



**RESULTS OF COMPLETENESS REVIEW
PLATEAU RESOURCES/SHOOTARING CANYON URANIUM PROCESSING FACILITY
LICENSE APPLICATION SUBMITTAL**

The following presents the results of a completeness review of the submittal in support of a license application for Shootaring Canyon Uranium Processing Facility. It is based on information obtained during a site visit on Wednesday April 5, 2006 and a preliminary review of the following documents:

1. Shootaring Canyon Uranium Processing Facility Environmental Report, Source Material License No. UT0900480; January 2006.
2. Shootaring Canyon Uranium Processing Facility Tailings Management Plan Amended – 2005.
3. Tailings Reclamation and Decommissioning Plan for Shootaring Canyon Uranium Project – 2005.
4. State of Utah Ground Water Quality Discharge Permit (UGW17003, March 17, 1999).

The primary regulatory requirements applicable to this submittal are included and referenced in the State of Utah Uranium Mills and Source Material Mill Tailings Disposal Facility Requirements R313-24. The results of this initial review identified the following concerns with respect to the submittal requirements within these regulations that are not addressed in the material provided. Note that some of the information not included in this latest submittal is referenced in the documents as being provided in previous submittals. However, in the interest of time, and to ensure that correct and complete information is provided, the Division requests that Plateau Resources precisely identify or provide the referenced information in documents previously provided.

1. Inspections, documentation, and reporting is required per R313-24-4 (R313-12-51, 313-19-100, 313-22-35), 10 CFR 40.26(c)(2), 10 CFR 40.61, and the R313-17 (groundwater quality regulations). However, it is not discussed in these documents. Reference is made to the previous submittals and SOPs that are included in these previous submittals. Therefore, please provide:
 - a. Procedures for maintaining records (and examples of such records) for receipt, transfer and disposal in accordance with 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).
 - b. The location, and an inventory of records, stored in accordance with R313-22-35 (7), in anticipation of ultimate closure. *“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”*.
 - c. Please submit SOP HP-21 and/or other appropriate procedures that cover daily inspections and the matrix for reporting requirements in accordance with 10 CFR 40.26(c)(2), and R313-19-50.
2. Per R313-22-33 (1) please provide the following or a direct reference in existing documents previously submitted that contain:
 - (a) Demonstration that applicant and all personnel who will be handling the radioactive material are qualified by reason of training and experience to use the material in question for the purpose requested in accordance with these rules in a manner as to minimize danger to public health and safety or the environment.

- (b) Demonstration that applicant's proposed equipment, facilities, and procedures are adequate to minimize danger to public health and safety or the environment.
3. Per R313-22-34 (2) please provide the following or a direct reference in existing documents previously submitted that contain requirements and conditions that are or might be needed for the Licensee to receive, possess, use and transfer radioactive material in ways that:
 - Minimize danger to public health and safety or the environment;
 - Prevent loss or theft of material subject to Rule R313-22.
 4. Please submit the Radiation Protection Program, implementing procedures and forms, in accordance with R313-15-101 (1); “*Each licensee or registrant shall develop, document, and implement a radiation protection program sufficient to ensure compliance with the provisions of Rule R313-15. See Section R313-15-1102 for recordkeeping requirements relating to these programs*”.
 5. Very limited information has been provided defining the basis for the proposed liner system design. The primary regulatory requirements applicable to the liner system are included and referenced in the State of Utah Uranium Mills and Source Material Mill Tailings Disposal Facility Requirements R313-24. They include:
 - **NRC Regulations 10 CFR 40 Appendix A Criterion 5(A)**
 - *(1) The primary ground-water protection standard is a design standard for surface impoundments used to manage uranium and thorium byproduct material. Unless exempted under paragraph 5A(3) of this criterion, surface impoundments (except for an existing portion) 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.*
 - *(2) The liner required by paragraph 5A(1) above must be--*
 - (a) 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;*
 - (b) Placed upon a foundation or base capable of providing support to the liner and resistance to pressure gradients above and below the liner to prevent failure of the liner due to settlement, compression, or uplift; and*
 - (c) Installed to cover all surrounding earth likely to be in contact with the wastes or leachate.*
 - *(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.

- *(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.*
- **State of Utah Ground Water Quality Protection regulations R317-6, part 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:” ...*
 - *Under part 6.4.A.3 ... “ the applicant is using best available technology to minimize the discharge of any pollutant”.*
 - *Best Available Technology (BAT) is defined under R317-6-1.1.3 as “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”.*

For waste cell liner systems as proposed by Plateau, the State of Utah considers BAT to be a double liner with leachate collection/detection systems. This means (starting from the top of the liner system):

- Leachate collection layer and removal system above a primary liner consisting of appropriately designed collection pipes, granular filter bed, and sump type extraction system. The leachate collection system shall have the ability to remove liquid from the cell in practical and timely manner while maintaining a minimal head on the primary liner with a maximum allowable head of three (3) feet.
- Primary HDPE Liner that is at least sixty (60)-mil thick.
- A rapid reporting leak detection layer and removal system between the primary and secondary liner consisting of appropriately designed collection pipes, geonet and/or granular filter bed, and sump type extraction system. The leachate detection system shall operate so as to maintain a minimal head on the secondary liner with a maximum allowable head of one (1) foot under anticipated impacts from siltation and clogging, rib layover and creep of synthetic components of the system, overburden pressures, etc.
- A composite secondary liner that consists of a HDPE liner that is at least sixty (60)-mil thick over at least twelve (12) inches of compacted clay with a maximum permeability of 1×10^{-7} centimeters per second.
- Bedding layer and/or appropriately prepared clean subgrade.
- Maximum side slopes of 3-horizontal to 1-vertical
- Leachate Monitoring, Operations, Maintenance and Reporting Plan (that addresses both the leachate collection and detection system)
- Ground Water Monitoring system (per the facility Ground Water Quality Discharge Permit)
- Ground Water Monitoring Plan (per the facility Ground Water Quality Discharge Permit)
- Liner Maintenance and Inspection Plan

The above referenced Tailings Management Plan presents the design of the proposed liner system that does include the liner components listed above for BAT. It also includes select design basis calculations, plans and limited material specifications. However, the following design base issues have not been addressed in the report and need to be provided. The Division will be able to conduct a complete review of the design for compliance with the regulatory requirements when this information is provided.

- a. To meet the regulatory requirements referenced above for the cell liner system the following evaluations or calculations need to be provided:
 - i. Liner system material (HDPE, clay, geonet, fabric, granular material, piping, extraction and monitoring equipment, etc.) to be compatible with leachate so as not to compromise the integrity of the system. Please provide information, data, and/or test results that demonstrate that all of the liner system materials and equipment will not be impacted by the chemical or physical nature of the leachate (e.g., low pH, sulfate content, etc.).
 - ii. Please provide an evaluation that demonstrates that the proposed lining system (all layers) will remain stable during construction and cell operations. Please provide:
 1. Anchor trench calculations that provide the basis for the anchor trench design.
 2. An evaluation of the impact of stress imposed by equipment, tailings and liquid during placement on the liner system side slopes that could result in movement and degradation of the liner system.
 3. Information to demonstrate the stability of the lining system interfaces, particularly the HDPE liner interfaces, on the cell side slopes during lining system installation and cell operation. Include information assessing the stability of the lining system in the event of a possible failure of anchoring of the lining system at the anchor trench as a result of cell loading during operations (such as from equipment), during unusually severe wind uplift conditions that might occur prior to or during the operational period, etc.
 4. An evaluation of the impacts of wind uplift forces, UV degradation, wetting/drying cycles, freeze-thaw cycles, and temperature fluctuations on the liner system while exposed to these forces.
- b. Per BAT for leachate collection and detection systems the Leachate Monitoring, Operations, Maintenance, and Reporting Plan needs to include an estimation of anticipated flow rates that include the flow rate under 3-feet of head on the primary liner for the leachate collection layer and the maximum capacity (flow rates) in both of these layers to demonstrate compliance with the above listed respective requirements.
- c. The *Action Leakage Rate*, which is defined as the maximum design flow rate that the leak detection system can rapidly remove without the fluid head on the liner exceeding one (1) foot, needs to be determined. The action leakage rate must include an adequate safety margin to allow for uncertainties in the design (e.g., slope, hydraulic conductivity, thickness of drainage material), construction, operation, and location of the system, waste and leachate characteristics, likelihood and amounts of other sources of liquids, considerations for rapid reporting when it is exceeded, and proposed response actions (e.g., the action leakage rate must consider decreases in the flow capacity of the system over time resulting from siltation and clogging, rib layover and creep of synthetic components of the system, overburden pressures, etc.). The development of the action leakage rate includes a reasonable and defensible estimation of an allowable leakage rate through the primary liner into the leak detection system. Note that the allowable leakage rate needs to consider that the maximum allowable head on the primary liner is 3-feet. Guidance can be found in 40 CFR 264.302, the EPA document *Action Leakage Rates For Leak Detection Systems*; January 1992, and in Geosynthetics International, *Special Issue on Liquid Migration Control Using Geosynthetic Liner Systems*, 1997, Vol. 4 (that includes an article on page 215 by GeoSyntec Consultants on this topic).
- d. Leachate collection and detection pipe strength calculations that provide a basis for their design.
- e. Liner system material and installation specifications. These are addressed for the cover system, but are not included for the liner system.

- f. Per 10 CFR 40 Appendix A Criterion 5(A)(4), are there any anticipated conditions that could result in overtopping of the cell, such as the design storm event? If so, what would be the impact on the liner, and would these lead to any design considerations. Potential overtopping will need to be considered in tailings management.
6. It is our understanding that a radiation survey is to be performed for the downstream area near the dam where a spill had once occurred, and in the area of the proposed cell where tailings are now stored (reference 10 CFR 40.42(3)(i)). Please provide a copy of this plan and any results that were produced.

Please feel free to contact us with questions comments and concerns you may have.