July 25, 2012

Mr. Steve Hatten
President
Lost Creek ISR, LLC
5880 Enterprise Drive, Suite 200
Casper, WY 82609

SUBJECT: LOST CREEK ISR, LLC, LOST CREEK *IN SITU* RECOVERY FACILITY, SWEETWATER COUNTY, WYOMING, SUMMARY OF JUNE 27, 2012 MEETING - (TAC NO. J00660)

Dear Mr. Hatten:

By letter dated September 23, 2011, Lost Creek ISR, LLC (LCI) submitted to the U.S. Nuclear Regulatory Commission (NRC) the Mine Unit 1 (MU-1) wellfield package for the Lost Creek Project in Sweetwater County, Wyoming, (Agencywide Documents Access and Management System (ADAMS) accession no. ML12202B115). The NRC and LCI staffs discussed questions concerning the MU-1 submission during a teleconference on April 30, 2012, which were documented in the meeting summary dated June 22, 2012 (ADAMS accession no. ML12174A095). On June 27, 2012, the NRC staff held a public meeting between the staff and LCI representatives to discuss NRC staff's questions concerning the MU-1 submission. The enclosed meeting summary documents discussions that occurred during this teleconference.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice for Domestic Licensing Proceedings and Issuance of Orders," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of NRC's document system ADAMS. ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html.

If you have any questions concerning this letter, please contact me, either by telephone at (301) 415-6142, or by email at Tanya.Oxenberg@nrc.gov.

Sincerely,

/RA/ JSaxton for TOxenberg

Tanya Palmateer Oxenberg, Ph.D.
Project Manager
Uranium Recovery Licensing Branch
Decommissioning and Uranium Recovery
Licensing Directorate
Division of Waste Management
and Environmental Protection
Office of Federal and State Materials
and Environmental Management Programs

Docket No.: 040-09068

Enclosure:
Meeting Summary

cc:
Meeting Attendees (w/o Enclosures)
M. Bautz, WDEQ (w/o Enclosures)
M. Newman, BLM (w/o Enclosures)

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ML12200A091

Office	DWMEP	DWMEP	DWMEP	DWMEP
Name	TOxenberg	BGarrett	JSaxton	JSaxton for TOxenberg
Date	7/19/12	7/23/12	7/23/12	7/25/12

OFFICIAL RECORD COPY

MEETING REPORT

DATE: June 27, 2012

TIME: 10:00 a.m. – 3:00 p.m.

PLACE: U.S. Nuclear Regulatory Commission
Two White Flint North, Rockville, Maryland
Room T8C1

PURPOSE: To discuss verification questions concerning MU-1 Wellfield Package at the Lost Creek Project (Attachment 2)

ATTENDEES: See Attached Attendee List (Attachment 1)

BACKGROUND:

Lost Creek ISR, LLC (LCI) submitted Mine Unit 1 (MU-1) wellfield package for U.S. Nuclear Regulatory Commission (NRC) review and verification on September 23, 2011 (ML11290A121) to meet requirements of license condition 10.12. LCI provided clarifications on several hydrology questions in an email dated March 29, 2012 (ML12093A405). The NRC and LCI staffs discussed questions concerning the MU-1 submission in a teleconference on April 30, 2012 (ML12174A095).

The discussions did not resolve all NRC staff's questions concerning the MU-1 submission and staff prepared an Excel table "the verification Issues Table" that details staff's need for clarification in order to provide verification of MU-1 Wellfield Package (Attachment 3; ML12200A128). The table listed the verification issue the staff's interpretation of LCI's perspective as discussed in the April 30 teleconference, the staff's perspective on LCI's position, and potential resolution of the issue.

Staff also attached documents with the backup calculations to document staff's position to the Excel Table. The attached documents consist of the following:

1. Vertical Anisotropy(Attachment 4; ML12200A140)
2. Extent of Mudstones between HJ Subhorizons (Attachment 5; ML12200A148)
3. Effect of Fully Penetrating Wells (Attachment 6; ML12200A152)
4. Radius of Influence for Line Drive (Attachment 7; ML12200A158)

The NRC staff made these documents available to the licensee two weeks prior to the meeting in order for the licensee to prepare for a meaningful discussion at the teleconference.

DISCUSSION:

The teleconference began at 10:00 a.m. EDT. The moderator read the standard introduction for a Category 1 public meeting followed by introductions of persons attending the meeting. One member of the public listened in on the meeting.

Issue Field QA/QC Item (1)

The discussions began with the Issues Table Field QA/QC Item 1 "Mistakes are made." LCI staff clarified that they are concern with minimizing errors. LCI assured NRC staff that the licensee has written Standard Operating Procedures (SOPs) and the licensee will complete the SOPs and QA/QC Manual prior to start of operations. The NRC staff indicated that the SOPs and QA/QC Manual will be reviewed at the pre-start inspection.

Issue Field QA/QC Item (2)

The issue is the outlier tests. LCI staff stated that they performed the outlier tests in accordance with requirements of the State of Wyoming. The NRC staff indicated that NRC will accept the statistical test for outliers as required by the State of Wyoming; however, outlier tests generally require evaluations of the probable source (e.g., laboratory error, hot spot, etc.) prior to eliminating the outlier based solely on a statistical probability. The NRC staff indicated that the evidence (Laboratory Workorder Receipt Checklist for samples submitted on 5/22/2008 (Attachment 12; ML12201A273), comparison of the data sets for the various sampling locations) suggests that the field sampler had misidentified the source locations of the samples. LCI staff responded that they were reluctant to "correct" the data as it may have been interpreted as arbitrarily modifying data by the regulatory agencies. The NRC staff stated that the evidence was supportive of the correction and that LCI should have noted the probable error in the discussion of the wellfield package regardless of whether or not LCI corrected the data. LCI staff stated that the State of Wyoming already approved the baseline dataset as is. The NRC staff indicated that some modifications to the baseline database would/may have to be made regardless of whether or not the data in question is revised (e.g., UCLs on a well-by-well basis, sampling results post perimeter well recompletions). LCI staff stated they would contact Wyoming with regard to revising the database. LCI will be submitting results of the recalculation and/or discussions with Wyoming staff in a follow-up report.

A discussion followed regarding the follow-up report, staff's MU-1 verification process, and LCI's requirement to approve the wellfield package through its Safety Evaluation Review Panel (SERP). The NRC staff indicated that the report will include items discussed in the teleconference that staff will need to complete its verification, once the follow-up report is submitted, if the documentation is sufficient, staff will provide a letter documenting that the MU-1 Wellfield Package is verified, and that LCI will have to approve the package through its SERP process. The SERP approval is required to ensure that the baseline data is properly documented as "Commission approved' with the SERP as a surrogate for the Commission through the risk-informed, performance-based license.

Issue Field QA/QC Item (3)

The NRC and LCI staffs discussed this issue with Item (1) above.

Issue Inadequate Evaluation … Item (1)

LCI clarified that the licensee based the rationale for the 800-foot radius on comments from Wyoming DEQ. The thought was that some of the production units in various subhorizons may not have a monitoring well sufficiently close to monitor for an excursion. LCI staff clarified that the phrase "800 foot capture radius for each monitoring well" did not mean that the monitoring well will be used as a pumping well for corrective actions but that the wells will ensure adequate monitoring for all production units.

After the teleconference, staff reviewed the text in the wellfield package with LCI's clarification. The text in the MU-1 package with references to the 800-foot radius consists of the following:

> Page MU1-23
>
> "Also, the completion interval of each monitor well targets the production zone(s) adjacent to that well within an 800 foot radius and on the same side of the Fault. Trend wells will be used to detect changes in water quality for those production completion horizons outside the 800 foot radius and not monitored by the exterior monitor wells (see Figure **MU1 5-6)."**
>
> Page MU1-25
>
> "Following the originally approved installation and testing of the MU1 monitoring system, the WDEQ-LQD requested a -revised monitor well completion program. The revised program (shown in Figure **MU1 5-6)** incorporates an 800-foot capture radius for each monitor well. In other words, each monitor well completion is based on those pattern completion horizons within an 800-foot radius from that monitor well on the same side of the Lost Creek Fault. In addition, two trend wells were installed to allow for those patterns not accounted for within the capture radius of the exterior monitor wells."
>
> "Wells TW1-1, TW2-1, and OWI-1 were also added to the monitoring system to improve detection capabilities in situations where there were no completion zones being monitored within 800 feet of the production pattern. Water levels will be collected from these wells on the same frequency as the monitor well ring wells."

The NRC staff is satisfied with LCI's explanation of the 800-foot radius; however, LCI needs to address one additional concern that the staffs did not discuss at the teleconference in the future report is as follows:

> Describe procedures to detect changes in water quality at the trend wells if LCI did not establish the baseline water quality at those trend wells.

Issue: Inadequate Evaluation … Item (2)

LCI staff committed to having an SOP completed by the pre-start inspection, which details procedures on frequency of water levels monitoring to determine an out-of-balance situation. This commitment is satisfactory to NRC staff.

Issue: Inadequate Evaluation … Item (3)

LCI staff committed to having the corrective actions documented in the follow-up report. This commitment is satisfactory to NRC staff.

Issue: Inadequate Evaluation … Item (4)

LCI staff indicated that the primary purpose for its modeling was to determine the cumulative drawdown; the LCI staff acknowledged the limitations of a one-layer model. NRC staff indicated that vertical anisotropy would both help control the vertical migration but also hinder corrective actions should wells to be used for corrective actions be completed n another subhorizon. The NRC staff presented the following figures at the meeting:

> "Static Potentiometric Surface Contour Map" (Attachment 7, ML12200A160),
>
> "Steady State Zone 3 Potentiometric Surface Contour Map w Zone 4 Wells Operating and 2-year Pathlines" (Attachment 8, ML12200A175),
>
> "Licensee's Potentiometric Surface Contour Map after 457.5 Days" (Attachment 9, ML12200A191), and
>
> "Steady State Zone 3 Potentiometric Surface Contour Map w/o Zone 4" (Attachment 10, ML12200A204).

These figures were generated by staff using a refinement to output from the Analytical Element Modeling (AEM) as documented in Attachment 3.

LCI staff indicated that LCI does not have hydrogeologists on staff and that modeling to account for the vertical anisotropy was expensive. The NRC staff stated that the concern is flare from the production unit, including the possibility of enhanced flare from operation of production units in separate subhorizons, and procedures to correct such flare. For action items, see Item (6) below.

Issue: Inadequate Evaluation … Item (5)

The NRC and LCI staffs discussed this issue in context to Item (4) above.

Issue: Inadequate Evaluation … Item (6)

The NRC staff notes that the multiple horizons both aid in controlling the migration of fluid from the production unit but will also hinder corrective actions and/or monitoring in other subhorizons should unwanted migration occur. LCI asked about the distribution of baseline wells in subhorizons within the production zone. The NRC staff provided handwritten notes on a copy of the licensee's Table MU1 4-1a on which the NRC staff attempted to estimate the subzones for each baseline well using screened elevations. The NRC staff also discussed that other licensees committed to screening fully penetrating wells in a wellfield that had multiple horizons and vertical anisotropy. The NRC staff reiterated that the concern was flaring within the exempted aquifer, that the flaring was minimized (ALARA) and that an adequate flare factor was incorporated in the financial assurance. Given the proposed use of line drives (see Issue: Use

of Methodologies Item (1)), the flare factor may increase over that for a wellfield with the typical 5-spot production patterns. LCI staff question the extent of proposed line drives; NRC staff produced handwritten notes on the extent of line drives and 5-spot patterns for LCI's MU-1 (Attachment 11).

LCI staff noted that multiple zones and line drives are not new and are subjected to and operated safely under ISR operations at existing licensed facilities. For example, LCI staff noted that multiple horizon wellfields include PRI's Wellfield 3, 4a and 15. The NRC staff noted that LCI's proposed operations differs in some respect from other facilities (the fault, contemporaneous versus staggered operations/restoration and segmented wellfields) and provided selected pages of a licensee's evaluation of an appropriate flare factor (Attachment 12).

The NRC staff suggested that the current flare factor may be acceptable for current financial assurance but for Year 1 or Year 2 updates (dependent upon the timing for construction and operation of the first mine unit, LCI would need to include detailed evaluation of the flare factor.

Issue: Inadequate Evaluation … Item (7)

The NRC and LCI staffs discussed this item in part under Item (6) above. An issue not discussed at the teleconference was adequate monitoring during restoration. The approved baseline wells would be sufficient to demonstrate compliance with groundwater protection standards; however, the NRC staff expects a licensee to demonstrate restoration progress through the production area in order to demonstrate that the licensee has performed best management practices in keeping with the ALARA process.

Issue: Inadequate Evaluation … Item (8)

LCI staff indicated that the licensee planned to install the well on the north side of the fault; however, responses to the pumping tests suggest that it is located south of the fault. LCI stated that the nearest well north of the fault would result in a gap of less than 500 feet from the fault to the well. This gap would not be detrimental to the timely detection of an excursion. NRC staff asked that the evaluation be included in the follow-up report.

Issue: Use of Methodologies … Item (1)

LCI staff stated that the industry commonly uses line drives. NRC staff stated that many of the line drives are used in conjunction with 5-spot patterns and not independent as proposed by LCI. NRC staff acknowledged that excessive flare and/or dilution by native groundwater are unwanted by a licensee and thus LCI would operate with a minimum flare factor as possible. NRC staff stated the concern is an adequate flare factor for the financial assurance should a third party have to complete restoration. The NRC and LCI staffs addressed this issue in **Issue: Inadequate Evaluation Item (6)** above.

Issue: Use of Methodologies … Item (2)

LCI committed to providing proper evaluations and commitments in the follow-up report.

PUBLIC DISCUSSION: Steve Brown, SENES, Inc. was the only member of the public. Mr. Brown did not ask any questions.

ACTION ITEMS:

NRC will provide a detailed meeting summary of the questions discussed and provide a timely review of the follow-up report to ensure NRC staff verification of the wellfield package in accordance with License Condition. Staff estimated that a review could take less than 30 days, if the report contains the information noted in this report.

LCI will provide a response to those issues as described above. Specifically, LCI will provide:

(1) A follow-up report which will include:

A. Evaluation of baseline conditions in accordance with license conditions and after consultations with Wyoming DEQ staff;
B. Discussion of Procedures to detect changes in water quality at the trend wells in accordance with LCI's narrative in MU-1 Wellfield Package;
C. Procedures for monitoring and evaluating water levels at the trend/monitoring wells and out-of-balance condition for the production units;
D. Corrective action procedures;
E. Evaluation that the spacing between the fault and the first well north of the fault is adequate to detect an excursion;

(2) SOPs and QA/QC Manual during pre-start inspection (as required by license condition);

(3) SERP of the Wellfield Package; and

(4) Detailed evaluation of a flare factor for Year 1 or Year 2 Financial Surety update.

ATTACHMENTS:
1. Attendee List
2. Meeting Agenda
3. Verification Issues
4. Vertical Anisotropy to the HJ Horizon Lost Creek, Wyoming
5. Extent of Clays between HJ Subhorizons
6. Effect of Fully Penetrating Wells
7. Radius of Influence for Line Drives
8. Static Potentiometric Surface Contour Map
9. Steady State Zone 3 Potentiometric Surface Contour Map w Zone 4 Wells Operating and 2-year Pathlines
10. Licensee's Potentiometric Surface Contour Map after 457.5 Days
11. Steady State Zone 3 Potentiometric Surface Contour Map w/o Zone 4
12. Staff Notes Presented during Teleconference

MEETING ATTENDEES

Topic: Discuss verification questions concerning MU-1 at the Lost Creek Project in Wyoming

Date: June 27, 2012

NAME	AFFILIATION	PHONE NUMBER	E-MAIL
Wayne Heili	Ur-Energy, Inc.	307-265-2373	wayne.heili@ur-energyusa.com
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John L. Saxton	HQ NRC	301-415-0697	john.saxton@nrc.gov
Alan Bjornsen	HQ NRC	301-415-1195	alan.bjornsen@nrc.gov
*Attended by telephone			

Attachment 1

MEETING AGENDA
Lost Creek ISR, LLC
June 27, 2012
Room T8-C1

MEETING PURPOSE: Discuss Verification Questions Concerning MU-1 at the Lost Creek Project.

MEETING PROCESS:

Time	Topic	Lead
10:00 a.m.	Introductions	All
	Discussion of MU-1 Package	All
2:30 p.m.	Summary of Action Items	Moderator
	Public Comment/Questions	Moderator
3:00 p.m.	Adjourn	

Attachment 2