Also applied to minerals mined for their content of non-metals. *The Compact Oxford English Dictionary*, Second Edition, Oxford University Press, 2000, p. 1224:915-916.
- Ore - a. A natural mineral compound of the elements of which one at least is a metal. Applied more loosely to all metaliferous rock, though it contains the metal in a free state, and occasionally to the compounds of nonmetallic substances, as sulfur ore. . . . b. A mineral of sufficient value as to quality and quantity that may be mined for profit. *Fay. A Dictionary of Mining, Mineral, and Related Terms*, compiled and edited by Paul W. Thrush and Staff of the Bureau of Mines, U.S. Dept. of Interior, 1968.

The Oxford English Dictionary points out that the current usage of the word "ore" goes back several hundred years. *A Dictionary of Mining, Mineral, and Related Terms* lists over 65 compound words using the word "ore," such as ore bin, ore body, ore deposit, ore district, ore geology, ore grader, ore mineral, ore reserve, ore zone. All of these terms incorporate the word "ore" as it relates to the mining of a native mineral. The term "ore," without explanation, has for many years been used in thousands, if not millions, of instances in thousands of mining, milling, geological, mineralogical, radiochemical, engineering, environmental, and regulatory publications.

¹² 42 U.S.C. § 2014(z)(2) states: "The term 'source material' means (1) uranium, thorium, or any other material which is determined by the Commission pursuant to the provisions of section 2091 of this title to be source material; or 2) ores containing one or more of the foregoing materials, in such concentration as the Commission may by regulation determine from time to time." NRC's regulation at 10 C.F.R. § 40.13 exempts ore containing source material from NRC regulations and the AEA, so long as a person does not refine or process such ore.

4.5.7. Therefore, the EPA and NRC regulations, as promulgated in response to UMTRCA, did not authorize the processing of feed materials other than natural "ore" and the disposal of tailings and wastes from the processing of feed material other than "ore." The State of Utah is required to conform its regulations to the AEA and EPA and NRC regulations and do not have the authority define 11e.(2) byproduct material to include alternate feeds.

4.5.8. The DRC must delete 10.1.C because the Licensee is prohibited from disposing any material on site that is not "byproduct material" as that term is defined in 42 U.S.C. Section 2014(e)(2).

4.6. License Condition 10.5. LC 10.5.E states: "The licensee shall also submit for Executive Secretary approval a revised written Standard Operating Procedure (SOP) for ISL disposal on or before December 1, 2010. The revised SOP shall describe the documentation required for ISL disposal, which shall include but is not limited to the following"

4.6.1. If the Licensee has submitted the SOP for ISL disposal, which was due on December 1, 2010, this license condition should be revised to refer to the submitted SOP and its provisions.

4.7. License Conditions 10.6-10.7, 10.9, and 10.11-10.19.

4.7.1 LC 10.6, 10.7, 10.9, 10.11, 10.12, 10.13, 10.14, 10.15, 10.16, 10.17, 10.18, and 10.19 should be deleted from the renewed license because the wastes from the processing of these materials are not "byproduct material," as that term is defined in Section 11e.(2) of the AEA. Further, the EPA standards and NRC regulations for uranium milling and disposal of 11e(2) byproduct material do not apply to the processing of "alternate feed," that is, the wastes produced from other mineral processing operations.

4.8. License Condition 11.7. LC 11.7 states: "Settlement Monitoring Standard Operating Procedure - the licensee shall submit for Executive Secretary approval a written Settlement Monitoring Standard Operating Procedure (SOP) on or before December 1, 2010."

4.8.1. *See § 4.6.1, supra.*

4.9. License Condition 11.7. LC 11.8 states: "Movement (Displacement) Monitoring Standard Operating Procedure - the licensee shall submit for Executive Secretary approval a written Movement Monitoring Standard Operating Procedure (SOP) on or before December 1, 2010."

4.9.1. *See § 4.6.1, supra.*

4.10. Additional License Conditions. The Renewed License should include the following provisions:

4.10.1. The Licensee should not be permitted to place alternate feed or ISL wastes in an impoundment that leaks.

4.10.2. The License must contain enforceable dates for the completion of all Licensee actions required by the DRC.

4.10.3. The Licensee must be required to clean up all balance of site contaminated soil (material onsite, but outside the tailings cells) at the mill that currently does not meet the soil cleanup standard in 40 C.F.R. § 192.32(b)(2): "(i) 5 picocuries per gram (pCi/g), averaged over the first 15 centimeters (cm) below the surface, and (ii) 15 pCi/g, averaged over 15 cm thick layers more than 15 cm below the surface." The Mill site should not contain areas of contaminated soils that do not currently meet the regulatory closure standards. The practice of waiting decades until final closure for the cleanup standards to be met is not protective of the public health and safety. Clearly, contaminated soils have the potential to migrate offsite, contribute to radioactive emissions (onsite and offsite), and contaminate ground and surface water.

4.10.4. The Renewed License must include a requirement for plan to cleanup the uranium and other materials that have been known to have been dispersed from the Mill site, including a date for the submittal of the plan and a date for the implementation of the plan. Any offsite contamination has the potential to impact humans, domestic animals, and the agricultural and natural environment through ingestion and inhalation of radionuclides. The DRC must not wait until final site reclamation to require the cleanup of 11e.(2) byproduct material that has migrated offsite due to the action of wind and water. *See* § 6.4.3, *infra*.

4.10.5. The Renewed License must include compliance with the National Emission Standards for Radon Emissions From Operating Mill Tailings (40 C.F.R. Part 61 Subpart W). The Renewed License must include the requirement set out in Subpart W: "The owner or operator shall have no more than two impoundments, including existing impoundments, in operation at any one time." 40 C.F.R. § 252(b)(1). According to 40 C.F.R. § 61.151(e), "*Operation* means that an impoundment is being used for the continued placement of new tailings or is in standby status for such placement;" and "An impoundment is in operation from the day that tailings are first placed in the impoundment until the day that final closure begins."

4.10.6. The Renewed License must identify the status of each of the tailings impoundments; i.e., the impoundments that are in operation at the mill, the impoundments that are in closure, and impoundments constructed, but not receiving tailings. The Renewed License must clearly state that only two cells can be in operation at one time, identify those cells, and identify the cells that have commenced final closure—in accordance with an approved reclamation plan that includes enforceable reclamation

milestones.

4.10.7. The Renewed License must include a stipulation that no new impoundments can be brought into operation unless there is only one or less operating impoundment and any impoundments not receiving tailings have started final closure.

4.10.8. If more than two tailings cells are currently in operation, the DRC must demand that only two may operate and the other cells must proceed to final closure and cannot receive any additional 11e.(2) byproduct material. Currently, it appears that Cells 2, 3, 4A, and 4B are licensed to receive tailings, although no tailings are being placed in Cell 2. That means that there are four operating cells, not two. Therefore, Cells 2 and 3 (the older, full or almost full cells) cannot receive more tailings and their status must be changed from "operational" to final "closure." These requirements must be imposed on the Licensee immediately.

4.10.9. The Renewed License should require the Licensee to notify the DRC of any changes to the Mill operation that the Licensee will make using the SERP process prior to initiating the SERP process and prior to making the change, so that the DRC can determine if a license amendment, rather than the SERP process, is required. *See* § 3.2, *supra*.

5. LICENSE RENEWAL APPLICATION, ENVIRONMENTAL REPORT.

Volume 4 of Denison's *License Renewal Application*, dated February 27, 2007, contains the Environmental Report (ER). UAC R313-24-3 - Environmental Analysis requires the submittal of an Environmental Report for each new license application, renewal, or major amendment for a uranium mill.

5.1. Written Analysis. UAC R313-24-3(3) states: "The Executive Secretary shall provide a written analysis of the environmental report which shall be available for public notice and comment pursuant to R313-17-2."

5.1.1. The Executive Secretary has not provided a written analysis of the ER as required by R313-24-3(3).

5.2. Applicable Standards for Review and Approval of LRA. The ER at Section 1.4.1 (page 2) states that the Licensee is required to include responses to the Licensing Guide that the DRC has identified as the applicable NRC Standard Review Plan for the RML application. The 2007 ER states that NRC directed the Licensee to use the *Standard Review Plan for In Situ Leach Uranium Extraction License Applications*, NUREG-1569. However, it is clear that NUREG-1569 is not applicable to this application, because it states (page xvii): "This standard review plan is intended to cover only those missions related to the licensing of an in situ leach facility."

5.2.1. The DRC must identify all NRC guidance documents that are applicable to the renewal of a source material license and all NRC guidance documents used by the DRC in its review of the White Mesa License Renewal application.

5.3. NUREG-1569. The introduction to NUREG-1569 states that reviewers should analyze the inspection history and operation of the site to identify major problems during the course of the license term and should review changes to operations from those currently found acceptable. NUREG-1569 includes Appendix A, entitled "Guidance for Reviewing Historical Aspects of Site Performance for License Renewals and Amendments." This guidance includes a number of specific areas that should be reviewed for compliance history, and site operations.

5.3.1. The SER does not indicate whether the DRC fully analyzed the inspection history and site operation and changes as required by Appendix A or even consulted Appendix A during the review. The SER must fully describe the DRC's analysis and review of the inspection history and operation and use of the Appendix A Guidance in that review.

5.4. NUREG-1748. NUREG-1748 (August 2003), entitled Environmental Review Guidance for Licensing Actions Association with NMSS Programs, provides guidance for the environmental review of NRC licenses, including the review of uranium recovery operation applications. Although the guidance is tied to the requirements of NEPA, which are applicable to NRC licensing actions, NUREG-1748 provides information applicable to Agreement States conducting environmental reviews of uranium recovery applications.

5.4.1. The SER does not indicate whether the DRC used NUREG-1748 to conduct its environmental review of the RML application. If the DRC did rely on this NRC guidance document, it should document that fact in the SER and in the required, but not yet issued, Environmental Analysis.

5.5. Cumulative Effects. The ER Section 2.2 (page 12) states: "There are no past, present, or reasonably foreseeable future actions [that] could result in cumulative impacts that have not been contemplated and previously approved the existing Mill License."

5.5.1. There are cumulative impacts from the processing and disposal of waste from the processing of materials that are physically, chemically, and radiologically different from natural "ore." The cumulative environmental impacts from processing and disposal thousands of tons of wastes from other mineral processing operations (so-called "alternate feed") have never been assessed in the context of a license renewal or amendment. Moreover, the incremental environmental impacts of most of the alternate feeds processed at the mill were never assessed, including materials from the facilities listed at § 3.1.7, *supra*.

5.5.2. The cumulative long-term impacts of the disposal of uranium mill tailings for the millions of years that the tailings will remain hazardous have not been assessed.

5.5.3. The destruction of significant historical and cultural resources on White Mesa by the construction and operation of the Mill is an existing and reasonably foreseeable action with cumulative impacts. None of the previous documents assessing the environmental impacts of the construction and operation of the Mill have documented this extensive destruction of cultural resources. The environmental assessments only state that the impacts of the destruction will be "mitigated." A description of the extensive, significant cultural resources that have been or will be destroyed by the Mill is never included. The impacts on the land and the historical, cultural, and economic value of the extensive archeological sites on White Mesa is never included. The impacts to the tribal groups who live in San Juan County, likewise, is ignored.

5.6. Comparison of the Predicted Environmental Impacts. The ER Section 2.3 (page 12) states: There have been no observed significant impacts which were not previously quantified and addressed to public health, safety or the environment resulting from existing activities conducted under the License."

5.6.1. The significant impacts to the historical and cultural resources on White Mesa due to the construction and operation of the mill have not been quantified and addressed. *See* § 4.3, *supra*.

5.6.2. The significant impacts from the processing and disposal of waste from the processing of materials that are physically, chemically, and radiologically different from natural "ore" have, for the most part, not been quantified or addressed because the impacts of processing most "alternate feed" at the Mill was not evaluated in the 1979, 1985, or 1997 environmental evaluations or in an environmental assessment associated with individual license amendments authorizing the receipt and processing of such materials.

5.6.3. The impacts from the offsite migration of uranium and other radioactive particulates and their deposition onto land, sediments, and water has not been assessed.

5.7. Transportation. The ER Section 3.11 (pages 57-59) discusses the number of vehicles on some transportation routes and relies on decade-old data to estimate expected usage (*see* Estimated 2002 Daily Car and Truck Traffic on Route 191 (Table 3.11-2)).

5.7.1. The transportation data is grossly out of date. The discussion of transportation does not include a discussion of the actual routes that ore currently is being shipped or expected to be shipped in the foreseeable future, including shipments from La Sal, Lisbon Valley, and the Licensee's mines in Arizona and Colorado. The 1979 Final Environmental Statement only assessed the impacts of transportation from small mines in the Blanding and Hanksville areas. The ER should include the actual routes taken by the ore trucks to the mill and the number and size of trucks using each route.

5.7.2. The ER does not assess the impacts of transportation with respect to the creation of dust and effects on residents, wildlife, and grazing animals on the transportation routes. The ER does not identify the current routes of the vanadium shipments to their eventual destinations, transportation of all alternate feeds to the mill, and the use of trailers connected to ore trucks.

5.7.3. The ER does not assess the impacts of transportation related to trucks carrying chemicals and fuels to the mill. The ER does not include information about the types of chemicals, number of trucks, routes, and emergency response. This type of information should be provided to the DRC and the public.

5.7.4. Ore trucks, including trucks that are not covered, have been repeatedly observed parking in the community for more than a day, often next to homes, stores, motels, and local roads. The ER does mention that ore trucks may be parked for periods of time near where people drive, walk, live, and shop, but fails to evaluate the impacts of this activity.

5.8. Ecological Resources and Biota. The ER Section 3.12 (pages 59-62) discusses the plants and animals in the vicinity of the mill.

5.8.1. There have been unconfirmed reports of Mill employees picking up dead birds in the area around ponds containing process water at the Mill site. A full evaluation of the impacts of open ponds of process water on birds that frequent the Mill site should be conducted by a competent, independent investigator.

5.8.2. The ER does not provide an updated assessment of the potential impacts to endangered and threatened species from offsite radioactive particulate emissions and the presence of toxic water in Mill ponds and impoundments.

5.9. Radiation Doses to Individual Members of the Public. Section 3.13.2.3 (page 68) discusses the grazing of cattle *north* of the mill site.

5.9.1. Cattle graze on the mill site *south* of the mill itself. Denison has in the past found evidence of cattle on the berms of the tailings cells. There should be a more accurate description of the number and location of cattle grazing in the vicinity of the mill, the impacts of the mill on those animals, and the impact of these animals on the integrity of the tailings cells.

6.0. COMPLIANCE WITH DRC REGULATIONS

6.1. UAC R313-15-101- Radiation Protection Programs. The SER (page 16-17) lists four requirements:

- (1) Each licensee or registrant shall develop, document, and

implement a radiation protection program sufficient to ensure compliance with the provisions of Rule R313-15. See Section R313-15-1102 for record keeping requirements relating to these programs.

(2) The licensee or registrant shall use, to the extent practical, procedures and engineering controls based upon sound radiation protection principles to achieve occupational doses and doses to members of the public that are as low as is reasonably achievable (ALARA).

(3) The licensee or registrant shall, at intervals not to exceed 12 months, review the radiation protection program content and implementation.

(4) To implement the ALARA requirements of Subsection R313-15-101(2), and notwithstanding the requirements in Section R313-15-301, a constraint on air emissions of radioactive material to the environment, excluding radon-222 and its decay products, shall be established by licensees or registrants such that the individual member of the public likely to receive the highest dose will not be expected to receive a total effective dose equivalent in excess of 0.1 mSv (0.01 rem) per year from these emissions. If a licensee or registrant subject to this requirement exceeds this dose constraint, the licensee or registrant shall report the exceedance as provided in Section R313-15-1203 and promptly take appropriate corrective action to ensure against recurrence.

6.1.1. The SER did not include sufficient data and information to support a conclusion that the Licensee has a radiation protection program that ensures compliance with the provisions of UAC R313-15. In fact, the SER does not contain *any* statement that the Licensee's radiation program ensured compliance with the provisions of R313-15.

6.1.2. The SER does not specifically document how the Licensee has demonstrated, or will demonstrate in the future, compliance with the dose standards in UAC R313-301(4), R313-301(1)(a) and (b), and R313-301(4).

6.1.3. The SER does not assert whether the Licensee's program demonstrates compliance with UAC R313-301(4). There is no discussion of the method of demonstrating compliance; how the Licensee utilizes monitoring data and other data, information, and assumptions to demonstrate compliance; or how often the Licensee is required to demonstrate compliance.

6.1.4. The SER does not specifically document how the Licensee has demonstrated, or will demonstrate in the future, compliance with the other provisions in

UAC R313-15, such as how the surveys of radiation levels are used to demonstrate the dose limits in UAC R313-15-301, as required by R313-302(1).

6.2. R313-15-301 - Dose Limits for Individual Members of the Public. UAC R313-301(1)(a) and (b) and R313-301(4) contain radiation protection standards:

(1) Each licensee or registrant shall conduct operations so that:

(a) The total effective dose equivalent to individual members of the public from the licensed or registered operation does not exceed one mSv (0.1 rem) in a year, exclusive of the dose contributions from background radiation, from any medical administration the individual has received, from exposure to individuals administered radioactive material and released, under Rule R313-32 (incorporating 10 CFR 35.75 by reference), from voluntary participation in medical research programs, and from the licensee's or registrant's disposal of radioactive material into sanitary sewerage in accordance with Section R313-15-1003; and

(b) The dose in any unrestricted area from external sources, exclusive of the dose contributions from patients administered radioactive material and released in accordance with Rule R313-32 (incorporating 10 CFR 35.75 by reference), does not exceed 0.02 mSv (0.002 rem) in any one hour; and

(4) In addition to the requirements of R313-15, a licensee subject to the provisions of the United States Environmental Protection Agency's generally applicable environmental radiation standards in 40 CFR 190 shall comply with those standards.

6.2.1. The SER did not fully document how the Licensee has demonstrated, and will demonstrate in the future, compliance with R313-301(1)(a) and (b) with respect the dose to the public.

6.2.2. The SER (page 10) discusses the use of MILDOS AREA Modeling for compliance with R313-15-101, R313-15-301, and 40 CFR 190. The SER quotes the Licensee's discussion of modeling to account for the receipt, processing, and disposal of alternate feed (i.e., uranium bearing wastes from other mineral processing operations that have different chemical, physical, and radiological characteristics than natural ores). At the end of this brief discussion, the DRC states: "After reviewing the additional information provided by the Licensee, the DRC concluded that the Licensee has met all applicable requirements." However, the SER does not state the requirements that were met or how they were met. The SER should have provided a more detailed analysis of the use of the MILDOS Area Modeling to show compliance with R313-15-101, R313-15-301 for all aspects of the Mill operation.

6.2.3. The SER does not include information regarding the parameters and assumptions that the Licensee used in the model to calculate the doses in order to demonstrate compliance. The SER must include an evaluation of the Licensee's use of the MILDOS AREA Model to determine the accuracy of that model for determining compliance with the applicable standards. For example, the DRC must determine whether all sources of radon, radon progeny, and other radioactive particulate emissions are included in the model and that the amount and radioactivity from radon and radioactive particulates are accurately determined, including the radioactive emissions from thorium-232 and progeny, which are present in some alternate feed (Maywood, W.R. Grace, Heritage, FMRI).

6.2.4. The SER fails to describe and assess the Licensee's demonstration of compliance with the hourly dose requirements in R313-15-301(b).

6.2.5. The SER fails to describe and assess the Licensee's demonstration of compliance with the dose standard in 40 C.F.R. Part 190 (R313-15-301(4)).

6.3. R313-15-302 - Compliance with Dose Limits for Individual Members of the Public. R313-15-302 states, on pertinent part:

(1) The licensee or registrant shall make or cause to be made surveys of radiation levels in unrestricted and controlled areas and radioactive materials in effluents released to unrestricted and controlled areas to demonstrate compliance with the dose limits for individual members of the public in Section R313-15-301.

(2) A licensee or registrant shall show compliance with the annual dose limit in Section R313-15-301 by:

(a) Demonstrating by measurement or calculation that the total effective dose equivalent to the individual likely to receive the highest dose from the licensed or registered operation does not exceed the annual dose limit; or

6.3.1. The SER neither describes the various surveys of the radiation levels in the unrestricted and controlled areas and radioactive materials in effluents released to unrestricted and controlled areas nor explains how the data from those radiation surveys are used to demonstrate compliance with the dose limits for individual members of the public as required by Section R313-15-301. The SER does not include a determination that the Licensee has taken into account all radioactive emissions from the Mill operation when calculating the dose to the public.

6.3.2. The LRA describes various monitoring locations and types of radionuclides that are monitored. While the LRA describes monitoring for radon and radioactive particulates, it does not appear to include monitoring for radon progeny from both radon-222 and radon-220. As a result, it appears that the Licensee fails to include these radon progeny when determining the offsite dose. The SER must fully explain this apparent omission of radon progeny and how the Licensee uses all Mill monitoring data to determine the dose to the public as required by R313-15-101, R313-15-301, and 40 CFR 190.

6.3.3. As noted earlier, the record indicates that the Licensee last ran the MILDOS AREA Model in 2007. Since that time there have been major changes to the Mill operation, including the construction of two new tailings impoundments, changes in the amount and nature of stockpiled ore and alternate feed, construction of the alternate feed circuit, construction of an additional bag house, and the dispersal of radioactive particulates that contribute to the offsite dose.¹³ In light of these significant changes at the Mill, it is unreasonable to assume that the offsite dose has not changed since 2007 and will not change in the future.

6.3.4. The Licensee is required to show annual compliance with the radon emission standard (20 pCi/(m²-sec)) from tailings impoundments in 40 C.F.R. Part 61 Subpart W. That fact is not mentioned in the SER. Further, The SER never mentions this requirement and does not explain how data used to show compliance with the Subpart W standard is used to show compliance with public dose standards. The SER must include a discussion of compliance with Subpart W standard and how that data are used to demonstrate compliance with R313-15-301.

6.3.5. The DRC must require, pursuant to UAC R313-302(2)(a), that the Licensee make an annual demonstration by measurement or calculation that the total effective dose equivalent to the individual likely to receive the highest dose from the licensed operation does not exceed the annual dose limit. Annual changes in the emissions from the Mill must be assessed. The Licensee must include the calculations and describe (in plain English) the data and assumptions used in the calculations.

6.4. UAC R313-24-3. Environmental Analysis. R313-24-3 states:

- (1) Each new license application, renewal, or major amendment shall contain an environmental report describing the proposed action, a statement of its purposes, and the environment affected. The

¹³ *Assessment of Potential Uranium Emissions from a Uranium Mill on Water, Sediments, and Plants Located near the Ute Mountain Ute Reservation, Utah*, David Naftz and Ryan Rowland, USGS, Salt Lake City, Utah; Anthony J. Ranalli, USGS, Lakewood, Colorado; Sam Vance and Robert Duraski, USEPA, Denver, Colorado; Colin Larrick and Scott Clow, Ute Mountain Ute Tribe, Towaoc, Colorado; 2009. http://www.gwpc.org/meetings/forum/2009/proceedings/Rowland_Ryan.pdf.

environmental report shall present a discussion of the following:

(a) An assessment of the radiological and nonradiological impacts to the public health from the activities to be conducted pursuant to the license or amendment;

(b) An assessment of any impact on waterways and groundwater resulting from the activities conducted pursuant to the license or amendment;

(c) Consideration of alternatives, including alternative sites and engineering methods, to the activities to be conducted pursuant to the license or amendment; and

(d) Consideration of the long-term impacts including decommissioning, decontamination, and reclamation impacts, associated with activities to be conducted pursuant to the license or amendment.

(2) Commencement of construction prior to issuance of the license or amendment shall be grounds for denial of the license or amendment.

(3) The Executive Secretary shall provide a written analysis of the environmental report[,] which shall be available for public notice and comment pursuant to R313-17-2.

6.4.1. As discussed above, the ER did not fully describe the environment affected by the continued operation of the White Mesa Mill. The ER is almost 5 years old and does not include updated information on the Mill operation since 2007.

6.4.2. The ER did not include a full assessment of radiological impacts from the processing of alternate feed and the dispersion of uranium and other radionuclides offsite. The ER discussion of 2007 MILDOS AREA modeling (Section 3.13.2.6, page 73) indicates the production considerations for Arizona Strip and Colorado Plateau ores. The production considerations do not include processing of alternate feed. Additionally, the ER does not explain how the various production data and other data and assumptions are used to calculate offsite doses.

6.4.3. Recent studies show that uranium particulates are being dispersed offsite. The initial results of the *Assessment of Potential Uranium Emissions from a Uranium Mill on Water, Sediments, and Plants Located near the Ute Mountain Ute Reservation, Utah*,¹⁴ study shows evidence of offsite dispersion of uranium. Uranium and other

¹⁴ http://www.gwpc.org/meetings/forum/2009/proceedings/Rowland_Ryan.pdf.

radioactive particulates that migrate offsite are still considered to be 11e.(2) byproduct material, which the Licensee must control and clean up. The ER does not include an assessment of the impacts of those offsite particulate emissions and how the Licensee will address offsite migration of 11e.(2) byproduct material.

6.4.4. The ER did not explain how, exactly, radionuclide monitoring data and other data and assumptions are used to determine compliance with radioactive emission standards in UCA R313-15. *See* § 6.3, *supra*.

6.4.5. The ER did not contain complete information regarding the impacts from the transportation of chemicals, fuels, alternate feed, and ore to the Mill and the uranium and vanadium products from the Mill.

6.4.6. The ER did not discuss the turnover of employees at the Mill, employee compensation, and other factors regarding employees that might affect the health and safety aspects of the Mill operation.

6.4.7. The ER did not discuss the work schedule of Mill employees and provide information about the presence of management and the radiation safety and environmental oversight during both day and night shifts at the Mill. Apparently, there is a difference in the management oversight of the workers during the night shift, which has the potential to effect the health and safety of the Mill operation.

6.4.8. The ER did not discuss the higher levels of uranium found at the Entrance Spring, documented in the *Assessment of Potential Uranium Emissions from a Uranium Mill on Water, Sediments, and Plants Located near the Ute Mountain Ute Reservation, Utah*.

6.4.9. The ER did not consider the cumulative impacts from the processing of alternate feed and the cumulative impacts to the historical and cultural sites on the Mill property.

6.4.10. The ER did not provide a full, updated assessment of any impact on waterways and groundwater resulting from the activities conducted pursuant to the license or amendment;

6.4.11. The ER did not consider the long-term impacts, including decommissioning, decontamination, and reclamation impacts.

6.4.12. The ER did not provide specific information regarding the current (2011) status of each tailings pond and tailings impoundment and how each impoundment may contribute to offsite emissions of radon and radioactive particulates. The status of Cell 2 is of particular interest, because the Cell-2 is not longer receiving tailings and may be in the process of drying out. When the water on top of the tailings impoundment starts to dry, there is a greater potential for release of radon and radioactive particulates.

6.4.13. The Executive Secretary did not provide a written analysis of the environmental report, which shall be available for public notice and comment, as required by R313-24-3(3).

6.5. UAC R313-22-33. General Requirements for the Issuance of Specific Licenses. R313-22-23 provides guidance on the issuance and renewal applications:

(1) A license application shall be approved if the Executive Secretary determines that:

(a) the applicant and all personnel who will be handling the radioactive material are qualified by reason of training and experience to use the material in question for the purpose requested in accordance with these rules in a manner as to minimize danger to public health and safety or the environment;

(b) the applicant's proposed equipment, facilities, and procedures are adequate to minimize danger to public health and safety or the environment;

(c) the applicant's facilities are permanently located in Utah, otherwise the applicant shall seek reciprocal recognition as required by Section R313-19-30;

(d) the issuance of the license will not be inimical to the health and safety of the public;

(e) the applicant satisfies applicable special requirements in Sections R313-22-50 and R313-22-75, and Rules R313-24, R313-25, R313-32, R313-34, R313-36, or R313-38; and

6.5.1. The Executive Secretary has not shown that the proposed equipment, facilities, and procedures adequate to minimize danger to public health and safety and the environment, due to the inadequacy of the application, inadequacy of the DRC review of the application, and failure of the DRC to develop the required analysis of the environmental impacts of the renewal of the White Mesa Mill license.

6.5.2. The Executive Secretary has not shown that the issuance of the license will not be inimical to the health and safety of the public. Among other things the Executive Secretary has not shown that the Licensee met the radiation protection requirements of R313-15-101, R313-15-301, R313-302.

6.5.3. The Executive Secretary has not shown that the applicant has satisfied applicable special requirements in Sections R313-22-50 and R313-22-75, and Rules R313-24, R313-25, R313-32, R313-34, R313-36, or R313-38. As discussed above at Sections 6.4, the Licensee did not satisfy requirements of R313-24-3(1) and the Executive Secretary did not satisfy the requirements of R313-24-3(3).

7. CONCLUSION

7.1. Denial of License Renewal. The Executive Secretary must deny the renewal of the White Mesa Mill License for the following reasons:

7.1.1. The Executive Secretary did not issue a written environmental analysis of the environmental impacts of the License Renewal, pursuant to 42 U.S.C. § 2021(o) and R313-24-3(3). *See* § 3.1, *supra*.

7.1.2. The Executive Secretary did not provide an opportunity for public comment on the agency's environmental assessment, pursuant to R313-24-3(3). *See* § 3.1, *supra*.

7.1.3. The Executive Secretary has not shown that the Licensee met the requirements in R313-22-33 for the issuance of a license. *See* § 6.5, *supra*.

7.1.4. The Licensee's Environmental Report did not meet the requirements in R313-24-3(1). *See* § 5, *supra*.

7.1.5. The DRC's technical review of the LRA, as documented in the SER, was an incomplete and unsatisfactory assessment of all of the technical aspects of the current and foreseeable operations of the White Mesa Mill. *See* § 3, *supra*.

7.1.6. License Condition 9.7 of the proposed renewed license contains outdated and erroneous information with respect the protection of cultural resources at the Mill. *See* § 4.3, *supra*.

7.1.7. License Condition 10.1(C) conflicts with the provisions in LC 10.1(B), the AEA, and EPA and NRC Regulation. LC 10.1(c) must be deleted from the License. *See* § 4.5, *supra*.

7.1.8. The Executive Secretary did not demonstrate that the issuance of the License Renewal would not be inimical to the public health and safety, as required by R313-22-33(d).

7.1.9. The Licensee has not demonstrated that it can provide adequate and responsible regulatory oversight over the Mill.

7.2. Imposition of License Conditions. It will take time for the DRC to develop the required environmental analysis of the LRA, make it available for public comment, review those comments, and issue the renewed license. Therefore, the DRC must impose the proposed License Conditions 9.1 and 9.11 on the Licensee immediately. The imposition of License Conditions 9.1 and 9.11 would preclude the construction of any mill process water, wastewater storage, and/or tailings disposal impoundments until the Executive Secretary approves the Reclamation Plan, ICTM Report, and the surety cost

estimates based on those submittals. The DRC is authorized to impose license conditions to protect the public health and safety and the environment.

Thank you for providing this opportunity to comment,

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