

U.S. NUCLEAR REGULATORY COMMISSION

**MATERIALS LICENSE**

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and the applicable parts of Title 10, Code of Federal Regulations, Chapter I, Parts 19, 20, 30, 31, 32, 33, 34, 35, 36, 39, 40, 51, 70, and 71, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations, and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

<p style="text-align: center;">Licensee</p> <p>1. Lost Creek ISR, LLC</p> <p>2. 5880 Enterprise Drive, Suite 200 Casper, WY 82609</p>	<p>3. License Number SUA-1598</p> <p>4. Expiration Date:</p> <p>5. Docket No. 40-9068 Reference No.</p>
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<p>6. Byproduct Source, and/or Special Nuclear Material</p> <p>a. Natural Uranium b. Byproduct material as defined in 10 CFR 40.4</p>	<p>7. Chemical and/or Physical Form</p> <p>Any Unspecified</p>	<p>8. Maximum amount that Licensee May Possess at Any One Time Under This License</p> <p>a. Unlimited b. Quantity generated under operations authorized by this license</p>
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**SECTION 9: Administrative Conditions**

- 9.1 The authorized place of use shall be the licensee's Lost Creek Project in Sweetwater County, Wyoming. The licensee shall conduct operations within the license area boundaries shown in Figure 1.3-1 of the approved license application.
- 9.2 The licensee shall conduct operations in accordance with the commitments, representations, and statements contained in the license application dated March 31, 2008 (Agencywide Documents Access and Management System (ADAMS) package ML081060525), which is supplemented by the submittals dated December 12, 2008 (ML090080451), January 16, 2009 (ML090360163), February 27, 2009 (ML090840399), August 5, 2009 (ML092310728), April 22, 2010 (ML102100263, ML102420249), May 14, 2010 (ML101600528), June 17, 2010 (ML101720161), and June 24, 2010 (ML101820155). The approved application and supplements are, hereby, incorporated by reference, except where superseded by specific conditions in this license. The licensee's approved license application must be maintained on site.

Whenever the word "will" or "shall" is used in the above referenced documents, it shall denote a requirement.

- 9.3 All written notices and reports sent to the U.S. Nuclear Regulatory Commission (NRC) as required under this license and by regulation shall be addressed as follows: ATTN: Document Control Desk, Director, Office of Federal and State Materials and Environmental Management Programs, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001. An additional copy shall be

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submitted to: Deputy Director, Decommissioning and Uranium Recovery Licensing Directorate, Division of Waste Management and Environmental Protection, Office of Federal and State Materials and Environmental Management Programs, U.S. Nuclear Regulatory Commission, Mail Stop T-8F5, 11545 Rockville Pike, Two White Flint North, Rockville, MD 20852-2738. Incidents and events that require telephone notification shall be made to the NRC Operations Center at (301) 816-5100 (collect calls accepted).

**9.4 Change, Test and Experiment License Condition**

- A) The licensee may, without obtaining a license amendment pursuant to 10 CFR 40.44, and subject to conditions specified in (B) of this condition:
- i Make changes in the facility as described in the license application (as updated);
  - ii Make changes in the procedures as described in the license application (as updated); and
  - iii Conduct test or experiments not described in the license application (as updated).
- B) The licensee shall obtain a license amendment pursuant to 10 CFR 40.44 prior to implementing a proposed change, test, or experiment if the change, test, or experiment would:
- i Result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the license application (as updated);
  - ii Result in more than a minimal increase in the likelihood of occurrence of a malfunction of a facility structure, equipment, or monitoring system (SEMS) important to safety previously evaluated in the license application (as updated);
  - iii Result in more than a minimal increase in the consequences of an accident previously evaluated in the license application (as updated);
  - iv Result in more than a minimal increase in the consequences of a malfunction of an SEMS previously evaluated in the license application (as updated);
  - v Create a possibility for an accident of a different type than any previously evaluated in the license application (as updated);
  - vi Create a possibility for a malfunction of an SEMS with a different result than previously evaluated in the license application (as updated);
  - vii Result in a departure from the method of evaluation described in the license application (as updated) used in establishing the final safety evaluation report (FSER), environmental impact statement (EIS), environmental assessment (EA) or technical evaluation reports (TERs) or other analysis and evaluations for license amendments.
  - viii For purposes of this paragraph as applied to this license, SEMS means any SEMS that has been referenced in a staff SER, TER, EA, or EIS and supplements and amendments thereof.

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- C) Additionally, the licensee must obtain a license amendment unless the change, test, or experiment is consistent with NRC's previous conclusions, or the basis of, or analysis leading to, the conclusions of actions, designs, or design configurations analyzed and selected in the site or facility SER, TER, and EIS or EA. This would include all supplements and amendments, and SERs, TERs, EAs, and EISs issued with amendments to this license.
- D) The licensee's determinations concerning (B) and (C) of this condition, shall be made by a Safety and Environmental Review Panel (SERP). The SERP shall consist of a minimum of three individuals. One member of the SERP shall have expertise in management (e.g., Plant Manager) and shall be responsible for financial approval for changes; one member shall have expertise in operations and/or construction and shall have responsibility for implementing any operational changes; and one member shall be the radiation safety officer (RSO) or equivalent, with the responsibility of assuring changes conform to radiation safety and environmental requirements. Additional members may be included in the SERP, as appropriate, to address technical aspects such as groundwater or surface water hydrology, specific earth sciences, and other technical disciplines. Temporary members or permanent members, other than the three above-specified individuals, may be consultants.
- E) The licensee shall maintain records of any changes made pursuant to this condition until license termination. These records shall include written safety and environmental evaluations made by the SERP that provide the basis for determining changes are in compliance with (B) of this condition. The licensee shall furnish, in an annual report to the NRC, a description of such changes, tests, or experiments, including a summary of the safety and environmental evaluation of each. In addition, the licensee shall annually submit to the NRC page changes, which shall include both a change indicator for the area changed, e.g., a bold line vertically drawn in the margin adjacent to the portion actually changed, and a page change identification (date of change or change number or both), to the operations plan and reclamation plan of the approved license application (as updated) to reflect changes made under this condition.

9.5 Financial Assurance. The licensee shall maintain an NRC-approved financial surety arrangement, consistent with 10 CFR 40, Appendix A, Criterion 9, adequate to cover the estimated costs, if accomplished by a third party, for decommissioning and decontamination, which includes offsite disposal of radioactive solid process or evaporation pond residues, and ground-water restoration as warranted. The surety shall also include the costs associated with all soil and water sampling analyses necessary to confirm the accomplishment of decontamination.

Proposed annual updates to the financial assurance amount, consistent with 10 CFR Part 40, Appendix A, Criterion 9, shall be provided to the NRC 90 days prior to the anniversary date (e.g. renewal date of the financial assurance instrument/vehicle). The financial assurance update renewal date for Lost Creek Project will be determined following consultation with the licensee and the State of Wyoming. If the NRC has not approved a proposed revision 30 days prior to the expiration date of the existing financial assurance arrangement, the licensee shall extend the existing arrangement, prior to expiration, for one year. Along with each proposed revision or annual update of the financial assurance estimate, the licensee shall submit supporting documentation, showing a breakdown of the costs and the basis for the cost estimates with adjustments for inflation, maintenance of a minimum 15-percent contingency, changes in engineering plans, activities

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performed, and any other conditions affecting the estimated costs for site closure. Within 90 days of NRC approval of a revised closure (decommissioning) plan and its cost estimate, the licensee shall submit, for NRC review and approval, a proposed revision to the financial assurance arrangement if estimated costs exceed the amount covered in the existing arrangement. The revised financial assurance instrument shall then be in effect within 30 days of written NRC approval of the documents.

At least 90 days prior to beginning construction associated with any planned expansion or operational change that was not included in the annual financial assurance update, the licensee shall provide, for NRC approval, an updated estimate to cover the expansion or change. The licensee shall also provide the NRC with copies of financial assurance-related correspondence submitted to the State of Wyoming, a copy of the State's financial assurance review, and the final approved financial assurance arrangement. The licensee also must ensure that the financial assurance instrument, where authorized to be held by the State, identifies the NRC-related portion of the instrument and covers the aboveground decommissioning and decontamination, the cost of offsite disposal of solid byproduct material, soil, and water sample analyses, and groundwater restoration associated with the site. The basis for the cost estimate is the NRC-approved site closure plan or the NRC-approved revisions to the plan. Reclamation or decommissioning plan cost estimates and annual updates should follow the outline in Appendix C to NUREG-1569 (NRC, 2003), entitled "Recommended Outline for Site-Specific In Situ Leach Facility Reclamation and Stabilization Cost Estimates."

The licensee shall continuously maintain an approved surety instrument for the Lost Creek Project, in favor of the State of Wyoming. The initial surety estimate shall be submitted for NRC review and approval within 90 days of license issuance, and the surety instrument shall be submitted for NRC review and approval 90 days prior to commencing operations.

- 9.6 Release of superficially contaminated equipment, materials, or packages from restricted areas shall be in accordance with the NRC guidance document "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material," dated April 1993 (ADAMS Accession No. ML003745526) or suitable alternative procedures approved by NRC prior to any such release.

The Guidelines shall also apply to the removal of equipment, materials, or packages from restricted areas that have the potential for accessible surface contamination levels above background regardless of the intent to release these items for unrestricted use. The licensee shall document their survey of equipment, materials, or packages prior to removing them from a restricted area.

Where surface contamination by both alpha- and beta-gamma-emitting nuclides exists, the limits established for alpha- and beta-gamma-emitting nuclides shall apply independently.

- 9.7 The licensee shall follow the guidance set forth in NRC, Regulatory Guides 8.22, "Bioassay at Uranium Recovery Facilities," (as revised) and 8.30, "Health Physics Surveys in Uranium Recovery Facilities," (as revised) or NRC-approved equivalent.

The licensee shall follow the guidance set forth in Regulatory Guide 8.31, "Information Relevant to

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Ensuring that Occupational Radiation Exposure at Uranium Recovery Facilities will be As Low As Is

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Reasonably Achievable (ALARA),” (as revised) or NRC approved equivalent, with the following exception:

The licensee may identify a qualified designee(s) to perform daily inspections in the occasional absence of the RSO and health physics technician(s) (HPT). The qualified designee(s) will have health physics training, and such training program will be specified by the licensee and submitted to the NRC for review and approval prior to commencement of operations at the Lost Creek Project. The qualified designee(s) may perform daily inspections on weekends, holidays, and times when both the RSO and HPT(s) must both be absent (e.g. illness or offsite training). A designee(s) shall not perform daily inspections for more than two consecutive days except in the event of a federal or company holiday, whereby more than three consecutive days will not be exceeded. Reports will be reviewed by health physics staff within 48 hours of completing the report or 72 hours in the event of a federal or company holiday. The licensee will also have a health physics staff member available by telephone while the qualified designee(s) is performing the daily inspections.

Other exceptions to the aforementioned guidance documents are subject to review and approval by the NRC.

- 9.8 Cultural Resources. Before engaging in any developmental activity not previously assessed by the NRC, the licensee shall administer a cultural resource inventory if such survey has not been previously conducted and submitted to the NRC. All disturbances associated with the proposed development will be completed in compliance with the National Historic Preservation Act (as amended) and its implementing regulations (36 CFR 800), and the Archaeological Resources Protection Act (as amended) and its implementing regulations (43 CFR 7).

In order to ensure that no unapproved disturbance of cultural resources occurs, any work resulting in the discovery of previously unknown cultural artifacts shall cease. The artifacts shall be inventoried and evaluated in accordance with 36 CFR Part 800, and no disturbance of the area shall occur until the licensee has received authorization from the NRC to proceed.

The licensee shall comply with the stipulations for cultural resource protection in the Memorandum of Agreement dated October 4, 2010, provided in the NRC letter to the Advisory Council on Historic Preservation dated January 13, 2011.

- 9.9 The licensee shall dispose of solid byproduct material from the Lost Creek Project at a site that is authorized by NRC or an NRC Agreement State to receive byproduct material. The licensee's approved solid byproduct material disposal agreement shall be maintained on site. In the event that the agreement expires or is terminated, the licensee shall notify the NRC within seven working days after the date of expiration or termination. A new agreement shall be submitted for NRC review within 90 days after expiration or termination, or the licensee will be prohibited from further lixiviant injection.
- 9.10 The results of the following activities, operations, or actions shall be documented: sampling; analyses; surveys or monitoring; survey/ monitoring equipment calibrations; audits and inspections; all meetings and training courses; and any subsequent reviews, investigations, or corrective actions required by NRC regulation or this license. Unless otherwise specified in a license condition or

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applicable NRC regulation, all documentation required by this license shall be maintained until license termination, and is subject to NRC review and inspection.

- 9.11 The licensee is hereby exempted from the requirements of 10 CFR 20.1902(e) for areas within the facility, provided that all entrances to the facility are conspicuously posted with the words, "CAUTION: ANY AREA WITHIN THIS FACILITY MAY CONTAIN RADIOACTIVE MATERIAL."

**SECTION 10: Operations, Controls, Limits, and Restrictions**

*Standard Conditions*

- 10.1 The licensee shall use a lixiviant composed of native groundwater, carbon dioxide, sodium carbonate or sodium bicarbonate, and hydrogen peroxide and/or oxygen, as specified in the licensee's approved license application and supplements.
- 10.2 Facility Throughput. The Lost Creek processing facility throughput shall not exceed an average daily flow rate equivalent to 6,000 gallons per minute not to exceed a maximum instantaneous flow rate of 6300 gallons per minute, excluding restoration flow. The annual production of yellowcake slurry shall not exceed 1 million pounds equivalent of dried yellowcake product.
- 10.3 At least 12 months prior to initiation of any planned final site decommissioning, the licensee shall submit a detailed decommissioning plan for NRC review and approval. The plan shall represent as-built conditions at the Lost Creek Project.
- 10.4 The licensee shall develop and implement written standard operating procedures (SOPs) prior to operation for:
- A) All operational activities involving radioactive and non-radioactive materials associated with licensed activities that are handled, processed, stored, or transported by employees;
  - B) All non-operational activities involving radioactive materials including in-plant radiation protection and environmental monitoring; and
  - C) Emergency procedures for potential accident/unusual occurrences including significant equipment or facility damage, pipe breaks and spills, loss or theft of yellowcake or sealed sources, significant fires, and other natural disasters.

The SOPs shall include appropriate radiation safety practices to be followed in accordance with 10 CFR Part 20. SOPs for operational activities shall enumerate pertinent radiation safety practices to be followed. A copy of the current written procedures shall be kept in the area(s) of the production facility where they are utilized.

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10.5 Mechanical Integrity Tests. The licensee shall construct all wells in accordance with methods described in Sections 3.2.4 and 3.2.5 of the approved license application. Mechanical integrity tests shall be performed on each injection and production well before the wells are utilized and on wells that have been serviced with equipment or procedures that could damage the well casing. Additionally, each well shall be retested at least once every five (5) years it is in use. Integrity tests shall be performed in accordance with Section 3.2.5 of the licensee's approved license application. Any failed well casing that cannot be repaired to pass the integrity test shall be appropriately plugged and abandoned in accordance with Section 6.3.2 of the approved license application.

10.6 Groundwater Restoration. The licensee shall conduct groundwater restoration activities in accordance with Section 6.2.3 of the approved license application. Permanent cessation of lixiviant injection in a wellfield would signify the licensee's intent to shift from the principal activity of uranium production to the initiation of groundwater restoration. Prior to initiation of groundwater restoration activities, the licensee shall determine the restoration schedule. If the licensee determines that these activities are inconsistent with the schedule as presented in Section 6.0 of the approved license application, then the licensee shall submit an alternate schedule request that meets the requirements of 10 CFR 40.42.

Hazardous constituents in the groundwater shall be restored to the numerical groundwater protection standards as required by 10 CFR 40, Appendix A, Criterion 5(B)(5). In submitting any license amendment application requesting review of proposed alternate concentration limits (ACLs) pursuant to Criterion 5(B)(6), the licensee must also show that it has first made reasonable effort to restore the specified hazardous constituents to the background or maximum contaminant levels (whichever is greater).

Changes to groundwater restoration or post-restoration monitoring plans shall be submitted to the NRC for review and approval at least 60 days prior to groundwater restoration in a wellfield.

10.7 The licensee shall maintain an inward hydraulic gradient in each individual wellfield starting when lixiviant is first injected into the production zone and continuing until the initiation of the stabilization period.

10.8 The licensee is permitted to construct and operate two lined Storage Ponds as described in Section 4.2.5 of the approved license application. The ponds will be used for storage of liquid byproduct material prior to disposal in a deep disposal well as described in Section 4.2.5 of the approved application. Routine pond inspections will be conducted in accordance with procedures defined in Section 5.3.2 of the approved license application. The inspections include:

A) Daily Inspections. The licensee will perform daily inspections in accordance with Section 5.3.2.1 of the approved license application. The inspections will include visual inspections of the piping, berms, diversion ditches, freeboard and leak detection systems. The minimum freeboard is 3 feet. If during the daily inspections a fluid height in any of the standpipes for the pond leak detection system is found to be in any excess of six (6) vertical inches, then the licensee will collect a sample of the fluid for analysis of specific conductance. If the specific conductance of the fluid in the leak detection system is in excess of 50 percent of the specific conductance of fluids in the pond, then it is concluded that a leak has occurred in the pond primary liner and the



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licensee will perform mitigative and corrective actions. The corrective actions include notifying the NRC Project Manager by telephone or email within 48 hours and lowering the water level in the pond sufficiently to eliminate the leak. If corrective actions are not completed within 60 days, the pond will not be used to store byproduct material until the liner is inspected by qualified personnel as discussed in subsection D. The licensee will submit a report to NRC upon completion of the corrective actions including documentation of all pond repairs. Routine daily inspections reports will be maintained on-site for NRC staff to review during routine inspections.

- B) Weekly Inspections. The licensee will conduct weekly inspections in accordance with Section 5.3.2.2 of the approved license application. The inspections will include visual inspection of the entire area including perimeter fencing. The inspection report will be reviewed by the RSO, Manager of EHS and Regulatory Affairs and Operations Manager. Routine weekly inspections reports will be maintained on-site for NRC staff to review during inspections.
- C) Quarterly Inspections. The licensee will conduct quarterly inspections in accordance with Section 5.3.2.3 of the approved license application. The inspections will also include sampling of the designated groundwater monitoring system. Results of the quarterly inspections will be included the quarterly report submitted to NRC as discussed in LC 11.1(A). Water levels at the wells in the groundwater monitoring system will be monitored monthly. Should water levels rise in the wells, the licensee shall institute an investigation. The investigation will evaluate whether or not the increased water levels are attributed to natural infiltration of surface water or infiltration of fluids from the pond. If the source of the water is attributed to the pond leakage, then the licensee will immediately perform corrective action to eliminate the leak and any appropriate remedial actions including characterization of impacts to shallow soils and water in the uppermost aquifer. Results of the quarterly inspections will be submitted to NRC for review.
- D) Annual Technical Inspection. The licensee will conduct annual inspections in accordance with Section 5.3.2.4 of the approved license application. The annual inspection will include a review of the previous year's daily, weekly and quarterly inspections, assessment of the hydraulic and hydrologic capacities, and a survey of the embankment by a qualified personnel. A copy of the report will be submitted to NRC for review.

- 10.9 The licensee shall establish and conduct an effluent and environmental monitoring program in accordance with those programs described in Section 5.7.8.2 (Surface Water Monitoring, Private Well Monitoring and Life-of-Mine Wells), and Section 5.7.7.1 (radon, air particulate, direct radiation, and soil) of the approved license application.

*Facility Specific Conditions*

- 10.10 Prior to the injection of lixiviant into a production unit, the licensee will attempt to locate and abandon all historic drillholes located within the perimeter well ring such that the drillhole will not provide a conduit for the migration of production fluids. The licensee will document its efforts to identify and properly abandon all abandoned drillholes within the area of influence of a wellfield in a report submitted to NRC prior to the start of operations at the production unit. If a vertical excursion is detected during operations, then injection of lixiviant into the area surrounding the monitoring well

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- will cease until the licensee demonstrates to the satisfaction of NRC staff that the vertical excursion is not attributed to leakage through any abandoned drillhole.
- 10.11 For mine units that abut (located within 100 feet of) the Lost Creek Fault, the licensee shall submit a plan to NRC for review and approval documenting the location and screened horizon of monitoring wells to monitoring potential excursions across the fault into the upper and/or lower aquifers on the opposite side of the fault. The additional wells will be included in the routine excursion monitoring program. The monitoring parameters will include the depth to water measurements and corresponding groundwater elevations.
- 10.12 Wellfield Packages. Prior to principal activities in a new wellfield, the licensee shall submit a hydrologic test data package to the NRC for review and approval. A hydrologic test package shall be submitted at least 60 days prior to the planned start date of lixiviant injection. In each wellfield data package, the licensee will document that all perimeter monitoring wells are screened in the appropriate horizon in order to provide timely detection of an excursion.
- 10.13 Wellfield Inspections. Injection manifold pressures and flow rates shall be measured and recorded daily by the on-line computer system and/or Wellfield Operator. During wellfield operations, injection pressures shall not exceed the specified maximum operating pressure as specified in Section 3.2.6 of the approved license application. To the extent possible, the daily inspections should visually inspect and document leaks or other abnormalities in the wellfield piping, wellheads or header houses in accordance with Section 3.2.7.5 of the approved license application. The licensee shall conduct the weekly in-plant inspection and audit programs described in Section 5.3 of the approved license application. In addition, as described in Sections 5.7.1 and 5.7.6 of the approved license application and supplements, the RSO, HPT(s), or designee, shall document that radiation control practices are being implemented appropriately.
- 10.14 The licensee will use calibrated radiation instrumentation that can detect radiation exposure readings that span from the lower limit of detection (LLD), as described in Regulatory Guide 8.30 (as revised), to a higher dose rate that can be reasonably measured to ensure the magnitude and extent of radiation levels are measured in accordance with 10 CFR 20.1501(a)(2)(i).
- 10.15 The licensee shall conduct radiological characterization of airborne samples for natural U, Th-230, Ra-226, Po-210, and Pb-210 for each restricted area air particulate sampling location at a frequency of once every 6 months for the first two years, and annually thereafter to ensure compliance with 10 CFR 20.1204(g). The licensee shall also evaluate changes to plant operations to determine if more frequent radionuclide analyses are required for compliance with 10 CFR 20.1204(g).
- 10.16 Any area with exposure rates that exceed 2 millirem in any one hour must be immediately treated as either a controlled area or restricted area in accordance with 10 CFR 20.1301(a)(2).
- 10.17 The licensee shall ensure radiation safety training is consistent with Regulatory Guides 8.13, "Instruction Concerning Prenatal Radiation Exposure," (as revised) and 8.29, "Instruction Concerning Risks from Occupational Radiation Exposure," (as revised) in addition to the requirements in Section 2.5 of Regulatory Guide 8.31 (as revised), or NRC approved equivalent.

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**SECTION 11: Monitoring, Recording, and Bookkeeping Requirements**

*Standard Conditions*

- 11.1 In addition to reports required to be submitted to NRC or maintained on-site by the applicable parts of Title 10 of the Code of Federal Regulations, the licensee shall prepare the following reports related to operations at the facility:
- A) A quarterly report that includes a summary of the weekly excursion indicator parameter values, corrective actions taken, and the results obtained for all wells that were on excursion status during that quarter. This report shall be submitted to NRC within 30 days following completion of the reporting period.
  - B) A semi-annual report that discusses: status of wellfields in operation (including last date of lixiviant injection), status of wellfields in restoration, status of any long term excursions and a summary of MITs during the reporting period. This report shall be submitted to NRC within 30 days following completion of the reporting period.
  - C) Quarterly report summarizing daily flow rates for each injection and production well and pressures for each injection manifold within the operating system. This report shall be made available for inspection upon request.
  - D) Consistent with Regulatory Position 2 of Regulatory Guide 4.14 (as revised), a semiannual report that summarizes the results of the operational effluent and environmental monitoring program.
- 11.2 The licensee shall submit the results of the annual review of the radiation protection program performed in accordance with 10 CFR 20.1101(c). This review shall include content and implementation of the radiation protection program. Results shall include an analysis of dose to individual members of the public consistent with 10 CFR 20.1301 and 10 CFR 20.1302.
- 11.3 Establishment of Background Water Quality. Prior to injection of lixiviant in all wellfields, the licensee shall establish background pre-operational groundwater quality data for the overlying and underlying aquifers and restoration target values (RTVs) for the ore zone aquifers for all wellfields. Background water quality sampling shall provide representative pre-operational groundwater quality data and restoration criteria as described in Section 5.7.8.1 of the approved license application.
- The data for each wellfield shall consist, at a minimum, of the following sampling and analyses:
- A) Ore Zone. Samples shall be collected from production and injection wells at a minimum density of one production or injection well per 4 acres. A minimum of six (6) wells will be required for the baseline data per mine unit; the data for subhorizons may be combined if the licensee demonstrates that the grouping of data are statistically valid. Wells selected for the baseline data will be those used to measure restoration success and stabilization.

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- B) Perimeter Monitoring Wells. Samples shall be collected from all perimeter monitoring wells that will be used for excursion monitoring in the HJ Horizon. Perimeter wells will be installed for a mine unit in accordance with information presented in Section 3.2.2.2 of the approved license application. In no case will the perimeter monitoring wells be installed outside of the exempted aquifer as defined by the UIC permit issued by the Wyoming Department of Environmental Quality. If the production patterns include multiple subhorizons within the HJ Horizon, the above requirements will be applicable to all subhorizons.
- C) Overlying and Underlying Aquifers. Samples shall be collected from all monitoring wells in the first overlying and first underlying aquifer at a minimum density of one well per 4 acres of wellfield.
- D) Sampling and Analyses. Four samples shall be collected from each well to establish background levels. The sampling events shall be at least 14 days apart. The samples shall be analyzed for parameters listed in Table 6.2-1 of the approved license application. The third and fourth sample events can be analyzed for a reduced list of parameters; the parameters that can be deleted from analysis are those below the minimum analytical detection limits (MDL) during the first and second sampling events provided the MDLs meet the data quality objectives for the sampling.
- E) Background Water Quality. For the perimeter monitoring wells (Section B) and monitoring wells in the overlying and underlying aquifers (Section C), the background levels shall be the mean values on a parameter-by-parameter, well-by-well basis in accordance with Section 6.2.2 of the approved license application. For the ore zone monitoring wells, the background levels shall be established on a parameter-by-parameter basis using either the wellfield or well-specific mean value. The restoration target value (RTV) for each parameter shall be established using the mean value plus a statistically valid factor to account for spatial variability in the data.
- 11.4 Establishment of UCLs. Prior to injection of lixiviant into a wellfield, the licensee shall establish excursion control parameters and their respective upper control limits (UCLs) in the designated overlying aquifer, underlying aquifer and perimeter monitoring wells in accordance with Section 5.7.8.2 of the approved license application. Unless otherwise determined, the default excursion parameters are chloride, conductivity, and total alkalinity. The UCLs shall be established for each excursion control parameter and for each well based on the mean plus five standard deviations of the data collected for LC 11.3. The UCL for chloride can be set at the background mean concentration and adding either five standard deviations or 15 mg/l, whichever is higher.
- 11.5 Excursion Monitoring. Monitoring for excursions shall be conducted twice monthly (semi-monthly) and at least 10 days apart for wells installed under LC 11.3 (B and C) at all wellfields. If, for any well during a semi-monthly sampling event, the concentrations of any two excursion indicator parameters exceed their respective UCL or any one excursion indicator parameter exceeds its UCL by 20 percent, then the excursion criterion is exceeded and a verification sample shall be taken from that well within 48 hours after results of the first analyses are received. If the verification sample confirms that the excursion criterion is exceeded, then the well is placed on excursion status. If the verification sample does not confirm that the excursion criterion is exceeded, a third sample shall be taken within 48 hours after the verification sampling. If the third sample shows that the excursion

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criterion is exceeded, the well is placed on excursion status. If the third sample does not show that

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the excursion criterion is exceeded, the first sample shall be considered to be an error and routine excursion monitoring is resumed (the well is not placed on excursion status).

Upon confirmation of an excursion, the licensee shall notify NRC, as discussed below, implement corrective action, and increase the sampling frequency for the excursion indicator parameters at the well on excursion status to at least once every seven days. Corrective actions for confirmed excursions may be, but are not limited to, those described in Section 5.7.8.2 of the approved license application. An excursion is considered corrected when concentrations of all indicator parameters are below the concentration levels defining the excursion for three consecutive weekly samples.

If an excursion is not corrected within 60 days of confirmation, the licensee shall either: (a) terminate injection of lixiviant within the wellfield until an excursion is corrected; or (b) increase the surety in an amount to cover the full third-party cost of correcting and cleaning up the excursion. The surety increase shall remain in force until the NRC has verified that the excursion has been corrected and cleaned up. The written 60-day excursion report shall identify which course of action the licensee is taking. Under no circumstances does this condition eliminate the requirement that the licensee must remediate the excursion to meet groundwater protection standards as required by LC 10.7 for all constituents established per LC 11.3.

The licensee shall notify the NRC Project Manager (PM) by telephone or email within 24 hours of confirming a lixiviant excursion, and by letter within 7 days from the time the excursion is confirmed, pursuant to LC 11.6 and 9.3. A written report describing the excursion event, corrective actions taken, and the corrective action results shall be submitted to the NRC within 60 days of the excursion confirmation. For all wells that remain on excursion after 60 days, the licensee shall submit a report as discussed in LC 11.1(A).

- 11.6 Until license termination, the licensee shall maintain documentation on spills of source or byproduct materials (including process solutions) and process chemicals. Documented information shall include, but not be limited to: date, spill volume, total activity of each radionuclide released, radiological survey results, soil sample results (if taken), corrective actions, results of post remediation surveys (if taken), a map showing the spill location and the impacted area, and an evaluation of NRC reporting criteria.

The licensee shall have procedures, which will evaluate the consequences of the spill or incident/event against Subpart M, "Reports," of 10 CFR Part 20, and 10 CFR 40.60 reporting criteria. If the criteria are met, then report to the NRC Operations Center as required.

If the licensee is required to report any wellfield excursions and spills of source, byproduct material, and process chemicals that may have an impact on the environment, or any other incidents/events, to State or Federal Agencies, a report shall be made to the NRC Headquarters Project Manager (PM) by telephone or electronic mail (e-mail) within 24 hours. This notification shall be followed, within 30 days of the notification, by submittal of a written report to NRC Headquarters, as per License Condition 9.3, detailing the conditions leading to the spill or incident/event, corrective actions taken, and results achieved.

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**SECTION 12.0: Preoperational Conditions**

*Standard Conditions*

- 12.1 Prior to commencement of operations in any wellfield, the licensee shall obtain all necessary permits and licenses from the appropriate regulatory authorities. The licensee shall submit a copy of all permits for its Class I underground injection wells, as well as documents clearly delineating the approved aquifer exemption areas and boundaries for the Class III wells to the NRC.
- 12.2 Prior to commencement of operations, the licensee shall coordinate critical emergency response requirements with local authorities, fire department, medical facilities, and other emergency services. The licensee shall document these coordination activities and maintain such documentation on-site.
- 12.3 The licensee shall not commence operations until the NRC performs a preoperational inspection to confirm, in part, that operating procedures and approved radiation safety and environmental monitoring programs are in place, and that preoperational testing is complete.

The licensee should inform the NRC, at least 90 days prior to the expected commencement of operations, to allow for sufficient time for NRC to plan and perform the preoperational inspection.

- 12.4 The licensee shall identify the location, screen depth, and estimated pumping rate of any new groundwater wells or new use of an existing well within the license area since the application was submitted to the NRC. The licensee shall evaluate the impact of ISR operations to potential groundwater users and recommend any additional monitoring or other measures to protect groundwater users. The evaluation shall be submitted to the NRC for review and approval prior to commencement of operations.
- 12.5 Prior to commencement of operations, the licensee shall submit the qualifications of radiation safety staff members for NRC review.
- 12.6 Prior to commencement of operations, the licensee shall submit a copy of the solid byproduct material disposal agreement to the NRC.

*Facility Specific Conditions*

Prior to the commencement of operations, the licensee shall request an amendment to remove the following items in LC 12.7 to LC 12.15.

- 12.7 The licensee shall install two monitoring wells (MW-2 and MW-3) in the southwestern and southeastern corner of the storage pond area in accordance with Section 4.2.5.4 of the approved license application. The wells along with existing wells MW-1 and MW-4, will be included in the quarterly monitoring program as described in Section 5.3.2.3 of the approved license application.
- 12.8 The licensee will continue to collect additional meteorological data on a continuous basis at a data recovery rate of 90 percent until the data collected is determined by the NRC to be representative of long-term conditions. Justification of the similarity or validity of the data will include analysis of the

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statistical data presented to illustrate confidence in the representativeness of the data. The data collected shall include, at a minimum, temperature, precipitation, wind speed, wind direction, and an annual wind rose. The submittal shall include a summary of the stability classification.

- 12.9 The licensee shall submit a preoperational radiological environmental monitoring program report for NRC approval that will include game as a food sample, analyze surface water for dissolved Ra-226, and soil samples co-located with air particulate samples, as described in Regulatory Guide 4.14 to comply with Criterion 7 to Appendix A of 10 CFR Part 40, prior to major site construction.
- 12.10 The licensee shall provide for the following information for the airborne effluent and environmental monitoring program in which it shall:
- A) Discuss how, in accordance with 10 CFR 40.65, the quantity of the principal radionuclides from all point and diffuse sources will be accounted for, and verified by, surveys and/or monitoring.
  - B) Evaluate the member(s) of the public likely to receive the highest exposures from licensed operations consistent with 10 CFR 20.1302.
  - C) Discuss and identify how radon (radon-222) progeny will be factored into analyzing potential public dose from operations consistent with 10 CFR Part 20, Appendix B, Table 2.
  - D) Discuss how, in accordance with 10 CFR 20.1501, the occupational dose (gaseous and particulate) received throughout the entire License Area from licensed operations will be accounted for, and verified by, surveys and/or monitoring.
- 12.11 The licensee shall develop a survey program for beta/gamma contamination for personnel contamination from restricted areas, and beta/gamma contamination in unrestricted and restricted areas that will meet the requirements of 10 CFR Part 20, Subpart F.
- The licensee shall provide for NRC review and approval the surface contamination detection capability (scan MDC) for radiation surveys meters used for contamination surveys to release equipment and materials for unrestricted use and for personnel contamination surveys. The detection capability in the scanning mode for the alpha and beta radiation expected shall be provided in terms of dpm per 100 cm<sup>2</sup>.
- 12.12 The licensee shall submit to the NRC for review and approval the procedures by which it will ensure that unmonitored employees will not exceed 10 percent of the dose limit.
- 12.13 The applicant will provide a revised decommissioning, decontamination, and reclamation plan within 90 days of receipt of license. The revised plan will include soil cleanup criteria for radionuclides other than radium based on the radium benchmark dose method, as well as procedures to monitor for beta-gamma contamination on equipment, structures, and material released for unrestricted use. The soil cleanup criteria, based on the radium benchmark dose methodology for U and other radionuclides, will demonstrate that residual radioactivity in soil meet the criteria in 10 CFR 40, Appendix A, Criterion 6(6).



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12.14 Prior to operations, the licensee shall submit a completed Quality Assurance Project Plan in accordance with the Table of Contents presented in Attachment 5.2-1 of the approved application.

FOR THE NUCLEAR REGULATORY COMMISSION

Dated: \_\_\_\_\_

\_\_\_\_\_  
Keith I. McConnell, Deputy Director  
Decommissioning and Uranium Recovery  
Licensing Directorate  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

DRAFT