License Number SUA-1602

**MATERIALS LICENSE**
**SUPPLEMENTARY SHEET**

Docket or Reference Number
04009092

NRC FORM 374

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.

| Licensee | |
|---|---|
| 1. AUC LLC | 3. License Number SUA-1602 |
| 2. 1536 Cole Blvd.<br>Lakewood, CO 80401 | 4. Expiration Date: February 28, 2027 |
| | 5. Docket No. 04009092<br>Reference No. |

| 6. Byproduct Source, and/or Special Nuclear Material | 7. Chemical and/or Physical Form | 8. Maximum amount that Licensee May Possess at Any One Time Under This License |
|---|---|---|
| a. Natural Uranium<br>b. Byproduct material as defined in 10 CFR 40.4 | a. Any<br>b. Unspecified | a. Unlimited<br>b. Quantity generated under operations authorized by this license |

**SECTION 9: Administrative Conditions**

*Standard Conditions*

9.1 The authorized place of use shall be the licensee's Reno Creek Project in situ recovery (ISR) in Campbell County, Wyoming. The licensee shall conduct operations within the Project area boundaries shown in Figure 1-2 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 October 3, 2012 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML122890785), and supplemented by submittals dated June 7, 2013 (ML131680092), July 19, 2013 (ML132190282), June 13, 2014 (ML14169A452), June 24, 2014, (ML14182A470), September 4, 2014 (ML14251A011), December 23, 2014 (ML15002A077), April 22, 2015 (ML15119A317), and November 23, 2016 (ML16337A046). The approved application and supplements, hereby, are incorporated by reference, except where superseded by specific conditions in this license. The licensee must maintain the approved,

updated, license application on site.

Whenever the word “will” or “shall” is used in the above referenced documents, it shall denote a requirement. The use of the word “Wellfield” in this license is synonymous with the use of the term “Production Unit” or as a general descriptive term; it may or may not equate to wellfield as defined in the approved license application. A “wellfield production area” means the area in which lixiviant is injected into the subsurface. The use of “verification” in this license with respect to a document submitted for U.S. Nuclear Regulatory Commission (NRC) staff review means a written acknowledgement by NRC staff that the specified submitted material is consistent with commitments in the approved license application, or requirements in a license condition or regulation. A verification will not require a license amendment.

9.3 All written notices and reports sent to the NRC as required under this license and by regulation shall be addressed as follows: ATTN: Document Control Desk, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001. An additional copy shall be submitted to: Deputy Director, Division of Decommissioning, Uranium Recovery and Waste Programs, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Mail Stop T-8F5, 11545 Rockville Pike, 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 tests 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 important to safety 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 important to safety with a different result than previously evaluated in the license application (as updated); or

vii Result in a departure from the method of evaluation described in the license application (as updated) used by the NRC in establishing the final safety evaluation report (FSER), environmental impact statement (EIS), environmental assessment (EA), technical evaluation reports (TERs), or other analyses and evaluations for license amendments.

For purposes of this paragraph as applied to this license, SEMS important to safety means any SEMS that has been referenced in a staff SER, TER, EA, or EIS, and supplements and amendments thereof.

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 meeting recommendations in paragraph 2.4 of Regulatory Guide 8.31 (Rev. 1) 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 groundwater restoration. The surety shall also include the costs associated with all soil and water sampling analyses

necessary to confirm the completion 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 the Reno 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 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 staff 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 approved, 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 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 Reno 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 staff review and approval 90 days prior to commencing operations.

9.6 Release of surficially contaminated equipment, materials, or packages for unrestricted use 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," (the Guidelines) dated April 1993 (ADAMS Accession No. ML003745526) or suitable alternative procedures approved by the NRC prior to any such release.

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.

Personnel performing contamination surveys for items released for unrestricted use shall meet the qualifications as health physics technician or radiation safety officer as defined in Regulatory Guide 8.31 (Rev. 1). Personal effects (e.g., notebooks and flash lights) which are hand carried need not be subjected to the qualified individual survey or evaluation, but these items should be subjected to the same survey requirements as the individual possessing the items.

9.7 The licensee shall follow the guidance set forth in NRC Regulatory Guides 8.22, "Bioassay at Uranium Mills" (Rev. 1), 8.30, "Health Physics Surveys in Uranium Recovery Facilities" (Rev. 1) and 8.31, "Information Relevant to Ensuring that Occupational Radiation Exposure at Uranium Recovery Facilities will be As Low As Is Reasonably Achievable (ALARA)," (Rev. 1) or NRC-approved equivalent with the following exception:

The licensee may identify one or more qualified designees to perform daily inspections in the occasional absence of the radiation safety officer (RSO) and radiation safety technician (RST). A qualified designee will meet the minimum qualifications and perform only those duties as outlined for a qualified Designated Operator as specified in the licensee's submittal dated December 23, 2014 (ML15002A077).

A qualified designee may perform daily inspections on weekends, holidays, and times when both the RSO and RSTs must both be absent (e.g., illness or offsite training). With the exceptions of those instances when a Federal holiday falls on a Friday or Monday, or the Thanksgiving holiday, qualified designees will not conduct the daily inspections for more than a total of two days per week. When a Federal holiday falls on a Friday or Monday, qualified designees may perform the daily inspections for a total of three consecutive days. For the Thanksgiving holiday only, qualified designees may perform the daily inspections for a total of four consecutive days. The licensee will also have the RSO or RST available by telephone while a qualified designee is performing the daily inspections.

Reports generated by a qualified designee will be reviewed by the RSO or an RST as soon as practicable, but not later than the close of business of the next work day following an absence, weekend, or holiday. The RSO or RST review shall be annotated with date and time on the report or other document that can be inspected upon request.

Notwithstanding the License Condition (LC) 9.4 change process, no additional exceptions to the guidance will be implemented without written NRC verification that the criteria in LC 9.4 do not require a license amendment.

9.8 Cultural Resources. Before engaging in any developmental activity not previously assessed by the NRC, and within the direct area of potential effects (APE) the licensee shall administer a cultural resource inventory. 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 Part 800), and the Archaeological Resources Protection Act (as amended) and its implementing regulations (43 CFR Part 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 to proceed from the Wyoming State Historic Preservation Officer or the NRC, as appropriate. For developmental activities outside of the direct APE, the NRC shall be notified and provide appropriate authorization before commencement of those activities.

9.9 The licensee shall dispose of solid byproduct material from the Reno Creek Project at a site that is authorized by NRC or an NRC-Agreement State to receive such byproduct material. The licensee's approved solid byproduct material disposal agreement shall be maintained on site during any time the facility is in operation. In the event that the agreement expires or is terminated, the licensee shall notify the NRC in writing 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 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 and/or sodium bicarbonate; and hydrogen peroxide and/or oxygen, as specified in Section 3.1.4.1 of the licensee's approved license application.

10.2 Facility Throughput. The Reno Creek Project processing facility throughput shall not exceed a maximum instantaneous flow rate of 11,000 gallons per minute, excluding restoration flow. The annual production of dried yellowcake shall not exceed two million pounds.

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 staff review and approval. The plan shall represent as-built conditions at the Reno Creek Project.

10.4 The licensee shall develop and implement written standard operating procedures (SOPs) prior to operation for:

A) All routine operational activities involving radioactive and non-radioactive materials associated with licensed activities that are handled, processed, stored, or transported by employees;

B) All routine 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. Should an activity be deemed 'non-routine', its procedures will be documented in a specific Radiation Work Permit for that non-routine activity.

10.5 Mechanical Integrity Tests. The licensee shall construct all wells in accordance with methods described in Section 3.1.3 of the approved license application. Initially, mechanical integrity tests (MITs) shall be performed on all wells (injection, extraction, and monitoring wells) before the well is utilized and on wells that have been serviced with equipment or procedures that could damage the well casing. Each injection and recovery well shall be retested at least once every five years it is in use. Integrity tests shall be performed in accordance with Section 3.1.3.3 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 3.1.3.3 of the approved license application.

10.6 Groundwater Restoration. The licensee shall conduct groundwater restoration activities in accordance with Section 6.1.5 of the approved license application. Permanent cessation of lixiviant injection in a Production Unit would signify the licensee's intent to shift from the principal activity of uranium recovery to the initiation of groundwater restoration and decommissioning for any particular Production Unit. If the licensee determines that these activities are expected to exceed 24 months for any particular Production Unit, then the licensee shall submit for approval an alternate schedule request to the NRC that meets the requirements of 10 CFR 40.42.

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

Restoration Stability Monitoring. The licensee shall conduct sampling of the parameters included in the baseline sampling under LC 11.3 during the restoration stability period in accordance with Section 6.1.5 of the approved application. The sampling consists of four samples during a nine month period. The sampling shall include the specified production zone aquifer wells used to define the baseline levels. The applicant shall continue the stability monitoring until the data show, for all parameters monitored, no statistically significant increasing trend, which would lead to an exceedence of the relevant standard in 10 CFR Part 40, Appendix A, Criterion 5B(5).

10.7 The licensee shall maintain a net inward hydraulic gradient at a Production Unit as measured from the surrounding perimeter monitoring well ring starting when lixiviant is first injected into the

production zone and continuing until initiation of the stabilization period.

10.8 The licensee shall establish and conduct an effluent and environmental monitoring program in accordance with programs described in Section 5.7.7 (Airborne Effluent and Environmental Monitoring Programs) and Section 5.7.8 (Groundwater/Surface Water Monitoring Program) of the approved license application.

*Facility Specific Conditions*

10.9 The licensee is permitted to construct and operate a single lined storage pond as described in Section 4.3.5 of the approved license application. The pond will be used for retention of liquid byproduct material prior to disposal in a deep disposal well. Pond inspections will be conducted in accordance with procedures defined in Sections 4.3.5.3 and 5.3.1 of the approved license application. The inspections include:

A) Daily Inspection. The licensee will perform daily inspections in accordance with Sections 4.3.5.3.1 and 5.3.1.1 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 two 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 excess of six 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 a leak has occurred in the pond primary liner and the licensee will perform mitigative and corrective actions. The corrective actions include notifying the NRC Headquarters Project Manager (PM) by telephone or electronic (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 any byproduct material until the liner is inspected by qualified personnel as required by Subsection D (Annual Technical Inspection). The licensee will submit a report to the NRC upon completion of the corrective actions including documentation of all pond repairs. Daily inspection reports will be maintained onsite for NRC staff review.

B) Weekly Inspection. The licensee will conduct weekly inspections in accordance with Sections 4.3.5.3.2 and 5.3.1.2 of the approved license application. The inspections will include visual inspection of the entire area including perimeter fencing. The weekly pond inspection report will be reviewed by the Manager of Health, Safety and Environmental Affairs, and the Operations Manager. The weekly inspection reports will be maintained onsite for NRC staff review.

C) Quarterly Inspection. The licensee will conduct quarterly inspections in accordance with Section 4.3.5.3.3 of the approved license application. Results of the quarterly inspections will be included in the semi-annual report submitted to the NRC as required by LC 11.1. If groundwater quality in the monitoring wells indicates a release of fluids from the pond, then the licensee will immediately perform corrective actions to eliminate the leak and any appropriate remedial actions including characterization of impacts to shallow soils and water in the uppermost aquifer.

D) Annual Technical Inspection. The licensee will conduct annual inspections in accordance with

Section 4.3.5.3.4 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 qualified personnel. A copy of the report will be submitted to the NRC for review.

10.10 The licensee shall submit to NRC staff for review and approval, plans for equipment and procedures prior to the use, storage, handling and transport of biological or chemical materials other than sodium sulfide for reductant injections during restoration.

10.11 Prior to conducting tests for a wellfield data package, the licensee will attempt to locate and abandon all historic drillholes as outlined in the approved license application within: A) The perimeter well ring for the Production Unit; and B) Downgradient of the wellfield between the perimeter well ring and anticipated point of exposure for a future alternate concentration limit (ACL) application pursuant to 10 CFR Part 40, Appendix A Criterion 5B(5)(c) by electing to abandon the downgradient historical drillholes either:

(i) prior to the start of operations, or
(ii) prior to the submittal of an ACL application. If the drillholes are abandoned after the start of operations of a wellfield, then the licensee is required to verify the location of such drillholes prior to the start of operation of that wellfield and provide the cost to cover the eventual abandonment of the drillholes in its surety estimate.

The licensee will document such efforts to identify and properly abandon all drillholes in the wellfield data package.

10.12 Wellfield Data Package. Prior to conducting principal activities in a new Production Unit, the licensee shall submit a hydrologic test data package (wellfield data package) to the NRC. The initial wellfield data package will be submitted for NRC staff review and verification. Each wellfield data 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: (1) all perimeter monitoring wells are screened in the appropriate horizon in order to provide timely detection of an excursion; and (2) the background values to establish groundwater protection standards and Upper Control Limits (UCLs) for the Production Unit are in accordance with LC 11.3. The wellfield data package will adequately define heterogeneities that may affect the chemical signature and groundwater flow paths within the ore zone as described in Sections 2.7.2.3, 3.1.1 and 5.7.8.1 of the approved license application with the following conditions:

(a) The licensee will construct monitoring wells used for the groundwater detection monitoring programs at the Production Units by Methods 1, 2 or 3 as defined by the approved license application. The licensee will document the potentiometric surface isopleth map for the OM aquifer in the wellfield data package. The licensee will include an analysis of flare in the wellfield data package. The calculated flare should be based on operational history after the initial wellfield data package. If the Production Unit contains atypical patterns (e.g., line or staggered line patterns), the licensee will provide specific justification for the calculated flare associated with the atypical patterns.

(b) If a non-AUC controlled well (e.g., Coal Bed Methane (CBM) well, Bureau of Land Management

(BLM) All Night Creek wells) exists within a proposed Production Unit, the licensee will evaluate the need to monitor the well water quality or install monitoring wells to monitor the potential migration should the casing cement pose a possible conduit for fluid migration, and include the results of that evaluation in the wellfield data package. If the non-AUC controlled well is screened within the ore zone, the licensee will submit to the NRC, for review and approval, a plan documenting the resolution of a well in the ore zone – including any discussions with the owners of that well.

(c) If the Production Unit is located within 400 feet of a tract of land for which the licensee does not hold mineral rights, the licensee will include in the wellfield data package a Memorandum of Reciprocal Well Agreement with the mineral rights holder.

(d) If production or monitoring wells are completed in a 100-year flood plain, the licensee will ensure the wellheads have mitigation measures for flood protection as specified in Section 2.7.1.5.2 of the approved license application and include the documentation of those measures in the wellfield data package.

10.13 Facility and Wellfield Inspection. Injection manifold pressures and flow rates shall be measured and recorded daily by the in-line computer system and/or Wellfield Operator. During wellfield operations, injection pressures shall not exceed the maximum operating pressure as specified in Section 3.1.3.3 of the approved license application. To the extent possible, the daily inspections shall include visual inspections and document leaks or other abnormalities in the wellfield piping, wellheads, or header houses in accordance with Section 3.1.6 of the approved license application. The licensee shall conduct the weekly in-plant inspection and audit programs described in Section 5.3.1 of the approved license application.

10.14 The licensee will use calibrated radiation instruments that can measure the full range of radiation exposure rates or dose rates for radiological parameters that are reasonably expected at an ISR facility to ensure the magnitude and extent of radiation levels are measured in accordance with 10 CFR 20.1501(a)(2)(i). The instruments used to measure airborne concentrations of radioactive materials will allow for a lower limit of detection (LLD), as described in Regulatory Guide 8.30 (Rev. 1), to provide a 95 percent confidence that measurements are in conformance with 10 CFR 20.1201, 20.1204, 20.1301, 20.1501, and 20.1502.

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 six months for the first two years, and annually thereafter to ensure compliance with 10 CFR 20.1204(g).

10.16 The licensee shall ensure radiation safety training is consistent with Regulatory Guides 8.13, "Instruction Concerning Prenatal Radiation Exposure," (Rev. 3) and 8.29, “Instruction Concerning Risks from Occupational Radiation Exposure," (Rev. 1) in addition to the requirements in Section 2.5 of Regulatory Guide 8.31 (Rev. 1), and as described in Section 5.5 of the approved application, or NRC-approved equivalent.

10.17 The licensee shall maintain a groundwater detection monitoring program for the storage pond that meets requirements of Criteria 5 and 7A of 10 CFR Part 40, Appendix A. The elements in this program will be documented in the licensee's SOPs.

10.18 Emission Controls (Dryer). The licensee shall maintain effluent control systems as specified in Sections 3.2.1.4, and 5.7.1.1 of the approved license application.

If any of the yellowcake emission control equipment fails to operate within specifications set forth in the SOPs, the drying and packaging room shall immediately be closed-in as an airborne radiation area and heating operations shall be switched to cooldown, and packaging operations shall be temporarily suspended. Packaging operations shall not be resumed until the vacuum system draws air into the system.

10.19 All liquid effluents from process buildings and other process waste streams, with the exception of sanitary wastes, shall be returned to the process circuit or properly disposed. The licensee is authorized to dispose of process solutions, injection bleed, and restoration brine using deep well injection, as permitted by WDEQ and described in the approved license application.

The licensee will obtain the necessary permits and construct at least one Class I Underground Injection Control (UIC) deep disposal well prior to the commencement of operations of the Reno Creek Project. The licensee shall ensure the deep disposal wells shall have enough capacity to handle the disposal of the total liquid effluent generation as stated in Section 3.1.8 of the approved license application. The licensee will ensure adequate deep well disposal capacity exists to dispose of liquids under normal operating conditions during production, production and restoration, and restoration phases as stated in the approved license application. In the event of a decrease in disposal capacity, the license shall decrease or stop its production rate (except to maintain an inward gradient per LC 10.7) to adequately dispose of all liquid effluents and increase its disposal capacity by completing another of the approved deep disposal wells. The licensee will notify the NRC Headquarters PM by telephone or electronic mail (email) within 24 hours if a disposal well is shut down and becomes inoperable, for reasons other than routine maintenance or required testing that is completed within 48 hours of shutdown. If necessary, the licensee will use additional deep well capacity, surge tanks, or reduce and/or cease injection activities until the operation of the disposal well is restored.

The licensee will notify the NRC Headquarters PM by telephone or email when the disposal well is placed back into service and report any repairs or service completed on the well that is not associated with routine maintenance. The licensee shall maintain a record of the volumes of solution disposed in each disposal well and submit this information in the annual monitoring report.

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

*Standard Conditions*

11.1 In addition to reports required to be submitted to NRC staff 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 excursion indicator parameter concentrations, 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 60 days following completion of the reporting period.

B) A quarterly report summarizing daily flow rates and pressures for each injection manifold within the operating system. This report shall be made available for inspection upon request.

C) A semi-annual report that discusses: status of Production Units (or wellfields if appropriate) in operation (including last date of lixiviant injection), progress of Production Units (wellfields) in restoration, status of any long term excursions and a summary of the MITs during the reporting period. This report shall be submitted to NRC within 60 days following completion of the reporting period.

D) Consistent with Regulatory Position 2 of Regulatory Guide 4.14 (Rev. 1), a semiannual report that summarizes the results of the operational effluent and environmental monitoring program. For this program, the nearby water supply wells are those within two kilometers (km) of the perimeter ring monitoring wells for all Production Units undergoing recovery operations or restoration. The report will include results of all wells, including industrial wells, and surface water sampling, if available, in accordance with the approved license application. This report shall be submitted to NRC within 60 days following completion of the reporting period.

E) An annual report pursuant to LC 9.4(E).

F) An annual report that summarizes modifications to the inventory of nearby water supply wells and land-use survey within two km of any Production Unit. This report shall be submitted to NRC within 90 days following completion of the reporting period.

11.2 The licensee shall submit the results of at least an annual review of the radiation protection program performed in accordance with 10 CFR 20.1101(c). This review shall include the 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. This report shall be submitted to NRC within 90 days following completion of the reporting period.

11.3 Establishment of Background Water Quality. Prior to injection of lixiviant in a Production Unit, the licensee shall establish background water quality data for the production zone and overlying aquifers. The background water quality sampling shall provide representative baseline data and establish groundwater protection standards and excursion monitoring upper control limits, as described in Section 5.7.8 of the approved license application and this license condition. The data for each Production Unit shall consist, at a minimum, of the following sampling and analyses:

A) Production Zone Aquifer. To establish a Commission-approved background concentration pursuant to Criterion 5B(5)(a) of 10 CFR Part 40 Appendix A, samples shall be collected from

production and injection wells at a minimum density of one production or injection well per four acres of wellfield production area, or, if a wellfield production area is sufficiently isolated from the other wellfield production areas in the Production Unit, a minimum of two wells. Wells selected for the baseline data will be the same ones used to measure restoration success and stabilization.

B) Perimeter Monitoring Wells. Samples shall be collected from all perimeter monitoring wells that will be used for the excursion monitoring program. The perimeter wells will be installed for a Production Unit in accordance with information presented in Sections 3.1.6 and 5.7.8.1.3 of the approved license application with the following qualifications: The distance to and spacing of the perimeter wells will be 400 feet in both fully saturated and partially saturated portions of the aquifer; and the perimeter wells will be partially penetrating at the horizon corresponding to the nearest inject/production wells. In no case will the perimeter monitoring wells be installed outside of the exempted aquifer as defined by the Class III UIC permit issued by the WDEQ.

C) Overlying Aquifer. Samples shall be collected from all monitoring wells in the first overlying aquifer at a minimum density of one well per four acres of Production Unit.

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 2.7B-22 in Addendum 2.7-B 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 ring monitoring wells (Section B) and monitoring wells in the overlying aquifer (Section C), the background levels shall be established based on a statistically valid analysis of the data on a parameter-by-parameter, well-by-well, Production Unit or sub-set of the Production Unit basis, as deemed appropriate, in accordance with Section 5.7.8.1 of the approved license application. The UCLs for monitoring wells in the perimeter ring and overlying aquifers are established per LC 11.4. For the Production Zone Aquifer monitoring wells, the background levels shall be established on a parameter-by-parameter basis using either the Production Unit, sub-set of the Production Unit or well-specific area. The established background value for each parameter shall be based on a statistically valid analysis of the data, in accordance with Section 5.7.8.1.2 of the approved license application.

11.4 Establishment of UCLs. Prior to injection of lixiviant into a Production Unit, the licensee shall establish excursion control parameters and their respective UCLs in the designated overlying aquifer and perimeter monitoring wells in accordance with Section 5.7.8.1.5 of the approved license application. The default excursion parameters for wells in the Production Zone Aquifer and overlying aquifer are chloride, conductivity, and total alkalinity. The UCLs shall be established for each excursion control parameter and for each well, Production Unit or subset of the Production Unit, as appropriate, based on the mean plus five standard deviations of data collected for LC 11.3. The UCL for chloride can be set at the background mean concentration plus either five standard

deviations or 15 mg/l, whichever is higher.

11.5 Excursion Monitoring. Monitoring for the excursion monitoring program shall be conducted twice monthly (semi-monthly) and at least 10 days apart for wells installed under LC 11.3 (B and C). If, at any monitoring 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 analysis 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 results of the first verification sampling are received. If the third sample shows that the excursion criterion is exceeded, the well shall be placed on excursion status. If the third sample does not show that 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 stated 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 5.7.8.1.6 of the approved license application. An excursion is considered corrected when concentrations of all indicator parameters defining the excursion status are at or below the UCLs defined in LC 11.4 for three consecutive weekly samples.

For Production Units located in an area in which the uppermost aquifer, the “SM Unit”, is comprised of saturated unconsolidated alluvium, the licensee will include monitoring wells in the SM Unit in that area of the wellfield as part of the excursion monitoring program as described above. The wellfield data package must include sufficient justification on the locations, baseline sampling if the frequency is less than quarterly and operational sampling if the frequency is less than semi-monthly for wells in the uppermost aquifer. The justification must demonstrate that the wells provide early detection of a release (including a surficial release).

If a vertical excursion is detected during operations, then injection of lixiviant into the wellfield production area surrounding the monitoring well will cease until the licensee demonstrates to the satisfaction of NRC that the vertical excursion is not attributed to leakage through any abandoned drillhole.

If an excursion is not corrected within 60 days of the initial confirmation, the licensee shall either: (a) terminate injection of lixiviant within the Production Unit, or a portion of the Production Unit provided the licensee demonstrates to NRC that only a portion of the Production Unit is within the area of influence for the excursion) until the excursion is corrected; or (b) increase the financial surety in an amount to cover the full third-party cost for correcting and cleaning up impacts that may be attributed to the excursion. The surety increase shall remain in force until the NRC has verified that the excursion has been corrected and appropriate remedial actions have been undertaken. The written 60-day excursion report shall identify which course of action the licensee is taking if the

excursion has not been corrected. Under no circumstances does this condition eliminate the requirement that the licensee remediate the excursion to meet groundwater protection standards as required by LC 11.3.

The licensee shall notify the NRC Headquarters PM by telephone or email within 24 hours of confirming a lixiviant excursion, and by letter within seven days from the time the excursion is confirmed, pursuant to this license condition and LC 11.6. 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 status 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 written procedures used for evaluating the consequences of the spill or incident/event against 10 CFR Part 20 Subpart M and 10 CFR 40.60 reporting criteria. If the criteria are met, then the licensee will report the spill or incident/event to the NRC Operations Center, as required.

If the licensee is required to report to a State or other Federal agency incidents/events that may have an impact on the environment, including wellfield excursions or spills of source, byproduct material, and/or process chemicals, the licensee shall submit a report to the NRC Headquarters PM by telephone or email within 24 hours. This notification shall be followed, within 30 days of the notification, by submittal of a written report to NRC Headquarters in accordance with LC 9.3, detailing conditions leading to the spill or incident/event, corrective actions taken, and results achieved.

**SECTION 12.0: Preoperational Conditions**

*Standard Conditions*

12.1 Prior to commencement of operations, the licensee shall obtain all necessary permits, licenses and approvals from the appropriate regulatory authorities. The licensee shall submit a copy of the permits it has obtained from other regulatory agencies for any effluent or waste disposal that includes treated or non-treated byproduct material, as well as documents clearly delineating the approved aquifer exemption areas and boundaries for the Class III UIC 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 Prior to commencement of operations, the licensee shall identify the location, screen depth, and estimated pumping rate of any new water supply well or new use for an existing well within two km of a proposed Production Unit, as measured from the perimeter monitoring well ring, since the application was submitted to the NRC. The licensee shall evaluate the impact of ISR operations and recommend any additional monitoring or other measures to protect groundwater users. The evaluation shall be submitted to the NRC staff for review and verification at least 30 days prior to the expected commencement of operations.

12.4 Prior to commencement of operations, the licensee shall submit the qualifications of radiation safety staff members, including the qualifications and responsibilities of a designee, and the policy on the work situations for a declared pregnant worker, for NRC review and verification.

12.5 Prior to commencement of operations, the licensee shall submit a copy of the solid byproduct material disposal agreement to the NRC.

12.6 The licensee shall not commence operations until the NRC performs a preoperational inspection to confirm, in part, that written 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.

*Facility Specific Conditions*

12.7 The licensee shall submit a survey program for NRC Headquarters staff review that meets the requirements of 10 CFR Part 20, Subpart F to detect beta-gamma radiation indicative of contamination on personnel exiting restricted areas and to detect beta-gamma radiation indicative of contamination in unrestricted and restricted areas. The survey program shall contain the surface contamination detection capability (scan minimum detectable concentration (MDC)) of the radiation survey meters used in surveys of personnel contamination and for releasing equipment and materials to unrestricted areas, or for unrestricted use, consistent with the limits described in "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, and Special Nuclear Material" (ADAMS Accession Number ML003745526) and the methodologies described in NUREG-1507 and NUREG-1575. In the scanning mode, the detection capability for any expected alpha and beta radiation shall be provided using the term disintegrations per minute (dpm) per 100 square centimeters ($cm^2$). Additionally, the survey program shall be modeled after a program previously approved by the NRC. The licensee shall receive written verification from NRC Headquarters staff on the requirements specified in this license condition prior to the NRC staff scheduling a preoperational inspection.

12.8 At least 60 days prior to the preoperational inspection, the licensee will submit a completed Quality Assurance Plan (QAP) for NRC staff review and verification. The QAP will be consistent with guidance for a Quality Assurance Project Plan in Regulatory Guide 4.15 (Rev. 2).

**MATERIALS LICENSE**
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12.9 Prior to the preoperational inspection, the licensee will provide to the NRC written SOPs required for LC 10.4, which will include procedures for the management of liquid byproduct material in the event of a pond leak.

12.10 Prior to construction of the storage pond, the licensee shall submit, for NRC review and verification, a groundwater detection monitoring program plan for the retention pond that meets requirements of Criteria 5 and 7A of 10 CFR Part 40, Appendix A.

12.11 The licensee shall complete and submit to the NRC, sample results to complete the preoperational sampling of wells identified within two km of the Reno Creek License area.

12.12 The licensee shall complete and submit to the NRC, sample results to replace the first two sampling events for the site characterization (preoperational sampling) at Well PZM2.

12.13 Prior to commencement of operations, the licensee shall collect twelve months of environmental samples from air monitor stations (AM-7 and AM-8) and a third round of vegetation samples and analysis. The samples from air monitor stations AM-7 and AM-8 will include air particulate, air radon, direct radiation, and soil. The licensee will also provide an updated Preoperational Monitoring Radiological Report that will include the twelve months of samples and results from air monitor stations AM-7 and AM-8, as well as the third round of vegetation samples and results prior to the preoperational inspection.

12.14 Prior to the construction of the storage pond, the licensee shall complete the site-wide quality assurance program and shall notify the NRC staff of its availability.

FOR THE NUCLEAR REGULATORY COMMISSION

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Dated: 02/17/2017

Andrea Kock, Deputy Director
Division of Decommissioning, Uranium Recovery
and Waste Programs
Office of Nuclear Material Safety
and Safeguards