May 26, 2009

Mr. Mike Griffin
Director of Environmental
and Regulatory Affairs
Uranium One
907 N. Poplar Street
Suite 260
Casper, WY 82601

SUBJECT: MAY 11, 2009, CONFERENCE CALL REGARDING ENERGY METALS CORPORATION'S MOORE RANCH IN SITU RECOVERY URANIUM PROJECT

Dear Mr. Griffin:

On May 11, 2009, a public conference call was held to discuss Energy Metals Corporation's (EMC's) application for a license to construct and operate an *in situ* recovery uranium facility at its Moore Ranch site. EMC is a wholly owned subsidiary of Uranium One, Inc. The U.S. Nuclear Regulatory Commission (NRC) had completed its review of the non-radiological aspects of EMC's application and prepared an internal draft of the Safety Evaluation Report (SER). The conference call was held to discuss open issues that NRC staff identified in preparing the non-radiological sections of the draft SER. A summary of the meeting is enclosed.

The issues discussed during the conference call must be resolved in order for us to continue development of the Moore Ranch SER. Within 30 days, please either provide the information identified in the meeting summary or inform us of the date you expect to provide the information. Note that a delay in providing information may result in a delay in our review of your application.

If you have any questions concerning this letter, please contact me, either by telephone at (301) 415-6629, or by e-mail at myron.fliegel@nrc.gov.

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.

Sincerely,

/RA/

Myron Fliegel, Senior Project Manager
Uranium Recovery Licensing Branch
Division of Waste Management
and Environmental Protection
Office of Federal and State Materials
and Environmental Management Programs

Docket No. 40-9073

Enclosure: Meeting summary

cc: G. Mooney, WDEQ

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Docket No.: 40-9073

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cc: G. Mooney, WDEQ

Distribution:
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Name	MFliegel	BGarrett	SCohen	MFliegel
Date	5/20/09	5 /20/09	5/21/09	5 /26/09

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MEETING SUMMARY
Energy Metals Corporation Moore Ranch ISR

DATE: May 11, 2009

TIME: 1:00 p.m. - 2:50 p.m.

PLACE: U.S. Nuclear Regulatory Commission
Two White Flint North, Rockville, Maryland
Room T8 C1

PURPOSE: To discuss non-radiological issues relating to Moore Ranch ISR License Application

ATTENDEES: See Attached Attendee List

BACKGROUND:

The teleconference was held to discuss Energy Metal Corporation's (EMC's) application to construct and operate an *in situ* recovery (ISR) uranium facility at its Moore Ranch site in Wyoming. EMC is a wholly owned subsidiary of Uranium One, Inc. The U.S. Nuclear Regulatory Commission (NRC) staff had completed its review of the non-radiological aspects of EMC's application and prepared an internal draft of the Safety Evaluation Report (SER). The teleconference was held to discuss open issues that NRC staff identified in preparing the non-radiological sections of the draft SER.

DISCUSSION:

The teleconference began at 1:00 p.m. EST. The NRC team leader for new uranium recovery facilities, Steve Cohen, stated that the meeting was open to the public and that members of the public would be allowed to ask questions or make comments at the end of the meeting. Several members of the public listened in on the conference call.

The NRC project manager for the Moore Ranch review, Myron Fliegel, discussed the status of the NRC review. He stated that the radiological and health physics sections of the draft SER were not yet complete but expected them to be finished within the next few weeks, at which time another conference call will be held to discuss open issues from that review.

The open issues were then discussed.

NON-HYDROLOGY OPEN ISSUES – MYRON FLIEGEL and DANIEL GILLEN

A summary of the issues identified and EMC's responses is presented below.

1. Consistency in identification of wellfields.

Chapter 1 of the Technical Report (TR) discusses 3 wellfields, with other chapters showing 3 wellfields in some figures. In other places in the TR only two wellfields are identified, with wellfield 3 designated as part of wellfield 2. The application must be consistent.

Enclosure

EMC responded that its plan is for two wellfields so it will make corrections to the TR.

2. Update schedule of activities.

The schedule of activities shown in figure 1.8-1 of the TR indicates construction is to begin in early 2009 with production starting in mid 2009. This should be updated and consistent in the TR.

EMC agreed to update the schedule.

3. Correct longitude and latitude of site.

The latitude (72º 55' 28.5739") and longitude (-72º 32' 14.4097") provided in section 2.1 of the TR are incorrect; those coordinates are a location in Baffin Bay off the coast of Canada. The correct coordinates should be provided.

EMC stated that it will correct the coordinates.

4. Explanation of proposed distant site boundaries.

The total area within the proposed site boundary is 7110 acres (11.1 square miles), while the restricted area around the central plant is approximately 1 acre. The proposed site boundary is, in many locations, more than a mile away from the central plant and the wellfields, as shown in figure 2.1-2. EMC has not provided explanation for the proposed distant site boundaries.

EMC stated that the proposed license boundary is based on its claims. The proposed license boundary may include additional wellfields based on further exploration and development. MILDOS was used to estimate the dose at the proposed site boundary in 16 compass directions. EMC stated that if the site boundary were closer, it would not be a problem with the dose assessment. EMC will address this issue.

5. Figure 5.7-1 is missing.

EMC indicated in Section 3.2.3.2 of the TR that a description of the areas in the proposed plant facility where radiological gases or air particulates could be generated is provided in Section 5.7 and shown on Figure 5.7-1 as monitoring locations. Note that Figure 5.7-1, intended to show monitoring locations for potential radiological gases or air particulates, is missing.

EMC will check and resolve this issue.

6. Liquid waste disposal plans are contingent on approval by Wyoming.

EMC submitted an application on May 12, 2008, to the State of Wyoming (WDEQ-WQD) for a UIC Permit. Since liquid waste disposal plans are contingent upon the approval of the State for deep well disposal, EMC must provide either the completed permit information or information on the latest status of this permit request which would then lead to a license condition requiring the completed permit information prior to operation.

In addition, EMC indicated in the TR that it plans to install three deep disposal wells at the Moore Ranch facility for liquid waste disposal. Subsequently, it stated that the third well **<u>may</u>** be

constructed as back up during restoration. Definitive clarification is needed on the waste volumes, well capacities, and resulting number of disposal wells.

EMC stated that it is working with the State on the waste disposal issue. EMC must resubmit the application as a Class I permit, as there are issues with permitting it under Class V. UIC Class V wells can not be used to inject radioactive waste, so EMC would have to remove the radium and uranium under this option. EMC did not want to produce a solid radioactive waste.

The original issue with permitting the disposal under UIC Class I was the prohibition of discharge to an aquifer above a drinking water aquiver. The State now concludes that the Madison formation, which is below the aquifer proposed for discharge, can be exempted as an underground source of drinking water, based on its great depth.

7. Incorrect reference on page 4-6 to figure 3.1-5A – should be figure 3.1-4A. Page 4-8 repeats paragraphs from previous page.

There are two minor issues related to the plans for liquid waste disposal: 1) TR page 4-6, section 4.2.2 incorrectly references Figure 3.1-5A when it should reference Figure 3.1-4A, and 2) page 4-8 has 2 paragraphs at the top that are duplicates of paragraphs on the previous page.

EMC agreed to fix the figure reference and repeated text.

8. Multiple tank failures are not addressed.

EMC indicated that a concrete curb would be built around the entire process building, and would be designed to contain the entire contents of the largest tank within the building in the event of a rupture. Any spill of plant fluids would be contained by this curb, drained to the sump system, and pumped to the waste disposal system. The applicant also needs to address the likelihood of and measures for preventing a multiple tank failure such as might occur if one failed tank fell into an adjacent tank or as recently occurred during an accident at PRI.

EMC will address this issue.

9. An agreement for disposal of 11e.(2) is needed.

EMC has committed to disposing of byproduct material (expected to average about 100 cubic yards per year) at a licensed site, and has indicated that a disposal agreement will be in place prior to the start of operations. Unless an agreement is provided before it is issued, the initial license will have a condition requiring verification of the solid waste disposal agreement prior to the start of operations.

EMC stated that it understands.

10. Interim storage of 11e.(2) is not discussed.

EMC estimates that the proposed project will produce approximately 100 cubic yards of 11e.(2) byproduct material per year, and that this material will be stored on site until such time as a full shipment can be made. The location of, and plans for, interim storage of 11e.(2) material prior to disposal must be included in the application's discussion of waste.

EMC will provide the information.

11. Section 5.2 does not include a focused discussion of reporting requirements.

Although Section 5.2 of the TR acceptably discusses recordkeeping, it does not include a focused discussion of reporting requirements – see SRP 5.2.3 (13) and relevant regulations in Parts 20 and 40.

EMC will provide the discussion.

12. There is no approved agreement for offsite waste disposal.

The TR sections on reclamation and decommissioning are also lacking information on an approved waste disposal agreement for 11e.(2) byproduct material. Also note that on TR page 6-22, top paragraph, there is a reference to "NRC-licensed disposal facility," when in fact the disposal facility does not have to be licensed by NRC.

EMC will correct the TR.

13. Flare factor used for surety estimate is not justified and is inconsistent in application.

The flare factor and pore volume assumptions must first be resolved in the hydrology review and then applied to the surety estimates. TR page 6-33 indicates that a flare factor of 1.5 is used, while the cost estimates in Appendix D use 1.4. The pore volume is an open issue in the hydrology review.

EMC agreed to revise its surety estimate based on resolution of the hydrology issues.

14. Compliance with 10 CFR 20.2202 and 20.2203 after radiological release accident is not discussed.

The discussion in TR section 7.5.2, discussing radiological release accidents, did not address how EMC would meet the requirements in 10 CFR 20.2202 regarding notification of incidents and 20.2203 regarding reports of exposures, radiation levels, and concentrations exceeding limits.

EMC will provide the information.

15. Multiple tank failure accidents are not discussed.

The discussions in TR section 7.5 did not consider the possibility of multiple tank failures caused by a single event.

EMC will provide a discussion.

16. Vacuum dryer accidents are not discussed.

The discussion in TR section 7.5.2, discussing radiological release accidents, did not address accidents involving the vacuum dryer or other plant equipment handling radioactive material.

EMC will provide a discussion.

HYDROLOGY – ELISE STRIZ

A summary of the issues raised by Elise Striz, NRC groundwater hydrologist, with EMC's responses is presented below.

1. **Characterization of 60 sand is incomplete.**

EMC reported that an approximately 80-foot shale separates the "68 sand" from the next aquifer known as the "60 sand." The "60 sand" aquifer is about 100 feet thick and continuous across the proposed license area. Where the 68 and 70 sands coalesce in Wellfield 2, EMC stated that it considers the "60 sand" as the underlying aquifer to the ore zone. EMC reported that no wells are currently in the "60 sand," so no information on the potentiometric surface or groundwater flow system is available. EMC stated that it is in the process of characterizing the "60 sand" by additional borings, so a technical evaluation of its behavior as the proposed underlying aquifer in these areas is not possible at this time.

EMC stated that there is ongoing work on the 60 sand and that it plans to provide information to address the question. Wells have been installed and it is going to schedule short-term pumping tests. However, EMC will not be able to provide the information within 30 days.

2. **The location of the area where the 60 sand is the underlying aquifer is not provided.**

EMC has not identified on a map the locations in the wellfields where the "60 sand" will be considered the underlying aquifer. This information is needed to assess the proposed monitoring of the underlying aquifer.

EMC will provide the information.

3. **The vertical gradient between the 68 sand and the 60 sand is not assessed.**

EMC did not assess the vertical gradient across the confining layer between the "68 sand" and the "60 sand" in Wellfield 2, even though EMC indicated the "60 sand" was the underlying aquifer in portions of this wellfield where the 70 and 68 sands coalesce. It is, therefore, unknown if the shale under the "68 sand" has the integrity to protect the "60 sand" from excursions in this region.

EMC is collecting the data and will provide it to NRC.

4. **Pump tests are lacking in the 68 sand where it is part of the ore zone.**

EMC has stated that the "68 sand" will be included as part of the ore zone in portions of Wellfield 2 which will be determined by future hydrologic testing. EMC has not, however, conducted pumping tests in the "68 sand" to establish confinement of the underlying "60 sand" aquifer from the "68 sand" in these areas of Wellfield 2.

EMC will be performing pumping tests in the "68 sand" on a smaller scale than other tests. There will be wells in "60 sand" and all the way up.

5. **The baseline water quality of the 60 sand is not assessed.**

EMC did not assess the average pre-operational baseline water quality in the "60 sand" in the proposed license area. The "70 sand" ore zone coalesces with the "68 sand" in several regions of Wellfield 2. EMC has stated that the "60 sand" will be the underlying aquifer in these areas of Wellfield 2. EMC must, therefore, assess the baseline water quality in the "60 sand."

EMC stated that it is tracking down data and may have one sample. It will be conducting further sampling soon.

6. **The impact of CBM water on the 72 sand is not completely evaluated.**

NRC staff recognizes the apparent lack of evidence of impact to the "72 sand" aquifer from coal bed methane (CBM) produced water based on a comparison of the type of water. However, NRC staff notes that EMC stated that there was an impact to surface water quality and in some locations (MRSW-10 and 11) there is infiltration of CBM produced water to groundwater at the site. NRC staff also reviewed the water quality from the four "72 sand" wells currently sampled in the proposed license area and found that OMW-2, which is near a drainage with CBM produced water discharge points, showed higher values for sodium, calcium, magnesium, sulfate, TDS, conductivity, manganese, total iron, total manganese and radium 226 as compared to OMW-1 and OMW-3 which are not close to discharge points and in topographic highs. OMW-4, which is also located near CBM water discharge points showed water quality which was elevated similar to OMW-3 with the exception of sodium. This sampling may show that CBM produced water has impacted the surficial aquifer water quality in the "72 sand" at Moore Ranch. EMC should continue to evaluate the impact of CBM discharge on the "72 sand" through well installation and water quality testing. This baseline is important to allow EMC and NRC to distinguish the impact of CBM produced water from surface spills, well/pipeline leaks or excursions to the "72 sand" from ISR operations.

EMC stated that it will reevaluate the data again because there may be differences that are not due to CBM discharge.

NRC pointed out that it's to EMC's advantage to identify the baseline quality and impacts from CBM produced water prior to ISR operations because it will be more difficult to attribute contamination of that aquifer to CBM water after operations commence.

7. **Proposed casing materials and joints are not justified.**

For wellfield infrastructure, EMC stated that wells would be completed with schedule 40 PVC well casing using either glue and screw or mechanical threaded joints. NRC staff notes that the use of Schedule 40 PVC and glue and screw joints has led to many failures in currently

operating ISL facilities. EMC has not justified the use of the casing materials and joints proposed in light of past industry experience.

EMC will address this issue.

8. **Evidence is not provided that extraction rates to recover an excursion will not result in excessive dewatering.**

The groundwater flow model simulations provide evidence that EMC can maintain a cone of depression for expected production and restoration operations in the unconfined "70 sand" aquifer. However, substantial dewatering can occur at extraction wells if rates exceed 20 gpm. Dewatering of wells in the unconfined aquifer will limit the flexibility in the extraction rates which can be used at Moore Ranch. These limits may pose a problem if an excursion of lixiviant from a wellfield occurs. Correcting an excursion typically involves a strategy of ceasing injection and increasing pumping rates near the excursion. In the application, EMC stated that an excursion could be reversed within a relatively short period of time, assuming the required extraction rates can be maintained. EMC also stated that additional simulations would be performed using the groundwater model to further refine methods to recover an excursion; however, it did not simulate this scenario with the groundwater flow model to demonstrate that excursion capture would not lead to excessive dewatering.

EMC will address this.

9. **The adequacy of the monitoring well ring to detect excursions is not shown.**

The groundwater flow model simulations conducted by EMC use a single layer model to represent the "70 sand." NRC staff notes this assumption is appropriate for the smaller five spot groundwater flow model which covered areas of the wellfields where the "70 sand" and "68 sand" do not coalesce. However, in the northeastern and central portion of Wellfield 2, the "70 sand" coalesces with the "68 sand." For these areas the single layer model might not be adequate and it may be necessary to create a multi-layer aquifer model to determine how the drawdown is propagated across the ore zone to the monitoring well ring as the thickness of the aquifer is the combined thickness of the 68 and 70 sands. In this scenario, the drawdown may be less and the cone of depression may not reach to the monitoring well ring.

EMC stated that much of this will be a wellfield specific question and will be addressed in detail during development of wellfield packages. EMC realizes that it will take a few pumping tests to get the detail for the area where the two layers coalesce.

10. **The description and use of downhole gas spargers at Moore Ranch is not provided.**

In the discussion of how oxygen dissolution was controlled in another unconfined ISR operation, it was stated that downhole gas spargers were used. If they are to be used at Moore Ranch, their physical and functional description must be included in the application.

EMC will provide descriptions of gas spargers or other proposed methods to keep oxygen in solution.

11. **The behavior of the 70 sand during operation has not been adequately assessed in the area where it coalesces with the 68 sand.**

The field testing and groundwater flow simulation results presented by EMC assess the behavior of the "70 sand" unconfined aquifer. However, it is unknown how the "68 sand" will be impacted by operations in the area where the "70 sand" and the "68 sand" coalesce as EMC did not include this layer in the simulations.

EMC understands and will address this issue.

12. **The location of monitoring wells in the 60 sand where it is the underlying aquifer is not provided.**

Monitoring wells will be established in the "72 sand" overlying aquifer and "68 sand" underlying aquifer on four-acre spacing for the proposed wellfields to detect vertical excursions. In the areas where the "68 sand" and the "70 sand" coalesce in Wellfield 2, EMC stated that it would treat them as one aquifer. It would, therefore, install additional monitoring wells in the "68 sand" to provide additional monitoring capabilities to detect any impacts outside of the area where the two sands coalesce. EMC also stated it would install monitoring wells in the underlying "60 sand" in the region where the 68 and 70 sand coalesce in Wellfield 2 at a spacing of one every four acres. EMC indicated the location of these underlying wells will be determined during wellfield planning and submitted to WDEQ in the wellfield hydrologic data package. Without reviewing the number and location of these wells, NRC staff cannot be assured that they will provide adequate monitoring of this region of Wellfield 2.

EMC will provide the information to NRC.

13. **The proposed excursion indicators for the overlying 72 sand may not distinguish effects from CBM water.**

EMC has proposed the use of chloride, conductivity and total alkalinity for excursion indicators in the overlying "72 sand." The "72 sand" may have been impacted in the past by CBM produced water discharge and may also be impacted in the future. CBM discharge, as described in the application, contains high values of TDS and bicarbonate which can influence the values of conductivity and alkalinity. EMC stated that, based on its analysis of water quality in the "72 sand" at four monitoring wells across the wellfields, there is currently no apparent impact from CBM produced water and concluded these indicators are appropriate. EMC has not demonstrated that this monitoring is sufficient to make this conclusion for all of the "72 sand." Such a determination may only be made after a thorough baseline evaluation of the water quality of the "72 sand" has been conducted to determine if there are areas of impact, especially near CBM discharge points. EMC may need to propose other excursion indicators in areas which have been impacted to distinguish between CBM produced water effects and future ISL operation spills, leaks or excursions on the "72 sand."

EMC understands the issue and will address it.

14. **NRC review of hydrologic data packages.**

The Moore Ranch site contains numerous unique aspects to its operation, many of which will only be resolved during hydrologic testing. NRC staff review of the hydrologic testing is

essential to resolve these issues. EMC should, therefore, provide the hydrologic data package for each wellfield to NRC for review and approval.

EMC agreed to provide the information.

15. **The potential for corrective actions for excursions resulting in excessive aquifer dewatering is not resolved.**

Once an excursion is verified, EMC will implement corrective actions. These include an investigation of probable cause, adjusting production/injection rates to produce an inward gradient away from the offending well, pumping individual wells to recovery more lixiviant, or suspending injection in the area adjacent to the well on excursion. EMC stated that an excursion could be reversed within a relatively short period of time. NRC staff is concerned that pumping of the aquifer to capture an excursion could lead to excessive dewatering. EMC stated that additional simulations would be performed using the groundwater flow model to demonstrate recovery of excursions; however, it did not simulate any excursion capture scenarios to support this assertion. EMC could use particle tracking modeling to simulate the movement of an excursion near the monitoring wells and scenarios for capture to address this concern.

EMC will address this.

16. **Revision of the surety if an excursion lasts longer than 60 days is not discussed.**

EMC stated an excursion will be considered corrected when the excursion indicators do not exceed the upper control limits (UCLs) or only one indicator exceeds a UCL by less than 20%. If the concentration of UCLs does not begin to decline after 60 days, EMC will submit a plan and compliance schedule to NRC. EMC did not state that it will update its surety for cleanup of excursions which remain for more than 60 days as discussed in NUREG-1569.

EMC will state that it will update its surety if an excursion lasts more than 60 days.

17. **Restoration of groundwater to the standards in 10 CFR part 40, Appendix A, criterion 5B is not proposed.**

EMC stated that the goal of the groundwater restoration is to return the groundwater quality of the production zone at Moore Ranch to the standard of baseline water quality using Best Practicable Technology (BPT). If this standard cannot be achieved, EMC stated it will achieve pre-mining class of use based on WDEQ standards. NRC regulations require that the groundwater quality be returned to the standards identified in Criterion 5B(5) of 10 CFR Part 40, Appendix A. Those standards are background, the values in the table in Criterion 5C of 10 CFR Part 40, Appendix A, or an alternate concentration limit established by NRC in accordance with Criterion 5B(6). The applicant's goal of restoration to background would meet the standard in Criterion 5B(5)(a), provided the staff approved the proposed background values. The proposal to restore groundwater to its pre-mining class of use is not consistent with the requirements of Criterion 5B(5) and is, therefore, not acceptable to NRC staff.

EMC had questions of how to apply the standards because they were originally written for conventional mills, but thinks they know how to apply them to ISRs and will revise the application to include the Criterion 5B(5) standards.

18. **NRC approval of restoration target values (RTVs) is not discussed.**

EMC proposed to set Restoration Target Values (RTVs) for the Moore Ranch wellfields based on the average baseline water quality in the "70 sand" production zone. A list of constituents to be included as RTVs was provided in Table 6.1-1 of the Technical Report. The baseline water quality will be determined from samples collected in wells completed in each wellfield in the planned production zone before mining begins. The NRC staff will have to review and approve the RTVs as appropriately representing baseline water quality.

EMC agreed and will revise the application to so state.

19. **RTVs for the 68 sand where it coalesces with the 70 sand are not discussed.**

EMC stated that the production zone in Wellfield 2 will include both the "70 sand" and the "68 sand" which coalesce in a large section in the center of the wellfield. EMC has not provided for the determination of RTVs for the "68 sand" in this region.

EMC understands the issue and will address it.

20. **Effect of potential conductivity impairment due to use of dissolved oxygen in lixiviant on restoration is not discussed.**

EMC addressed the issue of conductivity impairment in the ore zone due to the use of dissolved oxygen in the lixiviant. EMC stated that dissolved oxygen may evolve out of solution under reduced hydrostatic heads like those in ore zone "70 sand" unconfined aquifer at Moore Ranch. It stated the free gas phase can lead to "gas lock" in portions of the "70 sand." EMC provided a discussion of experience with "gas lock" and how it was controlled at an ISR in Texas. However, no discussion was presented regarding the restoration of that ISR. NRC staff is concerned that if "gas lock" reduces conductivity in sections of the ore zone, flow can bypass these regions and restoration may be incomplete.

EMC understands the issue and will address it.

21. **Pore volume of the 68 sand where it coalesces with the 70 sand is not included in the estimate of the total pore volume for restoration.**

EMC calculated the pore volume for restoration as the product of the affected ore zone area, the average completed thickness, the flare factor and the porosity. NRC staff notes that in Wellfield 2, the pore volume estimate should include both the "70 sand" and portions of the "68 sand" which coalesce in a large section in the center of the wellfield. EMC did not include this area, although it acknowledged that it would be restored as necessary.

EMC understands the issue and will address it.

21a. **Use of average completed thickness to calculate pore volume.**

This is an additional issue that was not identified on the agenda.

EMC stated that it will use the average completion thickness to calculate the pore volume for restoration. As EMC will only be doing partial completions, it will not screen the entire aquifer thickness. During operation there will be vertical gradients and portions of the aquifer above

and below the depth of the well screens will be affected. All portions of the aquifer affected by operations will have to be restored. EMC did not discuss why it did not use the saturated thickness of the aquifer when calculating pore volume for restoration.

EMC may have a different opinion but it will address the issue.

22. **Detailed description of monitoring during restoration is not provided.**

EMC stated that the mining zone "70 sand" will be monitored during restoration to determine restoration progress, optimize efficiency of restoration methods, and identify any areas of the wellfield that need attention. EMC did not, however, provide a detailed description of the monitoring, including sampling density, parameters, and frequency to substantiate that it will be able to closely monitor and optimize its restoration strategy to achieve or adjust the initial estimate of six pore volumes for restoration.

EMC will provide that information.

23. **Monitoring of the 68 sand where it coalesces with the 70 sand is not discussed.**

EMC has not indicated that the "68 sand" mining zone will be monitored for restoration success where the "70 sand" and "68 sand" coalesce in Wellfield 2.

EMC agreed and will revise the application to so state.

24. **Justification of the proposed 6 month stability monitoring period is not provided.**

EMC stated that after restoration is completed, a minimum six month stability monitoring period will begin, with samples collected every 60 days. EMC indicated that the stability monitoring period of six months is specified by WDEQ LQD Guideline 4. It provided no other justification for this time period which represents three samplings.

EMC will address this issue.

25. **Identification of hot spots when averages are used to determine that restoration standards are met is not discussed.**

EMC stated that the criteria to establish restoration stability will be based on wellfield averages for water quality. EMC has not, however, proposed a strategy to address how high concentration values, also known as "hot spots," in the "70 sand" and "68 sand" are identified and not masked by wellfield averaging during restoration and stability monitoring. NRC staff notes that depending on location and groundwater flow direction, these "hot spots" can act as potential sources of contamination and may require specific attention if they remain.

EMC stated that it will need to discuss this further with NRC staff.

26. **Restoration schedule inconsistent between Figures 1.8-1 and 6.1-1.**

A preliminary wellfield restoration schedule was provided in Figure 6.1-1 of the Technical Report. EMC reported that based on the results of the numerical groundwater flow modeling, it will take approximately four years to restore Wellfield 1 and six years to restore Wellfield 2. This restoration schedule conflicts with Figure 1.8-1 of the Technical Report**.**

EMC will address this issue.

26a. **5 tables are missing from the gw modeling report.**

This is an additional issue that was not identified on the agenda.

EMC will correct this.

NRC staff then discussed six confirmatory items. These were instances where EMC provided acceptable information in response to an NRC request for additional information, but failed to incorporate the information into the application. EMC agreed to address those items.

ACTIONS:

NRC will prepare a summary of the conference call.

EMC will respond to the issues discussed.

Public Participation

None of the members of the public asked questions, when given the opportunity near the conclusion of the conference call.

The meeting concluded at 2:50 p.m.

ATTACHMENTS: 1. Meeting Agenda
2. Attendee List

MEETING AGENDA
Uranium One/Moore Ranch ISR
May 11, 2009

MEETING PURPOSE: Teleconference to Discuss Non-Radiological Issues Relating to Moore Ranch ISR License Application.

MEETING PROCESS:

Time	Topic	Lead
1:00 p.m.	Introductions	All
	Discussion of Non-hydrology Issues (list of issues attached)	All
	Discussion of Hydrology Issues (list of issues attached)	All
	Summary of Action Items	Moderator
	Public Comment/Questions	Moderator
4:30 p.m.	Adjourn	

Attachment 1

Non-hydrology Issues
Uranium One/Moore Ranch ISR
May 11, 2009

1. Consistency in identification of wellfields.
2. Update schedule of activities.
3. Correct longitude and latitude of site.
4. Explanation of proposed distant site boundaries.
5. Figure 5.7-1 is missing.
6. Liquid waste disposal plans are contingent on approval by Wyoming.
7. Incorrect reference on page 4-6 to figure 3.1-5A – should be figure 3.1-4A. Page 4-8 repeats paragraphs from previous page.
8. Multiple tank failures are not addressed.
9. An agreement for disposal of 11e.(2) is needed.
10. Interim storage of 11e.(2) is not discussed.
11. Section 5.2 does not include a focused discussion of reporting requirements.
12. There is no approved agreement for offsite waste disposal.
13. Flare factor used for surety estimate is not justified and is inconsistent in application.
14. Compliance with 10 CFR 20.2202 and 20.2203 after radiological release accident is not discussed.
15. Multiple tank failure accidents are not discussed.
16. Vacuum dryer accidents are not discussed.

Hydrology Issues

Uranium One/Moore Ranch ISR
May 11, 2009

1. Characterization of 60 sand is incomplete.

2. The location of the area where the 60 sand is the underlying aquifer is not provided.

3. The vertical gradient between the 68 sand and the 60 sand is not assessed.

4. Pump tests are lacking in the 68 sand where it is part of the ore zone.

5. The baseline water quality of the 60 sand is not assessed.

6. The impact of CBM water on the 72 sand is not completely evaluated.

7. Proposed casing materials and joints are not justified.

8. Evidence is not provided that extraction rates to recover an excursion will not result in excessive dewatering.

9. The behavior of the 70 sand during operation has not been adequately assessed in the area where it coalesces with the 68 sand.

10. The description and use of downhole gas spargers at Moore Ranch is not provided.

11. The impact of operations on the 68 sand where it coalesces with the 70 sand is not provided.

12. The location of monitoring wells in the 60 sand where it is the underlying aquifer is not provided.

13. The proposed excursion indicators for the overlying 72 sand may not distinguish effects from CBM water.

14. NRC review of hydrologic data packages.

15. The potential for corrective actions for excursions resulting in excessive aquifer dewatering is not resolved.

16. Revision of the surety if an excursion lasts longer than 60 days is not discussed.

17. Restoration of groundwater to the standards in 10 CFR part 40, Appendix A, criterion 5B is not proposed.

18. NRC approval of restoration target values (RTVs) is not discussed.

19. RTVs for the 68 sand where it coalesces with the 70 sand are not discussed.

20. Effect of potential conductivity impairment due to use of dissolved oxygen in lixiviant on restoration is not discussed.

21. Pore volume of the 68 sand where it coalesces with the 70 sand is not included in the estimate of the total pore volume for restoration.

22. Detailed description of monitoring during restoration is not provided.

23. Monitoring of the 68 sand where it coalesces with the 70 sand is not discussed.

24. Justification of the proposed 6 month stability monitoring period is not provided.

25. Identification of hot spots when averages are used to determine that restoration standards are met is not discussed.

26. Restoration schedule inconsistent between figures 1.8-1 and 6.1-1.

Conference Call Participants
Energy Metals Moore Ranch
May 11, 2009

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