UTAH DIVISION OF RADIATION CONTROL

URANIUM ONE, INC.

SHOOTARING CANYON URANIUM PROCESSING FACILITY

INTERROGATORIES – ROUND 4

AUGUST 28, 2008

TABLE OF CONTENTS

Section Page

ACRONYMS AND ABBREVIATIONS 2
SUMMARY OF REQUESTED ITEMS 4
INTERROGATORY R313-24-1(3)-02/04: SUMMARY OF REGULATORY REQUIREMENTS 8
INTERROGATORY R313-24-4-05/04: DAILY INSPECTIONS OF WASTE TAILINGS 9
INTERROGATORY R313-24-4-06/04: MAINTAINING RECORDS 11
INTERROGATORY R313-24-4-12/04: SOIL FINAL STATUS SURVEY FOR SITE DECOMMISSIONING 13
INTERROGATORY R313-24-1-14/04: MILLING OPERATIONS 14
INTERROGATORY R313-24-4-16/04: SEISMIC HAZARD CHARACTERIZATION 15
INTERROGATORY R313-24-4-19/04: DOUBLE LINER SYSTEM CQA PLAN AND SPECIFICATIONS 16
INTERROGATORY R313-24-4-20/04: LINER STRENGTH & COMPATIBILITY 20
INTERROGATORY R313-24-4-21/04: LINER SETTLEMENT 23
INTERROGATORY R313-24-4-22/04: LEACHATE COLLECTION AND DETECTION SYSTEM DESIGN 24
INTERROGATORY R313-24-4-23/04: DIKE INTEGRITY 26
INTERROGATORY R313-24-4-24/04: BEST AVAILABLE TECHNOLOGY 28
INTERROGATORY R313-24-4-26/04: INFILTRATION AND CONTAMINANT TRANSPORT MODELING 33
INTERROGATORY R317-6-2.1-27/04: GROUNDWATER MONITORING 34
INTERROGATORY R317-6-6.3F-28/04: INFORMATION ON EFFLUENT DISCHARGE RATES 48
INTERROGATORY PR R317-6-6.3G-29/04: SURFACE WATER CONTROLS 49
INTERROGATORY R313-24-4-33/04: POST-CLOSURE DRAINAGE AND EROSION CONTROLS AND POSTCLOSURE MAINTENANCE 52
INTERROGATORY R313-24-4-34/04: RADON RELEASE MODELING 553
INTERROGATORY R313-24-4-36/04: OPERATIONAL DUST CONTROL 554
INTERROGATORY R313-24-4-37/04: COST ESTIMATES FOR DECOMMISSIONING AND RECLAMATION 57
INTERROGATORY R313-24-4-38/04: LONG TERM SURVEILLANCE COSTS 59

ACRONYMS AND ABBREVIATIONS

ALARA	As Low As Reasonably Achievable
BAT	Best Available Technology
CCQAP	Construction Control Quality Assurance Plan
CFR	Code of Federal Regulations
COD	Chemical Oxygen Demand
DOT	US Department of Transportation
DQO	Data Quality Objectives
EPCRA	Emergency Planning and Community Right-to-Know Act of 1986
EPPC	Evaporation and Process Pond Cell
FML	Flexible Membrane Liner
GPD	Gallons per Day
GPM	Gallons per Minute
HDPE	High Density Polyethylene
LCRS	Leachate Collection and Removal System
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
mg/l	Milligram per liter
MHGA	Maximum Predicted Horizontal Ground Acceleration
NBS	National Bureau of Standards
pCi/g	Picocurie per gram
PE	Potential Evaporation
PET	Potential Evapotranspiration
QAP	Quality Assurance Plan
QAPP	Quality Assurance Project Plan
RMTP	Reduced Moisture Tailings Placement
SARA	Superfund Amendments and Reauthorization Act

SDR	Standard Dimension Ratio
SOP	Standard Operating Procedures
TEDE	Total Effective Dose Equivalent
TMP	Tailings Management Plan
TRDP	Tailings Reclamation and Decommissioning Plan
TSS	Total Suspended Solids
URCR	Utah Radiation Control Rules

SUMMARY OF REQUESTED ITEMS

Please note information that Uranium One previously submitted to DRC may be provided in Uranium One responses by reference. However, each reference should be clear and specific or focused, i.e., the reference should include the title, author, date, page, and paragraph that included the information referenced, and how the reference is pertinent.

A summary of items requested with this round of interrogatories follows below. Please refer to the specific interrogatories for the context of the item requests:

1. Provide a revised and updated Tailings Management Plan (TMP).
2. Additional revisions to the final tailings inspection procedure SOP AP-3.
3. Provide accompanying explanatory text with the revised Figure 8-1 in the revised Tailings Reclamation and Decommissioning Plan (TRDP).
4. Provide additional revisions to final SOP HP-25.
5. Complete minor revisions to the seismic evaluation for the site.
6. Provide additional information regarding details of the proposed method for clay liner block sampling and testing, including additional information regarding sampling techniques and information regarding appropriate laboratory testing conditions, along with data to support determination of those testing conditions.
7. Provide additional information demonstrating whether edge effects will occur when constructing the compacted clay liner on sideslope areas and additional information to justify whether the currently-proposed field test pad program and the final liner system design will adequately characterize and accommodate such effects.
8. Provide additional information regarding the effects of temperature on geomembrane liner wind uplift and provide revised specifications for certain properties of the geomembrane liner that are appropriate for a textured HDPE geomembrane rather than a smooth HDPE geomembrane.
9. Additional information regarding the characteristics of drainage layer gravel and sand layers in the liner system anchorage design and information regarding the erodability of gravel and sand materials in the anchorage system.
10. Additional evaluation of stresses imposed by equipment, tailings, and liquid during all scenarios and phases of construction, operations and tailings placement on the liner system that could result in movement and degradation of the liner system.
11. Evaluation of the anticipated liner settlement associated with the final cell.

12. Provide additional information demonstrating whether a cushion geotextile is needed over the primary HDPE geomembrane to protect it from puncture/dimpling. Also indicate that the gradation envelope for acceptable particle sizes is shown on Figure 7-2.

13. Clarify references used in the stability analysis.

14. Provide additional information demonstrating that the proposed slopes will maintain integrity when live equipment loads are applied under all reasonable conditions that may prevail during operations.

15. Confirm that the most critical slopes and surfaces have been used in the stability analysis.

16. Provide clarifications regarding details related to the design of the liner system.

17. Provide justification that leachate collection system pipes are adequately sized to handle additional flows from precipitation.

18. Provide additional calculations to determine a facility-specific Action Leakage Rate to allow a complete review of adequacy of the LDS design.

19. Provide justification to demonstrate that the calculated 4.8% ring deflection result for sump riser pipes is acceptable.

20. Provide specific references for formulae and parameter values used in the buried pipe loading calculations.

21. Provide final technical specifications and drawings and a final Construction Quality Assurance Plan for the design including the liner, leachate collection, and leak detection systems.

22. Provide additional information addressing the effects of degradation processes on long-term infiltration rates and contaminant transport to respond to the Round 3 Interrogatory on Infiltration And Contaminant Transport Modeling.

23. Provide additional analysis and additional supporting information in Groundwater Monitoring Plan, Groundwater Monitoring Quality Assurance Plan, Standard Operating Procedure EP-1 - Groundwater Sampling (Follow Approved QAP), Groundwater Geochemical Evaluation and Background Water Quality Determination report, and the Groundwater Modeling and Proposed Monitoring Wells report to demonstrate the adequacy and appropriateness of the proposed groundwater monitoring new network and groundwater monitoring program.

24. Provide additional evaluation of the potential discharge of tailings solution to groundwater.

25. Provide additional information and clarifications regarding the proposed design of surface water control during facility operations.

26. Clarifications and additional information on the proposed post closure erosion controls.

27. Additional information and clarifications regarding methods and assumptions used for radon release modeling of the final cover system.

28. Provide additional information on proposed dust control methods/procedures.

29. Provide additional information regarding for cost estimates provided for decommissioning and reclamation and for long-term surveillance.

Please note that the Division will include specific license conditions that will address the need for complete standard operation procedures that cover operation, maintenance, inspection, and health and safety of the mill and tailings management prior to the start of operations.

INTERROGATORY R313-24-1(3)-02/04: SUMMARY OF REGULATORY REQUIREMENTS

INTERROGATORY STATEMENT:

NOTE: This interrogatory is carried forward without change from Interrogatory Round 3.

1. *Please provide a revised Tailings Management Plan that includes revisions as presented on Uranium One's response to Round 2 of this Interrogatory.*

URANIUM ONE RESPONSE:

Uranium One USA, Inc. (Uranium One) indicated that they will submit the requested document at a later time. As of date, this plan has not been submitted to the Division.

REFERENCES:

Uranium One USA, Inc., Response to Round 3 Interrogatories for the Shootaring Canyon Uranium Mill. May 28, 2008.

INTERROGATORY R313-24-4-05/04: DAILY INSPECTIONS OF WASTE TAILINGS

PRELIMINARY FINDING:

Refer to R313-24-4 and 10 CFR 40.26(c)(2): The documentation of daily inspections of tailing or waste retention systems and the immediate notification of the Executive Secretary, of any failure in a tailing or waste retention system that results in a release of tailings or waste into unrestricted areas, or of any unusual conditions (conditions not contemplated in the design of the retention system) that if not corrected could lead to a failure of the system and result in a release of tailings or waste into unrestricted areas; and any additional requirements the Executive Secretary my by order deem necessary. The licensee shall retain this documentation of each daily inspection as a record for three years after each inspection is documented.

Refer to R313-24-4 and 10 CFR 40 Appendix A(8)(a): Daily inspections of tailings or waste retention systems must be conducted by a qualified engineer or scientist and documented. The licensee shall retain the documentation for each daily inspection as a record for three years after the documentation is made. The Executive Secretary, must be immediately notified of any failure in a tailings or waste retention system that results in a release of tailings or waste into unrestricted areas, or of any unusual conditions (conditions not contemplated in the design of the retention system) that is not corrected could indicate the potential or lead to failure of the system and result in a release of tailings or waste into unrestricted areas.

Refer to R317-6-6.3 (O): Unless otherwise determined by the Executive Secretary, applicant for a groundwater discharge permit ...shall include the following information: O. Methods and procedures for inspections of the facility operations and for detecting failure of the system.

INTERROGATORY STATEMENT:

In addition to those items from Interrogatory R313-24-4-05/03 that have been addressed in Draft SOP AP-3, please ensure that the final tailings inspection procedure (SOP AP-3) addresses the following items, as requested in the Round 3 Interrogatory R313-24-4-05/03:

- *Upper tailings (slime) drain system*
- *Embankment Slope Conditions*
- *Slope Protection*
- *Emergency Discharge Facility*
- *Safety and Performance Instrumentation*
- *Operation and Maintenance Features*
- *Postconstruction Changes*
- *Groundwater Monitoring systems*

The final procedure should also address the process of revising the procedure, as requested in Interrogatory R313-24-4-05/03.

BASIS FOR INTERROGATORY:

While most of the items identified in Interrogatory R313-24-4-05/03 were addressed in the draft Procedure SOP AP-3, several were not. Those items not addressed in the draft procedure are the focus of this Round 4 Interrogatory.

REFERENCES:

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

NRC. Regulatory Guide 3.11.1, "Operational Inspection and Surveillance of Embankment Retention Systems for Uranium Mills." Washington DC. NRC October 1980.

Plateau Resources, Ltd., "Tailings Management Plan for Shootaring Canyon Uranium Processing Facility" Amended April 2007.

Plateau Resources, Ltd., "Tailings Reclamation and Decommissioning Plan for Shootaring Canyon Uranium Project", Dated December, 2005.

Plateau Resources, Ltd., "Shootaring Canyon Uranium Processing Facility Environmental Report, Source Material License No. UT0900480", Dated January 2006.

Uranium One USA, Inc., "Shootaring Canyon Uranium Mill Amendment Request for Radioactive Material License No. UT 09004480, 2nd Round Interrogatory Responses", November 28, 2007.

Uranium One USA, Inc. "Shootaring Canyon Uranium Mill Tailings Storage Facility Design Report, May 27, 2008".

Uranium One USA, Inc., Response to Round 3 Interrogatories for the Shootaring Canyon Uranium Mill. May 28, 2008.

Uranium One USA, Inc., "Inspection of Tailings or Waste Retention Systems", Standard Operating Procedure HP-25, Revision Draft, May 27, 2008.

INTERROGATORY R313-24-4-06/04: MAINTAINING RECORDS

PRELIMINARY FINDING:

Refer to R313-12-51 (1); "licensee or registrant shall maintain records showing the receipt, transfer, and disposal of all sources of radiation", and 10 CFR 40.61(a); "Each person who receives source or byproduct material pursuant to a license issued pursuant to the regulations in 10 CFR 40 shall keep records showing the receipt, transfer, and disposal of this source or byproduct material as follows:…".- See requirements under 10 CFR 40.61(a)(1) through (4).

Refer to R313-22; Persons licensed under Rule R313-22 shall keep records of information important to the decommissioning of a facility in an identified location until the site is released for unrestricted use. Before licensed activities are transferred or assigned in accordance with Subsection R313-19-34(2), licensees shall transfer all records described in Subsections R313-22-35(7)(a) through (d) to the new licensee. In this case, the new licensee will be responsible for maintaining these records until the license is terminated. If records important to the decommissioning of a facility are kept for other purposes, reference to these records and their locations may be used.

INTERROGATORY STATEMENT:

Please ensure that the final SOP HP-25 addresses the items and requests stated in the Round 3 Interrogatory R313-24-4-06/03 that have not been addressed in the responses to the interrogatory, namely:

1. *Please clarify how and when composite samples will be collected and how the resulting information will be used.*
2. *Section 7.3, "Document and Verify the Amount of Tailings Placed in Tailings Impoundments": Explain in detail how the mill operator will determine the amount of tailings transferred from the plant to the tailings impoundment. Delete extraneous references to "dewatering press", "dewatering process", and related concepts. Revise the procedure to reflect the intended practice of discharging tailings slurry to the tailings impoundment.*
3. *Please describe in detail the review, modification, and validation of the Mass Balance Tracking Database (MBTD) data entries, report generation, and programming. In addition, describe the structure of the MBTD, identifying the various types of data records that will be maintained and the parameters that will comprise each type of record.*

BASIS FOR INTERROGATORY:

While most of the items identified in Round 3 Interrogatory R313-24-4-06/03 were addressed in the draft Procedure SOP HP-25, several were not. Those items not addressed in the draft procedure are the focus of this Round 4 interrogatory.

REFERENCES:

Plateau Resources, Ltd., "Shootaring Canyon Uranium Processing Facility Environmental Report, Source Material License No. UT0900480", Dated January 2006.

Plateau Resources, Ltd., "Tailings Management Plan for Shootaring Canyon Uranium Processing Facility" Amended December 2005.

Plateau Resources, Ltd., "Tailings Reclamation and Decommissioning Plan for Shootaring Canyon Uranium Project", Dated December 2005.

Uranium One USA, Inc., "Shootaring Canyon Uranium Mill Amendment Request for Radioactive Material License No. UT 09004480, 2nd Round Interrogatory Responses", November 28, 2007.

Uranium One USA, Inc. "Shootaring Canyon Uranium Mill Tailings Storage Facility Design Report, May 27, 2008".

Uranium One USA, Inc., Response to Round 3 Interrogatories for the Shootaring Canyon Uranium Mill. May 28, 2008.

Uranium One USA, Inc., "Radioactive Materials Tracking and Balance", Standard Operating Procedure HP-25, Revision 0, May 28, 2008.

INTERROGATORY R313-24-4-12/04: SOIL FINAL STATUS SURVEY FOR SITE DECOMMISSIONING

INTERROGATORY STATEMENT:

Note: This interrogatory is carried forward without change from Interrogatory Round 3.

Please provide information that justifies the current MARRSIM class designations of the site and reflects the current proposed design shown in Figure 8-1.

RESULTS OF REVIEW:

The revised Figure 8-1 appears to be acceptable; however, additional explanatory text describing the different MARSSIM classification areas needs to be provided to fully support/ justify the proposed classifications. Please include information that addresses both areas where contamination currently exists (existing tailings area and Area F-1 of solution spillage). This additional information will be reviewed when it is provided. According to Uranium One's statements, we would expect this additional information would be submitted as part of the revised Tailings Reclamation and Decommissioning Plan (TRDP). To date, this Revised TRDP has not been submitted for Division review.

REFERENCES:

Uranium One USA, Inc., Response to Round 3 Interrogatories for the Shootaring Canyon Uranium Mill. May 28, 2008.

INTERROGATORY R313-24-1-14/04: MILLING OPERATIONS

URANIUM ONE RESPONSE:

Uranium One provided a complete material/production flow diagram, and discussion of the maximum head on the primary liner.

Uranium One indicated that they will provide the requested revisions to Item No. 2 of the Round 3 Interrogatory in the Operations Plan as a separate submittal.

RESULTS OF REVIEW:

Three issues were identified in the Round 3 Interrogatory. Responses to Items 1 and 3 are acceptable. Item 2 focused on procedures for placement of tailings into the disposal cells. The Revised Operations Plan will be reviewed after it is submitted. To date, the Revised Operations Plan has not been submitted for Division review.

REFERENCES:

Uranium One USA, Inc., Response to Round 3 Interrogatories for the Shootaring Canyon Uranium Mill. May 28, 2008.

INTERROGATORY R313-24-4-16/04: SEISMIC HAZARD CHARACTERIZATION

INTERROGATORY STATEMENT:

Due to the length of the Round 3 Interrogatory Statement (R313-24-4-16/03), and because Uranium One's responses to this interrogatory are deemed acceptable with a few minor exceptions (see below), this Round 3 Interrogatory Statement is not repeated here. Uranium One response:

In response to this Round 3 Interrogatory, Uranium One provided a Revised Seismic Hazard Analysis for the Shootaring Canyon Uranium Processing Facility, dated April 8, 2008, authored by Tetra Tech.

RESULTS OF REVIEW:

Of the 29 significant comments and 11 minor comments from Round 3, Uranium One's responses are acceptable with two minor exceptions:

1. *On page 7, 4th paragraph: "Normal" magnitude recurrence model is incorrect. It is either the "characteristic" or "maximum magnitude" recurrence model. Please correct.*

2. *PGA is defined on page 1. It should be used consistently from that point on in the text in place of "peak acceleration".*

REFERENCES:

Uranium One USA, Inc., Response to Round 3 Interrogatories for the Shootaring Canyon Uranium Mill. May 28, 2008.

INTERROGATORY R313-24-4-19/04: DOUBLE LINER SYSTEM CQA PLAN AND SPECIFICATIONS

PRELIMINARY FINDING:

Refer to R313-24-4, 10 CFR 40 Appendix A(5)(a)(1): Surface impoundments must have a liner that is designed, constructed, and installed to prevent any migration of wastes out of the impoundment to the adjacent subsurface soil, ground water, or surface water at any time during the active life (including the closure period) of the impoundment. The liner may be constructed of materials that may allow wastes to migrate into the liner (but not into the adjacent subsurface soil, ground water, or surface water) during the active life of the facility, provided that impoundment closure includes removal or decontamination of all waste residues, contaminated containment system components (liners, etc.), contaminated subsoils, and structures and equipment contaminated with waste and leachate. For impoundments that will be closed with the liner material left in place, the liner must be constructed of materials that can prevent wastes from migrating into the liner during the active life of the facility.

Refer to R317-3-1(1.7). 1.7. Construction Supervision. The applicant must demonstrate that adequate and competent inspection will be provided during construction. It is the responsibility of the applicant to provide frequent and comprehensive inspection of the project.

Refer to R317-3-10(4)(E). E. Construction Quality Control and Assurance. A construction quality control and assurance plan showing frequency and type of testing for materials used in construction shall be submitted with the design for review and approval. Results of such testing, gradation, compaction, field permeability, etc., shall be submitted to the executive secretary.

INTERROGATORY STATEMENT:

Please address the following additional information regarding the proposed clay liner permeability block sample testing program:

1. ***Refer to the Design Report and Response to Round 3 Interrogatories.*** *Please provide the following additional information:*

    a. *Information demonstrating that an approved, experienced testing laboratory is available for performing the permeability testing of the specified size of large block samples in accordance with ASTM D5084-Method C. Please include information demonstrating that the proposed engineering testing laboratory is certified and accredited by the AASHTO Materials Reference Laboratory (AMRL). Please also indicate whether the proposed testing laboratory complies with requirements contained in ASTM D3740-08.*

    b. *Information demonstrating that at least one additional engineering testing laboratory is available for performing independent permeability testing of the specified size of large block samples using the large-diameter permeameter and information indicating its AASHTO accreditation and compliance with respect to ASTM D3740-08 requirements.*

2. ***Refer to the Design Report and Response to Round 3 Interrogatories.*** *Please provide specifications for the ranges of hydraulic gradient, consolidation pressure, and backpressure values that would be used by the testing laboratories when performing the block sample permeability testing. Please include justification for the specified parameter ranges. Specifically, please include information demonstrating that the specified ranges for each of these parameters to be used by the laboratory will be representative of field conditions, including: (1) The period following liner construction and initial placement of the drainage gravel and sand filter layer across the floor of the cell and the early stage of cell operation when a limited thickness of tailings would be present in the cell and no tailings would be present over the lined cell sideslope areas; and (2) the conditions following final closure of the facility. In both cases, please address the deleterious effects of clay liner desiccation and/or freeze-thaw on the ultimate field permeability, and how the proposed test pad conditions and proposed laboratory testing protocol would provide a conservative representation of such effectsws.*
3. *Please justify how the diameter of the block sample will be sufficiently large to represent field conditions on the actual clay liner areas that are to be constructed, for both the floor and sideslope portions of the tailings management area cell liners. Alternatively, justify why five block samples collected from a relatively flat test pad will provide enough samples and samples of the type that will be representative of the actual field conditions in all cell liner areas. Please provide additional information to justify that the proposed method (arithmetic average vs. geometric mean) for averaging the test saturated hydraulic conductivity values would provide a conservative representation of actual subsequent clay liner conditions. Please include information concerning how ideas such as the central tendency of the data set and the consideration of higher values verses lower values were factored into the selected averaging method. Provide rationale as to why the block sample with the highest measured permeability is not (instead) used for establishing needed construction methods, equipment, and procedures (provided that the sample has a hydraulic conductivity of equal to or less than 1.0 E-7 cm/sec).*
4. *Please provide additional information to demonstrate that the block samples will be obtained following guidance contained in ASTM D6169. Include information demonstrating that the ends of the block sample will be cut and not troweled, so as to not seal off any cracks or other features that may conduct water flow. Please also include additional details regarding how far below the bottom of the driven cylinder (ring) the block sample would be cut in the field, and information indicating what criteria would be used for deciding that an excavated block sample is not acceptable for testing and that a new block sample is needed.*
5. *Please provide additional information to demonstrate that edge/margin effects along the contact between the compacted clay liner (CCL) and the sideslope surfaces will not compromise the in-place (as-built) permeability of the CCL in the lower portion of the CCL (in proximity to the sideslope surfaces). Please include information to justify whether an additional demonstration test pad is needed in order to demonstrate that such*

edge/margin effects would not significantly affect the CCL's hydraulic properties near the interface with the sideslope surfaces. Please also consider the need to retain an additional thickness of the "overbuilt" thickness of the CCL on the sideslope areas (as discussed in Section 5.2 of the Design Report) to compensate for any such edge/margin effects.

BASIS FOR INTERROGATORY:

As stated in Uranium One, Inc.'s Response to the Round 3 Interrogatories (Uranium One, Inc. 2008), the applicant has proposed to verify field saturated hydraulic conductivity by use of block test sampling as an alternative to the recommended ASTM D5093-02 Standard Test Method for Field Measurement of Infiltration Rate Using a Double-Ring Infiltrometer with a Sealed-Inner Ring. Uranium One has suggested obtaining five block samples, performing laboratory testing, constructing a test pad after completion of the laboratory testing, performing field saturated hydraulic conductivity testing followed by laboratory testing, and testing during the clay liner construction. The proposed testing program appears to lack several details as described above in the interrogatory statement.

Previous studies have documented hydraulic conductivity results that indicate nearly an order of magnitude lower value of geometric mean hydraulic conductivity for large-scale laboratory block test samples compared to values found in in-situ field test results obtained for the compacted clay liner from a sealed-ring infiltrometer (Albright et al. 2006). Such results indicate that block sample permeability results might not always provide a conservative indication of the compacted clay liner permeability in the test pad. Additional justification is needed to: 1) describe how the diameter of the proposed block samples will be equivalent to or greater than the representative elementary volume (REV) of the clay liner, or 2) how the number, spacing, and location of the block samples will be sufficient to represent actual field conditions. As an alternative, Uranium One may choose to rely on the block sample with the highest measured permeability to establish needed construction methods, equipment, and procedures; so long as said sample has a hydraulic conductivity of equal to or less than 1.0 E-7 cm/sec.

In the Response to the Round 3 Interrogatory regarding the need for performing field-scale double-ring infiltrometer testing to verify the saturated hydraulic conductivity the compacted clay liner, Uranium One indicated that 4 of the 5 proposed block samples (in lieu of infiltrometer testing) would collected at least 10 feet inward from the edge of the test pad "to avoid edge effects and damage from turning and reorienting the compaction equipment". Additional information needs to be provided regarding the potential for similar or other types of edge effects to occur during construction of the CCL, including possible edge effects in the CCL at/near the sideslope surface, along with information indicating how hydraulic conductivity testing of the test pad would include conditions representative of such in-cell constructed CCL conditions.

REFERENCES:

Albright et al., "Field Performance of a Compacted Clay Landfill Final Cover at a Humid Site, 2006", Journal of Geotechnical and Geoenvironmental Engineering November 2006.

Amoozegar, A, and A.W. Warrick. 1986. Hydraulic conductivity of saturated soils: field methods. American Society of Agronomy.

ASTM D5084 - 03 "Standard Test Methods for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter" ASTM International, West Conshohocken, PA.

ASTM D6169 - 98(2005) "Standard Guide for Selection of Soil and Rock Sampling Devices Used With Drill Rigs for Environmental Investigation", ASTM International, West Conshohocken, PA.

ASTM D3740 - 08 "Standard Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction", ASTM International, West Conshohocken, PA.

Benson CH; Hardianto FS; and Motan ES, "Representative Specimen Size for Hydraulic Conductivity Assessment of Compacted Soil Liners," ASTM Specialty Technical Publication 23883S, January 1994.

Uranium One USA, Inc. "Shootaring Canyon Uranium Mill Tailings Storage Facility Design Report, May 27, 2008".

Uranium One USA, Inc., Response to Round 3 Interrogatories for the Shootaring Canyon Uranium Mill. May 28, 2008.

INTERROGATORY R313-24-4-20/04: LINER STRENGTH & COMPATIBILITY

PRELIMINARY FINDING:

Refer to R313-24-4, 10 CFR 40 Appendix A(5)(a)(2)(a): The liner must be constructed of materials that have appropriate chemical properties and sufficient strength and thickness to prevent failure due to pressure gradients (including static head and external hydrogeologic forces), physical contact with the waste or leachate to which they are exposed, climatic conditions, the stress of installation, and the stress of daily operation;

Refer to R317-6-1 (1.3): "Best Available Technology (BAT)" means the application of design, equipment, work practice, operation standard or combination thereof at a facility to effect the maximum reduction of a pollutant achievable by available processes and methods taking into account energy, public health, environmental and economic impacts and other costs;

Refer to R317-6-6 (6.4): ["ISSUANCE OF DISCHARGE PERMIT - The Executive Secretary, may issue a ground water discharge permit for a new facility if the Executive Secretary determines, after reviewing the information provided under R317-6-6.3, that: ...(A.3) the applicant is best available technology to minimize the discharge of any pollutant…";

INTERROGATORY STATEMENT:

Previously the Division identified five separate issues under this Round 3 Interrogatory. Of those five, Uranium One did not resolve Round 3 Interrogatory Item 1, and either mostly or partially resolved Items 2 through 5. To resolve the remaining issues, please provide the following:

1. ***Refer to the Appendix F.4 Design Calculation Package: Liner Uplift (Appendix F.4)**. Please provide additional information addressing how the affects of elevated temperature (heating) of the geomembrane liner have been taken into account in the calculation of wind uplift of the liner (e.g., on sideslopes). This is issue is related to the original Round 3 Interrogatory, Item 2.*
2. ***Refer to Design Report (Sections 7.5, 7.6, and 7.7) and Supporting Drawings.** Please provide a calculation or calculations demonstrating that the synthetic liner will not be punctured by the drainage gravel materials proposed to be placed on the primary geomembrane liner on the cell floors and in sump areas or by soil materials derived from the Entrada Formation to be placed over the primary liner adjacent to, and over and within the liner system anchor trench. In the Design Report and on Figure 7-3 of the Design Report, please also provide additional details regarding the characteristics/ specific layering of the proposed anchor trench backfill and anchorage soil/Entrada materials, and information on the minimum required geotextile cushion thickness (mass/unit area) for any geotextile cushion needed, to be consistent with the liner puncture protection calculation(s) and the liner anchorage system calculation in Appendix F.4. Please also indicate the minimum required thickness of the geotextile cushion shown on the "Typical Access Bench Section" Drawing P1.10, and include a*

cushion protection calculation documenting the minimum required geotextile thickness at this location. These issues are related to the original Round 3 Interrogatory, Item 3.

3. ***Refer to the Design Report (Section7.7), the Calculation Package in Appendix F.3, and Table 3 of Appendix C (Tailings Construction Quality Control and Quality Assurance) of the Revised Tailings Management Plan, 2007.*** *Please provide justification for the use of the 228 lb/in value for the allowable tensile strength at break. This value is applicable for a 60-mil* ***smooth*** *HDPE geomembrane, not for a 60-mil* ***textured*** *HDPE geomembrane (Geosynthetics 2008). Also, please note that the elongation at break value (700%) cited in Table 3 of the Revised Tailings Management Plan (Plateau Resources and Hydro-Engineering 2007), applies to a 60-mil* ***smooth*** *HDPE geomembrane and needs to be revised to reflect an appropriate value for a 60 -mil* ***textured*** *HDPE geomembrane (Geosynthetics 2008). Please revise and resubmit the calculation package in Appendix F.3 that uses the revised, appropriate geomembrane property value. This issue appears to have occurred as a result of a change in the design from a smooth to a textured geomembrane, without a concomitant change being made in the geomembrane properties and the new properties not being carried through the referenced analysis).*

4. ***Refer to Figure 7-3 of the Design Report and the Calculation Package in Appendix F.3.*** *Please provide a revised figure to indicate the specific layering of the sand and gravel materials and demonstrate that the friction angle assumed in the calculation package is consistent with the detailed construction geometry for the anchor trench area. For example, Figure 7-1 of the Design Report shows a gravel layer as being located beneath the sand layer on the floor of the cell. This issue is related to the original Round 3 Interrogatory, Item 3.*

5. ***Refer to Design Report Appendix F.3.*** *Please justify that the surface of the anchor soil will remain stable and will not erode over time. This issue is related to the original Round 3 Interrogatory, Item 3.*

UNADDRESSED ROUND 3 INTERROGATORY ITEM IN URANIUM ONE'S RESPONSES TO THE ROUND 3 INTERROGATORY ON LINER STRENGTH & COMPATIBILITY:

1. *An evaluation of the impact of stress imposed by equipment, tailings, and liquid during all scenarios and phases of construction, operations and tailings placement on the liner system that could result in movement and degradation of the liner system. Please include an evaluation of the steepest slope where the liner will be subject to the highest stresses during all scenarios and phases of construction, operations and tailings placement. Explain what is meant (specifically) when stating that the slopes will be" relatively mild". In addition, please note that since the tailings will be placed in the cell via slurry, the statement that there will be no significant ponding of liquids against the exposed liner is not correct. Consider slurry and free liquids in the cell in the design and evaluating the stability of the liner system.*

Uranium One indicated that they will submit response to this Round 3 Interrogatory item at a later time. To date, the Division has not received any submittal from Uranium One to address or resolve Item 1 from the Round 3 Interrogatory.

BASIS FOR INTERROGATORY:

Review of the Applicant's response to this interrogatory revealed additional items that need to be addressed in the analysis of liner strength and compatibility in order to allow a complete review of adequacy of the lining system design for meeting the requirements of 10 CFR 40, Appendix A, Criterion 5 A(2) which addresses cell liner requirements, or for meeting the criteria identified in R317-6-1, 1.3 for BAT, for double liner systems. Exposure of the liner to elevated temperatures can affect the strength of the geomembrane (especially a black geomembrane, leading to a lower yield tension and lower yield strain (Germaine et al. 2001; Giroud et al. 1995). The allowable wind velocity over a given geomembrane decreases as temperature increases. Information should be provided to demonstrate that the calculated spacing and weight per lineal foot for the recommended restraint (ballast) components are appropriate and adequate under conditions where the geomembrane liner would be exposed to prolonged periods of elevated temperatures. Additionally, the extent to which the liner material could be subject to dimpling or puncture (e.g., see Valero and Austin 1999) by the proposed drainage gravel or proposed anchor trench cover soils/Entrada materials, and the thickness of any cushion geotextile that would be required to prevent puncture of the geomembrane liner have not been demonstrated.

REFERENCES:

Giroud, J.P., Gleason, M.H., and Zornberg, J.G. 1999. Design of Geomembrane Anchorage Against Wind Action", in Geosynthetics International, Vol. 6, No. 6, 1999, pp. 481-507.

Geosynthetics 2008. Specifier's Guide 2008, Volume 25, Number 6.

Germaine, A, Houlihan, M., and Richardson, G. 2001. "Exposed Geomembrane Covers: Part 3 – Geomembrane Restraint", in Geotechnical Fabrics Report, January/February 2001, pp. 20-23.

Giroud, J.P., Pelte, T., amd Bathhurst, R.J. 1995. "Uplift of Geomembranes by Wind", in Geosynthetics International, Vol. 6, No. 6, 1995, pp. 897- 952.

Uranium One USA, Inc. "Shootaring Canyon Uranium Mill Tailings Storage Facility Design Report, May 27, 2008".

Uranium One USA, Inc., Response to Round 3 Interrogatories for the Shootaring Canyon Uranium Mill. May 28, 2008.

Valero, S.N., and Austin, D.N., 1999. "Simplified Design Charts for Geomembrane Cushions", in Geosynthetics '99, Boston, Mass. Available at:
http://www.sedimentremediation.com/TechRef/Dredge/GPD-SM-116.pdf

INTERROGATORY R313-24-4-21/04: LINER SETTLEMENT

INTERROGATORY STATEMENT:

NOTE: This interrogatory is carried forward without change from Interrogatory Round 3.

Please indicate the extent of settlement, differential settlement, and distortion in the cover that are allowed at the time of final closure. Demonstrate that allowable settlement, differential settlement, and distortion resulting tailings consolidation with time will not damage the final liner system. Justify the respective design criteria and tailings material properties used.

Uranium One response: Uranium One indicated that they will submit a response to this Round 3 Interrogatory at a later time. To date, Uranium One has not provided any additional information to resolve this interrogatory.

REFERENCES:

Uranium One USA, Inc., Response to Round 3 Interrogatories for the Shootaring Canyon Uranium Mill. May 28, 2008.

INTERROGATORY R313-24-4-22/04: LEACHATE COLLECTION AND DETECTION SYSTEM DESIGN

PRELIMINARY FINDINGS:

Refer to R313-24-4(2)(J)(ii): Clarifications or Exceptions. "Utah Administrative Code, Rule R317-6, Ground Water Quality Protection" for ground water standards in "Environmental Protection Agency in 40 CFR part 192, subparts D and E" as found in the Introduction, paragraph 4; or "Environmental Protection Agency in 40 CFR part 192, subparts D and E (48 FR 45926; October 7, 1983)" as found in Criterion 5;

Refer to R317-6-1 (1.3): "Best Available Technology (BAT)" means the application of design, equipment, work practice, operation standard or combination thereof at a facility to effect the maximum reduction of a pollutant achievable by available processes and methods taking into account energy, public health, environmental and economic impacts and other costs.

Refer to R317-6-6 (6.4): ["ISSUANCE OF DISCHARGE PERMIT - The Executive Secretary, may issue a ground water discharge permit for a new facility if the Executive Secretary determines, after reviewing the information provided under R317-6-6.3, that: ...(A.3) the applicant is best available technology to minimize the discharge of any pollutant…".

Refer to Refer to 10 CFR Part 40 Appendix A, Criterion 5 (A)(4): …" a surface impoundment must be designed, constructed, maintained, and operated to prevent overtopping resulting from normal or abnormal operations, overfilling, wind and wave actions, rainfall, or run-on; from malfunctions of level controllers, alarms, and other equipment; and from human error…"

INTERROGATORY STATEMENT:

Please provide the following additional information:

1. *In the Response to Round 3 Interrogatories, provide additional information demonstrating whether a cushion geotextile is needed over the primary HDPE geomembrane at the locations described in Interrogatory R313-24-4-20/04 (Liner Strength and Compatibility) above, and if so, the minimum required mass/unit area geotextile that is required at each location.*
2. *In the Response to Round 3 Interrogatories, indicate that the gradation envelope for acceptable particle sizes is shown on Figure 7-2 (rather than Figure 7-1).*

BASIS FOR INTERROGATORY:

After review of the Response to Round 3 Interrogatories, two additional follow-up questions were identified. The possible deleterious effects of particles in the gravel drainage layer and in other rock or Entrada sand materials on the primary HDPE geomembrane have not been quantified. An incorrect figure is also referenced in the Response to this Round 3 Interrogatory.

REFERENCES:

Uranium One USA, Inc., "Shootaring Canyon Uranium Mill Tailings Storage Facility Design Report", May 27, 2008.

Uranium One USA, Inc., Response to Round 3 Interrogatories for the Shootaring Canyon Uranium Mill. May 28, 2008.

Valero, S.N., and Austin, D.N., 1999. "Simplified Design Charts for Geomembrane Cushions", in Geosynthetics '99, Boston, Mass. Available at:
http://www.sedimentremediation.com/TechRef/Dredge/GPD-SM-116.pdf

INTERROGATORY R313-24-4-23/04: DIKE INTEGRITY

PRELIMINARY FINDING:

Refer to R313-24-4, 10 CFR 40 Appendix A(5)(a)(5): When dikes are used to form the surface impoundment, the dikes must be designed, constructed, and maintained with sufficient structural integrity to prevent massive failure of the dikes. In ensuring structural integrity, it must not be presumed that the liner system will function without leakage during the active life of the impoundment.

INTERROGATORY STATEMENT:

By way of follow-up to the Response to the Round 3 Interrogatory, please provide the following information:

1. *Please provide the specific reference that contains the basis for defining that the horizontal coefficient used in the pseudostatic analysis is 2/3 of the established Peak Ground Acceleration (PGA).*

2. *Please provide the specific references and justification for each engineering soil property used in the slope stability analysis.*

3. *Information to demonstrate that the proposed slopes will maintain integrity when live equipment loads are applied under all reasonable conditions that may prevail during operations.*

UNADDRESSED INTERROGATORY ITEMS IN URANIUM ONE'S RESPONSES TO THE ROUND 3 INTERROGATORY ON DIKE INTEGRITY:

> *Please confirm that all slopes and friction failure surfaces--including the proposed liner interfaces--have been evaluated or are represented by the evaluation of the most critical slopes and surfaces. All scenarios and phases of construction, operations, and tailings placement must be considered. Provide such analyses for the Division's review. These analyses must include and/or consider the dikes between Cell 1 and Cell 2 and between Cell 1 and the Evaporation and Process Pond Cell (EPPC) and the conditions where the liner is assumed to have failed (e.g., worst case scenario).*

Uranium One indicated that: 1) the evaluation of all friction surfaces, including the proposed liner interfaces, will be presented in Interrogatory R313-24-4-20/03 Liner Strength and Compatibility, Responses 1 and 2) Final design parameters of the EPPC have not yet been developed; this condition will be evaluated when the EPPC design has been completed. To date, neither of these information needs have been provided and the Round 3 Interrogatory is incomplete and unresolved.

BASIS FOR INTERROGATORY:

Section 5.8 "Slope Stability" in the Design Report states that a horizontal coefficient that is 2/3 of the Peak Ground Acceleration (PGA) was used in the pseudostatic analysis. The PGA is 0.18, and 2/3 of 0.18 is 0.12. Please cite the specific reference used that supports the estimation of the horizontal coefficient as 2/3 of the PGA.

Table 5-1 "Design Soil Strength Parameters for Slope Stability Analyses" in the Design Report references the Hydro-Engineering LLC, 2005b, "Tailings Reclamation and Decommissioning Plan for Shootaring Canyon Uranium Project Garfield County, Utah; December 2005, revised December 2006" as the source for the soil engineering properties listed. However, review of this report did not reveal this information. Relative soil engineering property information was provided in other project documents, such as in the January 11, 2007 letter from Inberg-Miller Engineers on the seismic stability analysis results for the project found in Appendix A.7 of the 2007 version of the Tailings Management Plan. In addition, Section 2.6.3 and Appendix C of the Design Report includes some soil engineering property information from proposed borrow sources. The soil engineering properties used in the slope stability analysis need to be conservative estimates for the site specific soils to be used. Uranium One needs to provide the specific reference(s) used as a basis for each soil engineering properties and demonstrate that the values used are conservative estimates for the soil proposed for use in cell construction.

The slope stability analysis did not include the analysis of live equipment loading that will be applied during construction and operation.

REFERENCES:

Plateau Resources, Ltd. and Hydro-Engineering, LLC, "Tailings Management Plan for Shootaring Canyon Uranium Processing Facility," Dated December 2005, Revised April 2007.

Plateau Resources, Ltd., "Tailings Reclamation and Decommissioning Plan for Shootaring Canyon Uranium Project", Dated December 2005.

Plateau Resources, Ltd., "Tailings Management Plan for Shootaring Canyon Uranium Processing Facility" Amended December 2005.

Uranium One USA, Inc., Response to Round 3 Interrogatories for the Shootaring Canyon Uranium Mill. May 28, 2008.

Uranium One USA, Inc., "Shootaring Canyon Uranium Mill Tailings Storage Facility Design Report", May 27, 2008.

INTERROGATORY R313-24-4-24/04: BEST AVAILABLE TECHNOLOGY

PRELIMINARY FINDING:

Refer to R313-24-4, R317-6-1.3: ***Best Available Technology*** *means the application of design, equipment, work practice, operation standard or combination thereof at a facility to effect the maximum reduction of a pollutant achievable by available processes and methods taking into account energy, public health, environmental and economic impacts and other costs.*

Refer to R313-24-4, R317-6-6.4(A): The Executive Secretary may issue a ground water discharge permit for a new facility if the Executive Secretary determines, after reviewing the information provided under R317-6-6.3, that: 1.the applicant demonstrates that the applicable class TDS limits, ground water quality standards protection levels, and permit limits established under R317-6-6.4E will be met; 2. the monitoring plan, sampling and reporting requirements are adequate to determine compliance with applicable requirements;3. the applicant is using ***best available technology*** *to minimize the discharge of any pollutant; and 4. there is no impairment of present and future beneficial uses of the ground water.*

INTERROGATORY STATEMENT:

In the Round 3 Interrogatory, a total of five issues (or groups of issues) were identified by the Division. Of these fives, one was resolved and four were partially resolved. Of the latter four, a partial response was provided on one. After review of the Response to Round 3 Interrogatory, please provide the following follow-up information:

1. ***Refer to Design Report (Section 3.2.2 , 5.2, 7.2, Figure 7-3) and Supporting Drawing P.1.6.*** *Please provide information to resolve an apparent discrepancy between Detail A on Drawing P.1.6 and the information presented in Sections 3.2.2, 5.2, 7.2 and on Figure 7-3 of the Design Report regarding the minimum required final design thickness of the compacted clay liner (CCL) on the sideslope areas. Detail A on Drawing P.1.6 indicates a minimum 2-foot-thick CCL on the sideslope of the southern cell, whereas Section 3.2.2 and 7.2 and Figure 7-3 indicate the* ***finished*** *CCL on the sideslopes would be a minimum of 1 foot thick. Please verify whether the* ***finished*** *CCL thickness will be at least 2 feet thick over the sideslope areas and whether this final minimum thickness would be sufficient to account for possible edge effects during construction of the CLL (see Interrogatory R313-24-4-19/04: Double Liner System CQAP Plan and Specifications, above). Please revise Figure 7-3 and the text in Sections 3.2.2, 5.2, and 7.2 of the Design Report as needed to indicate the minimum required* ***finished*** *CCL thickness on the sideslope areas. This information relates to the Round 3 Interrogatory, Item 3.*
2. ***Refer to the Design Report (Section 7.6.3) and the Design Calculation Package: Leachate Collection and Leak Detection Design Calculations (Appendix F.1).*** *Please provide additional information, including a calculation as needed, demonstrating how the leachate collection system pipe capacity accounts for and accommodates the effects of precipitation that could occur during earlier phases of the embankment operation*

(when only a limited thickness [e.g., a few feet] of tailings has been placed on the cell floor). These information needs relate to the Round 3 Interrogatory, Items 1 and 2.

3. ***Refer to the Design Report (Sections 3.2.2, 7.4.1, and 7.4.2).*** *Please indicate and justify in the Design Report (Section 7.4.1 and 7. 4.2) that the leak detection system has been designed to provide sufficient capacity to prevent the fluid head in the leak detection system (LDS) from exceeding 1 foot above the lowest point in the lower membrane liner and to allow for the timely detection of liquids in the LDS and will allow for dewatering of the lined embankment within a reasonably short period of time following completion of operations to permit timely final closure of the embankment. Please also indicate the maximum allowable (calculated) Action Leakage Rate (ALR) value for which the LDS has been designed. These information needs relate to the Round 3 Interrogatory, Items 1 and 2.*

4. ***Refer to the Design Calculation Package: Action Leakage Rate (Appendix F. 2).*** *Please provide the following additional information (relevant to Round 3 Interrogatory, Item 2):*

    a. *All equations and specific references for each equation used in the calculation, and all input values used in the equations*

    b. *Additional information to justify the ALR value(s) used for designing the LDS. Please include information regarding the average geomembrane defect size assumed in the primary geomembrane liner, the assumed geomembrane defect frequency, and the equation used for calculating the leakage rate through each defect. Please demonstrate that the ALR value(s) are representative of the range of site and operational conditions expected to occur within each 40-acre-sized embankment cell. The methodology outlined in Giroud et al. (1997) should be followed.*

    c. *Please provide a compilation (or graphical representation) of different ALR values that would be appropriate for different heights of liquid within each 40-acre lined cell that covers the range of liquid levels that are anticipated to occur in that cell during tailings placement operations.*

    d. *Please include a calculation of the expected (long-term) permeability of the LDS geonet as a function of hydraulic gradient and the type of geonet to be employed. Please include as part of this information a calculation of the gradient value (as a function of the longest drainage path, slope of the geonet, and expected height of liquid above the liner system) that is used in the permeability calculation. Please also include additional information regarding the determination of the effective overall reduction factor used in the permeability calculation, along with information justifying the selection of the associated partial reduction factors.*

e. *Please provide a calculation of (equation used for, etc…) the maximum amount of head expected to occur within the LDS for the maximum ALR value determined in Step c. above, along with information supporting the selection of input parameters used in that calculation.*

f. *Please provide a calculation of (equation used for, etc…) the travel time for liquid to reach the LDS piping from the defect in the primary geomembrane liner based on the longest possible flow path in the geonet. Please indicate whether the LDS geonet would allow for the timely detection of liquids.*

g. *Please provide information demonstrating that the calculated factor of safety for flow in the LDS is acceptably large when considering potential long-term degradation of the installed geonet's flow capacity (e.g., through gradual partial degradation of the geonet core as a result of long-term exposure to the acidic solutions contained in the cell, possible damage of the geonet during/following installation, and other factors).*

5. ***Refer to the Design Report, Section 7.6.5 and Design Calculation Package: Buried Pipe Loading (Appendix F.2).*** *Please provide the following additional information (relevant to the Round 3 Interrogatory, Items 3 and 5.)*:

a. *Provide justification that the calculated 4.8 % pipe deflection result for the sump riser pipes from the Deflection of Pipe using Spangler's Modified Iowa Formula will be an acceptable pipe deflection. Please also provide information that this amount of deflection will not inhibit the ability to install extraction pumps down the pipes.*

b. *Please provide each specific referenced Plastic Pipe Institute PE pipe handbook pages for each pipe parameter value or equation used as attachments to this calculation.*

UNADDRESSED INTERROGATORY ITEMS IN URANIUM ONE'S RESPONSES TO THE ROUND 3INTERROGATORY ON BEST AVAILABLE TECHNOLOGY:

3. Complete Liner system design and construction drawings (plans), as well as material and performance specifications. They are to be certified by a Professional Engineer licensed in the State of Utah, and shall include, but not be limited to, cell liner, leachate collection, leak detection, dewatering operations, tailings transfer and management, and storm water control layouts, cross sections, details, and profiles. They must include proposed elevations and horizontal coordinates at all key locations. The specifications must cover (but not limited to) all proposed components and materials, their respective material and equipment and installation requirements.

5b. *The pipe and soil material properties need to be carried through to the project QAP and technical specifications to ensure that what is installed and constructed meets or exceeds the performance as presented in the respective demonstration.*

Uranium One indicated that they will submit the responses to these Round 3 Interrogatory items in a later submittal. To date, this information has not been provided to the Division.

BASIS FOR INTERROGATORY:

1. *The Applicant's submission does not include sufficient information to allow a complete review of adequacy of the LDS for meeting the criteria identified in R317-6-1, 1.3 for BAT, for double liner systems and criteria identified in R317-6-6.4(A).*

2. *Precipitation added into the partially filled cell would be expected to drain through the relatively thin tailings layer and flow into the leachate collection system and ultimately need to be handled by the leachate collection system pipes. The thin tailings layer could be saturated and therefore have no additional water-holding capacity. The pipes should be sized to handle this additional flow.*

3. *During some periods of cell operation, the volume of process liquids stored in the embankment cell will vary in height. During time periods of lower liquid levels, the flow (leakage) rates to the leak detection system will be less than when the cell would contain higher levels of liquids. If an ALR value determined based on the maximum projected liquid level in the cell were to be used as a threshold leakage rate value throughout the operational period of the cell, potentially important (i.e. significant) increases in flow rates to the LDS sumps that might be over and above the smaller flow rates that would typically (on average) entering the leak detection system, but at rates that could still be much lower than the ALR value based on the maximum height of liquids might not be readily detected.*

4. *Test data (e.g., GSE, undated) indicate significant differences in flow capacities for biplanar and triplanar geonets depending on flow directions within the geonet that differ from the machine direction. Geonet panel installation orientations and geonet panel overlap/connection configurations implemented in the field may therefore affect flow capacities depending on whether they include adjoining of panels or pieces in such a way that would lead to flows not parallel to the machine (roll) direction of the individual geonet panel/pieces.*

5. *The Design Report, Section 7.6.5 states that a safe deflection for Ring Deflection for a pressurized pipe with a SDR of 9, is considered to be 4.0%. However, the calculated result, shown in F.2 of the Design Report, for Ring Deflection using the Spangler's Modified Iowa Formula resulted in a 4.8% ring deflection. There is no justification provided to demonstrate that the calculated 4.8% result is acceptable.*

6. *Specific references to formulae and parameter values used in the calculations need to be provided to enable a comprehensive and complete review of the adequacy of the design.*

REFERENCES:

Giroud, J.P., Gross, BN.A., Bonaparte, R., and McKelvey, J.A. 1997. Leachate Flow in Leakage Collection Layers Due to Defects in Geomembrane Liners", Geosynthetics International. Vol. 4, Nos 3-4, pp. 215-292.

GSE (Undated). Installation of Geosynthetic Drainage Products - Technical Note. URL: http://www.gseworld.com/Literature/TechnicalNotes/PDF/TN025installationgeo.pdf

Plateau Resources, Ltd. And Hydro-Engineering, LLC, "Tailings Management Plan for Shootaring Canyon Uranium Processing Facility" Amended December, 2005, Revised April 2007.

Uranium One USA, Inc. "Shootaring Canyon Uranium Mill Tailings Storage Facility Design Report", May 27, 2008.

Uranium One USA, Inc., Response to Round 3 Interrogatories for the Shootaring Canyon Uranium Mill. May 28, 2008.

INTERROGATORY R313-24-4-26/04: INFILTRATION AND CONTAMINANT TRANSPORT MODELING

INTERROGATORY STATEMENT:

Note: This interrogatory is carried forward without change from Interrogatory Round 3.

UNADDRESSED ISSUES FROM THE ROUND 3 INTERROGATORY:

Please provide sufficient information to demonstrate that the cover system will not experience some potential long-term degradation through one or more processes (as discussed below in the Basis For Interrogatory), when active institutional control is no longer in effect to maintain the cover system.

Provide additional information to identify and evaluate the potential effects of long-term degradation processes on the components of the final cover system.

Conduct and report additional (infiltration sensitivity) analyses to assess the potential affects of such cover system component degradation on long –term infiltration rates through the cover during the cover's design life.

URANIUM ONE RESPONSE:

Uranium One indicated that the response to this Round 3 Interrogatory will be provided in the next submittal. To date, no information has been submitted for Division review.

REFERENCES:

Uranium One USA, Inc., Response to Round 3 Interrogatories for the Shootaring Canyon Uranium Mill. May 28, 2008.

INTERROGATORY R317-6-2.1-27/04: GROUNDWATER MONITORING

PRELIMINARY FINDING:

Refer to R317-6-2.1: "The following Ground Water Quality Standards (GWQSs) as listed in Table 1 are adopted for protection of ground water quality (refer to Table 1 in the standard, however, this list is not required for analysis per the current January 2004 GWQDP)."

Refer to R317-6-6.3.I: [APPLICATION REQUIREMENTS FOR A GROUND WATER DISCHARGE PERMIT] – "Unless otherwise determined by the Executive Secretary, the application for a permit to discharge wastes or pollutants to ground water shall include the following complete information: (I) A proposed sampling and analysis monitoring plan which conforms to EPA Guidance for Quality Assurance Project Plans, EPA QA (EPA/600/R-98/018, February 1998) and includes the following…1. ground-water monitoring to determine ground water flow direction and gradient, background quality at the site, and the quality of groundwater at the compliance monitoring point…"

Refer to R317-6-4.2 [Groundwater Protection Levels] –

"4.2 CLASS IA PROTECTION LEVELS

A. Class IA ground water will be protected to the maximum extent feasible from degradation due to facilities that discharge or would probably discharge to ground water.

B. The following protection levels will apply:

1. Total dissolved solids may not exceed the greater of 1.25 times the background or background plus two standard deviations.

2. When a contaminant is not present in a detectable amount as a background concentration, the concentration of the pollutant may not exceed the greater of 0.1 times the ground water quality standard value, or the limit of detection.

3. When a contaminant is present in a detectable amount as a background concentration, the concentration of the pollutant may not exceed the greater of 1.25 times the background concentration, 0.25 times the ground water quality standard, or background plus two standard deviations; however, in no case will the concentration of a pollutant be allowed to exceed the ground water quality standard."

Refer to R317-6.9 [PERMIT COMPLIANCE MONITORING] – "A. Ground Water Monitoring" - The Executive Secretary may include in a ground water discharge permit requirements for ground water monitoring, and may specify compliance monitoring points where the applicable class TDS limits, ground water quality standards, protection levels or other permit limits are to be met.

The Executive Secretary will determine the location of the compliance monitoring point based upon the hydrology, type of pollutants, and other factors that may affect the ground water quality. The distance to the compliance monitoring points must be as close as practicable to the point of discharge. The compliance monitoring point shall not be beyond the property boundaries of the permitted facility without written agreement of the affected property owners and approval by the Executive Secretary.

B. Performance Monitoring - The Executive Secretary may include in a ground water discharge permit requirements for monitoring performance of best available technology standards…"

Refer to R317-6.10 [BACKGROUND WATER QUALITY DETERMINATION] – "A. Background water quality contaminant concentrations shall be determined and specified in the ground water discharge permit. The determination of background concentration shall take into account any degradation.

B. Background water quality contaminant concentrations may be determined from existing information or from data collected by the permit applicant. Existing information shall be used, if the permit applicant demonstrates that the quality of the information and its means of collection are adequate to determine background water quality. If existing information is not adequate to determine background water quality, the permit applicant shall submit a plan to determine background water quality to the Executive Secretary for approval prior to data collection. One or more up-gradient, lateral hydraulically equivalent point, or other monitoring wells as approved by the Executive Secretary may be required for each potential discharge site.

C. After a permit has been issued, permittee shall continue to monitor background water quality contaminant concentrations in order to determine natural fluctuations in concentrations. Applicable up-gradient, and on-site ground water monitoring data shall be included in the ground water quality permit monitoring report."

Refer to R317-6.16 [6.16 OUT-OF-COMPLIANCE STATUS] – "A. Accelerated Monitoring for Probable Out-of-Compliance Status. If the value of a single analysis of any compliance parameter in any compliance monitoring sample exceeds an applicable permit limit, the facility shall:

1. Notify the Executive Secretary in writing within 30 days of receipt of data;

2. Immediately initiate monthly sampling if the value exceeds both the background concentration of the pollutant by two standard deviations and an applicable permit limit, unless the Executive Secretary determines that other periodic sampling is appropriate, for a period of two months or until the compliance status of the facility can be determined.

B. Violation of Permit Limits

Out-of-compliance status exists when:

1. The value for two consecutive samples from a compliance monitoring point exceeds:

a. one or more permit limits; and

b. the background concentration for that pollutant by two standard deviations (the standard deviation and background (mean) being calculated using values for the ground water pollutant at that compliance monitoring point) unless the existing permit limit was derived from the background pollutant concentration plus two standard deviations; or

2. the concentration value of any pollutant in two or more consecutive samples is statistically significantly higher than the applicable permit limit. The statistical significance shall be determined using the statistical methods described in Statistical Methods for Evaluating Ground Water Monitoring Data from Hazardous Waste Facilities, Vol. 53, No. 196 of the Federal Register, Oct. 11, 1988 and supplemental guidance in Guidance For Data Quality Assessment (EPA/600/R-96/084 January 1998)."

INTERROGATORY STATEMENT:

Based on the review of the information submitted to date, the following items need to be addressed by Uranium One:

1. ***Refer to the "[Response to] Interrogatory R317-6-2.1-27/03: Groundwater Monitoring", 13 pages plus 1 figure, undated document, Uranium One, 2008:*** *Please provide the BAT monitoring plan for the tailings disposal facility for review and approval. Based on the Division's review of Uranium One's response to* ***Interrogatory R317-6-2.1-27/03****, we understand that Uranium One proposes to include the BAT monitoring plan in an Operation Plan for the tailings disposal facility that would be submitted under separate cover. Please indicate whether the Operation Plan would be incorporated into the final Tailings Management Plan. Please provide additional information regarding elements of facility operation that would be included in the Operation Plan, such as tailings placement procedures, construction equipment to be used, dust control procedures, BAT monitoring plan, tailings process water management and sampling and testing protocols and frequency for testing process waters, etc…*

2. ***Refer to the "[Response to] Interrogatory R317-6-2.1-27/03: Groundwater Monitoring", 13 pages plus 1 figure, undated document, Uranium One, 2008:*** *Please provide the "Compliance Monitoring Plan" for all environmental media (e,g, water, air, soils and vegetation) for review and approval. Based on the Division's review of Uranium One's response to* ***Interrogatory R317-6-2.1-27/03****, we understand that this plan would be submitted under separate cover. Please note that for purposes of simplifying future reporting requirements and to facilitate future compliance reviews by the Division, the Compliance Monitoring Plan may focus on environmental media exclusive of groundwater. Development and implementation of the groundwater monitoring plan may be accommodated through the Groundwater Discharge Permit approval process.*

3. ***Refer to Groundwater Modeling and Proposed Monitoring Wells for the Shootaring Canyon Mill, Gard Water Consultants Inc., July 11, 2008 (hereafter referred to as the***

***Gard Groundwater Modeling** report**)**: As a general comment, several of the figures are very difficult to read and a number of wellbore numbers are illegible. Please provide the following:*

a. Show the location of existing well RM13 (whose data were used for developing the conceptual model) on Figure 4 and on other figures as needed.

b. Provide additional backup information to demonstrate the existence of an inferred area of the Uppermost Lower Conductivity Zone on Figure 10 (Upper Low K unit on Figure 14) and of an inferred area of the Deep Lower Conductivity Zone on Figure 12 (Lower Low K unit on Figure 14) in the northern corner of the modeled area (see Figures 10 and 12). Include copies of all boring logs used in developing and justifying these interpretations. Please include a copy of the boring log for the unidentified wellbore shown on the northern end of the North-South Cross Section of the conceptual model (Figure 14), and copies of boring logs for RM23, RM1, RM2, RM2R, RM13, RM14, RM19, RM7, and RM18.

c. Provide a revised version of Figure 16 (Perched Groundwater Table) that contains clear labels and identifiable, relevant site features, including borehole and well locations; the North Cell and South Cell footprints and their sumps; and the interpreted locations of areas of the Upper Low K unit beneath the site as depicted on Figure 10, so that the location of this zone relative to these features can be readily verified. As currently presented, this figure is illegible and the location of the perched zone with respect to these listed site features cannot be easily confirmed. The contour labels are also illegible and no explanation is given as to what the contour values represent (e.g., water table elevations, top surface of Upper Low K unit, base of Upper Low K unit?)

d. Provide Figure 26, which is missing from the report.

***4. Refer to Gard Groundwater Modeling** report: Two models were provided in the Gard Report: 1) MODFLOW, a simple three-dimensional stochastic groundwater flow and transport model; and (2) MODPATH, a particle tracking model. The models were used to evaluate potential plume shapes for potential releases from the tailings management area to support design of the proposed point-of-compliance monitoring well network including locations, well spacing and depth of the groundwater monitoring wells, and evaluate the transport of potential releases from a set of potential release points within the tailings management area. Please provide additional information to justify that the assumed modeled source term locations and sizes result in a conservative representation of potential releases from the tailings management area, for simulating release pathways from the tailings impoundment as discussed in Sections 3.1 and 3.2 and depicted on Figure 20 of this report. Different possible locations of contaminant sources would constitute alternative conceptual models that would need to be considered, since there is no valid basis to prefer one model over another (Neuman and Wierenga 2003, pages 63, 127 – 129, and 205 – 208). If the only possible source term locations are already included in the model, support needs to be given as to why alternative source term locations are not valid and are not considered. Please assess, for example, whether the sumps in the North and South Cells should be*

considered as possible source term locations. Present rationale regarding the probability (presumably relatively high) that these sump areas could likely be future release points from the impoundment area. Please include this information as part of a justification demonstrating that the POC groundwater monitoring well network will be capable of confirming, as an adjunct to the BAT monitoring system, the long-term performance of the overall system.

5. ***Refer to Gard Groundwater Modeling** report: Please provide additional information supporting and clarifying the information presented in Section 2.3 to justify the Entrada unit permeability (estimated as 0.02 ft/day) in the area east of the tailings area. Single well pumping test data from wellbores RM2 and OW1A in that area indicate permeabilities of 0.16 and 0.08 ft/day. Section 2.3 indicates that a change in permeability in this area accounts for the slightly different flow direction. Please discuss if any other factors besides a change in permeability could explain this slight change in flow direction, and if so, justify why these other factors should not be considered. Reasonable alternative models should be developed that are consistent with site data (Neuman and Wierenga 2003, page 63). Provide additional information to justify that the assumptions used for developing the model for this area of the site adequately reflect the central tendency of probable permeability values used in modeling this area.*

6. ***Refer to Gard Groundwater Modeling report:** Please evaluate the effects of joints sets and fractures and potential strata-bound heterogeneity present within the Entrada Formation beneath the proposed tailings management area (North and South Cells) on groundwater flow behavior (flow directions and flow rates) of plumes associated with potential future releases from the tailings management area. Please discuss the known existence of these joints and fractures and occurrence of cemented/uncemented sequences in the Entrada as revealed through previous subsurface investigations and the potential for such features to be present in the Entrada in the unsaturated zone and the zone of saturation (Main Entrada unit) in the groundwater modeling report and assess the effects of such features on permeability values and other aquifer properties assumed in the groundwater flow mode simulations. Please provide rationale regarding whether the following additional investigations are needed in order to further assess the potential for such effects to occur: (1) an outcrop mapping program of fractures and joints; (2) a supplemental core drilling program to gain additional information on the depth and distribution of fractures and joints (secondary permeability features), and stratabound heterogeneity (such as layered cemented/uncemented sequence) that might extend to deeper depths in the Entrada Formation; (3) single or multiple well pump tests across jointed/fractured zones or cemented and uncemented/poorly cemented sequences; and/or (4) an isotopic geochemistry investigation to further assess aquifer properties and recharge characteristics such as the origin, genesis, and age of the local groundwater and aquifer age-stratification characteristics. Alternatively, uncertainties relating to the presence of joints/fractures and strata-bound heterogeneity in the Entrada Formation should be addressed through the development of one or more alterative conceptual flow/transport model simulations. Alternatively, Uranium One may be able to provide additional explanation to justify how the existing model is representative and/or conservative of actual field conditions with regards to*

the possible permeability anisotropy and heterogeneity in question. This option would entail specific evaluation of the proposed monitoring well locations and spacing intervals, relative to the predicted contaminant plume locations and dimension, and establishment of an appropriately conservative monitoring well sampling frequency. Please include in the analysis information on the inherent heterogeneity of the hydrogeologic system as it contributes to model uncertainty, particularly on differing scales. Please include in the model report an evaluation of smaller scale processes such as "preferential" flow through fractures, joints, etc., in given areas as applicable (Neuman and Wierenga 2003, pages 36 and 63). Please refer to the Basis for Interrogatory Item Nos. 4 and 5 below for additional information.

7. ***Refer to Gard Groundwater Modeling*** *report**:** Even though the units for the parameters used in the flow and transport model can be inferred from other locations in the report, please specify the units for the parameters listed in Table 3.2.*

8. ***Refer to Gard Groundwater Modeling*** *report**:** The value for dispersivity given in Table 3.2 corresponds to the longitudinal dispersivity and is estimated from Figure 17, which shows the relationship between model scale and longitudinal dispersivity. Please identify the type of dispersivity parameter listed and units assumed, and identify the value (and units assumed) for transverse dispersivity used in the transport model to account for lateral spreading of the plume and provide justification for the value used.*

9. ***Refer to Gard Groundwater Modeling*** *report* ***and Shootaring Canyon Mill Site Ground Water Monitoring Plan, Tetra Tech, undated report*** *(hereafter referred to as the* ***Ground Water Monitoring Plan):*** *Please provide the following additional information:*

    a. *Provide additional information to justify that the proposed arrangement of Point-of-Compliance (POC) monitoring wells (shown on Figure 23 of the Gard Consultants and discussed on page 1 and shown on Figure 1 of the* ***Ground Water Monitoring Plan****) would be sufficient to ensure timely detection of potential releases from the tailings impoundment. Please discuss how alternative conceptual models (such as "preferential" flow through fractures, joints, etc., or differing source term locations), as applicable, could affect the locations and required number of POC wells for early/timely detection of potential releases. Please evaluate whether one or more additional POC monitoring wells would be required southeast of the sump in the North Cell and east of the South Cell footprint (e.g., for monitoring/verifying evidence of a potential release from the North Cell sump area).*

    b. *Please provide additional information demonstrating that the proposed annual sampling frequency following completion of the initial 8 quarterly sampling events is adequate. At a minimum, this justification must be based on the potential distribution of horizontal aquifer velocities at the site. Include information demonstrating whether the proposed POC monitoring well locations would or would not permit timely/early detection of a potential release or releases from anywhere within the tailings impoundment area if sampled on an annual, as opposed to a semi-annual, basis. Please consider uncertainties*

associated with the estimated aquifer parameters (including aquifer heterogeneity, saturated hydraulic conductivity or permeability – e.g., assumed permeability value for one modeled in Item 5. above, – effective porosity of the aquifer materials, and longitudinal and transverse dispersivities), together with conceptual model uncertainty (e.g., "preferential" flow through fractures, joints, etc., or differing source term locations). The larger-scale conceptual model may not account for possible "preferential" flow through fractures, joints, etc., in a localized area, and the flow velocity through these fractures may be significantly higher than the overall flow velocity assumed for the system. Therefore, the proposed annual sampling frequency may not be adequate for timely/early detection of potential releases.

10. ***Refer to the Ground Water Monitoring Plan, Ground Water Geochemical Evaluation and Background Water Quality Determination for the Shootaring Canyon Mill Site, undated report (****hereafter referred to as the* ***Ground water Geochemical Evaluation*** *report****), and Draft Groundwater Monitoring Quality Assurance Plan Utah Ground Water Quality Discharge Permit, Tetra Tech, July 2008 (****hereafter referred to as the* ***Draft Ground water Monitoring QAP):*** *Please provide the following:*

    a. *In Section 2.0 and in Table 1 of the* ***Ground Water Monitoring Plan****, please provide additional information regarding the proposed screened intervals of the proposed POC monitoring wells. The text currently states only that the wells will be screened "over the top 100 feet of the saturated portion of the aquifer". Table 1 is blank. Please coordinate the final proposed well screened intervals with the conceptual model. Provide more detailed definition of the proposed screened interval depth ranges and screen lengths to assess the adequacy of the proposed wells. Please demonstrate that existing well bore log information and additional ongoing characterization results (including nested well pairs as discussed below) will be used to determine the most optimal screened intervals on a well- by- well basis for the Point of Compliance wells to be installed. This determination needs to address vertical hydraulic gradients in the water table aquifer at the site. Simulated groundwater "flow tubes" or "stream tubes" used, as applicable, as a basis for determining screened intervals in individual well need to be described for DRC review.*

    b. *In Section 3.0 and or 4.0 of the* ***Ground Water Monitoring Plan****, please provide information regarding where, how, and how often the vertical hydraulic gradient would be determined or confirmed. Assess whether an additional (nested) POC monitoring well pair will be required if wells RM8 and RM20 are to be decommissioned. Use of flow or stream tubes might need to be considered for better defining flow (flow directions) in the perched aquifer and in the shallow and deeper saturated zone as a means of delineating optimal screened intervals in the proposed monitoring wells. The installation of one or more nested well pairs and/or use of model flow tubes may be required to better define the lateral extent of the perched aquifer. The inferred lateral extent of the perched aquifer needs to be depicted relative to the existing on-site wells and the proposed new monitoring wells (See Item No. 3 of this interrogatory above).*

c. *In Section 3.0 of the **Ground Water Monitoring Plan**, Section 3.0 of the **Ground Water Geochemical Evaluation** report, and Section 3.0 of the **Draft Groundwater Monitoring QAP,** please provide additional information about the procedures to be used for identifying the proposed routine sampling constituents that would be analyzed in samples collected from the proposed POC monitoring wells following the 2-year initial sampling period. Please include a more detailed discussion of the results of tailings process waters testing and describe how that data have, and will be used in refining routine monitoring well test parameters. Identify the specific location or locations where tailings process waters would be tested, the frequency of process water testing, parameters to be tested, and (except for the **Ground Water Geochemical Evaluation** report**,** where this is discussed) the procedures/criteria to be used for refining the list of routine groundwater monitoring well analytical parameter based on analyses of those test data. Please include information on proposed process water test parameters, including the basis to be used for establishing the proposed parameters for testing at each periodic testing event. The basis should include contaminants that are or could (based on studies of similar tailings process waters) be: 1) prevalent or predominant in the tailings wastewater, 2) found in concentrations that are significantly above the State Groundwater Quality Standards, and 3) mobile in groundwater environments. Applicable information contained in NRC 1980 (Table 5.3); NRC 1987; and Hamp et al. (1995) should be considered.*

d. *Section 3.0 of the **Ground Water Geochemical Evaluation** indicates that constituents may need to be added to the list of parameters for compliance monitoring based on the testing of tailings process waters. Please specify the procedures for establishing Groundwater Compliance Limits (Final GWCLs) for any constituents that are added.*

e. *In Section 4.0 and Table 3 of the **Ground Water Monitoring Plan and** Section 5.0 of the **Ground Water Geochemical Evaluation,** Interim GWCLS were determined for site groundwater based on analysis of existing available data. Please provide additional information describing how the Interim Groundwater Compliance Limits (Interim GWCLs) in Table 3 were determined for the 21 listed constituents. Please describe the procedure used or clearly reference the document (e.g., Section 5.1 and Tables 2 and 3 of the **Ground Water Geochemical Evaluation** report) where this procedure is described. Please also include information in the **Ground Water Monitoring Plan** and the **Ground Water Geochemical Evaluation** report that demonstrates that the derived Interim GWCLs comply with applicable requirements contained in R317-6, including, but not limited to requirements of R317-6-4. For example, provide information that demonstrates that the proposed Interim GWCLs for silver, chromium, and mercury (100 % non-detects according to Table 2 of the **Ground Water Geochemical Evaluation** report) listed in Table 3 comply with R317-6-4.2 requirements. Those requirements dictate that protection levels for non-detected but regulated constituents not exceed the greater of 0.1 times the MCL or the Detection Limit for that constituent for Class IA Protection Level sites, whereas the Interim GWCL values listed in Table 3 for silver, chromium, and mercury all exceed both of these levels. Please also provide additional information to justify that the proposed method of determining the Interim GWCLs is*

environmentally conservative with respect to reflecting the existing variability that may exist in groundwater geochemical conditions across the site. Please demonstrate that the Interim GWCLs are conservative with respect to variability that might exist in site groundwater that could be indicated through additional groundwater well sampling and testing, including analysis of trace element concentrations in groundwater, to verify the degree of homogeneity or heterogeneity of groundwater chemistry beneath the site. Alternatively, Interim GWCLs should be derived in accordance with the fractions approach methodology described in R317-3.6-4, Section 4.2. .

f. *Section 4.0 of the* ***Ground Water Monitoring Plan*** *and Section 5.2 of the* ***Ground Water Geochemical Evaluation*** *indicate that final GWCLS will be determined for the new POC monitoring wells, after sufficient data become available, using intra-well techniques. The proposed statistical analysis method provided in the Draft Groundwater Monitoring Plan includes the construction and use of control charts and intra-well data analysis for determining statistically significant trends in groundwater quality. The use of control charts (Shewart-CUSUM approach) is not a preferred methodology of the DRC for routine compliance determinations. As set forth in the Utah Administrative Code R-317-6-6.16.b.2, control charts can be used as a means to determine statistical significance. Trend evaluation is also an important element of an intra-well statistical method, and needs to be evaluated. Please provide additional information on the specific data analysis method(s) that would be used and rationale that would be used for their selection. Please demonstrate that the selected statistical analysis technique conforms to guidance provided by the U.S. Environmental Protection Agency. Additional considerations pertaining to the use of control charts are discussed in the Basis of Interrogatory Item No. 7 below.*

g. *Please revise Section 1.0 of the* ***Ground Water Monitoring Plan*** *and Sections 2. 0 and 8.0 of the* ***Ground Water Geochemical Evaluation*** *report to reflect the correct date of the referenced Groundwater Modeling and Proposed Monitoring Wells for the Shootaring Canyon Mill report by Gard Consultants. The referenced report is dated July 11, 2008, whereas both Tetra Tech reports reference the Gard document as having been issued in June 2008. Please clarify/revise the date of the referenced Gard document and indicate that the referenced information presented in the two Tetra tech reports is still valid for the July 2008 Gard report.*

11. ***Refer to Section 4.0 and Figure 3 of the Ground Water Monitoring Plan and Section 6.0 and Figure 4 of the Ground Water Geochemical Evaluation*** *report****:*** *Please provide additional details of (1) the proposed timetable for conducting resampling of a POC monitoring well if a compliance limit is exceeded in a sample from that POC monitoring well, (2) the timetable for notifying the Executive Secretary of a Probable Out-of-Compliance finding, and (3) the information that will be included in that notification. It is unclear whether the currently proposed procedure complies with R317-6.16 and R317-6.17 requirements. Please verify whether the resampling event in response to observing initial evidence of a (statistically significant) release will occur "immediately" after that observation, and indicate whether the results of the well resampling results will be included*

in the notification given to the Executive Secretary within 30 days of initially observing evidence of a release. Please indicate whether "criteria" included in the lowest diamond on the flow chart in Figure 3 of the ***Ground Water Monitoring Plan****, and Figure 4 of the* ***Ground Water Geochemical Evaluation*** *report is a GWCL. Please provide additional information in these two figures and in the text of the two reports concerning proposed procedures for implementing accelerated Out-of-Compliance status monitoring, if required, including proposed timetables for providing required notification to the Executive Secretary and information that would be included in that notification.*

12. ***Refer to the Draft Groundwater Monitoring Quality Assurance Plan [QAP], Utah Ground Water Quality Discharge Permit,*** *Uranium One USA, Inc., July 2008****:*** *Please provide additional information, including revised and updated QAP and Monitoring SOP documents, as necessary, that demonstrates that the QAP and SOP are compatible with the final monitoring well network design and final Groundwater Monitoring Plan. Please include information demonstrating that the well purging and sampling methods contained in the QAP (Sections 3.5 and 3.6) and SOP are appropriate for the final well screened zones selected for the various monitoring wells, "routine" analysis parameters (QAP, Section 3.2 and Table 3), and "reduced list of constituents" (QAP, Section 3.0) for groundwater, and proposed sampling frequencies for monitoring wells (QAP Section 3.0), are consistent with the final Groundwater Monitoring Plan.*

BASIS FOR INTERROGATORY:

1. *Information supporting the conceptual model needs to be complete and verifiable. Adequate rationale and supporting information/data need to be provided for any model assumptions, model parameter values assumed, and model elements considered*

2. *Reasonable conceptual model alternatives and system heterogeneity on different scales need to be considered. Such an approach is needed to minimize modeling bias and underestimation of model uncertainty (Neuman and Wierenga 2003, pages 7 and 36).*

3. *Several of the figures submitted in the* ***Groundwater Modeling and Proposed Monitoring Wells for the Shootaring Canyon Mill, Gard Water Consultants Inc. report*** *are very difficult to read, including a number of cases where wellbore numbers are illegible and some key wellbores are missing, and one figure is missing.*

4. *The sumps in the proposed North and South Cells could be considered to have a relatively high probability of being future release points for constituents from the tailings impoundment area since the locations of these sumps represent the lowest points in each containment cell and would therefore be locations where most of the leachate would accumulate. If the sump in the North Cell was considered as a possible source term, the plume emanating from such a location could likely extend to the south and east from that point. Such a potential plume could escape timely detection in groundwater unless one or more additional POC monitoring wells were installed south/southeast of the North Cell sump and east of the South Cell.*

In designing the proposed POC monitoring well network, the applicant does not appear to have appropriately represented the central tendency of aquifer permeability values in the area east of the proposed tailings management area or adequately addressed the effects of uncertainties associated with the possible range of locations of potential future releases from the tailings impoundment area. Additionally, a number of borings/core holes (which included several intervals of recovered NX core samples) previously drilled within the proposed tailings management area (e.g., boreholes S-5, S-6, S-13, S-15, S-16, S-17, Tt-4) which intercepted either fractures or joints within the Entrada Formation at depths ranging between about 5 and 57 feet below the ground surface [Woodward-Clyde Consultants 1978 and 1979; Tetra Tech 2008 field investigation data]. The depth of the borings/core holes ranged from 3 ft to approximately 80 ft, with the exception of two borings that extended to approximately 100 ft (S-1) and approximately 152 ft (S-18). Packer tests conducted in a series of boreholes (S-14 through S-19) penetrating the Entrada Formation yielded permeability values that ranged over approximately three orders of magnitude, depending on a number of factors that appear to include the presence of joints, fractures, and/or conditions relating to layered cemented/poorly cemented zones within the Entrada (Woodward-Clyde 1979, Table A-1). These data indicate that the Entrada Formation is heterogeneous in its permeability characteristics and that joints/fractures and/or variable strata-bound cementation conditions underlying and downgradient of the North and South Cell areas could likely effect groundwater flow rates beneath the site, with some zones allowing faster flow rates for potential future releases of groundwater constituents from the North or South Cell areas. Some zones (e.g., joint sets or fracture networks) could allow for flow in directions different than those currently simulated. Due to the limited data, especially at deeper depths, uncertainty exists with regard to whether joints/fractures extend into the saturated zone and to the distribution of cemented vs. uncemented zones in the Entrada beneath the site. The applicant needs to evaluate and address the possible effects of known and potential joints/joint sets and fractures and the distribution and occurrence of variously cemented/uncemented zones in the Entrada Formation on groundwater flow directions and flow rates in plumes associated with potential future releases from the tailings management area. Additional site investigations may be needed to obtain additional information on the depth and distribution of these features and additional evaluation may need to be done to assess the effects of these features on groundwater flow rates and flow directions for potential future releases from the tailings management area. Uncertainties relating to the presence of joints/faults in the Entrada Formation should be addressed through the development of one or more alterative conceptual flow/transport model simulations that evaluate the effects of potential secondary permeability and effects of cemented/poorly cemented sequences on flow characteristics. Alternatively, Uranium One may be able to provide additional explanation to justify how the existing model is representative and/or conservative of actual field conditions with regards to the possible permeability anisotropy and heterogeneity in question. This option would entail specific evaluation of the proposed monitoring well locations and spacing intervals, relative to the predicted contaminant plume locations and dimension, and establishment of an appropriately conservative monitoring well sampling frequency.

5. *The Ground Water Quality Discharge Permit, No. UGW170003, states that after completion of the accelerated quarterly background monitoring program, the permittee will begin compliance monitoring on a semi-annual basis. However, the* ***Ground Water Monitoring Plan*** *proposes an annual sampling frequency after the accelerated quarterly background monitoring program. The information provided is not adequate to demonstrate the suitability or appropriateness of the proposed annual sampling frequency following completion of the initial 8 quarterly sampling events. Additional information needs to be provided regarding uncertainties associated with aquifer parameters, conceptual model uncertainty, including system heterogeneity on different scales (for example, "preferential" flows, zones of higher flow rates), and uncertainties associated with potential future release locations from the North and South Cell areas, and the effects of these uncertainties on estimated groundwater flow rates and flow directions for potential future releases and on model simulation results. The potential for higher horizontal flow rates and differing flow directions associated with potential joint or fracture networks and the potential for higher flow rates based on the cementation characteristics of different zones in the Entrada Formation needs to be specifically considered*

6. *The applicant needs to demonstrate that Ground Water Compliance Limits proposed for the facility comply with all applicable requirements contained in R317-6, including R317-6-4.2. In Section 3.0 of the* ***Ground Water Geochemical Evaluation*** *report (Section 3.0) it states that analytical parameters tested during routine monitoring events following the first two years of sampling would be limited to all inorganic chemical constituents that have historically been measured at the site, and six other unregulated constituents (magnesium, sodium, potassium calcium, bicarbonate and carbonate) that are characteristic of tailings would also be tested. In that section, it also states that periodic testing of process waters associated with the tailings would be done and the associated list of routine analytical parameters would be refined as needed to match the process water testing results. However, details regarding the testing location(s), parameters to be tested, testing frequency for the process waters, and establishment of the Final GWCLs for newly added constituents are not provided in any of the three documents referenced in Items No. 8.c and No. 8d of this Interrogatory. This information needs to be provided.*

7. *The use of control charts (Shewart-CUSUM control chart approaches) is not a preferred methodology of the DRC for routine compliance determinations. Requirements associated with the application of this methodology, including requirements for verifying data autocorrelation and variance characteristics, establishment of appropriate initial control limits, requirements relating to updating of "in control" baseline data and updated trend analysis, and required maintenance (updating) of the control charts, make it difficult to review, verify, and update the results for this statistical analysis approach. As set forth in the Utah Administrative Code R-317-6-6.16.b.2, control charts can be used as a means to determine statistical significance. However, should Uranium One insist on the use of this statistical method, be advised the following will be required: 1) said control charts will be based on intra-well data collected from the actual Point of Compliance wells authorized by the Ground Water Permit (Permit), and will not be derived from existing or historical inter-well data collected at the site, 2) detailed and comprehensive demonstration must be made to*

show that initial control limits and control chart construction have been done in conformance with all applicable guidance from the U.S. Environmental Protection Agency (EPA), and 3) acceptable procedures are provided to show how future use of the control charts to demonstrate compliance will conform with U.S. EPA guidance.

8. *Based on review of the information presented in the **Ground Water Monitoring Plan** and in the **Ground Water Geochemical Evaluation** report, additional information needs to be provided to ensure that the proposed POC well monitoring plan procedures for Probable Out-of-Compliance and Out-of-Compliance Status situations will comply with applicable requirements contained in R317-6.16 and R317-6-6.17. This information needs to be provided.*

9. *Based on review of Uranium One's "[Response to] Interrogatory R317-6-2.1-27/03: Groundwater Monitoring", 13 pages plus 1 figure, undated document, 2008, it is understood that: (i) a "comprehensive Compliance Monitoring Plan" for all environmental media (ground water, air, soils and vegetation) is being developed and will be submitted at a future date; and (ii) specific details regarding the BAT monitoring plan for the tailings disposal facility will be included with the Operation Plan for the tailings disposal facility and will be submitted under separate cover. When available, please provide a copy of those plans for review.*

REFERENCES:

Hamp, S., Jackson, T.J., and Dotson, P.W. Contaminant Distributions at Typical U.S Uranium Milling Facilities and their Effects on Remedial Action Decisions. December 1995, 26 pp. URL: http://www.osti.gov/bridge/product.biblio.jsp?osti_id=10122392

Hydro-Engineering, LLC. Ground Water Monitoring of Shootaring Canyon Tailings Site – 2005. February 2006.

NRC (Nuclear Regulatory Commission) 1980. Final Generic Environmental Impact Statement on Uranium Milling. NUREG-0706, Vol. 1.

NRC (Nuclear Regulatory Commission) 1987. Sampling of Uranium Mill Tailings Impoundments for Hazardous Constituents. Memo to Robert E. Browning and R. Dale Smith. February 9, 1987.

Neuman, S.P. and Wierenga, P.J. "A Comprehensive Strategy of Hydrogeologic Modeling and Uncertainty Analysis for Nuclear Facilities and Sites". NUREG/CR-6805. U.S. Nuclear Regulatory Commission, Washington, D.C., July 2003.

Plateau Resources, Ltd. Ground-Water Monitoring of Shootaring Canyon Tailings Site – 2005. Hydro-Engineering, L.L.C, February 2006.

Uranium One USA, Inc., "Shootaring Canyon Uranium Mill Amendment Request for Radioactive Material License No. UT 09004480, 2nd Round Interrogatory Responses", November 28, 2007.

Uranium One USA, Inc. "[Response to] Interrogatory R317-6-2.1-27/03: Groundwater Monitoring", 13 pages plus 1 figure, undated document, 2008.

Uranium One, Inc. (Prepared by Gard Water Consultants, Inc.),"Groundwater Modeling and Proposed Monitoring Wells for the Shootaring Canyon Mill Tailings Disposal Facility", July 11, 2008.

Uranium One USA, Inc. (Prepared by Tetra Tech), " Shootaring Canyon Mill Site Ground Water Monitoring Plan", undated document, 2008.

Uranium One USA, Inc. (Prepared by Tetra Tech), " Draft Ground Water Monitoring Quality Assurance Plan, Utah Ground Water Quality Discharge Permit", July 2008.

Utah Department of Environmental Quality. Ground Water Quality Discharge Permit. Permit #UGW170003, issued January 14, 2004.

Utah Department of Environmental Quality. Division of Radiation Control. Radioactive Material License UT 0900480, Amendment # 2.

Woodward-Clyde Consultants 1978. Tailings Management Plan and Geotechnical Engineering Studies, Shootaring Canyon Uranuim Project, Garfield County, Utah. September.

Woodward-Clyde Consultants 1979. Stage 1 - Tailings Impoundment and Dam Final Design Report, Shootaring Canyon Uranium Project, Garfield County, Utah. May.

R317. Environmental Quality, Water Quality, R317-6: Ground Water Quality Protection.

INTERROGATORY R317-6-6.3F-28/04: INFORMATION ON EFFLUENT DISCHARGE RATES

INTERROGATORY STATEMENT:

Note: This interrogatory is carried forward without change from Interrogatory Round 3.

UNADDRESSED ISSUES FROM THE ROUND 3 INTERROGATORY:

Estimate the leakage through the secondary liner in similar fashion to the method used to calculate leakage through the primary liner (Section 5.1.4.7 of the TMP). Prepare the estimate using assumptions of head based on the intended operating conditions within the secondary containment sumps (i.e., head caused by one day of leakage and reasonable assumptions as to the leakage through the liner into the underlying subgrade. State and justify the estimated discharge quality and quantity. State the estimated leakage rate for each of the areas, recognizing that the impoundments each will be lined with secondary containment, and that the ore pad will allow greater leakage through the clay liner

Please provide the maximum daily leachate (gpd) and discharge rate (gpm) in each discharge or combination of discharges. Include in this information any discharge that may result from leakage through the tailings cells liner systems, the ore pad liner, and the Evaporation and Process Pond Cell. Please provide the appropriate calculations for each discharge. Also, please state the expected concentrations of pollutants in each discharge and the basis for the determination.

URANIUM ONE RESPONSE:

Uranium One indicated that the response to this Round 3 Interrogatory will be provided in the next submittal. To date, no information has been provided by Uranium One to address and resolve the Round 3 Interrogatory.

REFERENCES:

Uranium One USA, Inc., Response to Round 3 Interrogatories for the Shootaring Canyon Uranium Mill. May 28, 2008.

INTERROGATORY PR R317-6-6.3G-29/04: SURFACE WATER CONTROLS

PRELIMINARY FINDING:

Refer to R317-6-6.3G: Unless otherwise determined by the Executive Secretary, the application for a permit to discharge wastes or pollutants to ground water shall include the following complete information:

G. Information which shows that the discharge can be controlled and will not migrate into or adversely affect the quality of any other waters of the state, including the applicable surface water quality standards, that the discharge is compatible with the receiving ground water, and that the discharge will comply with the applicable class TDS limits, ground water quality standards, class protection levels or an alternate concentration limit proposed by the facility.

INTERROGATORY STATEMENT:

This issue was originally brought to Uranium One in the Round 1 Interrogatory. Partial answers were provided by Uranium One in their Responses to the Round 1, 2, and 3 Interrogatories. Please provide the following information which is not adequately provided in the current Design Report:

1. *Please provide an evaluation or analysis of the impact upon site groundwater due to the surface water impoundment proposed behind the cross valley berm and adjacent to the northern berm. It is our understanding that this area currently contains tailings. Please clarify if the water is now impounded on the tailings, or will be impounded on the tailings, or if the tailings will be removed prior to impoundment of water in this area. If water is impounded on the tailings, then provide a demonstration that this water will not impact the underlying groundwater aquifer. .*
2. *Discussion, modeling, analysis, etc., describing the impact that impounded water will have on the groundwater flow direction and groundwater quality in the Upper Entrada Aquifer. Please justify statements that infer that no storm water will impact "waters of the State" considering that surface water will be impounded and has the potential to impact groundwater. Please provide evidence to support the statement "impounded water will not alter or compromise groundwater flow directions in the Upper Entrada Aquifer". This point is not adequately addressed in the Round 3 responses and must be further evaluated.*
3. *Clarification of the conflict that appears to exist between the design, that demonstrated the impoundment of potentially contaminated site runoff in the undeveloped North Cell (Phase II area), and statements in the responses to the last interrogatory that "all collected water will be impounded within the tailings cells".*
4. *The rip rap sizes that are proposed are very large and can easily damage the filter fabric during installation. Please discuss and demonstrate how this material will be placed to ensure that the filter fabric (filter layer) operates as designed. Consideration should be given to adding appropriately designed filter layers beneath the rip rap instead of or in*

addition to the filter fabric. In addition, rip rap layer thickness should be evaluated and presented in the design (1.5 times D_{50} size).

5. *Two calculations relate to area M1-14 on page 7 of 18 of Appendix G.1: One entry incorrectly suggests that M1-14 drains to E Cyn. The duplication is carried through the remainder of this table.*
6. *A flow entry for OS1-1 is presented on page 8 of 18 of Appendix G.1 suggesting that no flow results from this area. However, the channel is designed for a flow depth of 1.5 ft. What is the basis for this design?*

BASIS FOR INTERROGATORY:

Uranium One USA, Inc. has satisfactorily demonstrated that the surface waters will be managed in such a way as to ensure that the clean and contaminated streams would be kept separate to the extent practicable, and that potentially contaminated streams would not appear to discharge to uncontrolled or offsite areas via surface water channels. Overall, the work performed since the last interrogatory round is substantial. The design calculations and the drawings and illustrations were clearly represented and easy to follow.

The primary outstanding issue is in regard to providing evidence to support "How impounded water will not alter or compromise the groundwater flow directions in the Upper Entrada Aquifer". This point was not adequately addressed in the Round 3 responses and must be further evaluated. The general response provided by Uranium One USA, Inc. suggests that there may have been an incomplete understanding of the Round 3 Interrogatory Statement which includes the request that "statements that infer that no storm water will impact "waters of the State" in consideration that surface water will be impounded and has the potential to impact groundwater". According to R313-6-6.3G, the operator is required to determine that discharges will not affect "waters of the State" which includes groundwater. Specifically, the concern is in regard to the storage of contaminated surface water draining from the central and northern portions of the facility to the undeveloped North Cell (phase II area). We were unable to identify any accounting for the impact upon groundwater due to the water that is to be impounded behind the cross valley dam and the northern berm. Nor were we able to ascertain the magnitude of the impounded water in this location.

Uranium One USA, Inc. presents a response to the Round 3 interrogatories regarding the collection of surface water. The response suggests that "all collected water will be impounded within the tailings cells". We disagree with this statement as the current surface water design (to be revised in accordance with the previous interrogatories) illustrates that a significant portion of the active processing facility will drain to an unlined area to the north of the cross valley berm.

REFERENCES:

Plateau Resources, Ltd., "Tailings Management Plan for Shootaring Canyon Uranium Processing Facility" Amended December, 2005.

Plateau Resources, Ltd. and Hydro-Engineering, LLC. "Tailings Management Plan for Shootaring Canyon Uranium Processing Facility" Amended December, 2005, Revised April 2007.

Uranium One USA, Inc., "Shootaring Canyon Uranium Mill Tailings Storage Facility Design Report", May 28, 2008.

Uranium One USA, Inc., Response to Round 3 Interrogatories for the Shootaring Canyon Uranium Mill. May 28, 2008.

INTERROGATORY R313-24-4-33/04: POST-CLOSURE DRAINAGE AND EROSION CONTROLS AND POSTCLOSURE MAINTENANCE

INTERROGATORY STATEMENT:

Note: This interrogatory is carried forward without change from Interrogatory Round 3.

UNADDRESSED ISSUES FROM THE ROUND 3 INTERROGATORY:

In accordance with UAC R317-6-6.3.S, please provide a plan for closure and post-closure maintenance that discusses post-closure maintenance requirements and identifies measures that will be taken to prevent groundwater contamination during the facility's closure and postclosure phases and to minimize the need for active maintenance following closure. Maintenance of the cover and erosion control systems should also be addressed.

Please provide analyses and discussion of the long-term performance of the cover system considering wind erosion, slope stability, settlement, seismic events, etc. Please describe and provide a basis for the demonstration period during the interim period of site transfer to the custodial party. Please demonstrate that the cover system will remain effective for 1000 years, to the extent achievable, and for a minimum of 200 years and require minimal maintenance following closure.

URANIUM ONE RESPONSE:

Uranium One indicated in its response to the Round 3 Interrogatory that this information will be provided in a later submittal. To date, no additional information has been provided to the Division.

REFERENCES:

Uranium One USA, Inc., Response to Round 3 Interrogatories for the Shootaring Canyon Uranium Mill. May 28, 2008.

INTERROGATORY R313-24-4-34/04: RADON RELEASE MODELING

INTERROGATORY STATEMENT:

Note: This interrogatory is carried forward without change from Interrogatory Round 3.

UNADDRESSED ISSUES FROM THE ROUND 3 INTERROGATORY:

Please provide additional justification for the moisture content and dry density values proposed or, alternatively, more conservative values should be substituted in the modeling (refer to the discussion included in the Basis for Interrogatory).

Please provide adequate justification to support taking any credit for the presence of the HDPE geomembrane for reducing radon release in the long-term after the geomembrane's radon release barrier efficiency is essentially no longer effective.

Provide adequate justification for not completing a radon release simulation where the radon attenuation effects of the cover system layers overlying the radon barrier layer component of the cover are neglected, or include this simulation.

URANIUM ONE RESPONSE:

Uranium One indicated in its response to the Round 3 Interrogatory that this information will be provided in a later submittal. To date, no additional information has been provided to the Division.

REFERENCES:

Uranium One USA, Inc., Response to Round 3 Interrogatories for the Shootaring Canyon Uranium Mill. May 28, 2008.

INTERROGATORY R313-24-4-36/04: OPERATIONAL DUST CONTROL

PRELIMINARY FINDING:

Refer to R313-24-4, 10 CFR 40 Appendix A(8): To control dusting from tailings, that portion not covered by standing liquids must be wetted or chemically stabilized to prevent or minimize blowing and dusting to the maximum extent reasonably achievable. This requirement may be relaxed if tailings are effectively sheltered from wind, such as may be the case where they are disposed of below grade and the tailings surface is not exposed to wind. Consideration must be given in planning tailings disposal programs to methods which would allow phased covering and reclamation of tailings impoundments because this will help in controlling particulate and radon emissions during operation. To control dusting from diffuse sources, such as tailings and ore pads where automatic controls do not apply, operators shall develop written operating procedures specifying the methods of control which will be utilized.

INTERROGATORY STATEMENT:

Review of the Uranium One Response to Round 3 Interrogatory shows the answers provided partially addressed the issues identified. In order to resolve all the issues, please provide additional information, as follows:

Discuss the long- and short-term impacts chemical dust suppressants will have the engineering geotechnical properties of the tailings, and justify their use from the perspective of ensuring long-term stability for the impacts.

Estimate radiological doses to facility workers and members of the general public that might result from exposure to allowable dust emissions and demonstrate that projected doses will satisfy applicable regulatory dose limits.

Provide ALARA evaluations to demonstrate that airborne releases will be reduced to levels that are as low as reasonably achievable.

Please ensure that the final SOP AP-5 addresses the items and requests stated in Interrogatory R313-24-4-36/03 that have not been addressed in the responses to the interrogatory, namely:

1. *Material specifications (including chemicals used for dust suppression; allowable sources and characteristics of water used for dust suppression), and supporting detail on dust suppression and air monitoring methods and locations to be used on the tailings piles and drying and packaging operations.*
2. *Provide air monitoring requirements and ALARA evaluations performed for dust suppression to ensure that airborne effluent releases are reduced to levels as low as reasonably achievable. Include provisions to quantify radiological releases in fugitive dust considering ore stockpiles, roads, drying and packaging operations, and tailings piles.*
3. *Include discussion describing monitoring or inspection activities that are unique to construction activities that might be different from used in support of operations.*

In addition, SOP AP-5 should also be revised to accomplish the following:

4. *Include in the definition of the phrase "out of normal" reference to satisfying (or failing to satisfy) applicable regulatory requirements.*
5. *Identify the sources and radiological characteristics of waters that may be used for dust suppression.*
6. *Revise the language prohibiting operation of spray lines under high wind conditions (considering that dust will be most likely under exactly these conditions).*
7. *Identify and invoke the standard operating procedure that will govern the decontamination of vehicles.*
8. *Provide a procedure for decontaminating personnel, vehicles, and equipment.*

BASIS FOR INTERROGATORY:

While most of the items identified in Interrogatory R313-24-4-36/03 were addressed in the draft Procedure SOP HP-25, several were not. Those items not addressed in the draft procedure are the focus of this interrogatory. Some topics should be addressed well prior to commencement of proposed construction:

- *Long- and short-term impacts chemical dust suppressants will have the engineering geotechnical properties*
- *Estimates of radiological doses to facility workers and members of the general public*
- *ALARA evaluations*
- *Air monitoring equipment, locations, and requirements*
- *Decontamination of vehicles*

Other topics should be addressed prior to commencing operations:

- *Revised language prohibiting operation of spray lines under high wind conditions*
- *Definition of the phrase "out of normal"*
- *Specifications of chemical dust suppressants and allowable characteristics of water used for dust suppression*

REFERENCES:

Plateau Resources, Ltd., "Tailings Management Plan for Shootaring Canyon Uranium Processing Facility," Dated December 2005, Revised April 2007.

Regulatory Guide 3.56, "General Guidance for Designing, Testing, Operating, and Maintaining Emission Control Devices at Uranium Mills," Task CE 309-4, USNRC, May, 1986.

Uranium One USA, Inc., "Shootaring Canyon Uranium Mill Amendment Request for Radioactive Material License No. UT 09004480, 2nd Round Interrogatory Responses", November 28, 2007.

Uranium One USA, Inc. "Shootaring Canyon Uranium Mill Tailings Storage Facility Design Report, May 27, 2008".

Uranium One USA, Inc., Response to Round 3 Interrogatories for the Shootaring Canyon Uranium Mill. May 28, 2008.

Uranium One USA, Inc., "Fugitive Dust Control", Standard Operating Procedure AP-5, Revision 0.0, May 27, 2008.

INTERROGATORY R313-24-4-37/04: COST ESTIMATES FOR DECOMMISSIONING AND RECLAMATION

INTERROGATORY STATEMENT:

Note: This interrogatory is carried forward without change from Interrogatory Round 3.

UNADDRESSED ROUND 3 INTERROGATORY ISSUES:

***After all design changes are made** for the facility and its component equipment, structures, and systems pursuant to this and subsequent rounds of interrogatories, please respond to the following general and specific directives and requests:*

1. *Provide the basis for EACH quantity, duration, allowance, and lump sum identified in the cost estimates presented in Section 11 of the "Tailings Reclamation and Decommissioning Plan for Shootaring Canyon Uranium Project – Revised 2006." This basis should be related in some way to the quantity of materials to be handled (based on relevant drawings) and a documented productivity for similar activities.*
2. *Estimate and include the cost of providing an appropriate level of security at the facility during reclamation and decommissioning.*
3. *Either (A) make a connection between the structures, components, and systems listed in the second paragraph of Section 8.0 and the cost estimate presented in Section 11.1 **OR** (B) estimate and include the costs of decommissioning each of the structures, components, and systems listed in the second paragraph of Section 8.0*
4. *Justify and provide references for unit costs used with quantity (hour, volume, area, etc) estimates shown throughout Section 11.*
5. *Include an adder of 31.7 percent in salaries for individuals listed in Sections 11.1.18, 11.2.10, and 11.3.10 to account for total benefits provided to workers by the contractor, consistent with the information provided for construction workers in Table 5 of the report located at page 11 of http://www.bls.gov/news.release/pdf/ecec.pdf*
6. *Justify OR revise and justify the allowance for Living Costs of $40, $67, and $66 per person per day in Sections 11.1.18, 11.2.10, and 11.3.10, respectively. Justify discrepancies between the crew sizes used in Sections 11.2.10 and 11.3.10 for calculating the allowance for Living Costs and the crew sizes stated in Item 1 of Sections 11.2 and 11.3, respectively, OR revise them to make them consistent.*
7. *Include in the cost of verifying that soils have been properly cleaned up the cost of remedial action support surveys (Section 11.1.16). Justify, on the basis of MARSSIM guidance, the estimate that final status surveys will require only 48 person-hours. Include in the estimate the costs of analyzing remedial action support and final status survey samples.*

8. *Include the cost of excavating, hauling, spreading, and compacting sandy Interim/Grading material, clay cover material, and Rocky Soil Cover material from local borrow sites, lack of royalty notwithstanding, (Section 11.2.4).*
9. *Justify that 44 bags of grout per well is adequate for the purposes of abandoning monitoring wells (Sections 11.2.8 and 11.3.8).*
10. *Ensure that the costs of environmental monitoring are included in closure and decommissioning costs estimates as appropriate.*
11. *Apply 25 percent of subtotal costs for contingency allowance in Tables 12-1-Cell-1 and 12-1-Cell-2, consistent with relevant NRC guidance on cost estimates supporting determination of financial assurances.*
12. *Revise the Uranium One Management Overhead percentage allowed in Tables 12-1-Cell-1 and 12-1-Cell-2 to reflect the possibility that the Tailings Reclamation and Decommissioning Plan will be performed by an independent third-party contractor. This percentage should allow for:*
    - *Labor Overhead and Profit*
    - *Materials and Subcontract Overhead and Profit*
    - *General Conditions*
    - *Subcontract Administration and Engineering*
    - *Construction Oversight*
13. *Ensure that all revisions made in Section 11 and 12 are incorporated into other sections of the Tailings Reclamation and Decommissioning Plan and elsewhere in the License Amendment Request.*

URANIUM ONE RESPONSE:

Uranium One indicated in its response to the Round 3 Interrogatory that this information will be provided in a later submittal. To date, this additional information has not been provided to the Division.

REFERENCES:

Uranium One USA, Inc., Response to Round 3 Interrogatories for the Shootaring Canyon Uranium Mill. May 28, 2008.

INTERROGATORY R313-24-4-38/04: LONG TERM SURVEILLANCE COSTS

INTERROGATORY STATEMENT:

NOTE: This interrogatory is carried forward without change from Interrogatory Round 3.

UNADDRESSED ROUND 3 INTERROGATORY ISSUES:

Justify or revise and justify the allowance of $752,600 for DOE to provide Long Term Maintenance (as shown in Table 12-1-Cell-1 and 12-1-Cell-2). Base the allowance on EITHER:

1. *A detailed listing of activities and cost components (expressed as quantities with unit costs), together with an orderly estimate of associated costs, including an explanation of basis. This cost estimate should address planned and expected costs for a period of at least 100 years following reclamation and decommissioning and should consider a rate of return on secure financial instruments of 2 percent real.*
2. *Justifying, including explanation of basis*
    - *A value that was acceptable to DOE in 1978,*
    - *That DOE still honors the 1978 basis for determining costs that should be covered for it providing Long Term Maintenance, and*
    - *Cost escalation from 1978 to 2007 using an appropriate construction cost index.*

URANIUM ONE RESPONSE:

Uranium One indicated in its response to the Round 3 Interrogatory that this information will be provided in a later submittal. To date, this additional information has not been provided to the Division.

REFERENCES:

Uranium One USA, Inc., Response to Round 3 Interrogatories for the Shootaring Canyon Uranium Mill. May 28, 2008.