



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

December 7, 2017

MEMORANDUM TO: Bill Von Till, Chief  
Uranium Recovery Licensing Branch  
Division of Decommissioning, Uranium Recovery,  
and Waste Programs  
Office of Nuclear Material Safety  
and Safeguards

FROM: John Saxton, Hydrogeologist */RA/*  
Uranium Recovery Licensing Branch  
Division of Decommissioning, Uranium Recovery,  
and Waste Programs  
Office of Nuclear Material Safety  
and Safeguards

SUBJECT: PUBLIC MEETING SUMMARY

On November 16 2017, the U.S. Nuclear Regulatory Commission (NRC) staff held a Category 1 public meeting using a webinar that originated from the Rockville Headquarters Complex. The purpose of the meeting was to discuss issues identified during staff's adequacy review of Lost Creek ISR, LLC's responses to the request for information on the Lost Creek ISR, LLC's application for the Lost Creek East Expansion area and KM Horizon amendments. A summary of the meeting is enclosed.

Enclosure: Meeting Summary

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SUBJECT: PUBLIC MEETING SUMMARY, DATED DECEMBER 7, 2017

DISTRIBUTION:

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**ADAMS Accession No.: ML17339A177**

<b>OFC</b>	URLB	URLB	URLB
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<b>DATE</b>	12/07/17	12/07/17	12/07/17

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## MEETING SUMMARY

DATE: November 16, 2017

TIME: 10:30 a.m. to 12:00 p.m.

PLACE: Webinar/Teleconference

PURPOSE: This meeting was held at the U.S. Nuclear Regulatory Commission (NRC) Headquarters to discuss issues identified during the staff's administrative completeness adequacy review of the response to staff's request for additional information on the Lost Creek East and KM Horizon amendments.

ATTENDEES: See attached Attendees List.

### **Introduction and Meeting Purpose**

At the request of the U.S. Nuclear Regulatory Commission (NRC) staff, a Category 1 public meeting was held with representatives of Lost Creek ISR, LLC (LCI) to exchange technical information on specific aspects of LCI's response to the NRC staff's Request for Additional Information (RAI) on the KM and Lost Creek East amendment applications. The public meeting notice was published on NRC's webpage on November 7, 2017. A copy of the notice is presented as Attachment 1 (the notice can also be found in the Agencywide Documents Access and Management System (ADAMS) Accession Number ML17311A941).

The meeting started with participant introductions and a reading of a prepared statement by the NRC staff regarding the meeting participation and issuance of the meeting summary. The meeting participants are listed in Attachment 2.

The NRC staff summarized topics for discussion during this meeting, including a review of the issuance of RAIs to Lost Creek. The RAIs were issued as follows:

- RAI 1 through 15; issued July 27, 2017 (ML17199F574)
- RAI 16 through 19; issued August 28, 2017 (ML17227A312)
- RAI 20 through 26; issued October 30, 2017 (ML17298B724)

By letter dated September 25, 2017, LCI submitted a response to RAIs 1 through 19 (first two subsets) (ML17275A674). Currently, the NRC staff is reviewing these responses as part an administrative completeness or adequacy review. The NRC staff explained that the completeness review determines whether (1) the licensee's response addresses the NRC staff's RAI and (2) the entire submitted information is sufficient for the NRC staff to have a reasonable assurance determination for preparation of the Safety Evaluation Report (SER). The NRC staff also explained NRC's role as a cooperating agency with the U.S. Department of the Interior's Bureau of Land Management (BLM) in the preparation of a NEPA review document (a draft Environmental Impact Statement (EIS)) with a release date anticipated prior to completion of the

Enclosure

NRC staff's SER. The NRC staff emphasized the need for the EIS to comport with determinations contained in the SER, which, in part, depends upon an evaluation of LCI's response to staff's RAI's.

Preliminary results of the NRC staff's review of LCI's responses indicate that most appear to be adequate but several may be inadequate; hence, the public meeting was to discuss those RAIs and seek clarification rather than determine outright that the Responses were inadequate.

### **Discussion of RAI Response**

A PowerPoint presentation prepared by the NRC staff was used as a guide for discussions during the webinar (ML17324B356).<sup>1</sup> The NRC staff discussed with LCI representatives that six (6) responses (RAI-2, 8, 11, 15, 16 and 19) appeared to be inadequate and will be those primarily discussed in the public meeting. Several additional RAI's (RAI-13 and 18) were also discussed primarily for minor clarification purposes. The NRC staff noted that RAI-13 and 18 were deemed acceptable; however, the responses included verbiage with which staff disagreed and would be better if LCI revised the language.

LCI's partial response to RAI-2(a) (barometric efficiency calculations) was discussed first. The NRC staff used this partial response as an example of difficulties staff faced with many responses. The NRC staff explained that the information supplied by LCI was sufficient for staff to continue its review but the revised summary table was incorrect in listing the uncorrected rather than corrected drawdown. The NRC staff suggested that the LCI had supplied sufficient information such that staff could correct the revised table in its analysis for the SER. That approach may require additional work and is not desirable. The NRC staff did not specifically request LCI to respond to RAI-2(a).

LCI's response to RAI-8 (cumulative drawdown) was discussed next. The NRC staff indicated that LCI's response that it was an "academic exercise" was inadequate. The NRC staff explained that it will have to determine the maximum potential impact for both the safety and environmental reviews. The NRC staff noted that the information supplied by the application and responses were deemed insufficient and may lead to less than a "reasonable assurance" determination. LCI inquired if the centroid method of using a single well to estimate drawdown for a wellfield was acceptable and staff agreed. LCI stated it understood the issue and that it would provide additional information.

Subsequent to the public meeting, on November 27<sup>th</sup>, the NRC staff held a project-manager to project manager discussion with LCI representatives to clarify information needed to address this issue. The NRC staff and LCI discussed the following items: (1) the mutual interference drawdown in the HJ and KM horizons need to be evaluated; (2) each horizon could have its own separate analysis; (3) a centroid well model was acceptable but multiple wells for a single wellfield were also acceptable; and (4) any method of analysis could be used provided the timing and space variability of the pumping were included. The NRC staff further clarified that the LCI should provide a conservative analysis and that the method may include simplifications as long as the justification or rationale for the simplifications were provided for staff's evaluation.

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<sup>1</sup> Due to time constraints, the PowerPoint presentation was made available only after the public meeting.

LCI response to RAI-15 (missing tables and figures) was discussed next. The NRC staff stated that the electronic submittal only contained figures but not tables. LCI committed to providing the tables to the NRC staff.

LCI response to RAI-16 (commitment to permit three additional Class I deep disposal wells) was discussed next. The NRC staff stated that the response did not provide any additional clarification and LCI did not provide a commitment for permitting of the three additional Class I deep disposal wells and thus was unacceptable. The NRC staff further stated that a commitment to have initiated the permitting process at the time of the Lost Creek East approval, as suggested in the RAI, may have been too conservative. Nevertheless, the NRC staff indicated that LCI needed to commit to some sort of threshold to start the permitting process, considering the lead time to complete the permitting and construction of the new wells and the future existing disposal capacity, in order for staff to have adequate assurance that the disposal capacity is not a limiting factor in any future operation. LCI agreed to re-evaluate this response and determine an appropriate threshold to initiate the permitting process.

LCI response to RAI-11 (background radiological characterization of the Lost Creek East area) was discussed next. Regarding RAI-11(b), the LCI consultant who performed the field work provided additional information on the calibration of portable survey instruments used for measuring exposure rates on Utility Terrain Vehicles (UTV's). LCI agreed to provide additional documentation on the correlation between the previous UTV-based gamma scans (2008 Tech Report volume 2 section 2.9) and the 2013 UTV-based gamma scans (2017 Tech Report section 3.12 and D-10).

Regarding RAI 11(c) and (d), LCI agreed to collect additional surface and subsurface soil samples in the Lost Creed East area, based on a sampling plan that will be submitted to the NRC staff for review.

Regarding RAI 11(e) (sediment sampling downgradient of a stock pond located at the NE, NW quarter of Section 21, T25N R92W, which is fed by a small drainage channel), the NRC staff requested additional clarification as to whether water leaving the pond would cross a site boundary. LCI explained that the drainage channel from that pond is more than one mile from a site boundary and that any water in the drainage channel would likely be rapidly absorbed by the very porous surface soils, with little chance of pond water or sediments traversing a downgradient site boundary. However, the NRC staff also noted that the background sampling is intended to establish baseline conditions should the area be impacted by operations in the future. LCI agreed that the sediment sampling will be performed.<sup>2</sup>

Regarding RAI-11(g) (sampling of vegetation that serves as forage for cattle grazing in the Lost Creek East area), LCI stated that it is difficult to obtain grass samples in sufficient quantity to meet the lower limits of detection recommended in Regulatory Guide 4.14, revision 1 (1980). The NRC staff suggested that LCI review the new MILDOS-AREA calculations when they become available, and compare the results to those obtained from previous MILDOS-AREA calculations (for the currently licensed Lost Creek site) to determine which areas have the

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<sup>2</sup> In accordance with 10 CFR Part 40 Appendix A Criterion 7, the background sampling can be performed during the first year prior to major site construction.

highest airborne particulate concentrations predicted by MILDOS-AREA. If the calculations demonstrate that the areas for the highest airborne particulate concentrations remain within the existing licensed area, then LCI could provide a rationale or justification that the prior sampling meet the recommended sampling of Regulatory Guide 4.14, revision 1. LCI also confirmed that forage samples are not collected and analyzed as part of the operational monitoring program for the Lost Creek site.

The status of a response to RAI-13 (revision of the MILDOS-AREA calculations for the Lost Creek East area), was discussed next. LCI stated that a subcontractor (Two Lines Inc.) will start revising the calculations this month. Given this new information, no additional discussion of this RAI was necessary during this meeting.

LCI response to RAI-18 (airborne effluent and monitoring program) was discussed next. The NRC staff requested LCI to provide additional information on the current status of the program to supplement the information provided in response to RAI-18. LCI stated that it will provide information on (1) monitoring at location HV-6; (2) removal of air particulate station HV-1 and passive radiological stations PR-1, PR-7, PR-8, and PR-11 as authorized by SERP LC17-02; (3) the rationale for not including Th-230, Pb-210 and Po-210 in the analyses of quarterly samples from stock watering ponds; and (4) the ad hoc surface water sampling that will be conducted as necessary and as feasible at "LC" or other ad hoc locations within ephemeral drainage using storm water autosamplers.

LCI response to RAI-19 (QAPP) was discussed next. LCI agreed to submit the latest version of the QAPP, and describe any other changes to Section 5 of the Technical Report.

The discussions then returned to the response to RAI-2 concerning the conceptual model for the confining properties of the K Shale, which is the designated underlying confining unit for the KM Horizon. The NRC staff noted that the commonly accepted excursion monitoring programs are based on the existence of a confining unit. LCI asked if a density of 1 well per 2 acres was sufficient. The NRC staff indicated that the exact density such as 1 well per 2 acres or 1 well per 1 acre could be proposed as long as sufficient justification was provided. The NRC staff further reiterated that the commitment in the responses was somewhat ambiguous. In the Q&A portion of the response, LCI maintained the existing requirement of 1 well per 4 acres unless some future analysis deemed otherwise. In the revised Operations Plan that was submitted with the response, LCI conditionally proposed 1 well per 2 acres if the confining unit thins to less than 5 feet or if a drawdown of greater than 3 feet is observed in the underlying (or overlying) aquifer during a pump[ing] test.

The following additional clarifications were made by the NRC staff on RAI-2 during the public meeting. First, NRC staff stated that it could not approve this application based on a future analysis of the confining ability without any bounding analysis. This is particularly true where staff will not have any responsibility to approve the future analyses. Second, the NRC staff stated that the conditions currently listed in the operations plan do not provide clear criteria for the database for any future analysis. The NRC staff provided several examples that illustrate why additional information is needed. One example concerns interpreting the thinning of the confining unit, i.e., based on a wellfield average or limited to a specific area. Another example

that needed clarification is the method to determine the minimum thickness as few drillholes other than the monitoring wells will likely penetrate the lower confining unit.

The NRC staff emphasized that the monitoring of the lower aquifer is just one facet that needs to be analyzed for the control of fluid migration. The NRC staff proffered a conceptual model for the faulting of the KM and lower horizons at the existing licensed area that may be consistent with the data. The conceptual model is based on the faults not as barriers but may serve as conduits for groundwater flow. The NRC staff considered it necessary for LCI to address this possibility as well as the need for additional monitoring in areas, such as across the fault, if the faulting was not a barrier to groundwater flow.

The NRC staff noted that the results of LCI's data analysis, based on the conceptual model chosen by LCI, will be used in the NRC staff's evaluation, and may, in turn, lead to some restrictions. The NRC staff provided the two examples for clarification. The first example is the use of a value of 1 for the ratio of horizontal:vertical hydraulic conductivities. This ratio, which is significantly less than that typically used for this lithology (e.g., a value of 10), would greatly increase the flare factor and thus increase the calculated pore volume used in the financial surety calculations. A second example is the use of 4 pore volumes of groundwater seep to capture that flare in LCI's numeric modeling. Again, the current financial surety calculations are based on 1 pore volume for the groundwater sweep. LCI expressed a view that the value of 1 for the ratio of hydraulic conductivities was not consistent with their general conceptual model and were unaware that groundwater sweep of 4 pore volumes was used in any analysis. The NRC staff agreed to provide this information as an action item. After the public meeting, the NRC staff provided excerpts from the responses/application for this action item (ML17325A714).

There were no other items for discussion. The NRC staff stated that it would prepare a public meeting summary and a letter to Lost Creek ISR, LLC, noting the deficiencies discussed during this public meeting. The NRC staff explained that LCI is responsible for submitting a written response to that correspondence to document commitments and provide additional information.

At the conclusion of the technical discussions, the NRC staff asked if there were questions from members of the public. The members of the public did not have any questions or comments.

The meeting was adjourned at 12:00 EDT.

**ATTACHMENTS:**

1. Meeting Notice
2. List of Attendees





## PUBLIC MEETING AGENDA

Discuss Lost Creek's responses to

RAIs November 16, 2017, 10:30

AM to 12:30 PM

Webinar

<i><b>Time</b></i>	<i><b>Topic</b></i>	<i><b>Speaker</b></i>
11:00 AM – 11:05 AM	Introductions, Opening Remarks, and Statement of Purpose	NRC
11:05 pm – 12:45 pm	Discuss Lost Creek's Responses to RAIs	NRC/Lost Creek
12:45 pm – 13:00 pm	Public discuss regulatory issues with NRC	Public
13:00 pm	Closing Remarks/Adjourn	NRC

The time of the meeting is local to the jurisdiction where the meeting is being held.

The NRC provides reasonable accommodation to individuals with disabilities where appropriate. If reasonable accommodation is needed to participate in this meeting, or if a meeting notice, transcript, or other information from this meeting is needed in another format (e.g., Braille, large print), please notify the NRC meeting contact. Determinations on requests for reasonable accommodation will be made on a case-by-case basis.

ADAMS Accession Number: ML17311A941

Distribution:

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Link to meeting details: <https://www.nrc.gov/pmns/mtg?do=details&Code=20171373>

Commission's Policy Statement on "Enhancing Public Participation in NRC Meetings" 67 Federal Register 36920, May 28, 2002  
The policy statement may be found on the NRC website <http://www.nrc.gov/reading-rm/doc-collections/commission/policy/67fr36920.html>

Attachment 1



## MEETING ATTENDEES

**Date: November 16, 2017**

**Topic: Discussion of LCI's Response to RAI's on the Lost Creek East/KM Horizon Amendment**

NAME	AFFILIATION
John Saxton	NRC
Anthony Huffert	NRC
Ian Irvin	NRC
Christine Pineda <sup>a</sup>	NRC
Sarah Achten	NRC
John Cash <sup>a</sup>	Lost Creek ISR, LLC
Steve Hatten <sup>a</sup>	Lost Creek ISR, LLC
Mike Gaither <sup>a</sup>	Lost Creek ISR, LLC
Jim Bonner <sup>a</sup>	Lost Creek ISR, LLC
John Cooper <sup>a</sup>	Lost Creek ISR, LLC
Bob Meyer <sup>a</sup>	Lost Creek ISR, LLC Consultant
John Berry <sup>a</sup>	Member of the Public <sup>b</sup>
Beth Kelly <sup>a</sup>	Member of the Public <sup>b</sup>

<sup>a</sup> Participated via the webinar/telephone

<sup>b</sup> Although considered a member of the public for this meeting, the participant is a consultant for BLM in the preparation of an Environmental Impact Statement that would be used for this project.