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LOST CREEK ISR, LLC

April 27, 2016

Brian Wood
State of Wyoming
Department of Environmental Quality - Land Quality Division
510 Meadowview Drive
Lander, WY 82520

RE: Submittal of Addendum to Non-Significant Revision 13 to Permit to Mine Lost Creek Project PT788

Dear Mr. Wood,

Enclosed with this cover letter is an addendum to Non-Significant Revision (NSR) 13 to the Permit to Mine for the Lost Creek ISR Project PT788 based on WDEQ-LQD comments received via email on April 18, 2016 and April 25, 2016. An additional index sheet, changed pages, and corrected changed pages (listed in the original index) are included. Corrections were made to pages OP-1, OP-54, and OP-77 - 80.

If you have any questions regarding this submittal please feel free to contact me at the Casper Office.

Sincerely,

Michael D. Gaither
Manager EHS and Regulatory Affairs
Ur-Energy USA, Inc.

Attachments: **NSR 13-2 Index Sheet, replacement pages, corrected pages OP-1, 54, 77-80**

Cc: Mark Newman, BLM Rawlins Office
John Saxton, NRC Project Manager (electronic copy)
Ms. Theresa Horne, Ur-Energy, Littleton Office (electronic copy)

INDEX SHEET FOR MINE PERMIT AMENDMENTS OR REVISIONS

Date: April 27, 2016

MINE COMPANY NAME: Lost Creek ISR, LLC MINE NAME: Lost Creek PERMIT NO.: PT0788

Statement: I, Michael Gaither, an authorized representative of Lost Creek ISR, LLC declare that only the items listed on this and all consecutively numbered Index Sheets are intended as revisions to the current permit document. In the event that other changes inadvertently occurred due to this revision, those unintentional alterations will not be considered approved. Please initial and date. MG 4/27/2016 NSR13-2

NOTES: 1) Include all revision or change elements and a brief description of or reason for each revision element.
2) List all revision or change elements in sequence by volume number; number index sheets sequentially as needed.

VOLUME NUMBER	PAGE, MAP OR OTHER PERMIT ENTRY TO BE REMOVED	PAGE, MAP OR OTHER PERMIT ENTRY TO BE ADDED	DESCRIPTION OF CHANGE
Permit to Mine Volume 5 - Operations Plan	Page OP-53 (Rev6 Feb10)	Page OP-53 (Rev7 Apr16)	Corrected water balance flow volumes
Permit to Mine Volume 5 - Operations Plan	Table OP-6 (Rev4 Oct09)	Table OP-6 (Rev5 Apr16)	Corrected water balance flow volumes
Permit to Mine Volume 5 - Operations Plan	Table OP-7 (Rev4 Oct09)	Table OP-7 (Rev5 Apr16)	Corrected water balance flow volumes

This table is an addendum to the original NSR13 index.

OP 3.6.3 Projected Water Balance and Water Level Changes

In addition to evaluating the operation of each mine unit individually, the overall water balance and water level changes will be taken into account to ensure all aspects of the operation (e.g., ISR and restoration) are being conducted as efficiently as possible. The overall water balance is based on the potential pumping and injection rates at the mine units and the capacity of the Plant and Class III UIC wells for production and for restoration. The water level changes, including both drawdown and mounding from production and injection, respectively, will be evaluated to minimize interference among the mine units and to determine cumulative drawdown.

OP 3.6.3.1 Water Balance

The water balance requirements for the facility over various life-of-project operational modes are presented in this section for the purpose of discussing the correlation of the capacity requirements of the production and restoration schedules with the water/waste water treatment and disposal systems. The water balance discussion, figures and tables included in this section consider the production and restoration phases to be operating at maximum flow capacity so, the full potential contribution of each unit operation to the water balance can be analyzed.

Full production plant capacity is planned for a nominal maximum flow rate of 6,000 gpm. This capacity is determined by the pump and pipeline system design along with the flow rate design capacity of the ion-exchange system. Process plant facilities downstream of the ion exchange circuit have little to no impact on the water balance requirements. A 200 gpm reverse osmosis (RO) treatment unit is incorporated into the production system design. The RO system output will be adjustable to produce concentrated brine at a rate equivalent to the production bleed requirement of 0.5 to 1.5 percent of the production flow. When operating at maximum capacity, the net bleed stream will be at or near 48 gpm. The RO permeate produced at approximately 170 gpm will be returned to the injection lixiviant stream minus a fraction disposed by Class V injection. Incorporating a RO unit into the production stream throughout the operating life will result in lower concentrations of contaminants building up in the lixiviant circuit. The design is expected to ultimately reduce the time and volume requirements for groundwater restoration without altering the production water balance inputs and outputs.

The restoration circuit is designed to process produced water from both the ground water sweep (GWS) and the RO treatment phases of restoration. The circuit will be installed within a designated area of the plant facility. The restoration circuit will be designed to

Table OP-6 Water Balance Summary (Page 1 of 3)

INFLOW (approximate values)				
Operational Phases	**Production Flow to Plant (gpm)**	**Restoration Flow to Plant (gpm)**	**Well Water Supply (gpm)**	**Total Flow to Plant (gpm)**
Full Production Only	6000	0	10	6010
Full Production & GWS	6000	200	10	6210
Full Production, GWS & RO	6000	480	10	6490
Full Production & RO	6000	480	10	6490
GWS & RO	0	800	10	810
RO Only	0	800	10	810

Table OP-6 Water Balance Summary (Page 2 of 3)

OUTFLOW (approximate values)								
Operational Phases	**Injection Flow to Mine Units (gpm)** (A)	**Permeate to Restoration (gpm)** (B)	**Permeate to Disposal (gpm)** **(C)**	**RO Brine to Disposal (gpm)** (D)	**Plant Waste to Disposal (gpm)** (E)	**Total Flow to Disposal Wells (gpm)** (F)	**Flow to WYPDES (gpm)** (G)	**Total Flow from Plant (gpm)** A+B+C+D+E
Full Production Only	5952	0	18	30	10	58	0	6010
Full Production & GWS	5952	0	188	60	10	258	0	6210
Full Production, GWS & RO	5952	259	218	51	10	279	0	6490
Full Production & RO	5952	435	54	51	10	115	0	6502
GWS & RO	0	540	200	60	10	270	0	810
RO Only	0	540	200	60	10	270	0	810

Table OP-6 Water Balance Summary (Page 3 of 3)

BALANCE SUMMARY (approximate values)						
Operational Phases	**Total Flow to Plant** **(gpm)**	**Injection Flow to Mine Units** **(gpm)** (A+B)	**Re-injected Flow** **(percent)**	**Gross Consumptive Use Flow** **(gpm)** (F + G)	**Net Mine Unit Consumptive Removal** **(gpm)** (C + D + G)	**Net Mine Unit Consumptive Removal** **(percent)**
Full Production Only	6010	5952	99.0%	48	38	0.6%
Full Production & GWS	6210	5952	95.9%	258	248	4.0%
Full Production, GWS & RO	6490	6211	95.7%	279	269	4.1%
Full Production & RO	6490	6387	98.4%	115	105	1.6%
GWS & RO	810	540	66.7%	270	260	32.1%
RO Only	810	540	66.7%	270	260	32.1%

Note: Net Mine Unit Consumptive Removal figures do not include Plant Water Supply well contribution Plant Flows.

Table OP-7 Water Balance - Calculation Details (Page 1 of 2)

PRODUCTION PLANT (approximate values)					
Operational Phases	**Production Flow To Plant (gpm)**	**Flow to Production RO (gpm)**	**Production RO Recovery (percent)**	**Production RO Permeate (gpm)** (A)	**Production RO Brine (gpm)**
Full Production Only	6000	200	85.0%	170	30
Full Production & GWS	6000	200	85.0%	170	30
Full Production, GWS & RO	6000	200	85.0%	170	30
Full Production & RO	6000	200	85.0%	170	30
GWS & RO	0	0	85.0%	170	30
RO Only	0	0	85.0%	170	30

Production RO repurposed for restoration GWS and RO and RO only

RESTORATION PLANT (approximate values)						
Operational Phases	**GWS Phase Flow to Plant (gpm)**	**RO Phase Flow to Plant (gpm)**	**Restoration Total Flow to Plant (gpm)**	**Primary Restoration RO Recovery (percent)**	**Primary Restoration RO Permeate (gpm)** (B)	**Primary Restoration RO Brine (gpm)**
Full Production Only	0	0	0	0.00%	0	0
Full Production & GWS	200	0	200	85.0%	170	30
Full Production, GWS & RO	80	400	480	85.0%	408	72
Full Production & RO	0	480	480	85.0%	408	72
GWS & RO	40	760	800	85.0%	510	90
RO Only	0	800	800	85.0%	510	90

Table OP-7 Water Balance - Calculation Details (Page 2 of 2)

SECONDARY BRINE CONCENTRATION (approximate values) *					
Operational Phases	**Secondary RO Feed (gpm)**	**Secondary RO Recovery (percent)**	**Secondary RO Permeate (gpm)**	**Secondary RO Brine (gpm)**	**Total Brine to Disposal (gpm)**
Full Production Only*	0	0%	0	0	0
Full Production & GWS*	0	0%	0	0	0
Full Production, GWS & RO	102	50%	51	51	51
Full Production & RO	102	50%	51	51	51
GWS & RO	120	50%	60	60	60
RO Only	120	50%	60	60	60

** Note: Secondary Brine Concentration not utilized when feed rate would be below 100 gpm.*

PERMEATE UTILIZATION (approximate values)						
Operational Phases	**Total Flow Permeate (gpm)**	**Permeate to Injection (gpm)**	**Permeate to Restoration (gpm)**	**Permeate to Plant Use** (gpm)**	**Permeate to Drill Use (gpm)**	**Permeate to WYPDES (gpm)**
Full Production Only	170	18	0	0-10	0	0
Full Production & GWS	340	188	0	0-10	0	0
Full Production, GWS & RO	629	218	259	0-10	0	0
Full Production & RO	629	54	435	0-10	0	0
GWS & RO	740	200	540	0-10	0	0
RO Only	740	200	540	0-10	0	0

***As needed basis*

OPERATIONS PLAN

Lost Creek ISR, LLC (LC ISR, LLC) has prepared this Operations Plan (OP) for the Wyoming Department of Environmental Quality (WDEQ) in support of a permit to conduct In Situ Recovery (ISR) of uranium in Sweetwater County, Wyoming. The Lost Creek Project (Project) will use existing ISR technology and best industry practices to extract uranium from permeable, uranium-bearing sandstones, located at depths ranging from 300 to 700 feet below surface, through a series of mine units. Each mine unit consists of a "pattern" of production and injection wells, ringed by monitor wells. Once extracted from a mine unit, the uranium will be recovered by means of ion exchange, using commercially available anionic resin, and prepared for shipment as uranium oxide (U_3O_8) "yellowcake" slurry to a facility licensed to process the slurry into dry yellowcake.

OP 1.0 OVERVIEW OF PROPOSED OPERATION

The Lost Creek Permit Area (Permit Area) contains approximately 4,254 acres (**Figure OP-1**). Within that area, the surface to be affected by the ISR operation will total approximately 324 acres (**Figure OP-2a**), following the ore trend which extends east-west through the Permit Area (**Figure OP-2b**). The mine units, the Lost Creek Plant (Plant), the Storage Ponds, and the disposal wells, which are described in more detail below, are the significant surface features associated with the ISR operation. An illustration of a typical ISR operation, such as the Lost Creek Project, is shown on **Figure OP-3a**, and an illustration of a mine unit is shown on **Figure OP-3b**.

The Project requires the preparation, construction, and operation of the following:

- the access roads/utility corridors, including pipelines connecting the mine units to the Plant;
- the Plant, which includes the ion exchange facility and other processing circuits, the shop, the laboratory, storage areas, fuel tanks, the offices, possible living quarters, and parking;
- the Storage Ponds, which will be used in conjunction with the Underground Injection Control (UIC) Class I and Class V wells for waste water disposal, located adjacent to the Plant;
- UIC Class I and Class V wells; and
- the mine units, which include the header houses, through which fluids are routed to/from the injection/production well patterns, and the monitor wells, including those which ring the pattern area and those in overlying and underlying aquifers.

treat a nominal maximum flow of 600 gpm. The capacity of the circuit is determined by the sizing of the ion-exchange and primary RO systems. The primary restoration RO units will be designed to produce a 85/15 split of permeate/brine. The permeate stream will be treated for injection into the active restoration areas while the brine is managed as waste water or treated with a secondary reverse osmosis unit.

A secondary reverse osmosis system will be installed to re-treat the combined brine streams of the primary restoration and production RO units. The unit will have a designed feed capacity of 250 gpm. The secondary RO unit will be operated as a water management tool whenever the combined flow rate of the two primary brine streams exceeds the objective for net consumptive removal of the operating areas. Permeate from the secondary RO will be beneficially used in the restoration circuit to reduce the rate of consumptive removal from the process. The brine produced by the secondary RO will be managed as waste water. This type of system has been demonstrated as technically viable during the groundwater restoration operations of the Christensen Ranch ISR facility and incorporation of the secondary RO unit into the process is considered BPT.

The capacity (flow rate) of the mine unit injection wells will determine the number of wells required in operation to arrive at the plant flow rate capacities for production and injection. LC ISR, LLC has used transmissivity and storativity data determined from aquifer characterization tests (**Appendix D6**) to arrive at an expected average flow rate of 32 gpm per recovery well. Since injection well efficiency approximates production well efficiency and the transmissivity of the formation ultimately defines the rate that water moves through the pore space, the number of injection wells should be expected to closely approximate the number of production wells. However, other factors including ore geometry and effective pattern design often result in injector to producer well ratios of 2:1 or greater. The design basis for the Lost Creek Project is derived to provide the nominal maximum production plant capacity (6,000 gpm) from each typical mine unit. Therefore, each typical mine unit includes approximately 180 (32 x 180 = 5,760 gpm) production wells and 360 (2:1) injection wells in use at any given point in time. The capacity of the mine unit injection wells is not expected to be diminished during the restoration operations. Therefore, full restoration activities will only occur in a portion of a given mine unit at any point in time.

The process liquid waste will be managed through a UIC Class I and a Class V well system. LC ISR LLC has been permitted to operate up to five Class I wells and two Class V wells to serve the waste water disposal needs of the Project. The permit authorizes the operation of each well at a rate not exceeding 50 gpm (250 gpm total) for Class I and 200 gpm for Class V. LC ISR, LLC anticipates that the installation and operation of three Class I wells will capably exceed the maximum rate of waste water production (gross consumptive use) throughout the planned life of the Project. LC ISR, LLC will install additional disposal wells (up to five in total) as required to meet the disposal needs. The maximum rate of waste water production is further discussed in the remainder of this section.

5a, b, c, d, e, and f. The combined volume of eluate bleed and yellowcake wash water will be on the order of 5 gpm. In addition, the laboratory analyses for evaluating uranium content of the production fluid and similar operational parameters will generate liquid waste on the order of 25 gallons per day. These wastes will be collected, treated and the waste discharged to the Storage Ponds and UIC Class I or Class V well(s).

During operations, there will also be an occasional need to decontaminate equipment so it can be disposed of, sent to another NRC licensed facility, or released for unrestricted use. The first step for decontaminating equipment will be to wash the object with high pressure water to remove any potential contaminants. The RSO or Health Physics Technician (HPT) will then scan the object with the appropriate instrument to determine if release standards have been met. If the standards have not been met then an additional wash may be performed to remove residual contamination. The RSO or HPT will then perform a second scan to determine if the item can be released. Since high pressure water will typically be used to decontaminate objects, the volume of water generated is minimal; on the order of 200 gallons per week. The water resulting from decontamination will enter the waste water circuit through a sump and will ultimately be disposed of in the UIC Class I well(s) or in the Class V wells following treatment.

The same process used for decontaminating plant equipment during operations will also be used for decommissioning. The bond calculation conservatively assumes that 100% of the equipment in the plant will require decontamination regardless if it is disposed of at a landfill or as byproduct material. Assuming it takes two hours to pressure wash each piece of equipment at a rate of 3.5 gpm and about 65 pieces of equipment (representative pieces and quantities listed below) must be washed, the total volume of water generated will be about 26,000 gallons:

Fourteen IX columns;
Two elution vessels;
Six eluant storage vessels;
Two waste water storage tanks;
Six RO systems;
Four water storage tanks;
Two yellowcake slurry tanks;
Two filter presses;
Four precipitation cells;
Four resin shakers;
Sixteen pumps and stands.

In addition to the equipment which must be decontaminated, the surface of the concrete plant floor will also need to be decontaminated. The area of the plant floor requiring decontamination will be approximately 22,500 square feet. Assuming an employee can

power wash 10 square feet in 1 minute, it will take 2,250 minutes to wash the affected plant floor. At 3.5 gpm this equates to about 8,000 gallons of water.

Therefore, the total quantity of water required to decontaminate the plant equipment and floor is about 34,000 gallons. After applying a conservative contingency factor of 100%, the total volume of water required for decontaminating at decommissioning is about 68,000 gallons. The waste water generated during final decommissioning will be disposed of in the UIC Class I or Class V wells. Given that the well(s) disposal capacity will be greater than 100 gpm, all of the waste water generated during final decommissioning could be disposed of during the course of a day. It will be necessary to leave the well disposal system in place until the very final stages of decommissioning.

Any equipment which cannot be decontaminated during operations or decommissioning will be stored in a designated restricted area of the plant or plant yard until it can be disposed of as byproduct material at an NRC licensed disposal site or sent to another NRC licensed facility for use. The annual bond assessment will include the cost of disposing of all byproduct material in storage and that which may be generated during decommissioning. Byproduct waste will be stored in a manner that prevents the spread of contamination. For example, openings in tanks will be sealed off if they could leak contaminated material, removable contamination will be washed from the exterior of equipment, and employees will wear appropriate PPE when handling by-product material and will survey according to procedures before exiting the restricted area.

OP 5.2.2.2 "Affected" Groundwater Generated during Well Development and Sample Collection

It may be necessary to develop (or redevelop) wells and collect samples of groundwater that has been affected by the mining operation to the extent that surface discharge of the water is not appropriate. During well development and sample collection, this water will be collected and treated; and the waste will be discharged to the Storage Ponds and UIC Class I and Class V wells.

OP 5.2.2.3 Groundwater Generated during Aquifer Restoration

During the various steps of aquifer restoration (**Section RP 2.3**), groundwater will be generated; and disposal of some or all of the water will be required. During sweep, groundwater will be pumped from the production zone, creating an area of drawdown. This will create an influx of water from outside the production zone that will replace the affected volume of water within the production zone. In most cases, the water produced during sweep will be processed for residual uranium content through the ion exchange

circuit, and then disposed directly to the UIC Class I wells. In some cases, the groundwater pumped from the production zone may be treated by RO to reduce the waste volume; and the treated water (permeate) may be used in Plant processes or for makeup water, in other restoration activities, or discharged to a UIC Class V well. To maintain the area of drawdown, the permeate will not be re-injected into the production zone, but will be transferred to other mine units for use as makeup water or injected into the UIC Class I or Class V wells. The concentrated byproduct material (brine) will be injected into the UIC Class I wells.

During RO, groundwater will be pumped from the production zone. The pumped water will be treated by RO; and the permeate will be injected back into the production zone. To maintain an area of drawdown, an effective bleed will occur by adding additional permeate from other RO activities or by adding clean water to the permeate at a rate less than the produced rate. The brine from the RO treatment will be injected into the UIC Class I wells. Similarly, during other restoration steps, the amount of groundwater pumped from the aquifer will exceed the amount pumped back to the aquifer; and that excess water will be disposed of in the UIC Class I wells.

OP 5.2.3 Disposal of Liquid 11(e)(2) Byproduct Materials

The liquid 11(e)(2) byproduct materials generated during the Project will be managed by disposal well injection in conjunction with Storage Ponds.

OP 5.2.3.1 Storage Ponds

The two Storage Ponds described in **Section OP 2.9.4** will be used to temporarily store the water that will ultimately be disposed of in the UIC Class I wells. To help maintain the integrity of the ponds by reducing liner exposure to sun, wind, and freezing temperatures, water will be kept in the ponds at all times by diverting a portion of the water that would normally go to the UIC Class I wells. The exception would be during pond maintenance or repair, at which times the liquid would be piped directly to the UIC Class I wells.

Routine pond inspections and monitoring will be conducted as specified in **Section OP 2.9** of this report. The inspection reports and monitoring results will be maintained on-site and summarized in the Annual Report submitted to NRC and WDEQ-LQD. Any maintenance issues identified during an inspection will be addressed in a timely manner to reduce the chance for damage to the pond integrity or liquid release to the environment.

LC ISR, LLC commits to maintain the concentration of selenium in the holding ponds to less than or equal to 0.02 mg/L, which is the level at which selenium concentrations can become detrimental to some wildlife including birds. The growth of algae and other plant growth in the ponds will be minimized through the use of a biocide. This will minimize the growth of plants and therefore minimize the potential for bioaccumulation of selenium. If the level of selenium in the ponds cannot be maintained at a level of less than or equal to 0.02 mg/L selenium, the ponds will be covered to prevent access by birds and/or the affected water will be drained.

OP 5.2.3.2 UIC Class I Wells

Up to five UIC Class I wells are planned in the southern portion of the Permit Area as the primary disposal method for the liquid 11(e)(2) byproduct materials. LC ISR, LLC has been issued a UIC Class I permit from WDEQ-WQD, which has primacy in Wyoming for the UIC program. In addition to the liquid 11(e)(2) byproduct materials, other compatible liquid wastes will be disposed of in the wells (**Section OP 5.2.1)**. The wells will be monitored in accordance with the requirements of the UIC permit; and an evaluation of the well performance will be included in the Annual Report submitted to NRC and WDEQ.

OP 5.2.3.3 UIC Class V Wells

Two UIC Class V wells within the Plant area are added as a secondary disposal method for treated waste water. LC ISR, LLC has been issued a UIC Class V permit from WDEQ-WQD. Permeate from RO treatment of waste water will be disposed of in the wells (**Section OP 5.2.1)**. The wells will be monitored in accordance with the requirements of the UIC permit; and an evaluation of the well performance will be included in the Annual Report submitted to NRC and WDEQ.

OP 5.3 Solid Wastes

Solid wastes, some of which will be classified as NRC 11(e)(2) byproduct materials, will be produced during construction, operation, and reclamation activities of the Project. Appropriate storage, treatment, and disposal methods for these wastes differ, as outlined below.

OP 5.3.1 Solid Non-11(e)(2) Byproduct Materials

The solid non-11(e)(2) byproduct materials will include: non-hazardous materials typical of office facilities, such as paper, wood products, plastic, steel, biodegradable items, and sewage sludge; and hazardous materials also typical of office and ISR facilities, such as