40-8681

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

July 17, 1998

International Uranium (USA) Corporation
ATTN: Ms. Michelle Rehmann, Environmental Manager
Independence Plaza, Suite 950
1050 Seventeenth Street
Denver, CO 80265

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION ON THE RECLAMATION PLAN FOR THE WHITE MESA URANIUM MILL, BLANDING, UTAH

Dear Ms. Rehmann:

The U.S. Nuclear Regulatory Commission (NRC) staff is continuing its review of International Uranium (USA) Corporation's (IUSA's) reclamation plan, dated February 1997, for the White Mesa Uranium Mill site, located near Blanding, Utah. By letter dated December 16, 1997, IUSA provided responses to the NRC staff's requests for additional information, dated August 19, and December 5, 1997. In addition, the NRC staff and its contractor met with representatives of IUSA and its contractor on June 12, 1998, to discuss the staff's review of IUSA's responses.

Based on its review of IUSA's written responses and the discussion during the June 12, 1998, meeting, the staff considers that several of the previously identified omissions or deficiencies have been resolved; however, a number still remain open. In the enclosure to this letter, the staff has identified the additional information that it considers necessary to address the remaining omissions or deficiencies.

Please note that IUSA's reclamation plan will not receive final NRC approval until all of the enclosed comments have been addressed to the satisfaction of the NRC staff. Responses should be as thorough as possible in order to avoid additional requests for information and delay of the approval process. Please refer to the comment numbers when responding to specific comments.

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In order to support a timely review schedule, please provide the requested information by August 14, 1998. In addition to mailing its responses to NRC, the staff requests that IUSA also mail a copy directly to NRC's contractor, the Center for Nuclear Waste Regulatory Analyses, at the following address:

Center for Nuclear Waste Regulatory Analyses
ATTN: Patrick Mackin
6220 Culebra Road
P.O. Drawer 28510
San Antonio, Texas 78228-0510

In responding to this NRC staff request, PRL may reference information contained in previous submittals, pursuant to 10 CFR 40.31(a). Page changes to the reclamation plan should be provided as appropriate. Failure to respond to this request for additional information may be grounds for denial of the application, in accordance with 10 CFR 2.108(a).

If you have any questions concerning this letter or the enclosure, please contact Mr. James Park of my staff at (301) 415-6669.

Sincerely,

Joseph J. Holonich, Chief
Uranium Recovery Branch
Division of Waste Management
Office of Nuclear Material Safety
and Safeguards

Docket No. 40-8681
License No. SUA-1358

Enclosure: As stated

cc: H. Roberts, IUSA

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[Original signed by]

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cc: H. Roberts, IUSA

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REQUEST FOR ADDITIONAL INFORMATION
Detailed Site Reclamation Plan for IUSA's White Mesa Uranium Mill

The U.S. Nuclear Regulatory Commission (NRC) staff has reviewed the responses of International Uranium (USA) Corporation (IUSA) to the staff's requests for additional information (RAIs) as provided in letters dated August 19, and December 5, 1997. In addition, the NRC staff met with IUSA on June 12, 1998, to discuss the staff's review of IUSA's responses. Based on its review and discussions during this meeting, the staff has determined that further information is required to complete its review of the site reclamation plan. The requested information is identified in the following comments.

GEOTECHNICAL AND RADON BARRIER DESIGN

1. The proposed random fill material requires additional characterization

   IUSA states that the random fill material to be used consists of clay, silt, sand, and gravel. The material, which has been stockpiled onsite, contains isolated pockets of clay (CL type) and varying amounts of sandstone cobbles (from 75 to 300 millimeters [mm] in size) and boulders (larger than 300 mm in size). IUSA states that it may screen out the cobbles and boulders prior to placing the material on the disposal cell. It is not clear from IUSA's response what it proposes as the maximum size of particles in random fill to be placed in the disposal cell.

   If placed in a disposal cell, a strongly heterogeneous random fill can significantly affect the performance of the radon barrier, making complex and difficult the estimation of differential settlement and the potential for cover cracking.

   Therefore, IUSA should specify the maximum particle size of random fill material to be placed in the disposal cell. Quality control (QC) procedures to ensure the separation of undesirable materials and to ensure material specifications are met should be provided. If stones and large particles, such as boulders and cobbles, are used, their potential effects on differential settlement, cover cracking potential, preferential infiltration pathways, and the potential for cover erosion should be analyzed and documented.

2. A QC test procedure and appropriate test frequencies are required to ensure that only CL and CH clays will be used for cover construction.

   Soil profiles provided by IUSA show that layers of acceptable types of clay (CL and CH) are overlain by clays with undesirable properties (SC, SM, and ML). The thicknesses of undesirable clay layers have considerable spatial variation. These clays need to be separated from the acceptable clay types to ensure that the radon barrier will have desirable radon containment properties. An adequate QC plan with an acceptable sampling program is necessary to ensure that required tests and any corrective action are completed to ensure that acceptable clay types are used for cover construction.

   The test frequencies proposed by IUSA are inadequate to ensure that only clays with desirable properties are used in the radon barrier. The NRC Staff Technical Position on

testing and inspection plans (NRC, 1989) provides guidelines for the frequencies of QC tests deemed acceptable for disposal cell construction.

Therefore, IUSA should revise the QC procedure documented in the reclamation plan to provide appropriate measures to ensure that only clays with desirable properties will be used in the construction of the radon barrier. IUSA also should revise its test frequencies for these materials to meet those recommended by the staff.

REFERENCE: NRC, "Staff Technical Position on Testing and Inspection Plans During Construction of DOE's Remedial Action at Inactive Uranium Mill Sites," January 1989.

3. The test hole locations used to estimate the properties of mill tailings and cover materials should be identified. The standards and procedures used to determine the material properties also should be specified.

IUSA should provide a map(s) showing the locations of the test holes from which tailings and cover material characterization samples were obtained. The locations to be identified should include those samples described in Appendix A of the reclamation plan and in Attachment A of IUSA's December 16, 1997, response. IUSA also should specify the standards and procedures used to assess the material properties.

4. Tests using multiple samples should be used to quantify adequately and account for the intrinsic variation of material properties in IUSA's analyses.

The intrinsic variability of the material properties should be characterized by conducting measurements of each property using several samples. Such a process appears not to have been followed. For example, the Atterberg Limits tests, Standard Proctor test, and permeability test were carried out using only one sample (UT-1). Moreover, the location from which this sample was obtained has not been provided. Similarly, supporting information concerning the samples used for determining the material properties employed in the slope stability analyses is missing also. Moreover, the hydraulically-placed tailings show significant heterogeneity that must be taken into account in settlement analyses.

IUSA should conduct and document tests using multiple samples to adequately estimate the intrinsic variation of material properties, including the heterogeneity of the tailing properties (see NRC, 1978). The location of Sample UT-1 should be specified, as well as the additional samples used for determining the parameters for the slope stability analyses. Technical justification should be provided to support the contention that the material property values used in the slope stability analyses are appropriate and acceptably consider the intrinsic variability.

REFERENCE: NRC, April 1978, "Laboratory Investigations of Soils for Engineering Analysis and Design of Nuclear Power Plants," Regulatory Guide 1.138.

5. Technical support is required for the contention that the slope stability analysis is conservative.

The sketch of the cross section for Dam No. 4 provided with Attachment 3 of IUSA's December 16, 1997, response, shows the top of the bedrock to be inferred from borehole logs (which were not provided with the reclamation plan). This bedrock surface is closer to the toe of the slope than the hypothetical surface used in the slope stability analysis. IUSA justifies this inconsistency by stating that the analysis presented with a bedrock surface lower than actual would be conservative. A technical rationale is required for this statement.

Assessments conducted by the NRC staff suggest that the actual mode of failure may be quite different from the circular failure surface assumed by IUSA in the hypothetical case presented in the reclamation plan (a plot of the critical failure surface was not provided with the reclamation plan). The assessments suggest that the critical failure surface may not be circular and a portion of the failure surface may be bounded by the bedrock surface. Consequently, the failure of the slope may be determined by the cohesion and friction of the interface between the foundation material and the bedrock.

Therefore, IUSA should conduct and document in the reclamation Plan an appropriate suite of analyses to determine the effects of bedrock close to the toe of the slope, specifically with respect to the mode of failure. In addition, the appropriateness of the assumption of a circular failure profile should be demonstrated.

In its analyses, IUSA also should:

- investigate and analyze other potential failure modes using other analysis methods (e.g., the wedge method [Lambe and Whitman, 1979]);
- address the potential for tensile crack formation, and if significant, analyze the possible effect on water infiltration and on the integrity and function of the cover;
- measure (in the laboratory) or estimate (based on available published information) the properties of the bedrock interface. Estimated values should be justified, and a sensitivity analysis should be conducted to demonstrate the conservativeness of the assumed values;
- include the effects of potential seismicity at the site (a horizontal ground acceleration of 0.12g) in the slope stability analysis;
- indicate the measured location of the phreatic surface and, if appropriate, account for the effects of this surface in the slope stability analysis; and
- assess the potential impacts from earthquake-induced pore pressures.

REFERENCE: Lambe, T.W., and R.V. Whitman, "Soil Mechanics, SI Version," New York NY: John Wiley and Sons, 1979.

6 Inconsistencies between figures and borehole logs should be resolved so that the position of the bedrock surface can be identified.

There appears to be inconsistency among the figures in Appendix G and the borehole logs from Chen & Associates given in that appendix. Without a discussion of the borehole logs and the figures, it is not possible to determine how the position of the bedrock surface was inferred from the borehole logs. For example, Figure 1 of Appendix G shows that the bedrock surface was encountered in two boreholes: Chen #29 and Chen #77. The borehole logs provided in Appendix G do not include these boreholes. If these two boreholes belong to the series of holes shown in Figure 3 (BH-15 through BH-28), then the boreholes named Chen #29 and Chen #77 cannot intersect the boundary of Cell 4. If these holes belong to the series of borehole logs given in Appendix G (Hole 1 through Hole 75), then information about borehole Chen #77 is missing.

Also the surface elevation contours given in Figure 3 do not match the borehole logs provided. For example, according to the contours in the figure, the collar elevation of BH-24 should be between 5570 ft and 5580 feet. However, according to the borehole logs, BH-24 is between 5601 and 5609 feet.

Therefore, IUSA should resolve the inconsistencies among the figures and the borehole logs and provide the missing information.

7. The proposed frequencies of QC tests for controlling the quality of the construction of the final disposal cell should be modified.

The NRC Staff Technical Position (STP) on testing and inspection plans (NRC, 1989) provides guidelines for the frequencies of QC tests deemed acceptable by the staff for disposal cell construction. IUSA is proposing to perform these QC tests with frequencies significantly less than those recommended in the STP.

The objective of the recommended frequencies for the different tests is to ensure that acceptable construction quality of the disposal cells can be achieved given the importance to public health and safety and required long life, as specified in 10 CFR Part 40, Appendix A, Criterion 6(i). The frequencies of testing recommended by the NRC staff are consistent with standard industry practice (e.g., the U.S. Departments of the Army, Navy, and Air Force, the U.S. Bureau of Reclamation) and have been adopted by licensees at other UMTRCA Title II sites.

While the NRC staff recognizes that construction methodologies and material testing frequencies should reflect site-specific conditions, the staff considers it inappropriate at this stage in the reclamation process to commit to the proposed frequencies absent actual construction data. Therefore, the staff requests that IUSA modify its QC plan to meet the recommendations in the STP. Once IUSA can demonstrate using actual construction data that acceptable quality can be achieved with QC tests less frequent than those specified in the STP, the testing frequencies and associated surety assessment can be modified appropriately.

REFERENCE: NRC, January 1989, "Staff Technical Position on Testing and Inspection Plans During Construction of DOE's Remedial Action at Inactive Uranium Mill Tailing Sites."

8. Additional information and analysis are necessary to address the potential for cover cracking due to liquefaction.

The tailings properties indicate that the material has the potential for liquefaction, and in its December 16, 1997, response, IUSA acknowledges this potential. The potential for liquefaction must be assessed to demonstrate that any resulting damage would be minor and would not cause cover damage.

Therefore, IUSA should evaluate the potential for liquefaction at several locations within the impoundment in order to provide adequate areal coverage. This evaluation should be based on laboratory and/or field tests and pore pressure measurements, if necessary. Methods used for interpreting test data and assessing liquefaction potential should be consistent with current practice in geotechnical engineering (Seed and Idriss, 1971 and 1982; Seed, 1994).

As a minimum, potentially liquefiable zones should be identified based on index properties and gradation test results for the maximum credible earthquake assessed in Appendix G of the reclamation plan. If the extent of potentially liquefiable zones is local or minor, the effects on stability, assuming zero material strength, should be assessed and the cover integrity should be demonstrated. However, if the potential for liquefaction is assessed to be significant (e.g., involving the entire impoundment and/or the embankment), mitigation measures or redesign of the tailings ponds and/or the embankments should be proposed.

REFERENCES: Seed, H.B. and Idriss, I.M., 1971, "A Simplified Procedure for Evaluating Soil Liquefaction Potential," ASCE Journal of the Soil Mechanics and Foundations Division, ASCE, Vol. 97, No. SM 9, pp. 1249–1274.

Seed, H.B., and Idriss, I.M., 1982, "Ground Motions and Soil Liquefaction During Earthquake," Earthquake Engineering Research Institute, Engineering, Monograph, Vol. 5.

Seed, R.B., 1994, "Introduction to Evaluation of Potential Liquefaction Hazard. Advances in Earthquake Engineering Practice," Workshop at the University of California at Berkeley, May 31–June 4, 1994.

9. Additional information and analysis are necessary to address the potential for cover cracking due to differential settlement.

One important consideration for settlement analysis is the calculation of the spatial variation of settlement and any potential for cover cracking due to this differential settlement. This calculation requires estimation of the settlement at various locations to provide an adequate areal coverage. Moreover, due to the heterogeneity of the tailings

materials, a settlement analysis that takes into account the spatial variability of the material properties is indispensable to developing an adequate settlement monitoring program.

In general, monitoring stations or monuments are not placed quickly enough to record the original conditions. Consequently, the estimation of time to 90 percent consolidation (i.e., t_{90}) from field measurement alone becomes extremely difficult without auxiliary analyses for estimating settlement with location-specific parameter values.

Therefore, to provide an adequate areal coverage, IUSA should estimate the settlement due to self-weight and the construction of the cover at several locations. These estimates should be based on the known or measured distribution of materials (e.g., sand, slime) at each location and laboratory-measured consolidation parameter values. Settlement should be calculated at each settlement platform and monitoring well and, if necessary, pore pressure measurements should be provided to confirm 90 percent consolidation values.

IUSA also should calculate the maximum differential settlement, and analyze the strain on the clay cover due to the differential settlement. In addition, the capability of the proposed clay cover to withstand the settlement strain without developing cracks should be demonstrated. These assessments are particularly important considering that the proposed thickness of the clay cover is thin (one foot) when compared to the standard practice in geotechnical engineering (Bennett and Kimbrell, 1991).

Finally, additional settlement that may occur as a result of the volume change of tailings during a seismic event (even in the absence of a liquefaction scenario) should be considered in assessing the settlement of the disposal cell cover.

REFERENCE: Benett, R.D. and Kimbrell, A.F., 1991, "Recommendations to the NRC for Soil Cover Systems Over Uranium Mill Tailings and Low-Level Radioactive Wastes: Construction Methods for Sealing Penetrations in Soil Covers," NUREG/CR-5432, Vol.3.

10. Additional information addressing the details of disposal cell construction should be provided.

Details of disposal cell construction are necessary to support NRC's detailed analysis of IUSA's proposed reclamation plans and surety estimate. The minimum required information includes methods, procedures, and requirements for excavating, hauling, stockpiling, and placing contaminated and non-contaminated materials, and other disposal cell materials. The procedures for material placement and compaction should be adequate to achieve the desired moisture content, placement density, and permeability. Use of acceptable procedures, such as the recommendations provided in NUREG/CR-5041 (Denson, et al., 1987), for gradation, placement, and compaction necessary to achieve design drainage rates and volumes, to prevent internal erosion or piping, and to allow for collection and removal of liquids should be confirmed. Compaction specifications should include restrictions on work related to adverse weather conditions (e.g., rainfall, freezing conditions, etc.). Plans, specifications, and

requirements for disposal cell compaction should be supported by field and laboratory tests and analyses to assure stability and reliable performance.

A plan for settlement measurement that is satisfactory for producing representative settlement data throughout the disposal cells is required. Settlement measurement stations should be of sufficient coverage and should be strategically placed to yield adequate information for determination of differential and residual settlements. Monitoring monuments should be designed to be durable.

The proposed frequency of monitoring should conform to acceptable practice (e.g., NRC, 1989). Procedures and specifications for use of riprap, rock mulch, and for filter placement should be provided and should be consistent with commonly accepted engineering practice and the design specifications (NRC, 1977 and 1982). The construction sequence should be described and demonstrated to be adequate to achieve the intended configuration for the tailings. The proposed time to completion should be reasonably achievable. Appropriate QC provisions should be provided to ensure that the construction will be in accordance with the reclamation plan, and that the appropriate records will be maintained.

IUSA should provide the information necessary to support an evaluation of disposal cell construction.

REFERENCES: Densen et al., 1987, "Recommendations to the NRC for Review Criteria for Alternative Methods of Low-Level Radioactive Waste Disposal," NUREG/CR-5041.

NRC, December 1977, "Design, Construction, and Inspection of Embankment Retention Systems for Uranium Mills," Regulatory Guide 3.11, Revision 2.

NRC, August 1982, "Rock Riprap Design Methods and Their Applicability to Long-Term Protection of Uranium Mill Tailings Impoundments," NUREG-2684.

NRC, January 1989, "Staff Technical Position on Testing and Inspection Plans During Construction of DOE's Remedial Action at Inactive Uranium Mill Tailing Sites."

11. The reclamation plan should address radionuclides other than radium-226 that may require cleanup.

The verification survey, as described in Appendix A of the reclamation plan, describes a method to ensure that only radium-226 concentrations will be less than NRC requirements. Other radionuclides, including thorium-230 and uranium, may also be present in the soil. It is noted that IUSA states in Section 3.3.2 of Appendix A of the reclamation plan that "[t]he facility currently monitors soils for the presence of Ra-226, such results being presented in the second semiannual effluent report for each year. Guideline values for these two materials will be determined and will form the basis for the cleanup of the White Mesa Mill... ." This statement appears to imply that two

radionuclides will be sampled during reclamation. However, if this is the case, the second radionuclide is not identified.

IUSA should either (1) provide technical justification for not including radionuclides other than radium-226 in the soil cleanup plan, or (2) describe the methodology that will be used to determine that other radionuclides have been reduced to acceptable levels.

12. The value proposed as the background radium concentration in the soil should be provided.

In accordance with Appendix A of 10 CFR Part 40, during the final site cleanup, the soil must be reclaimed such that the average radium concentration in the soil does not exceed the background level by more than 5 picocuries per gram (pCi/g) in the upper 15 centimeters (cm) or by more than 15 pCi/g in 15 cm sections below the upper 15 cm. In order to comply with these regulations, a value for the background radium concentration in the soil must be determined. In the reclamation plan, IUSA has provided the historical soil sampling data, but it has not committed to a value for the background radium concentration in soil.

IUSA should provide the value for background radium concentration in soil that will be used to determine the soil cleanup standards during decommissioning.

13. Technical support should be provided for the scanning rate used for windblown contamination during mill decommissioning.

On the fifth page of the mill decommissioning calculations, the rate of scanning used for the calculation of the time required to scan for windblown contamination is 1.5 meters per second (m/sec). According to NUREG/CR-5849 (NRC, 1992), the recommend 1 scanning rate for a ground survey is 0.5 m/sec. Of concern to the staff is the potential for IUSA's use of a 1.5 m/sec scanning rate to result in inaccurate surveys.

IUSA should adopt the scanning rate recommended in NUREG/CR-5849, or alternately, provide a technical justification that its proposed scanning rate will provide accurate survey results. If the recommended scanning rate is adopted, IUSA should revise its decommissioning costs to reflect the time and associated costs needed to complete these surveys

REFERENCE: NRC, 1992, "Manual for Conducting Radiological Surveys in Support of License Termination," NUREG/CR-5849.

14. Additional information about the location of samples taken to characterize the radon barrier materials is required.

In Appendix A of the Tailings Cover Design (Titan Environmental, 1996), data is provided for the tailings and materials that will be used to construct the tailings cover. However, insufficient information is given about the location and depth of the samples,

which is necessary to determine whether these samples are representative of the long-term properties of all materials on-site. The samples at question include:

(a) The samples labeled "Tailings," "Composite (21, 3, and 5)," "Site #1," and "Site #4," in a March 4, 1988, Rogers and Associates Engineering Corporation report;

(b) The samples labeled "Random (2, 3, and 5),' "Site 1," and "Site 4" in a May 9, 1988, Rogers and Associates report;

(c) The sample labeled "UT-1" in a 1996 Advanced Terra Testing report;

(d) The sample labeled "UT-1" in a September 3, 1996, Rogers and Associates report; and

(e) The samples labeled "Test Pit 1, 2, and 3" in a March 8, 1982, D'Appolonia report (depth of samples only is needed).

For the above listed samples, IUSA should provide a map showing the sampling locations and the depths at which these samples were acquired.

REFERENCE: Titan Environmental, "Tailings Cover Design White Mesa Mil, October 1996 for Reclamation of White Mesa Facilities, Blanding, Utah," prepared for Energy Fuels Nuclear, Inc., Denver, CO, October 1996.

15. Confidence limits are required for the guideline value for the correlation between gamma readings and the Ra-226 concentration.

On page 8 of its December 16, 1997, response, IUSA states that a correlation will be performed between gamma readings and the Ra-226 concentration. However, IUSA has not specified the confidence limit for the guideline value to be used in this correlation. In the past, the NRC staff has found this method of correlating gamma readings to soil radium concentration acceptable when the guideline value is set at the lower 95 percent confidence limit of the correlation.

IUSA should indicate the confidence limit it will use in making the correlation between gamma readings and radium concentration from which the guideline gamma reading value will be established.

SURFACE WATER HYDROLOGY AND EROSION PROTECTION

16. Additional information and analyses are needed to show that the breached area of Cell No. 4A is protected adequately from erosion.

Because there is a potential for gully headcutting to occur and potentially affect the reclaimed tailings area, erosion protection may be needed to mitigate the effects of local scouring and future gully headcutting. Therefore, IUSA should provide estimates of the

peak probable maximum flood (PMF) flow through the breach, water surface profiles, channel velocities, riprap needed, scour depths, and other design information including drawings, calculations, and analyses.

17. Additional information is needed to assess the adequacy of the discharge channel.

To evaluate the adequacy of the discharge channel, it is necessary to know the drainage area contributing flow to the channel and the bases for IUSA's estimates of peak PMF flow rates, channel velocities, flood routings, etc. Such information, including detailed drawings and calculations, are needed to determine if the channel and its associated erosion protection are adequate. Therefore, IUSA should provide this information or, if such information has been provided to NRC in the past, IUSA should provide appropriate references.

18. Additional rock durability tests are necessary to characterize adequately the sandstone rock IUSA proposes to use as riprap.

One rock durability test is not considered to be adequate to document that the sandstone rock riprap is sufficiently durable to meet longevity requirements. Given the marginal quality of the rock, IUSA should conduct several durability tests taken from samples at the proposed source. Results of these tests should be provided to NRC.

19. Additional information is needed to describe the proposed rock toes.

Detailed drawings and calculations should be provided to document the design bases and to show the design configurations of the rock toes, particularly in those locations where the toes transition into areas where sandstone bedrock is present. The competency of the bedrock layer also should be assessed.

CLARIFICATIONS AND EDITORIALS

20. The discussion concerning potential impacts to endangered and threatened species should be brought up-to-date.

In Section 1.7 of the reclamation plan, IUSA discusses the effects of the site on endangered and threatened species as of 1978, when the Environmental Report for the site was written. Between that time and the present, new species may have been placed on or removed from the endangered species list, and new species may have been observed on-site.

IUSA should update its analysis of potential effects from reclamation activities on listed, proposed, or candidate endangered or threatened species. If appropriate, IUSA should confirm, at a minimum, that the evaluations conducted for the 1978 endangered species analysis still are applicable.

21. Two references require clarification.

In Section 3.2.3.2 of the reclamation plan, two references are made to information contained in Section 4.3.2.1. The staff is unable to locate a Section 4.3.2.1 in the reclamation plan. IUSA should clarify these references.

22. An apparent inconsistency between values used for the moisture content of the clay and random fill should be resolved.

On page 5 of Appendix B of the Tailings Cover Design (Titan, 1996), IUSA states that the moisture content of the clay and random fill used for the radon flux calculations are 14.1 percent and 9.8 percent, respectively. These values are inconsistent with the values used to calculate the freeze-thaw effects on the cover, which are 13.9 percent for the clay and 11.8 percent for the random fill (Titan, 1996; Appendix E, page 3).

IUSA should resolve the inconsistency in the values for the moisture content of the clay and random fill.

23. Applicability of replacement pages should be clarified.

In Attachment 3 to IUSA's December 16, 1997, response, six pages from the "Geotechnical Data Base for Monticello Millsite Characterization" are provided as replacement pages for several illegible pages in IUSA's initial submittal. It is not clear how this data from the Monticello site is applicable or relevant to IUSA's reclamation activities and analyses. Therefore, IUSA should clarify the applicability of this data base to the present licensing action.